

The Fab City

How can we produce deep cultural transformations
by redistributing production?

By Tomas Diez

Introduction

This is not a forecast of the future or a report from the past, the power of what we do today is going to shape both our past and future, so will concentrate on that. We are in the age of making possible the impossible, even of our own destruction; we (humans) have become geological agents in a process accelerated from the second half of the last century. We have entered the era of the anthropocene, we are transforming the pace of the planet, its climate, its ecosystems, exhausting its resources to sustain a model to live a life attached to a culture we have developed for a couple of hundred years, but that is a consequence of thousands of year of human history on earth. Any significant transformation in our culture has been attached to a technological revolution, that lead to a subsequent economic model, which at the same time shapes our societies. We are now integrating new technologies in our everyday life, and we are facing the tensions of a significant transition towards new values, models, power structures and even philosophies towards the human life on earth. We might be revisiting things we have reviewed in the past, but there is no question that we are doing it from a different perspective. Through this article I want to place us in the present, and introduce a possible future, which already started to be constructed.

It was Made in China?

While we are writing and/or reading in our computers, thousands of underpaid employees in African and South American countries are extracting minerals to make microchips and electronic parts (micro controllers, voltage regulators, resistors, capacitors, etc) that make possible for us to see what we type in a keyboard visible in a screen; also for our washing machines, smart phones, gadgets, cars, and almost every single object we use today. Oil extraction camps are surrounded by battle fields where military forces are deployed in order to control the supply chain of polymers that are demanded by our clothing, plastic pieces that make our gadgets, and fuel to power boats, cars and aircrafts that transport goods in shipping containers to every corner of the planet. Raw materials are transported to massive manufacturing centres in countries where extreme low cost hand labour (under inhuman conditions) are permitted and regulated; exploded people process and assembly products we will buy at stores and shopping malls to satisfy our demand for consumption in the places we live. Today's cities are factories of trash that is produced from the disposal of products that could hold frequent flyer numbers, that rely on top of high social costs in places that we even don't know how to mention, and by us paying a high costs too: the lost knowledge on how things are made, where they come from, or which materials are used to be made; we don't question which are the consequences of having a 42" flat screen in every single room of a house. God bless the industrial revolution and the world economic model constructed on top and limited access to production means, and supply chain controlled by a small elite.

Asia, and specially China, is often described as "the factory of the world", the high revenue coming from supplying the world with products have produced thousands of new cities and societal structures, which is following a copy-cat of capitalism, leading to (un) predictable consequences for the resources and ecosystems of the planet. New Chinese and Indian cities have been created and have been growing alongside massive factories for the last half century, creating one of the fastest process of urbanisation in human history ; large scale infrastructure is needed to connect and urbanise hundreds of million people, as well as to supply these new cities with water, energy, products and food. What happens when one third of the world population wants to repeat the contemporary way of living the west have been enjoying for the last century?

I am not saying that our Indian or Vietnamese brothers do not have the right to, but... is the consumer society that good to be replicated? Do we have enough resources in the planet to sustain this type of living for 7 billion and more? Beyond having one of the biggest economic, social and ecological crises in the history of this planet, we haven't looked closer to the biggest of them: cultural crisis. Our culture is constructed on top of our means of production, which have shaped our economy for the last 200 years.

While China's manufacturing capacity has sustained the world's demand for products and goods, western cities have become large entertainment centres that produce tons of trash every day as voracious monsters wanting to be fed. We are thirsty for cheap electronics and products, although these costs are just part of the largest mortgage in history we have sign with large corporations, we don't care as long as we are entertained by semi - naked bodies in our screens that promise us that projections of ourselves are better than we could ever be. The planet's ecological future has been compromised by the greed that feeds the actual economic system, which promised us wealth, quality of life and opportunities. It is working, but only for 1 per cent of the planet's population. And this is a model yet to be copied and desired by the newcomers to world's urbanisation process.

Is this going to change?

There are new indicators showing a change of this tendency towards local production and manufacturing, powered by distributed networks and accessible/ affordable new technologies. China's city-factories are looking for alternative countries to establish their production plants caused by social and economic pressure by Chinese workers. The proposed projects for the construction of the Nicaragua canal will support a new pattern of the supply chain in the global market: goods are traveling slower than before, production is moving back to countries, in a slow pace. While the Panama canal can allow ships with certain size to go through, the truth is that due to the reduction of the demand of transport, larger cargo ships are needed in order to reduce the cost per container. The Nicaragua canal will allow large cargo ships (5 times bigger than the ones going through the Panama canal) to navigate from the Pacific Ocean to the Atlantic Ocean, with a considerable effect in the ecology of Central America . We hope the process of relocating production is more radical, and make shipping containers obsolete.

When did we turn our cities into parasites, killed our local industry and decided that products should be “made in China”? Answer is simple: when cheap products based on cheap production and maximum profit became our religion. The problem is that we did not only lose production capacity in terms of infrastructure, we have lost the knowledge of how things are made, we do not care care since we just have to use and dispose, and this is the base of contemporary culture. But things flow, as Zygmunt Bauman states, we have a constant flow of resources, products, money, trash, polymers, rivers, oceans, air streams, clouds... all inside the same planet makes the trash we dispose comes back to our dining table, and the misery caused in countries that make our products possible is embedded in the things we buy with money earned in jobs we do not like at all. Flows create constant change, and that is the base of our contemporary life, that is what creates tension between the established and accommodated class and the redistribution of resources and power. Things are going to change, they are changing, the question is how we want them to change.

Making Makers

And there it comes the maker movement proclaimed by Chris Anderson as a new industrial revolution that is going to transform everything. People's garages will make as all of us entrepreneurs. Everyone can own its own company, the promise of the inventor that creates a unique technology and then turn it into a mass consumption product and become a billionaire, everyone is a maker and create their own start-up, Silicon Valley could be replicated in any country in the world, and we can have small scale workshops in our houses (as if the rest of the world has a garage) and use our 3D printers (using fossil fuel based plastics) to make our own innovations using cheap prototyping electronic boards which components are made in China. A new supply chain demand has been created for new products that look a bit more geeky, these products power newly invented gadgets to automatically water our plants that can tweet how happy they are using IoT. The maker movement did not start in the Internet, probably we lost the movement initiated when the Whole Earth Catalogue was publishing instructions for anyone to make their own solar cooker, their own urban farming or fixing instructions for washing machines, just for normal people, it was not claiming to be for an specific group of people gifted by technology, but for everyone. We are all makers, but how are we going to learn how to make almost anything?

During the last decade, Fab Labs have been growing exponentially, getting close to a 1000 labs and a community of close to 10,000 people that share common visions on the future of production, and how to make accessible to anyone to make things, by using technology as the main empowerment tool. At the White House in 2013 a the National Maker Faire was hosted for the first time, president Obama months after at the State of the Union addressed the importance of recovering the manufacturing capabilities back to (north) America, by developing advanced manufacturing and research centres, and by supporting the spirit of innovation of the maker nationwide, from schools to large manufacturers. Meanwhile Europe concentrates more than 50 per cent of the entire number of Fab Labs in the world. Fab Labs are network of close to a thousand small scale manufacturing and invention facilities lead by passionate people with the aim to bring access to these tools for anyone, anywhere to make almost anything; Fab Labs allow anyone to make almost anything while sharing it with the world. It is true that this is a large phenomena in the developed world, but it is also true that there is an emergent network of Fab Labs in Latin America (close to 60 labs), Africa, and Asia, that are nowadays the most consolidated and articulated community in the network, developing projects such as the Amazon Fab Lab, a floating laboratory to study and protect the Amazon River ecosystem through the use of advanced and clean technologies. In Africa, Fab Labs develop 3D printers out of electronic waste, and are bringing new educational programs to schools by teaching computer science and making at any levels. In Asia, Fab Labs and makerspaces have become one of the key strategies to large countries like China to promote entrepreneurship and local invention, looking towards the transformation of the local economy. Fab Labs today collaborate in projects with corporations, local governments, nations and worldwide organisations in order to promote invention with three main objectives: educate, activate the economy and produce social and environmental impact. This is the largest network of articulated and curated spaces for innovation in the world today.

From made in China to Make in China

China is jumping into the Maker movement in a high pace, more than 200 mini fab labs are going to be deployed in Beijing, 46 new Maker Spaces appeared in Shenzhen in 9 months between October 2014 and June 2015, a whole network of digital fabrication laboratories is growing in the country, supported by public and private initiatives. Fab Labs are maker spaces are being deployed since 2010 (China's first hackerspace was created in Shanghai) in Universities, high schools, company buildings, as community spaces, almost all type of these are appearing in major Chinese cities. The raise of the Maker in China is a reality: SeeedStudio (the largest Chinese DIY electronics store based in Shenzhen) is boosting the maker spirit in the whole country (and the world), bringing Arduino boards, kits to make drones, 3D printers, and all the "buzz products" that are part of the maker movement to Chinese consumers; other companies and hardware accelerators are enabling the construction of an ecosystem that is pushing for a transition from the "made in China" to the "created in China", or "innovate in China". Devices produced in the country that used to be packed in shipping containers are staying to promote a new culture for locals.

While the Maker Movement has a strong open source component in the western countries, China has its own interpretation of it. The ecosystem of manufacturers in places like Shenzhen work quite different than in the west; IP protected schematics of circuits or firmware is openly shared between the manufacturers through "leaks" of information, allowing the creation of many variations of products such as simple phones, washing machines or toaster, which usually share the same DNA inside, only having variations in quality control and outer skin of the products. You can find as many different copies of an iPhone in Shenzhen, but what is more fascinating is the variation of the product made by local inventors (or makers?), often in a lower quality. Researchers such as Silvia Lindtner or Bunny Huan have been mapping and study the maker community in China for more than six years now, trying to understand the underlying motivations and the differences with the western way of making, and its similarities.

Chinese industrial ecosystem is going to be transformed dramatically in the coming years (or months), changing completely the world market of design and manufacturing that we use to rely on. We see China becoming a factory of new factories, instead of being the factory off world's smart phones and products. The Chinese open innovation ecosystem is now connected with global networks like the Fab Labs. If you can make almost anything in a Fab Lab, then you should be able to make the things that make almost anything (machines that make research). The Fab Lab network aims to launch the self-replicable Fab Lab (Fab Lab 2.0) at FAB12 in Shenzhen in 2016, in collaboration with the local maker community, government and industries.

A multi-scalar manufacturing ecology: From the 3D printer in your desktop to the factory in China.

Today, it is impossible for local manufacturers to compete with the prices in China, which generates their product margin. The question is if profit will keep being the only value for our products in the years to come.

Why we cannot produce small batches of a product in our cities? We have oversimplified the manufacturing landscape in terms of the infrastructure available to produce things. The extensive exploitation of resources is killing the biodiversity, but we have are also eliminating the diversity of products and opportunities to make a difference on how things are made.

IKEA will move their business from having warehouses filled with stock at the outskirts of cities, to micro-factories in neighbourhoods where citizens can produce their own designs.

China does not want to make but to create, we should be able to make again and create together.

Space exploration will open a new era of innovation that will hopefully allow us to develop technologies and solutions that are more needed in Earth than in other planets or spaceships.

Bring back production into cities will all its social and cultural consequences. New jobs, new skills, new use of time and approach to problem solving. Redistributing manufacturing is key for the future of the urban life, and to enrich the dessert of the standardised way of living we have created with the massive globalisation.

The City of Cities

It is not a secret that cities are the biggest creation of mankind, where most problems concentrate, where most national budgets are being spent, where more than 50 per cent of the global population already live, and we will find the opportunities to create new models for our economy and society of the future. For many years, authors, architects, economists, movements, urbanists and even artists have proposed their model of cities, now we have a family of different approaches: The Garden City of Ebenezer Howard; the Bioregional City of Peter Berg, the Polycentric City; the Green City; the Ecological City of Richard Register and Paul Downton; the Open City; the Smart City now being developed by Google Sidewalk Labs in New York; the Sharing City of Neal Gorenflo. Models that try to reflect and map the understanding of what the city is under different principles, connected with technology, philosophy, strategies, approaches to governance and more. The city is actually a city of many cities that contain as many visions as people inside them, everyone is a city and master of his/her own destiny or we live in one single city. The city is a multi-scalar system of systems, connected to different networks at subatomic or universal scales. The complex task of understanding a city requires a permanent shift of scale, resilience and adaptation, without fixing ideas and models, but taking this understanding to concrete actions that are driven by a vision that might not have a form, name or shape, but that assumes the role of the city as the place to offer the best environment for men and women to thrive, without compromising resources or rely on others exploitation.

From Fab Lab Barcelona, IAAC, CBA at MIT and Fab Foundation we want to add another city to the mix: the Fab City. From the Fab City Whitepaper:

FAB City takes the ideals of the Fab Lab - the connectivity, culture and creativity - and scales it to the City. It is a new urban model of transforming and shaping cities that shifts how they source and use materials from 'Products In Trash Out' (PITO) to 'Data In Data Out' (DIDO). This means that more production occurs inside the city, along with recycling materials and meeting local needs through local inventiveness. A city's imports and exports would mostly be found in the form of data (information, knowledge, design, code).

The Fab City project will help civic leaders to develop locally productive cities in collaboration with local communities, companies and institutions, revitalising manufacturing infrastructure and incentivising a new economy. Fab Lab and makerspace based innovations could be a source for solutions to connect to real problems in cities, opening opportunities for businesses, research and education through projects. With its inherent zero waste and carbon reduction goals, linked to education, innovation, skills development and the creation of employment opportunities and livelihoods through the relocalisation of manufacturing, the FAB City approach can contribute to achieving a range of city objectives.

In this way, the citizens and the city are empowered to be the masters of their own destiny, their resilience is increased and a more ecological system is developed with movements of materials and associated energy consumption and carbon emissions typical of the current economy drastically reduced. In order for this to be possible, the city must be locally productive and globally connected to knowledge, economic and social networks, making cooperation between cities, citizens and knowledge centers the basis of the scientific knowledge.

To become a FAB City requires having a more precise knowledge of the way that cities work. The evolution of the project will make it possible to create better systems of capturing and analysing data, developing knowledge about a city, and it will also require the implementation of an evaluation system and detailed monitoring.

The Fab City strategy is unique in that it addresses a range of environmental, social and economic objectives (carbon reduction, waste minimisation, relocalisation of manufacturing and work) in a systems approach by harnessing new technology and production approaches. All of this is brought to a practical level, by connecting with the existing Fab Lab Network, a vast source for urban innovations being shared already globally by makers in more than seventy countries and 600 labs. The first city to become self-sufficient - simultaneously increasing employment by creating opportunities through open innovation, and radically reducing carbon emissions by re-localising production - will lead the future of urban development globally.

Who owns the Fab City? No one. It is not a model to follow, it is a network to connect, a movement to support and a vision to share. We are building a world of possibilities by connecting the existing Fab Lab Network (more than 1,000 labs in the world) with global experts in design, architecture, philosophy, arts, economy, ecology, engineering, astrophysics, and every other discipline that needs the city to exist and to thrive. Fab Labs open the space for opportunities for individuals and communities, for organisations, companies or governments, that can access to a network of knowledge and creativity, which use technology as a mean to empower people to take the control of their own destiny, without compromising the future generations and by respecting their own social and environmental context. The Fab City is becoming a moment, an aircraft under construction while is being flown, that is looking to possible futures started to be constructed today.

100 years

In Barcelona at FAB10 we claimed that was to moment to challenge Fab Labs to produce Fab Cities. Having ten years of Fab Labs as consolidated spaces, community and network, made us throw the challenge for the next ninety years: to transform our cities through local production, citizen empowerment and advanced technologies. Otto Neurath approach to the mix of bottom-up and top-down and connected networks is already one hundred years old. There is a confluence of needs, new technologies and philosophies coming together again at the beginning of the twenty-first century, that makes us think on similar moments in history, described by authors like Jeremy Rifkin. Jane Jacobs advocated for locally productive cities where citizens thrive, we want to celebrate her one hundredth birthday thinking on the urbanism to come, hoping not to be driven by profit, competition and accumulation, but by values and collaboration. Digital platforms (powered by the Internet), ubiquitous computing (powered by mobile connected computing/smart phones), advanced manufacturing (powered by digital fabrication), distributed networks (powered by new technologies such as the blockchain), and most important: organised and articulated civic society, are taking the challenge of creating the world we desire beyond ideologies and dogmas, but with the only goal of creating equality and stop the destruction of the resources in this planet.

Bibliography

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2. Andreas Gursky has created the portrait of China in many of his works, a recommended one is Manufacturing Landscapes. I have no license to these pictures. <http://1.bp.blogspot.com/-1YO8Ou4NJQ/UmEtzDwVo7I/AAAAAAAAACXM/Lf9iQI3RWtY/s1600/Manufacturing-11.jpg> <http://www.phillips.com/Xigen/lotimg/Andreas-Gursky/UK010312/30>
3. <http://worldif.economist.com/>. The section What If launched by The Economist claims that the shipping container traffic is slowing, as production of consumer-goods is getting closer to centers of consumption (cities, townships, regions); this is one of the main reasons to have a Nicaragua canal: the need of bigger containers (“five times the container-carrying capacity of those that currently traverse the Panama Canal”) to go from the Pacific to the Atlantic, which allows to reduce the cost per container shipped by suppliers.
4. https://en.wikipedia.org/wiki/Zygmunt_Bauman
5. Fab Labs started as an outreach project of the Center for Bits and Atoms at MIT, directed by Neil Gershenfeld, and have become a global network of people sharing knowledge about personal and distributed fabrication. Fab Labs reunite every year in a different country for the FABX conference, in 2014 Barcelona hosted FAB10, a game changer for the Fab Lab network, where the FAB City project was launched, envisioning the future of locally productive and globally connected cities. In 2016 Shenzhen will host the twelfth Fab Lab international conference, FAB12, and will become the center of the network for a week during the summer. As part of the Fab Lab research road map, the Fab Lab 2.0 project will have an important milestone in Shenzhen, which makes the match between the large scale and mass manufacturing capacity of the Guandong region with the idea of the distributed manufacturing processes. Shenzhen is opening a city wide Fab Lab Network in preparation for FAB12.
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