Incubators at the Frontiers of Capital: An Ethnographic Encounter with Startup Weekend in Khayelitsha, Cape Town

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19 April 2024

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Abstract

Technology incubators are one of the infrastructural ends at the urban frontiers of capital. When built in areas of poverty in cities of the Global South, these hubs cultivate entrepreneurialism and opportunities for profit at the intersection of development and technological innovation. They promise to address the social challenges of urban marginality with remunerative market solutions.

In Cape Town, Africa's so called 'silicon cape', the largest technology incubator of the city ventured in its most marginal township —Khayelitsha— in 2015, pledging to lay the infrastructural groundwork for fruitful entrepreneurial innovation. This paper recollects, ethnographically, an important moment at the outset of this incubator: a 54-hour franchised hackathon, *Startup Weekend*, which took place in September 2015 as an inaugural event.

The argument of this article is that such incubator was a socio-technical formation meant to create the conditions for entrepreneurship in a deprived urban area, relying on a web of material and immaterial connections; that it materialized the rationalities of millennial development as well as alternative goals; that, as infrastructure, it was patched with diverse aspirations and improvised forms of sociality. The article thus contributes to an urban geography of development which acknowledges its uncertainties and singularities as political openings.

Key words: *Cape Town, Millennial Development, technology incubator, infrastructure*

1. Introduction.

"I am seeing [...] the future of Africa"[1] said then UN general secretary Ban Ki-Moon to a group of Kenyan software developers and creatives, during a 2014 visit to Nairobi's iHub incubator, at the centre of a tech ecosystem which has been dubbed 'Silicon Savannah'. Technology, he continued, "can be used as a great power to change your life, to change our lives, particularly the life and future of Africa"[2]. Investments in innovation policies are indeed not uncommon across the continent. In South Africa, the country hosting the largest number of technology firms and venture capitals in the region, newly appointed president Cyril Ramaphosa, himself a former investor, has recently launched a 1.4-billion-Rand state initiative to support investments in technology startups, channelled through four venture-capital funds, three growth-capital funds, two impact-finance funds, and one acceleration program[3].

These two examples attest to inextricable link between technological innovation and economic development in Africa. Far from being dormant, the apparatus of development still takes many different forms: from Chinese large-scale investments in infrastructuring Africa's section of the Belt and Road logistic initiative (Wiig and Silver 2019), to more subtle profit-seeking schemes that involve harvesting the raw entrepreneurial energies of poorer people, their markets at the so-called "bottom of the pyramid" (Elyachar 2012), and their "poverty capital" (Roy 2010). This gentler version of development is what Ananya Roy has eloquently described as "millennial development":

> on the one hand, [....] a reinvention of development as an enterprise of building global industries and global asset classes. [...]. On the other hand is the aspiration that such forms of development can democratize capital and stretch market forces to reach the world's bottom billion (Roy 2012, 32).

Beyond microfinance (Roy 2010), a myriad of other economic experiments targets the bottom-of-the-pyramid poor as a potential market. High-tech startups, for example, especially startups that combine profit and social change, are also at the forefront of the fight against poverty and inequality. Not incidentally, Ramaphosa's fund distributes resources across both profit- and impact-driven tech firms —that is, startups that are after scalable, profitable market solutions to poverty, in a country where the issue of racialized economic marginality has been a productive concern in the making of the post-apartheid nation (Parnell 2005; Ferguson 2007).

This paper interrogates the geography of this technology-driven approach to millennial development in South Africa, through one of its infrastructural forms: the technology incubator built in urban areas of poverty to foster 'good' entrepreneurship. These technology

hubs have become a "fixture" in many African cities (Friederici 2018a). To date, however, much of current research on technology and innovation economies is Africa is framed around the binary 'challenges-opportunities' (see Sriram and Mersha 2010; Lose and Tengeh 2015; Amankwah-Amoah et al. 2018 and Devine and Kiggundu 2016 for a wide-ranging review of the economic literature). As far as opportunities are concerned, economics and innovation scholars see technology-based clusters in African cities as vehicles for addressing economic marginality (eg. Drouillard 2016; Jimenez and Zheng 2018). Challenges, on the other hand, refer to the institutional and infrastructural constraints of innovative entrepreneurship: accordingly, these are the key impediments to the development of scalable technologies of social change in Africa. Technology hubs are thus seen as the intermediary formations that allow African entrepreneurs in overcoming these infrastructural barriers (Desta 2018; Friederici 2018b; Littlewood and Kiyumbu 2018). In South Africa, not incidentally, supporting policies have long posited incubators as crucial for the sustainability of small enterprise development (Ndabeni 2008; Masutha and Rogerson 2014).

Whilst these studies have been important to empirically dispel some of the simplistic narratives of technological innovation in Africa, this paper moves in a different direction and engages a more critical scholarship that has characterized technology-based economic experiments in the Global South as new frontiers of capitalist accumulation. Specifically, I address two of the main claims that emerge from this literature. First, that antipoverty enterprises seek to innovatively harness the social networks of the poor in order to produce profit opportunities at the "frontiers of capital" (Fisher and Downey 2006). By turning the "unusable" economies of the poor into new potential markets (Dolan and Roll 2013), these business models seek to replicate the profit mechanisms of large tech corporations at the bottom of the pyramid and to stretch market forces to reach territories that are yet to be explored by technology companies (see Maurer 2012; Elyachar 2012). The second point is that in this process entrepreneurial incubators and startup competitions play a crucial role: they produce the right kind of neoliberal, entrepreneurial subjects that are needed to foster and populate these new markets. Although mostly located in the Global North, several authors have argued that technology incubators and hackathons cultivate neoliberal citizenship by encouraging individualistic hopes and training certain skillsets that are needed to inhabit a world of smart technologies (eg. Irani 2015; Ho 2017; Rossi and Di Bella 2017; Perng et al 2018; Cardullo and Kitchin 2019). As Catherine Dolan and Dinah Rajak have further argued, in African contexts, what was once seen as the innate entrepreneurial energy of the poor has been recast as something that needs to be taught and stimulated (2016).

Whilst these two critical arguments are important, my paper challenges the schematic diagram that links incubators at the urban frontiers of capital to new profit opportunities and to the

making of entrepreneurial citizenship. To do so, I chart a moment in the life of one such incubator, the Barn Khayelitsha, in Cape Town's poorest township, during the 54 hours of an entrepreneurial competition that took place in September 2015 (Startup Weekend). Cape Town is a proficuous vantage point for understanding the tangled geography of development and technology startups, because the city boasts the highest concentration of venture capital and the largest number of tech startups on the entire African Continent (Startup Genome 2017). It is often described as the "Silicon Cape" of or "Digital Gateway" to Africa (Antenucci 2019), and, within South Africa, the city elites have been able to engineer a solid regional advantage in the knowledge economy (Pollio 2019a).

One the other hand, the city offers a fertile terrain of developmental issues. As one of the most unequal cities on the planet, Cape Town still bears the wounds of apartheid planning, with vast townships which offer few, patched public services and are often disconnected, both physically and otherwise, from the city's richer suburbs. Despite manifold governmental efforts (see Parnell and Robinson 2012), poverty and unemployment still dominate the communities that live at the urban margins. The setting of this paper, Khayelitsha, is one of these peri-urban settlements: some 40-square kilometers of both formal and informal small houses and shacks, often lacking access to basic services.

Initiated by the apartheid administration to segregate Eastern Cape rural-to-urban migrants outside the city, Khayelitsha —*new home*, in isiXhosa— is still growing at a rapid pace, offering a 'new home' to both newcomers and those who flee displacement and violence from other townships of Cape Town. Here, earlier in 2015, the city's most prominent startup hub, the Barn, had launched a spin-off incubator, thanks to a private-public investment. Not long after its opening, the still-smelling-of-fresh-paint building hosted *Startup Weekend*, a hackathon-competition that was meant to create new technology startups capable of addressing local issues and targeting local markets. In this paper, I thus recount the 54 hours of that September weekend, during which the Barn Khayelitsha visibly functioned as an infrastructure at the convergence of several ideas, projects and desires of millennial development, including the possibility of extracting profit at the —rather literal— frontiers of capital.

Given the urban disconnections of Khayelitsha, the ideas developed during the hackathon were supported by multiple layers of other infrastructures, not least what Simone (2004) calls "people as infrastructure", the human networks that make cities work in contemporary Africa. However, the two arguments of this paper are that the technology incubator did not only work to monetize these networks and to produce new territories of profit by forging neoliberal citizens among the poor. In fact, I will show how it incorporated multiple rationalities that escaped the politics of finding market solutions to poverty. And that it cultivated hopes way

beyond individual wealth. It is in this sense that I embrace Simone's and Pieterse's call for "re-describing"[4] urban life (2017) at its "digital peripheries" (Poggiali 2016). Whilst various elements of this entrepreneurial incubator were precisely designed for the purpose of mining the "fortune at the bottom of the pyramid" (Prahalad 2005), some other features emerged out of different "desires and fantasies" (Larkin 2013) or were even 're-inscribed' (see Akrich and Latour 1992) for purposes other than capitalist extraction.

In the following section of this paper, I explain the reasons for thinking infrastructurally about an incubator and my methodological approach to a fast (as it only lasted for three days) ethnography of infrastructure. The core of this article is a narration of the weekend, drawing on my notes and recordings of the most salient moments of the competition. Finally, I offer some reflections on the "ontological politics" (Mol 1999) of re-describing entrepreneurial experiments at the urban margins.

2. A fast ethnography of developmental infrastructures

In recent years, infrastructure has become a critical touchpoint to understand the political and economic geographies of African urban worlds (e.g. Silver 2014; Baptista 2019; Guma 2019; Mains, 2019). Following in the footstep of this scholarship, I too embrace a "technopolitical" approach, whereby I consider infrastructures as both means and ends of political projects (Mitchell 2002). In this perspective, ethnography is one of the tools that allows to document the mutual shaping of technical and social forms (Star 1999). In fact, one central argument of this literature has been to rethink the location of politics, and thus of the objects of ethnographic research, by charting the collectives that are gathered, created, and transformed by technological devices (Collier et al. 2016; McFarlane and Graham 2014; Poggiali 2017).

Concurrently, ethnographic research has shown that certain forms of collectivity can 'act' back upon infrastructures, in order to generate additional or alternative possibilities of action (see Björkman 2015; Poggiali 2016). Such interest in the repoliticization of infrastructure has been particularly important in Africanist scholarship. Achille Mbembe (2001), for example, has argued that Africa has a long history of 'doubling' between what infrastructures were meant for and they were actually used for. In South African cities, for example, where apartheid planning used infrastructures to engineer spatial and social segregation, more recent urban devices conceived to enforce neoliberal citizenship have become malleable technologies for other ethical and political engagements (Von Schnitzler 2008; 2013).

In other words, thinking infrastructurally is a way of both charting the material capacity of urban infrastructures to incorporate political projects, but also the possibility to inscribe other

agendas by tinkering with technical features (Bowker et al. 2019). Abdoumaliq Simone, for example, has questioned the 'working' of Africa's urban infrastructures, arguing that not only that these do work, possibly through idiosyncratic webs of formal and informal systems, but that urban administrative machines coexist with "pirate" ones as ways of engaging the world (2006), and that technocratic architectures, despite their initial aims, can be transversally enrolled in the functioning of other processes (2004). In this sense, Simone has called for a wider notion of infrastructure, one that includes the mobile and provisional networks of objects, spaces, persons, and practices that become platforms "providing for and reproducing life in the city" (Simone 2004, p.408).

The 'infrastructure' of this article was similarly caught in these wider socio-technical networks and ridden with contradictions between what it was meant to engender (profit at the frontiers of capital), and what it was eventually used for. To give a sense of these contradictory openings, as I mentioned, this paper captures the ethnographic notes and recordings of the three days that I spent participating in an entrepreneurial competition taking place at the Barn Khayelitsha in September 2015.

My understanding of ethnography is influenced by John Law's methodological reflections. Disputing a 'modern' view of method as a set of tools which, somehow, social scientists can use to describe the world, Law argues that ethnographic practice, like other ways of knowing, is "a combination of reality detector and reality amplifier" (Law 2004, p.14). As a detector, ethnography offers a temporary, ephemeral grasp of the messiness of the phenomena it observes. As an amplifier, ethnography is also an intervention, a way of contributing to and validating one reality over others. This is even more relevant in the case of the research underlying this paper: as I explain later, I was able to participate in Startup Weekend Khayelitsha because I was deemed to be an expert that could contribute to its success. I was thus an active player in the ethnographic world I wanted to explore. From an epistemic perspective, the fact that I could not and cannot extricate myself from the infrastructure of my research had both practical and political consequences.

Practically, it meant that I was exposed, first hand, to the muddle of an infrastructural experiment that, on paper, was designed to harvest the capital of poverty but in reality enabled several other collective desires and individual hopes, and it did very little to create actual profit. My own experience empirically clashed with some of the normative readings that link technology incubators to the expansion of capitalism in the territories of poverty. Good ethnographic work, wrote Michael Burawoy (1998), should not limit itself to the unexpected discovery of stories that challenge existing theories. It should be a process where deductive and inductive engagements are mutually constituted, where "social fact and sociological

imagining" are coproduced (Comaroff and Comaroff 2003, p. 172). It is for this reason that, in drawing the conclusions of this paper, I put to test some of the more common research hypotheses surrounding technology economies in spaces of marginality, and I argue that my fine-grained insights refine some of these assumptions (which I have sketched in the introduction to this paper).

However, stories have also a value of their own (Behar 2003). It may be impossible to free them from the analytical eye of somebody who, like me, participated in them with a vested research interest. Yet, I try to "make small facts speak to large concerns" without juxtaposing them to "powerful discourses that organize events into understandable and seemingly predictable trajectories" (Gibson-Graham 2014, p.147). To do so, as I detail in the core section of this paper, I maintain the voice of somebody who joined in a hackathon and was genuinely surprised by the ways in which my fellow participants sought to hack the competition for purposes other that capitalist profit. This is what I understand as the political consequence of considering ethnography as a 'reality amplifier': Startup Weekend was not an uncontested playbook, but a mesh on infrastructural singularities that nurtured diverse political openings which I have a responsibility to represent as such. More so because of the privileged[5] access that I was granted to such openings, which participants to the competition had deliberately provoked.

Singularities bring me to an important question of temporality: how can a method that traditionally implies long periods of immersion be refunctioned on a short span of time? By the time of Startup Weekend, I had been involved in Cape Town's entrepreneurial ecosystem for several months, but I had had very little experience of the Barn incubator. Even afterwards, my ethnographic encounter with the Barn remained, for pragmatic reasons, limited to those three days. What claims can be made, then, after such a brief ethnographic blitz (possibly, a contradiction in terms)?

A common response to temporal limitations on ethnographic work has been that of replacing length with intensity (see Rist 1980). However, it is also possible to go back to one of the original meanings of participant observation to make ethnography work when access to the field is short-lived. At the beginning of last century, Bronisław Malinowski was half-unwillingly stranded on a Pacific Archipelago for several years, when he discovered the perks of long-duration ethnography (Young 2004). Such immersive method revealed a non-market society which was, contrary to common colonial belief, rationally organized according to functioning economic principles. Malinowski's insights led a younger generation of ethnographers to question simplistic assumptions about economic life (see Mauss 2012). For all its problematic colonial assumptions, one does not need to read between the lines of

Argonauts of the Western Pacific to sense Malinowski's impatience for universalistic accounts of social life (2014). Clifford Geertz thus called this type of writing "microscopic" (1973, 21), in the sense that not only it took place in small worlds —villages and islands— but it also gave relevance to singularities in the portrayal of a cultural-economic system. For Geertz, it was the minute details, not just the extended duration, that differentiated the 'ethnographic imagination' from other forms of writing research.

Back to the question of temporality, then, for a contemporary and fast ethnography of a developmental infrastructure —a startup incubator at the urban margins of Cape Town— my suggestion is that such an ethnographic practice can still work to reveal the limits of the seemingly predictable operations of capital[6], if it takes to heart its "microscopic" nature. Whilst it only grasps a very brief moment in the life of the Barn Khayelitsha, this article shows its multiple ends as an incubator of millennial development: some of these were indeed machinic attempts at producing profit opportunities and neoliberal citizenship among the poor; others, however, were molecular attempts at recasting these infrastructural possibilities within different ethical regimes.

3. 54 hours in September 2015.

For months, at the time of SW, I had been trying to conduct some research in the Barn. The reasons of my interest were multiple. The Barn was a centre of calculation, where knowledge was transferred, translated and produced. It was a specific didactic enterprise, with various entrepreneurial and coding courses. Most importantly, it had recently opened its spin-off incubator in Khayelitsha: I was therefore interested in the relationship between a business incubator and the diverse economies of urban marginality. However, my emails had been bounced from one manager to the other. I had attended some of the public events hosted in Woodstock, but had little success in getting a proper access to the people of the incubator. With other excuses, I had visited both headquarters, but, after several months, I had given up the idea of gaining ethnographic notes beyond those that I had by attending a few public events. In the spirit of collecting other materials, I had subscribed to the mailing list of the incubator, and that is where I read about Startup Weekend Cape Town (SWCT).

Startup Weekend (SW) is a format for an entrepreneurial contest that lasts 54 hours, from a Friday night to the evening of the following Sunday. The events, now owned by one of the largest franchise acceleration programme in the world (Techstars), gather tech enthusiasts, developers, designers, but also people who are not familiar with the world of digital startups. At the beginning of the weekend, individual participants pitch their ideas for new ventures.

Among those ideas, a small number of them is selected and teams are formed accordingly. During the rest of the hackathon, the teams develop a working prototype of their business, and prepare a final presentation to give on the last evening. At this point, a panel of judges selects a winning startup, which receives a prize—usually consisting of future help in the development of the business. Every year, SW is held in hundreds of cities across the globe. It had reached the shores of Cape Town in 2012.

For the first time, I read on the online advertisement, SW would not be hosted in the Barn's main hub, but in the newly opened incubator space in Khayelitsha. With renewed hopes, I sent an email to the organizers, offering them to help with anything that may be needed. My email to the anonymous address capetown@startupweekend.org was followed by a phone conversation with Bongani —manager of the enterprise development programme of the Barn— who was overseeing the 2015 SWCT. She interviewed me on the phone and, much to my surprise, decided I should participate as a mentor, not just as a volunteer. She thought that my previous expertise in software development could be useful to the prospective entrepreneurs, as they were short of mentoring volunteers.

After the phone call, I received a formal invitation letter which followed the SW template that I was already familiar with. Each aspect of the organization was homogenized through SW's guides and checklists. Not long after my reply to the invitation, with a short bio and a photo as requested, my name appeared on the event webpage, alongside the judges, the other mentors, the organizing committee and the sponsors. Hence, it is as a mentor that I entered SWCT and could observe the event as an active participant. Although the organizers knew about my research interests, and, by the end of the weekend, everyone else too, my position in the field was not neutral. It is for the reason of preserving a sense of this dual stance that this section of the paper is free of analytical commentaries, beyond the empirical observations that are drawn from my notes and recordings. As I will show, some of the expectations that were put on me as a mentor, and that perhaps I had not foreseen, allowed me to tap into the diverse hopes that the weekend mobilized.

Startup Weekend Cape Town 2015 takes place between the 11th and the 13th of September. Although the competition is held in Khayelitsha, the weekend begins, for me and a few others, in Woodstock, not far from the CBD. While it is easier for people living the middle-class suburbs to access the township, rather than the opposite, a shuttle bus has been organized for the late afternoon of the Friday, to make sure that participants without cars can reach Khayelitsha. The same arrangement will work throughout the weekend. Transportation will be free. As I am later told, the organizers have worked hard to guarantee that the sponsors

would support services like free shuttles, which ensure the inclusivity of the event beyond geographical and socio-economic disconnections.

A mixed crowd of about fifteen people gets on the shuttle, following the instructions of the organizers. Once on the bus, the geography of the event becomes the first topic of discussion. As we drive through the shacks and small public housing units of the Cape Flats, the participants on the bus list several thriving local startups, as a sort of ceremony that sets the expectations high. When we finally arrive to the fenced gravel car park that rests outside Lookout Hill, the complex where the Barn is located, the excitement is palpable. As the name explains, Lookout Hill is a small sandy hill on the vast, flat land of Khayelitsha. On top of it, a wooden deck overlooks a horizon of informal settlements, formal township sections, and the long, white shore of False Bay. At dusk, Table Mountain is a distant shape hiding the city's central, wealthy suburbs.

Down in the Barn, the organizers are working on the last preparations. At the registration desk, guests are divided into mentors, coaches, creative geniuses, business gurus, coders, speakers and judges. Roleplaying is not only part of the ice-breaking activities, but it also allows teams to be sufficiently diverse and feature all the competences needed to prototype a piece of software, from its business model to its actual design and code. To the organizers' surprise, more than a hundred people turn up, which is a big number for a startup weekend, and the colour-coded name tags seem to be running out so fast that, against the rules of the template, it is decided to pause the registration and start the event.

Bongani takes the stage to introduce the competition and the guest speakers that will open the evening. When her time is over, Chris Vermeulen, head of the enterprise development programme at CiTi (Cape IT Initiative), gives an institutional welcome on behalf of the organization that runs the space where we are all seated. He mentions the importance of incubators like the Barn in places like Khayelitsha. Summarily, his argument is that technological innovation can be a solution to poverty, and that new software can disrupt the status quo in the way in which Uber did[7]. "In this facility", Vermeulen continues, "we will test real things, this will be the real innovation hub for Africa" (personal notes, September 2015).

The following speaker is Alan Winde, Minister of Economic Opportunities for the Western Cape (as of 2019, Premier of the province). In what seems now a cliché, he tells the audience that he has just had a meeting with Uber's corporate team in Cape Town. The presence of Uber, however, does not come without issues—the Minister continues:

> Uber will not only disrupt the taxi industry, it will have a broader effect on the way in
> which we think about cities. Today, and tomorrow, and Sunday, you may want to work

on ideas that take up this challenge, the way in which we will live without owning cars (personal notes, September 2015).

It becomes immediately clear that the Minister's speech has a specific goal: orienting the competition towards areas of innovation where his department think more job and economic opportunities can be created. Mobility is the first of these areas, with mentions of Uber's and Google's self-driving cars as examples of how steadily that industry is changing. However, it is predictable that the Minister's suggestions on the development of new ideas for the automobile industry will not generate much following. Ironically, the car park outside is almost empty. Most of the participants are young, unemployed or scarcely employed dwellers of Khayelitsha. Creating an app for self-driving cars is not the reason they have come to SW—as I will later find out.

After the minister's speech, other spokespeople of the local technology sector take the stage to address the audience with more examples of the possibilities at the intersection of digital innovation and social challenges. A representative of the Western Cape Economic Development Partnership (EDP) recounts the story of a group of Danish entrepreneurs that are experimenting a GPS-enabled system of garbage collection that empowers homeless citizens in District 6, a neighbourhood of the central city that was razed during apartheid. She has put together a long PowerPoint presentation full of similar initiatives in various cities around the world, and some didactic slides with definitions of concepts like smart city, open data and others. After the speech, she waves a USB flash drive containing the PowerPoint, pledging to share her contents with the participants.

The talks that follow are similarly concerned with both orienting the competition and showing examples of fortunate startups. Sizwe, a local entrepreneur, shares his successful story: his small ethical farm has become a global hit, when he was featured as keynote speaker at a recent international Slow Food conference. His tale shifts the attention from technological innovation to something that seems more fathomable by the audience: hopes of personal success. The measure of his accomplishment is the fact that he has managed to build a prosperous business while remaining in the township and addressing issues such as unemployment and food safety. He is doing well for himself while doing good for others. Global fame is the seal of his achievements.

When Bongani takes the stage again, to conclude the introductory section of SW, her final words are welcomed by the biggest round of applause thus far:

> You will learn how to be an entrepreneur, to look at problems as opportunities, to have the lifestyle of an entrepreneur! (personal notes, September 2015).

It is already clear that the expectations of the organizers will be met in a very idiosyncratic way: while ideas of social change, personal success, and tackling local challenges find immediate response, technological, digital, software concerns appear to have a much weaker grip on the imagination of the participants and the mentors. Ikhonko, who is sitting beside me, was shaking her head while the Minister spoke. She thinks that the focus on technology and innovation is misplaced. She is the CEO of a non-profit enterprise that delivers business management training to informal female entrepreneurs in the townships, giving them the legal tools to register their enterprises and access the formal economy. As she explains to me, coding a good piece of software is of little importance if it makes just somebody rich. This is the reason why she has decided to volunteer as business mentor: she hopes her insight filters down as a focus on social outcomes rather than on innovative tools. She will be using her mentoring position to influence the teams, she explains, unapologetically.

When the competition formally starts, with individual participants pitching their ideas in a very short presentation, it is already evident that very few of them are proposing digital innovations, or ideas that could become profitable. Even fewer have specific technical solutions in mind. Janet is an exception. A business student at Stellenbosch university, she is proposing a software application to buy electricity remotely. After the end of apartheid, South Africa has shifted to prepaid electric meters as a way of enforcing payments. This has generated, among other things, what is perceived as a peculiarly complex, inconvenient way of purchasing electricity. It is, obviously, a middle-class issue which is in an uncanny, stark contrast with what the other presenters are laying before the audience: an idea to protect the rights of informal domestic workers, a system to prevent fire accidents in shack dwellings, a mechanism for sharing water in water-scarce areas, an application for financial literacy, a scheme for accessing healthcare for slum dwellers, and so forth. Though some of these ideas have a technical side, the presenters are not preoccupied with giving details about the technological solutions that they have in mind. Eventually, they will all be asked to develop a piece of software as part of the script of SW. But late at night, when the first day comes to an end, nobody is worried about technicalities, and the organizing team decides to postpone the selection of the ideas to the next day.

The ten most voted ideas are variegated but, as expected, all somehow concerned with issues of living in the townships. To select them, Bongani has come up with an analog polling system, which replaces the online voting with paper post-its, given that many participants do not own smartphones. Teams are then formed by distributing the capabilities of the participants. Unusually for the tech industry, the contestants with coding skills are all young female students of JavaScript, trained in an after-school tech education programme that takes place in the Barn Khayelitsha itself. These young women have been nicknamed 'agile girls', as they

are trained in the 'agile' approach to coding. Mentors are asked to concentrate their help on two or more teams, in order to distribute their skills. I will be collaborating with Benny and his Peninsula Business Club, a mentoring and networking platform for university students, and Lindile's group of young men who want to tackle the unmanageability of financial debt.

Benny is from the remote province of Limpopo. Thanks to a government scholarship programme for rural South Africa, he was able to attend the Cape Peninsula University of Technology, an institution located both in the city and Belville, in the metropolitan area, not far from Khayelitsha. He graduated in mechanical engineering in 2013. With another fellow engineer, who will join us the following day, he started an organization called Peninsula Business Club (PBC). Their goal was to create a networking platform for graduates and soon-to-be-graduate students in technological fields. Compared to the more prestigious University of Cape Town, CPUT lacks many of the industry links that secure employment after graduation. For this reason, Benny and his friend decided to set up a venture that would mentor and connect students, find internships for them, and, most importantly, organize its own version of Startup Weekend in the form of pitching sessions where students team up and pitch their business ideas to venture capitalists. Thus far, they have received money from the SAB foundation (South Africa's largest company), and a philanthropist is paying their expenses. Whilst they have not yet found a way of plugging into any capital fund, Benny is also, himself, a subject of admiration for the young men who join him, and for the organizers that let him have his way in defiance of the rules (he is working on an already-existing organization).

The second team that I help is called FinWell. Of the four young men, three are from Khayelitsha, and Lindile, the leader, from a township nearby. Like Benny, he attended university and holds a degree in management. His goal is to tackle a pressing need of male youth: overindebtedness. Given the scarce and sporadic employment opportunities, often very small gigs, young men accumulate debts that are hard to be repaid through usual monthly instalments[8]. The desultory nature of income in the townships needs a different form of lending and repayment, and this, according to Lindile, can only start by training people to a different understanding of their financial situation. The problem, he explains, is that young men manage their debts according to paradigms that only work in the case of a steady income, and in situations where expenses are planned in the medium term. When young unemployed men receive a payment for an odd job, they tend to use up the money for immediate needs, especially if paid in cash[9].

What if, asks Lindile, we can have a system that allows these men to be reminded of their debt each time they receive a monetary settlement? This system would, for example, prioritize

lenders and function on a reimbursement plan based on gig jobs rather that wage labour, but also vary in percentage according to the value of the sum. In his vision, his startup will be an alternative lending institution, based on the needs of the poorest of the borrowers, and would create a new financial paradigm for the informal economy. But Lindile is also a realistic person. He believes he needs to change the way people think about and get into debt before his revolutionary institution starts. Therefore, at SW, he is only willing to prototype the induction engine of his financial institution: a mechanism to train people in a more concrete and pragmatic understanding of indebtedness. When I ask him what this system looks like, if it is an app, a website, he shrugs. He is here to find out.

Halfway through the morning, while we are still working on defining the business model of the startups, Bongani calls the teams back to the main hall, where they will receive a short training session about online tools that they can use to 'bootstrap' some of the features of their business ideas. On the stage, two of the mentors, Krystina and Adil, speak for half an hour about free online tools that startuppers can use to create mailing lists, to test a brand name, to manage social media accounts, to develop a free landing page, to automatize accounting, and so forth. Having worked with the two teams for some hours, many of Krystina and Adil's suggestions seem too ambitious. Their high-flying tips find little resonance among the members of the teams that I am helping. However, their story is worth reporting here as it speaks about the mobility of startup knowledge in the creation of profit opportunities at the urban edges of capital.

Krystina and Adil are the cofounders of MAQTOOB, "a platform for entrepreneurs to search, rate, and review business apps"[10]. Maqtoob is based on a freemium business model, but it is mainly a collaborative aggregator where online applications are categorized according to the need they target. Although Forbes elected MAQTOOB —"the Ikea for entrepreneurs"— as one of 2015's top 5 up-and-coming startups of London's Silicon Roundabout[11], both Krystyna and Adil like describing themselves as more than tech entrepreneurs. They both believe in the social mission of making digital tools accessible to entrepreneurs all over the world. Earlier in the year, they started a journey across the Global South, *MAQTOOB On the Move*, with the purpose of reaching entrepreneurs who do not read Forbes or TechCrunch. Having already been in Lebanon, Iran, Morocco and in Kenya, South Africa is the fifth stop of their journey, which is documented by a blog of travel diary entries[12].

Events like SW are the kind of activities that MAQTOOB On the Move undertakes to live up to the ambition of disseminating awareness about easily accessible business tools in developing countries. It is not a mystery that this strategy also engineers a user base and, therefore, makes MAQTOOB more enticing for premium users. What is interesting is that the production of a

service like MAQTOOB intersects the working of SW in the peculiar nexus of digital innovation and voluntarism that has been choreographed in Khayelitsha. On the experience, Krystyna would write, a couple of days later:

> Our last workshop was a real treat. A few courageous enthusiasts organized a Startup Weekend right in the midst of Khayelitsha township. We witnessed scores of talented aspiring entrepreneurs pitching their business ideas, learning, and innovatively prototyping over the span of only three days. [...] South Africa is boiling and as always its ranks of determined entrepreneurs hold up the torches of hope[13].

These torches of hope, in the hours that follow Krystina's inspiring talk, shed light on a very practical problem. Some of the teams do not have a business model that can be easily prototyped as a digital application. At the same time, the organization crew keeps pushing them to work on their piece of software, explaining that only teams with a developed software prototype will be able to compete. The Java-trained 'agile girls' are actually too few to help all the teams. It is in this peculiar situation that some of the teams take an unexpected direction in the development of their business.

Confronted by their lack of coding skills, they take a peculiar step in bridging the urban and digital divides of a place like Khayelitsha. The FinWell team, for example, develops a very easy application that does not contain any financial literacy tools. It is instead an empty piece of software that connects users to what Lindile is trying to build: a network of volunteers, university students that will give their help to people in need to manage their debts. It is people like him, he tells me, people that were fortunate enough to go to university coming from the township, that will make the FinWell software work. It is a peculiar infrastructural underpinning that he has envisioned, one made of people that work as connective tissue where disconnection is the norm, where digital and financial literacy are part of the same cleavage that separates the Cape Flats from the rest of Cape Town.

Similarly, Benny's polished prototype is an application that has the fundamental divides of the city at its core. Out of the many features of his messy and complicated business idea, he has decided to develop software for connecting students from poor backgrounds to mentors working in corporate environments. As he explains to the audience during his final pitch, even when they go to university, students from the townships only understand how the informal economy works. They lack the ability to apply their knowledge to the environment where they live and come from. It is for this reason that his PBC features a layer of middle-class volunteers that are willing to mentor and help these students finding ways to bridge the disconnection between their careers and their backgrounds. Benny himself has had a mentor, a local social entrepreneur whose enterprise sponsored some of PBC's early activities.

As the end of the second day approaches, other teams have been more successful. Janet's group has obtained information from the energy department, in order to prototype a software that responds to the technical requirements of the electric meters in current use. However, their focus has shifted from the idea of 'buying electricity remotely' to the idea of 'saving electricity' by having software that, among various things, allows remote purchase. This is, of course, a variation in the narrative of their purpose, rather than a change in the business idea, but it shows how pervasive the concept of 'good' entrepreneurship has become in less than two days. On the other hand, and perhaps unsurprisingly given the nature of the competition, ideas that seemed a hard sell at the beginning, with little opportunities for profit, have been developed into profitable business models, thanks to the mentors. This is what happened to the team working on a platform to connect sports enthusiasts in the townships. They now have a well-scripted profit mechanism attached to what was originally presented as a website to connect footballers across the Cape Flats.

When the morning of the third day comes, most groups are finalizing their software and polishing their presentations. Judges will arrive in the early afternoon, and Bongani keeps rekindling the competitive spirit of SW by reminding participants of the short time remaining. Only one group is still struggling with an impasse in their project. It is lunchtime when Cebisa, the managing director of the Barn Khayelitsha, comes to me to ask for help. Her mentees, a group of five young women who are working on a system to prevent blazes in the shacks, have not prototyped anything yet. She asks me to help them design a quick wireframe of the application that they have envisioned. At the present stage, their idea is not competitive because they do not have any software.

As I start working with them, however, I realize that software is the last of their concerns, despite Cebisa's apprehensions. In fact, I am told that their fire-prevention mechanism relies on the networks of women that exist within the township. It is an alarm system that spreads through the connective tissue of established social relations—again, using networks of people as infrastructural patches. The warning moves through this human fabric and reaches shack-dwellers both through their phones, via SMS, and through the actual distress-signals that women are able to physically circulate. It is clear that there is little or no need for a software application. The model relies entirely on infrastructures that are often digitally disconnected. They are, in fact, made of human relations of proximity and mutual living. However, the women have taken to heart the competitive nature of SW, so we prototype a wireframed app that geolocates distress alarms and contains a series of instructions to deal with the early stage management of fire events.

The relevance of their idea, although many aspects are underdeveloped, will eventually give them the first prize. Even in their team name, Khayafighters, the reference to Khayelitsha could not be more apparent. In their final pitch, they also attach a profit mechanism to their model, which will eventually lead to the installation of fire detectors, an activity that purportedly creates jobs and wealth. The final presentation is a mixture of extremely naive and extremely pragmatic pieces. Whilst the profit mechanism remains very simplistic, their capacity for envisioning ways to bypass the lack of digital connections through other forms of infrastructure, which work even in a place like Khayelitsha, is extremely sophisticated. It is this specificity which impresses the judges.

The sun is still up when the competition is over. The judges leave in their vehicles, some participants in the shuttle bus, but most of them just walk out of the car park, onto the main road. Sunday evening in Khayelitsha is when young people gather just around the corner from Lookout Hill, for Pakhini. The few car-owners put music on and leave the doors of their vehicles open in the middle of the road, which becomes an ad-hoc event space. Informal meat vendors and ramshackle barbecues pop up on the dilapidated footpaths. The air becomes thick with smoke, kwaito music, and isiXhosa chatter. I have been invited by the three team members of FinWell to join them, as they want to ask me if their startup stands a chance, and thank me with a beer bought from the local shisa nyama. Lindile has left. They know that with his degree and his network of other university students like him, he does not really need them. They still wonder whether he will be successful. In a moment of sheer honesty, they confess that the reason why they participated to SW was in the hope to be given a job, by someone, somehow. That they enjoyed the competition, and learning new things, but they are disappointed that so few of the ideas bore the promise of profit and wealth. Even the judges and the mentors were of little help. And yet, SW was also a choreographed exercise that taught them something about engaging the future, especially in its promise of creating connections between a divided city. A lively proof comes two days later, in the form of an email that one of them sends me:

> Yho my friend this is Siviwe I thought I should just pop you a mail and just check up on you and I just sent some of my documents if maybe there might be some one looking for some one for some vacancy just hook them up with stuff my nigga I would appreciate that to the fullest "thanks" (personal email, September 2015).

He has attached his CV and a series of certificates and diplomas. In the following months, I will be sending him various links to job vacancies or other opportunities. He will, eventually, enrol in a coding course, thinking that his struggles with unemployment will be finally over, once skilled in software development. I have, since then, lost contact with him, but our last

conversation was again about the promise of entrepreneurial knowledge, this time in the form of JavaScript, a promise which was not started by Startup Weekend alone, but certainly cultivated and encouraged during those 54 hours is September 2015.

4. Conclusion.

This article has focused on a particular infrastructural form, the entrepreneurial incubator, and its relationship to the making of entrepreneurial experiments of development in Cape Town. When created in places of economic marginality, such as Khayelitsha, these technology hubs mobilise experts, knowledge and capitals around a core idea: fighting poverty by expanding entrepreneurial opportunities. As Ananya Roy argued, these new frontiers of accumulation are the very forefronts of millennial development (2010). The raw, untapped capital of the poor becomes the potential terrain of new assets and new forms of profit. Informal economies, networks of mutual help, "phatic" infrastructures (Elyachar 2010) as well as the capacity of marginal citizens to make-do with the urban disconnections of divided postcolonial cities are all possible frontiers of profit, especially within the elastic, experimental business models of technology firms. This is not dissimilar to the way in which these corporations monetize social networks in so-called 'advanced' societies. This paper has indeed shown how in a "transnationally legible emblem of innovation" (Irani 2010, 801) —the entrepreneurial hackathon— there were several attempts at harvesting the social networks of the poor to produce new capitalist markets. Even if only at a speculative level, during Startup Weekend the Barn did operate to monetize this connective capacity—a process that has been documented in other contexts of the Global South, where capitalist operations incorporate such connective tissue with the help of humanitarian and developmental institutions (Elyachar 2012; Maurer 2012; Dolan and Roll 2013).

However, my brief immersion into Startup Weekend Khayelitsha also revealed that these networks of solidarity and mutual help were not only mobilized to promise wealth. Both Benny's and Lindile's startups attest to their capacity to patch the technological limits of living in a township with what Simone has described as "people as infrastructure" (2004). Both replaced the most technologically-complex elements of their business ideas with a layer of willing volunteers. These decisions were not, in any simple way, driven by their desire to profit from these strategic business models. In fact, I have described the diverse rationalities that Benny and Lindile foregrounded in their decision to participate to the event: most importantly, their will to help and mentor others in the way they thought they had been fortunate to be helped and mentored in their past. Even more visibly, the women of Khayafighters were so unpreoccupied with finding ways of profiting from their idea of using the phatic networks of

the townships to prevent fires that, eventually, they had to pretend to have a business model, for the sake of the competition. In other words, incubators such as the Barn Khayelitsha, even when purposefully designed to mine the fortune at the bottom of the economic pyramid, may in fact enrol the existing economic infrastructures of the poor for purposes other than monetizing them. This is both empirical evidence and an analytical move that I am about to explain.

The second contribution of this paper is to the argument that incubators and hackathons serve the purpose of producing neoliberal subjectivities: the entrepreneurial, competitive individuals that capitalist markets need. This is indeed the promise of millennial development: a democratisation of capital that would help the poor help themselves as entrepreneurs (Roy 2010). One could suggest that incubator spaces are the infrastructural ends through which capitalist modernity is cultivated at its urban frontiers, by endowing marginal citizens with the technical skills (from Javascript to managerial tools) that they need to inhabit neoliberal nations (Ho 2017) or purportedly "smart" cities (Rossi and di Bella 2017; Cardullo and Kitchin 2019; Perng et al. 2018). Lilli Irani has shown, for example, how hackathons and accelerated entrepreneurial programmes are the generative humus of entrepreneurial citizenship (2015). However, as Colin McFarlane has suggested (2012), the co-production of entrepreneurialism in places of economic marginality like slums, where global neoliberal mantras are renegotiated against local networks of solidarity and alternative economies, often exceeds the mere focus on market inclusion.

Let me take this second argument further. Startup Weekend did cultivate hopes of individual wealth and personal success. It did so, I suggested, using multiple other layers of infrastructure, furrowed by the urban divides inherited from apartheid and hitched by the capacity of Khayelitsha residents to cross those gaps. However, my article shows that additional hopes and desires were nurtured at the intersection of these patched infrastructures. Not just profit, but a wider range of rationalities, many of which transcended personal gains but were in fact collective aspirations of economic inclusion and desires to overcome the infrastructural divides of a divided city. These "patches of disturbance and mutualistic transformation", writes Sung-Yueh Perng,

> demonstrate how neoliberal co-optation can be disturbed in practice and how social, technological and organisational arrangements can be devised so as to repurpose the knowledge, skills and technologies otherwise owned by corporations for shaping desirable futures (2015).

Urban infrastructures may be the epitome of segregation, marginality, and poverty. History tells us how infrastructures were vital to the spatial production of apartheid. However, as Ash

Amin has written, urban machines are also bearers of other hopes and promises: they offer a glimpse of future possibilities which "render the incomplete and often unfulfilling present bearable", and produce "an imagined commons of shared affects and assets supposed to iron out the divisions and differences of the everyday city" (Amin 2014, 138-139; see also Mains, 2019). Incubators are not a typical kind of infrastructure. However, as in Ash Amin's words, they do produce shared understandings of what forms of economic life are best suited for the future of, in this case, a South African township. Moreover, as infrastructures, incubators function through several technical features that, inevitably, can be hacked for alternative projects. Even when designed for the purpose of creating profit opportunities, the possibility of refunctioning is always at hand. Despite the templates, the rules, individuals inscribe their desires, their hopes, their agendas in the operations of such urban machines. This is what many mentors and participants did during those 54 hours in September 2015.

In this sense, this article speaks to the possibility of a different urban geography of development (Power et al. 2006), one that acknowledges the microscopic singularities within seemingly overdetermined neoliberal experiments of entrepreneurial citizenship. As Abdoumaliq Simone and Edgar Pieterse write:

> A number of urban theorists have [... pointed] to the need to be less obsessed with an endless rediscovery of differentiated processes of neoliberalization, but, rather, *also* explore grounded and speculative alternatives that can animate and stitch together a plethora of diverse and divergent molecular experiments. (Simone and Pieterse 2017, 56).

The extent to which urban areas like Khayelitsha are drenched with colonial, environmental, and neoliberal violence is well documented in geography and other literatures (see Brunn and Wilson 2013; Smit et al. 2016; Pentecost and Cousins 2017). Inevitably, these are the dominant framings through which South Africa's urban margins are portrayed: as terrains of speculated and/or physical extraction. However, write Simone and Pieterse, it is possible to be interested

> in how instruments developed to bring about greater certainty and precision to the operations of governance and infrastructure might actually intensify uncertainty. [And] in how the roll-out of building projects at different scales sometimes seems to become an instrument, not of immediate profit or discernible use, but of "wild" attempts to make the city into something that it is not (yet) [... And] in how domains that otherwise might be seen as the exemplars of cut-throat competition might also be important spaces for rehearsing collective thought and action (2017, 61).

My aim was thus to offer a material ethnography of urban infrastructure which revealed "added matter for a politics of social recognition and justice" (Amin 2014, 156), in recognition of what Annemarie Mol calls "ontological politics" (1999). These are the *additional reasons*, the political ones, for choosing to amplify, in this case ethnographically, one reality over another. Hence, my microscopic description of Startup Weekend is an attempt at navigating against some of the predictable trajectories of neoliberal entrepreneurialism and millennial development — something I learnt from the competition participants themselves, who recognised the possibility of alternative political grounds, both within and without the infrastructural constraints of urban life at its margins.

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6. Notes

[1] https://www.un.org/sg/en/content/sg/speeches/2014-10-31/remarks-i-hubushahidi [4/19/18].

[2] see note 1.

[3] https://ventureburn.com/2019/03/sa-sme-funds-eight-funds/ [3/30/19]

[4] This resonates with what feminist geography has described as "reading for difference" (Gibson-Graham 2008).

[5] On the "privilege" of fieldwork in technological fields, see Shannon Mattern, "Cloud and Field," *Places Journal,* August 2016.

[6] for "operations" see Mezzadra and Neilson (2015).

[7] As I wrote elsewhere (Pollio 2019 b), the presence of Uber in Cape Town signifies a success in its world-city aspirations, but it also a reenactment of developmental narratives of entrepreneurialism.

[8] Technologies of debt and credit, as Deborah James has shown (2014), are inextricably interwoven into the making of economic subjectivities in post-apartheid South Africa.

[9] As a matter of fact, there are several informal, semi-formal and formal systems for avoiding profligacy in condition of indebtedness (see James 2014). These technologies of saving, however, were seen by Lindile as perpetuating old-school approaches to debt.

[10] http://www.adilgherib.com/ [10/12/2016]

[11] http://www.forbes.com/sites/edmundingham/2015/01/20/welcome-to-the-ikea-for-entrepreneurs-1000-handpicked-apps-to-help-build-your-business-overnight/#3a3a13e96804 [10/12/2016]

[12] https://maqtoob.com/on-the-move [10/12/2016]

[13] https://blog.maqtoob.com/south-africa-on-a-crazy-road-trip-mother-nature-and-hope [10/12/2016]