The Open Innovation Paradigm:
From outsourcing to open-sourcing in Shenzhen, China

Clément Renaud, Telecom ParisTech, UMR i3
Valérie Fernandez, Telecom ParisTech, UMR i3
Gilles Puel, Toulouse University, LEREPS

Context : The OPIMPUC project

- **Evolved from previous work on urban spaces and tech in China : *Cities and information sharing program (CYP12)***

- **3 research teams**
  - **Telecom ParisTech (i3)** Gestion / Media
  - **Toulouse 2 (LEREPS)** Economics / Geography
  - **Nanjing University (DPLUP)** Urban Plannig

- **Started in June 2014**

- **Results at EUROLIO Conf in Toulouse Jan 2016**

- **Funded by French National Research Agency (ANR)**

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Shenzhen : headtown of the makers ?

1980	**Gaige Kaifang**	**Western manufacturing facilities relocate in PRD** (Al & Al, 2012; Richet & Ruffier, 2014)
1990	**White Box**	**Made in Taiwan, Computers commodified (**Magretta, 1998)
2000	**Shan Zhai**	**Small manufacturers producing countless low-cost mobile phones** (Chien & Wang, 2010; Keane & Zhai, 2012; Puel, 2014)
2010	**Created in China**	**Switch towards an innovation-driven industry ?** Global maker movement (Anderson, 2013) Makers in China (Le Dantec, Lindtner & Li, 2012) *Made in China 2025* policy

Conceptual Framework

Open innovation

- **R&D strategy** (Chesbrough, 2003 ; Chesbrough & Bogers,2014)
- **Open Data, Open Source, Open Standards** (West & al., 2014)
- **"spatial turn"** (Dale & Burrel 2008, Warf & Arias 2009, Van Marrejick & Yanow 2010)

Open Production

third-places (Oldenburg, 1999), **coworking spaces** (Miller, 2011), **hacker / makerspaces** (Lallemand, 2015)

"a city where citizens could have access to a new array of infrastructures, including public fablabs with close ties to private initiatives"
the "Fab City" (Diez, 2014)

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Methodological Framework

Places : synapses of a physical and virtual network for the creation of intellectual capital (Dumay et al., 2011)

Key actors in these places, as nodes of the network (Bathelt & Glückler, 2011)

- **Fieldwork 1 : Jun to Sep 2012 - R&D of China Unicom (Liang, 2012) about telephone makers ecosystem**
- **Desk research : 3 meta-models of innovation places :**
  1. **'third places' (Renaud et al, 2015)**
  2. **hardware incubator/accelerator**
  3. **cluster model**
- **Fieldwork 2 : Dec 2014 to Feb 2015 - in Shenzhen**
  - **10 visits + inventory of the objects and machines present**
  - **27 interviews "person-to-person" (Gotman & Blanchet 2007) with actors**

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Shenzhen and the Shanzhai manufacturers

- Phones incorporate all the latest technologies - no patents - thanks MTK kits
  - **2011** : 80 million units (1/3 of phones made in China) were sold (Liang, 2012). 3 million people employed in PRD.
  - **2012** : 10,000 companies worked in this industry in the Shenzhen region
- **Extreme competition and small production units :** need to differentiate > iterative innovation model
  - Target each community of consumers differently
  - manufacturing cycle shorter than the big brands (6 weeks)
  - almost seasonally adapt to market demand with agility and flexibility
- Success story (Xiaomi) **quickly returns to traditional models** (patenting, R&D centers, etc.)

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Shanzhai: the decline of Huaqiangbei

The world's largest electronics marketplace is suffering

- Giant cluster of small retailers and wholesalers : **B2B for family factories** (kits from design houses)
- **Suffering from competition by the big manufacturers** doing direct marketing and online sales
- **Little expertise and/or education** on advanced technologies
- **Factories are closing, replaced by big national players -** 2016 : 5 brands share 60% of Chinese phones market in China

Photo : Clément Renaud (CC)
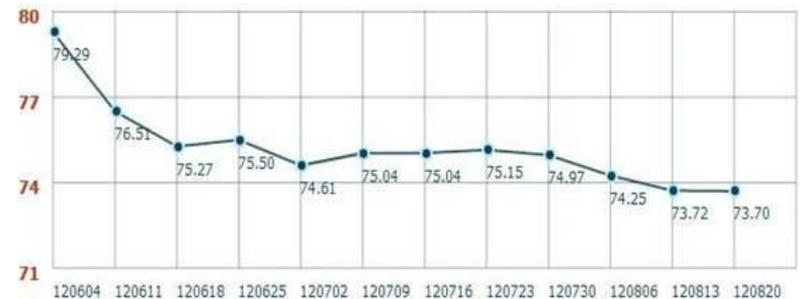
Huaqiangbei Mobile Phone Sales 2012 (gdprice.org)

Bao'an District : a creative industrial cluster

F518 : creative cluster for connected objects

- **Bao'an : outside the SEZ, cluster of factories assembling and manufacturing electronics**
- **F518 : one-stop-service for smart devices**
- **50+ different firms inside : marketing, design, packaging, assembling, etc.**
- **State-owned**

"We work with hundreds of factories in the area."
Huang Xi, F518's manager

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SEM : From electronic design to production

Many small electronics manufacturers (SEM) and designers turn to open-source technologies to focus on quality and avoid the shanzhai model.

"In shanzhai phone business, the product lifecycle is 3 months maximum. (...) So he is always running, rushing, working…This is very hard work, very tiring. You can make a lot of money but it is very dangerous. (...) If it is good and on time, he can have big return on his investment. If not, he is finished. For guys in shanzhai business, a deadline really means dead"

Eric Dong, *Mixtile*

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Seeeds Studio : maker-friendly supply chain

Design, prodution and sales of open-source electronics.

- **Founded in 2008**
- **2 sites : Liuxiandong (Nanshan) and OCT (Chaihuo "hackerspace")**
- **In-house assembly line, warehouse and online retail**
- **Original product design : Arduino, Intel, MTK**
- **Industrial design, assembly and drop-shipping worldwide for startups (crowd-funding)**

Source : Seeed Studio
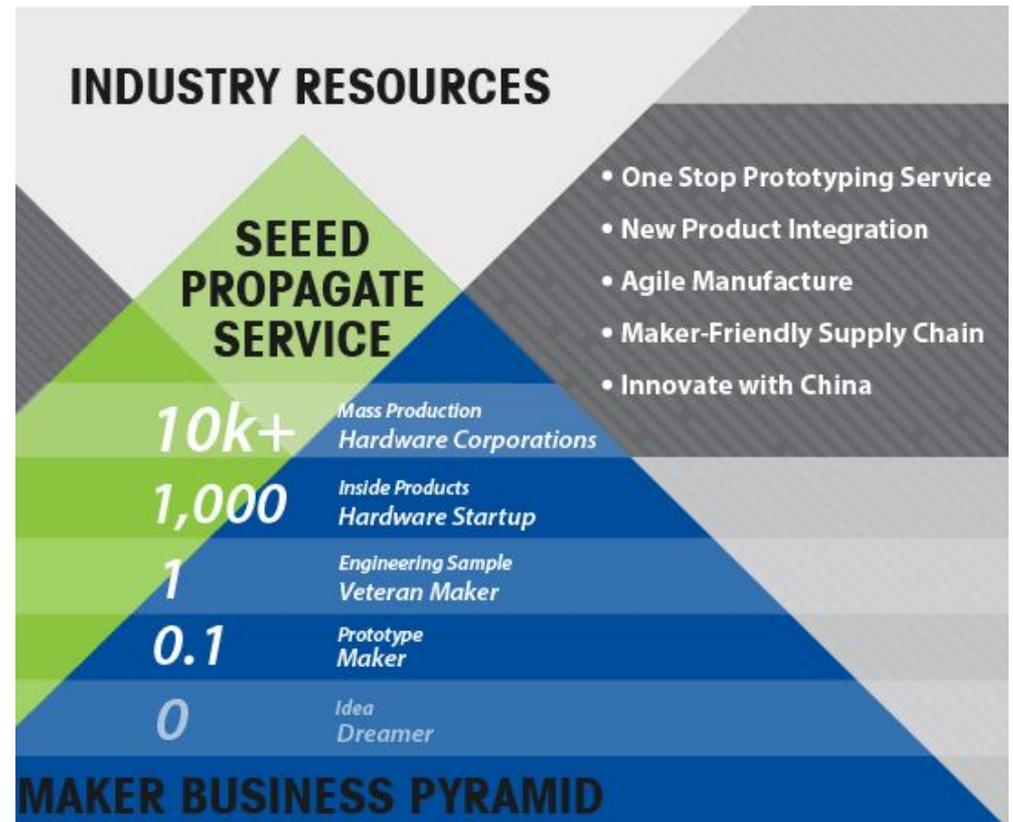
HAX(LR8R) : "Lean Hardware" for startups

Shenzhen's Californian incubator for hardware startups

- **111-days hardware-only incubation program : marketing, manufacturing, export regulations, etc.**
- **Products launch on Kickstarter at Demo Day in San Francisco**
- **85% success rate**
- **Backed by SOS Ventures, US mentors and SZ resources**

Discussions: upgrading the local industry

- **Shenzhen : model of a "Fab City"**
  - places are nodes for an upstream funding network (crowdfunding), skills, contacts...
  - production /distribution of small and medium series
  - new models have grown out of its industrial history and its regional characteristics

- **Open innovation accelerates business development and employee training**
  - solve economies of scale / scope
  - lower cost for prototypes (re-design / design)
  - easier access to complex electronic design resources

- **After California, Shenzhen is using open-source models to leverage a pre-existing resources of its territory** (develop IT sector, attract innovators...)

The "Makers" and the "Shanzhai"

- *shanzhai* helped rapid development of a "distributed" manufacturing fabric

- *makers* network revolves mostly around Seeed Studio, is adept of Shanzhai methods of fast prototyping and products testing (+ share similar relationships to intellectual property)

- Model Follows the tradition of the Shanzhai (MTK) and Western open source innovation : driving costs quickly down until giving products for free to create an ecosystem
  - ex. a "pressy" button for phones goes from $27 to 0 in 3 months, then become open-source

- *Shanzhai* and *makers* are different stories : not about Western empowerment.

Conclusion

- **Open innovation accelerates the upgrade of the existing socio / tech / economic infrastructure into a globally competitive IT industry.**

- **Shenzhen is in position to influence the evolution of hardware IT sector.**

- **The situation is unique and not reproducible**

- **Despite being discussed, existing relationships between the *shanzhai* manufacturers and the *makers* are not obvious and difficult to observe.**

- **Both communities evolves from very different backgrounds, despite sharing some practices.**

Annexes: entretiens

Name	Role	Activity	1h
Momi Han	Manager	Electronics maker	1h30
Eric Dong	Founder	Electronics maker	1h30
Martin Liu	Founder	Electronics maker	2h
Joseph Wang	Founder	Bitcoin	1h
Qu Hang	PR executive	CIC Manager	1h
Huang Xi	Parti leader	CIC HR	1h
C. Eberweiser	Founder	Incubator	1h
Cao Meiying	OpenPlatform	Web business	1h
C. Valenza	Founder	FPGA	1h
Eric Dong	Founder	Electronics	1h30
Fu Na	Urban Planner	Urban Planning	1h30

Name	Role	Activity	
Tat Lam	Founder	Community	1h30
Nik	Export reseller	Electronics gross sales	2h
Momi Han	Manager	Electronics maker	1h
Mayling C	Sales	LED maker	1h
Jack Lee	Founder	Hardware startup	1h
Lafier Kong	Manager	Fablab	0h45
J. Gadikian	Founder	Hardware startup	1h30
Shu Wen	International lead	Training and education	2h
Si Jinling	Program head	Training and education	1h
Shirley	Founder	Professional association	1h

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Thanks for your attention

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