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Created in China: The Makings of China's Hackerspace Community

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Hackerspaces are shared studios that bring together people committed to the free and open sharing of software and hardware, as well as ideas and knowledge. As of April 2012, there are more than 500 active hackerspaces in existence worldwide, making them a global phenomenon [1]. A typical studio will be equipped with tools that allow for experimenting with the physical/digital boundary—laser cutters, 3-D printers, microcontroller kits, and so forth. Many hackerspaces also host educational workshops where these tools are used to teach others about manipulating the physical environment through software, or vice versa. The global hackerspace movement has helped proliferate a “maker culture” that revolves around both technological and social practices of creative play, peer production, a commitment to open source principles, and a curiosity about the inner workings of technology [2,3].

In September 2010, China's first hackerspace opened its doors in Shanghai under the name XinCheJian 新车间 (literal translation: new workshop, or new factory). Only a year after the founding of XinCheJian, the Shanghai government announced a call for proposals to build 100 “innovation houses” (chuangxin wu 创新屋) to be supported by government funding. Although the official document [4] described this initiative as part of a larger effort to build a citywide platform for supporting popular science work and innovation, national and international media interpreted this move as an endorsement of China's fledgling maker culture by Chinese politicians.

What is going on here? What motivated politicians in China to support the growth of a community that has come to be known for its commitments to a do-it-yourself (DIY) approach toward making technologies and to the free and open exchange of knowledge? How does maker culture manifest itself in

► Figure 1. Promotional flyers for the HAXLR8R program.

China, where “making” in the DIY sense collides with China’s image as the world’s largest manufacturer?

Here we explore what goes into making a hackerspace community in China today. In doing so, we debunk two common myths: first, that maker culture is inherently apolitical, and second, that innovation is limited to so-called post-industrial or developed regions functioning on the principle that wealth production comes from “ideas, knowledge, skills, talent and creativity” [5]. Our explorations are based on a two-year collaboration between the co-authors that unfolded through a series of engagements, including ethnographic research, the organization and attendance of workshops and conferences in the field of DIY and maker practice [6], and exchanges through emails and social networking sites. This ongoing collaboration includes members of XinCheJian as well as people in our network in and beyond China [7].

One of the points we make is that establishing a hackerspace in China is necessarily entangled in both the nation’s wider economic and political transformations *and* the global maker culture. The story of setting up a hackerspace in China is not about the linear transfer of knowledge and tools from the West to the East. On the contrary, the story of China’s hackerspace community critiques such a view and highlights how technologies and values are sites of negotiation, remaking, and constant appropriation as they are translated into particular local settings. By looking at hackerspace developments in a place like China, where commercial hardware manufacturing provides employment for many, we provide an alternative perspective on dominant stories of innovation and peer production.

Making Community

The establishment of XinCheJian in Shanghai marked the beginning of a nascent community in China committed to both the technological and ideological processes of free and open source software. It consists of six hackerspaces across the cities of Nanjing, Shanghai, Beijing, Hangzhou, Shenzhen, and Haerbing. Their members share ideas across several mailing lists, collaborate on projects, and attend or organize international technology and arts events. For example, in April of this year, they organized the first Mini Maker Faire in Shenzhen and a maker carnival in Beijing that drew participants from China and abroad.

Members of the growing scene are not only into making and remaking technologies, organizing workshops, and showcasing their work to others, but also are actively engaged with political debates. For example, the announcement by the Shanghai government to support the establishment of hackerspaces as innovation houses has been the subject of heated debate. At the maker carnival in Beijing, Ricky Ng-Adam, one of the co-founders of XinCheJian, initiated a discussion about the official announcement, proposing that it “only focuses on the tools and physical space without consideration for the community—the aspect which ought to be the most prevalent.”

Financial sustainability is a constant issue for hackerspaces and the subject of continuous reflection. The Chinese hackerspaces are not the first to wrestle with how and when to seek or accept support from institutions. Mitch Altman, one of the co-founders of a hackerspace in San Francisco and a long-term member of the U.S.-based maker community, sharply criticized O’Reilly Media

for its acceptance of DARPA funding for an educational mentoring program aimed at bringing “the practices of making into education and [to] extend the maker movement into schools” [8]. Altman’s concern was a principled one, based on tying the maker movement, a grassroots organization, to the goals of the defense industry and the U.S. military [9]. Altman recently toured through China, where he promoted hackerspaces as community spaces that bring together people who are committed to doing “what they love doing,” even if it might entail giving up a secure job and taking some risks: “Hackerspaces are supportive communities for people to explore what they love... You might find that if you love what you are doing, you can make a living off of it. The Internet is all fine, it’s a great tool. But it’s not real community. When people come together in physical places and share what they love, magical things happen. That happens all day long and all year round in a hackerspace.” For Altman, hackerspaces have the potential to independently sustain themselves, because first, they have access to a global community of like-minded people who support one another, and second, they know how to make technologies that can be sold directly to the consumer, rather than depending on institutional funding.

What the co-founders of the two hackerspaces share, despite working within different economic and political regions, is a careful attention to the social and cultural processes of making technologies. They put as much emphasis on the writing of code as on the creation of community, social cohesion, and critical reflection on their practices.

By “making community,” then, we stress the importance of considering the relationship between the

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making of things (e.g., the work that goes into setting up a physical hackerspace, the acquisition and making of tools and digital and electronic objects) and the making of meaning (e.g., reflecting on what it means to make these things in the first place). Reflective engagement with things such as DARPA or Shanghai government funding show that—contrary to common perceptions—maker culture is all but apolitical. Maker culture in China's hackerspaces, similar to hackerspaces elsewhere, possesses a strong engagement with contemporary politics and debates over both societal and technological issues, such as freedom of expression, innovation, and what counts as post-industrial.

Remaking Innovation

While China's hackerspaces participate in the global maker culture, commitments to working beyond existing institutional frames and a DIY approach toward technology production take on unique forms.

Maker culture is often associated with a critical, hands-on approach toward challenging the status quo. This includes projects that subvert the use of copyright law that favors an ever-expanding corporate monopoly over products, even after they have been sold to consumers. Other projects repurpose old and discarded products in order to provide alternatives to our contemporary throwaway consumer culture. Inspiration for these projects often stems from the European avant-garde movement or the 1970s Internet counterculture movement from the U.S. West Coast [10]. Building on these earlier social movements, making and remaking are held up as tactics to subvert contemporary forms of domination.

Similarly, hackerspaces in China draw upon the past in order to situ-

ate their work today. Rather than focusing on a European or American history of counterculture, however, they leverage China's past and its current role in global manufacturing. In particular, they propose that many factories in China have long sustained their low-cost production through the open source sharing of resources and ideas within a network of hardware manufacturers. For members of hackerspaces in China, this means that open source production has been around all along, albeit out of economic necessity rather than motivated by countercultural sentiment.

China's hackerspaces see themselves as hubs that bring together these two cultures of making: maker culture and the countercultural sentiments of the U.S. and Europe on the one side, and open source manufacturing in China on the other. Their ultimate goal is to remake what innovation means for China.

Shanzhai—open source of another kind. Shenzhen is most widely known as home to the Foxconn factories, where firms like Apple, Hewlett-Packard, Intel, and Microsoft produce their products. What is receiving less news coverage than Foxconn's controversial labor practices is that many Shenzhen factories have adopted a model of open source sharing in order to lower production costs. They have informally organized a peer-to-peer database for sharing hardware design schematics and the bill of materials (BOM), a list of materials used in manufacturing a particular product. The open sharing of these resources allowed the factories to lower production costs to stay competitive in a global market.

This form of open source manufacturing has co-evolved with the formation of new production sites, including, for example, counterfeit/

copycat design houses. Over the years, these copycat productions have adopted these open source processes and moved beyond simply copying popular brands such as Nokia or Apple. Today they often produce new, consumer-specific products, such as mobile phones with additional features tailored to particular customer segments or location-specific demands. Examples include dual-SIM-card mobile phones that support two operator networks on one device—such as the G5 phone, a made-in-Shenzhen brand for the Indian market—and phones with built-in compasses that are shipped to consumers in the Middle East, who may need to know the direction of Mecca during prayers [11,12]. Many of these innovations were later reappropriated by mainstream mobile manufacturers; for example, in 2010 Nokia launched two dual-SIM mobile phones.

Copycat productions from Shenzhen are often described with the term *shanzhai* (山寨). However, in the hackerspace community, *shanzhai* now speaks to a new form of innovation based on the principle of open source manufacturing and continuous remaking. The literal translation of *shanzhai* is “mountain village” or “mountain stronghold,” the home to bandits or Robin Hood-like figures who oppose and evade corrupted authority. China’s hackerspaces invoke this image of subculture in order to argue for an alternative take on the meaning of copying through the lens of remaking.

The examples of *shanzhai* phones cited above are used to challenge ideas of innovation promoted by politicians and corporations. Since China’s entry into the WTO in 2001, a new line of reforms stresses the need to transcend China’s reliance on manufacturing. Through



► Figure 2. Nomiku promotional photograph.

redirecting social and economic development toward the creation of ideas, services, and knowledge, China should evolve from the image of “made in China” to “created in China.” Drawing upon *shanzhai* innovation, China’s hackerspaces argue for an alternative version of “created in China.” Rather than proposing to overcome manufacturing for the sake of knowledge production, they offer a view that China’s existing manufacturing infrastructure could be used to accomplish in practice what so far has been a political vision.

When two maker cultures meet.

China’s hackerspaces use *shanzhai* innovation not only to challenge political approaches toward economic change in China, but also to offer a broader remaking of innovation, redefining what counts as innovation and where it originates.

Depicted in Figure 1 are two promotional flyers for HAXLR8R [13], a 15-week mentorship program that invites foreign hardware-based start-ups to China in order to realize their ideas in direct collaboration with manufacturers in regions such as Shenzhen.

HAXLR8R uses China’s hackerspaces as local hubs to facilitate this collaboration. During their time in China, the invited start-ups are based out of hackerspaces, where they brainstorm and build prototypes. The staff of the hackerspaces facilitate connections with local manufacturers to implement the ideas. HAXLR8R merges maker creativity with the open source manufacturing of Shenzhen’s *shanzhai* factories. The idea is that both sides benefit: Hardware manufacturers find new clients as mass-scale production demands from big corporations decrease; at the same time, small start-ups are able to affordably produce and test their products.

Nomiku, one of the projects that took shape during the latest HAXLR8R, illustrates this idea of merging maker and *shanzhai* culture. Nomiku, depicted in Figure 2, is a Kickstarter project that received crowd-sourced funding to make an affordable and easy-to-use device for sous vide cooking—a technique popular among high-end chefs that uses water, airtight plastic bags, along with precise

temperature control to cook dishes. During the HAXLR8R program, the Nomiku team learned how to turn their sous vide DIY kit, which they had developed with help from U.S.-based makers like Mitch Altman, into a compact consumer product that is more affordable than most competing versions on the market. Nomiku not only uses open source manufacturing in Shenzhen but in many ways also reflects the maker-culture ethos. The device is the brainchild of a couple of passionate home cooks who gave birth to the idea while they sat at home watching *Top Chef*. Nomiku was designed to function on simple, cheap components, and rather than being financed by a large corporation or investor, it was sponsored through Kickstarter, a crowd-funding website that has become emblematic as a DIY and maker business model. With Kickstarter, anyone—a geek working out of a basement, or a passionate home cook—can become inventor and producer by seeking financial support from the Kickstarter community. This is how the Nomiku founders described their original idea: “Our goal is to create the best immersion circulator for home cooks so everyone can have sous vide in their kitchen arsenal. Eating and sharing perfect food shouldn’t be out of reach” [14].

HAXLR8R projects like Nomiku and China’s hackerspaces together demonstrate that “created in China” is already a reality, but it takes a slightly different form from how politicians, policy makers, and large corporations envision the future of innovation.

Concluding Thoughts

China’s technology sector is often assumed to inherently lack innovation and creativity. Frequently

named contributing factors are China’s historical development, its educational system, and its culture or focus on manufacturing following the years of economic reform. For example, in a blog post in response to a *New York Times* article by John Markoff and David Barboza on China’s innovation goals [15], James Landay reflected on his work and teaching experiences at Microsoft Research Asia and Tsinghua University in Beijing. He argued that “the level of innovation and creativity in this cohort is much lower than in similar cohorts in the U.S. And in fact, the ones that are the best on the ‘creativity’ scale almost invariably are folks who received their Ph.D.s in the U.S./Europe or worked in the U.S./Europe” [16]. Comments such as Landay’s often contribute to cultural stereotypes and extend existing systems of power. We have attempted to show that the hackerspace and maker culture in China challenges dominant views that define regions other than “the West” as inherently lacking creativity or the capacity to innovate. Cross-regional collaborations on DIY and open-source development such as HAXLR8R projects provide alternative takes on what innovation means in the first place. China’s hackerspaces demonstrate that “created in China” already exists and that it has emerged from grassroots communities committed to a maker ethos and DIY. These spaces demonstrate that making and remaking is as much about forming community across cultural boundaries and engaging critically with political debates as it is about hacking together a low-cost sous vide tool.

ENDNOTES:

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