

Schafft Wissen: Gemeinsames und geteiltes Wissen in Wissenschaft und Technik: Proceedings der 2. Tagung des Nachwuchsnetzwerks "INSIST", 07.-08. Oktober 2016, München

Engelschalt, Julia (Ed.); Maibaum, Arne (Ed.); Engels, Franziska (Ed.); Odenwald, Jakob (Ed.)

Veröffentlichungsversion / Published Version
Konferenzband / conference proceedings

Empfohlene Zitierung / Suggested Citation:

Engelschalt, J., Maibaum, A., Engels, F., & Odenwald, J. (Hrsg.). (2018). *Schafft Wissen: Gemeinsames und geteiltes Wissen in Wissenschaft und Technik: Proceedings der 2. Tagung des Nachwuchsnetzwerks "INSIST", 07.-08. Oktober 2016, München* (INSIST-Proceedings, 2). <http://nbn-resolving.de/urn:nbn:de:0168-ssoar-58220-7>

Nutzungsbedingungen:

Dieser Text wird unter einer CC BY-ND Lizenz (Namensnennung-Keine Bearbeitung) zur Verfügung gestellt. Nähere Auskünfte zu den CC-Lizenzen finden Sie hier: <https://creativecommons.org/licenses/by-nd/1.0/deed.de>

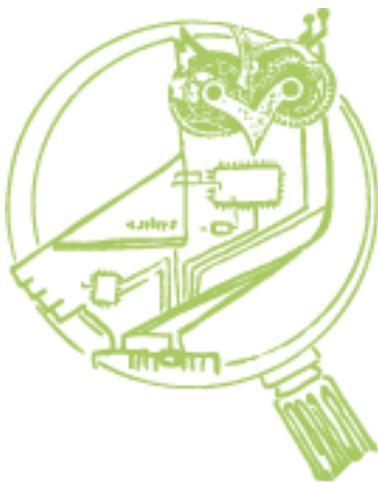
Terms of use:

This document is made available under a CC BY-ND Licence (Attribution-NoDerivatives). For more information see: <https://creativecommons.org/licenses/by-nd/1.0>

Schafft Wissen: Gemeinsames und geteiltes Wissen in Wissenschaft und Technik

Proceedings der 2. Tagung des
Nachwuchsnetzwerks „INSIST“,
07.-08. Oktober 2016, München

Herausgegeben von
Julia Engelschalt, Arne Maibaum,
Franziska Engels & Jakob Odenwald



Inhaltsverzeichnis

Geleitwort	i
Editorische Notiz.....	ii
Technologie und Collagekunst.....	1
Laura Voss	
Vom Forschen erzählen: Thomas Huxleys Method of Zadig als ‚popularisierte Wissenschaftstheorie‘ am Ende des 19. Jahrhunderts	4
Jakob Odenwald	
„Herrliche, liebliche und fůrtreffliche Nutzbarkeit.“ Vermittlung von praktischem Wissen durch Franz Ritters Astrolabium-Traktat von 1613	22
Agnes Bauer	
Gebrauchsanleitungen für „lebende Maschinen“? Synthetische Biologie zwischen Ingenieur und Anwender	43
Michael Funk	
Chronogrammatologie. Zeitregistratur der Laufzeit bei Hermann von Helmholtz um 1850	68
Christoph Borbach	
Quantified Self als verwissenschaftlichte Selbsterkenntnis	92
Lars Gaentzsch	
(De-)Constructing Participation in Transdisciplinary Sustainability Research: A Critical Review of Key Concepts	106
Livia Fritz	
Soziologische Spuren im Design Thinking und die Möglichkeit einer soziologischen Fremdbeschreibung der Soziologie	125
Tim Seitz	
Same, same but different: Storytelling of innovative places and practices in Nairobi.....	139
Alev Coban	
The Relationship between Openness and Closedness in the FabLab. A Differentiated Typology of Possible Relations between Institutional Logics ...	153
Jana Deisner & Chris Grieser	
Zur Verwissenschaftlichung einer „nachgeordneten Behörde“ – Die Projektträgerorganisation im Spannungsfeld von Politik und Wissenschaft ...	170
Lisa Kressin	
Konflikte um Technisches als Ansatzpunkte für eine Biografie der Technik ...	187
Andie Rothenhäusler	
I Robot, You Unemployed: Robotics in Science Fiction and Media Discourse.....	203
Lisa Meinecke & Laura Voss	
Autor*innenverzeichnis	222

Geleitwort

Initiiert an einem Bielefelder Küchentisch, blickt das Interdisciplinary Network for Studies Investigating Science and Technology (kurz: INSIST) auf eine mittlerweile fünfjährige Geschichte zurück. Der Anspruch der Beteiligten war von Anfang an, Nachwuchsforscher*innen, Studierenden und allen Interessierten, die sich für Fragen der Geschichte, Philosophie und Soziologie der Wissenschaft und Technik und angrenzende Felder interessieren, eine Plattform zum thematischen wie auch informellen Austausch zu bieten. INSIST versteht sich als *bottom-up* organisierter, offener Rahmen für das Ausprobieren und die gemeinsame Umsetzung neuer Ideen, als Interessenvertretung für Nachwuchsthemen und auch als Möglichkeit zum Knüpfen von Praxiskontakten.

Wie fruchtbar neben dieser Offenheit auch die Schaffung von Kontinuität sein kann, zeigt die Tatsache, dass aus der ersten INSIST-Nachwuchstagung, die 2014 in Berlin stattfand, inzwischen eine Konferenzreihe geworden ist. Am 7. und 8. Oktober 2016 fand in München die zweite Tagung mit dem Titel „Schafft Wissen: Gemeinsames und geteiltes Wissen in Wissenschaft und Technik“ statt – diesmal mit großzügiger Unterstützung des Munich Center for Technology in Society (MCTS) der Technischen Universität München.

Neben einer inspirierenden Keynote von Prof. Dr. Ulrike Felt (Universität Wien) bot diese Konferenz in zehn interdisziplinären Panels ein breites Spektrum an Themen und viel Raum für kritische Diskussionen. Alle Beiträge einte das gemeinsame Interesse an den vielfältigen Aushandlungsprozessen, denen wissenschaftliches wie technisches Wissen in verschiedensten Kontexten der Produktion und Kommunikation unterliegt. So ging es in den Vorträgen unter anderem um die Wechselbeziehung zwischen Wissen und Öffentlichkeit(en), Wissen und Politik, Wissen und Körper sowie Wissen und Digitalisierung. Daneben wurden Orte des Wissens, aber auch sozio-experimentelle Wissens(an)ordnungen und Fragen der Teilhabe an Wissen bzw. der partizipativen Wissensproduktion diskutiert. Darüber hinaus wurde die Nachwuchstagung durch eine Ausstellung mit Collagen von Laura Voss (MCTS) bereichert, die in ihrer Auseinandersetzung mit Innovation und der Produktion von Wissen und Technologie wissenschaftliches und künstlerisches Arbeiten in einen fruchtbaren Austausch bringt.

Zur INSIST-Tagungsreihe erscheint hiermit nun auch der zweite Band der Proceedings-Reihe. Ein Teil der Vorträge wurde von den Autor*innen zur Veröffentlichung ausgearbeitet und hat ein Peer-Review-Verfahren durchlaufen. Wir bedanken uns ganz herzlich bei allen Autor*innen, Reviewer*innen und Herausgeber*innen für ihre unermüdliche Arbeit – und freuen uns schon jetzt auf die dritte INSIST-Nachwuchstagung, die im Oktober 2018 in Karlsruhe stattfinden wird.

Julia Engelschalt & Franz Kather, Universität Bielefeld
Sprecher*innen von INSIST

Editorische Notiz

Die hier versammelten Beiträge der zweiten INSIST-Nachwuchstagung 2016 „Schafft Wissen: Gemeinsames und geteiltes Wissen in Wissenschaft und Technik“ reflektieren, wie auch die Proceedings zur ersten INSIST-Tagung, sowohl die Bandbreite an Themen, die aktuell in der Wissenschafts- und Technikforschung diskutiert werden, als auch die rege Beteiligung unterschiedlichster Fachrichtungen an diesen Diskussionen.

Um – bei allem Wunsch nach Interdisziplinarität – der disziplinären Verortung der einzelnen Autor*innen gerecht zu werden, haben wir uns entschieden, die Zitierweise, die bibliographischen Angaben und fachspezifischen Gepflogenheiten im Textsatz weitgehend beizubehalten und lediglich im Layout zu vereinheitlichen.

Die Reihenfolge der hier zusammengestellten Artikel reflektiert weder die zeitliche Abfolge der Vorträge im Verlauf der INSIST-Tagung, noch soll durch die gewählte Anordnung eine qualitative Wertung vorgenommen werden. Vielmehr möchten wir auf diese Weise die Vielfalt und Unterschiedlichkeit der größtenteils in deutscher und erstmals auch teils in englischer Sprache eingereichten Texte unterstreichen.

Eine künstlerische Rahmung für den Band bilden ausgewählte Collagen von Laura Voss, die während der Tagung in München ausgestellt wurden. Entsprechend beginnt der Band mit einer Erläuterung dieser Arbeiten unter dem Titel „Technologie und Collagekunst“ (Voss). Im weiteren Verlauf des Bandes markieren die Collagen eine lose thematische Gruppierung der Textbeiträge in fünf Schwerpunkte: Popularisierung von Wissen im historischen Kontext (Odenwald, Bauer); Wissen in Experimentalanordnungen (Funk, Borbach); Wissensgemeinschaften (Gaentzsch, Fritz, Seitz); Wissen und Organisationen (Coban, Deisner & Grieser, Kressin); und schließlich Technik und Narration (Rothenhäusler, Meinecke & Voss).

Wir möchten uns an dieser Stelle bei allen Autor*innen für ihre Einreichungen bedanken. Alle Beiträge haben ein anonymes Peer-Review-Verfahren durchlaufen. Daher gebührt unser Dank auch den Mitgliedern des Review-Teams für ihre konstruktiven Anmerkungen und Verbesserungsvorschläge. Für die Möglichkeit der Online-Publikation im Social Science Open Access Repository (SSOAR) danken wir außerdem dem GESIS Leibniz-Institut für Sozialforschung.

Julia Engelschalt, Universität Bielefeld

Arne Maibaum, Technische Universität Berlin

Franziska Engels, Wissenschaftszentrum Berlin für Sozialforschung / Munich Center for Technology in Society (MCTS), Technische Universität München

Jakob Odenwald, Universität Zürich

Same, same but different: Storytelling of innovative places and practices in Nairobi

Alev Coban

“Don’t mind that once again, you are missing the story. You just made up one, and that is what writers do. You are just doing your job.”
(Okari, 2016)

In his ironic blog post “How to Write About Tech in Kenya...and Africa”¹, Okari mocks everyone, including himself, because everyone is writing the same story with the same buzzwords over and over again when trying to describe the tech scene in Nairobi. One of those buzzwords is “Silicon Savannah”, which was introduced by international magazines. The term should describe the tech scene in Nairobi by drawing a literal connection to Silicon Valley. Thus, it describes a fast growing scene of technological entrepreneurs, start-ups and various co-working spaces to spur innovative thinking and making. The most prominent place (and thus the most visited from abroad) is the iHub, which is the first and largest Technology Hub in Sub-Saharan Africa. Since its opening in 2010, it has become a “nerve center for all things tech in Kenya” (Hersman, 2013: 62). iHub is therefore the place in Nairobi where technicians, investors, tech-companies, developers and researchers meet to co-work, discuss and network (cf. Macharia and Mutuku, 2014). And so it became a role model for ‘African’ innovation with the goal “to continuously fuel an ecosystem of innovation and technology that allows people to develop enterprises that creatively solve problems around them using technology, while shaping the way African innovation is viewed by the world” (www.ihub.co.ke).²

iHub is crucial to the story about the emergence of Nairobi’s tech scene and its story can be found everywhere – in blogs, on websites, told by the guides who lead the daily visitor groups through the working places at iHub, in newspapers and in the few academic accounts that focus on iHub (cf. Gathege and Moraa, 2013; Hersman, 2013; Marchant, 2015; several chapters in Ndemo and Weiß (eds.), 2017). It is telling us about the emergence of Nairobi’s tech scene, its im-

1. Written in the style of Binyavanga Wainaina’s famous essay “How to Write about Africa”.
2. The reproduction of ‘Africa’ as a single location is only done when it is used like this by the specific actors to which I refer. Personally and academically, I separate myself from the underlying conviction that an entire continent can be generalized into a homogeneous context and environment.

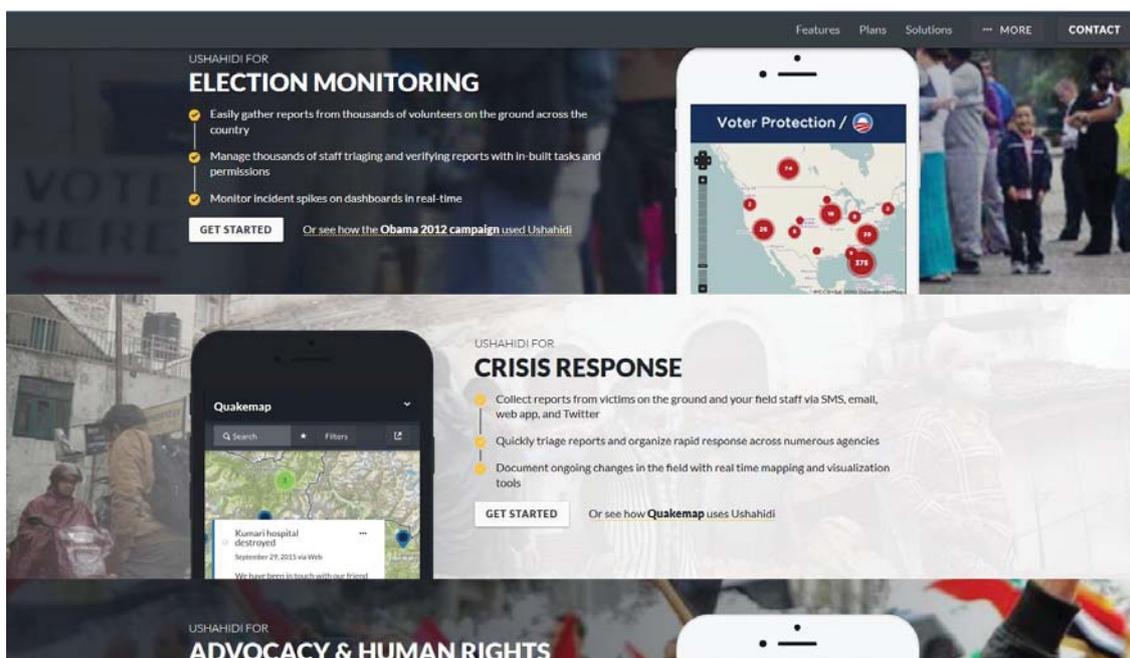
portance to the country's economy and the quick pace of Silicon Savannah's development. Although the story is told by many actors through various media outlets, it still remains the same. It took me by surprise during my research stays that I did not once encounter a different story about the emergence of Nairobi's tech scene than the ones I have read and heard about from abroad. Also, Okari's irony, introduced in the beginning, shows a certain critical awareness of this mainstreamed storytelling. Thus, the following paper claims that storytelling is a practice equally important to innovating, building, making and coding in innovative places in Nairobi. Whether the stories are produced in order to apply for funding, to gain accountability, to share knowledge following the open source codex or as mere self-presentations, the reasons for telling stories about technological innovations are diverse. But what are the characteristics of those stories about innovation, technology and the actors behind them? What do we realize when listening to stories of innovation? The stories produced around the tech scene in Nairobi follow certain characteristics of how to tell stories of science, innovation and technology, and global role models of how innovative places should be. The norms and role models of how to tell specific stories bear several consequences: stories become streamlined without context specificity and the expectations to tell the right story are high.

The following paper is based on (organizational) ethnographic research in Nairobi between 2015 and 2016 where I collaborated with several innovative working places. The methodological focus was on participant observation in two specific co-working and makerspaces in order to experience places and practices of innovating and making hardware. That means, I participated in the daily life of technological developers and makers by working at/for my research partners' spaces, attending events like panel discussions, hackathons and pitch competitions, conducting interviews and initiating round table discussions. In the following, the gathered insights are used to show how stories about places of innovation in Nairobi are oriented toward the dominant imaginaries of science, technology and innovation and how those demand how and what to innovate. In order to make this argument, the paper is divided in four parts: first, I'm going to introduce the founding story of iHub, which is told in the same way - no matter where or by whom. Secondly, specific characteristics of storytelling about science, innovation and technology are depicted and compared to iHub's founding story. Thirdly, the way in which the stories around the tech scene in Nairobi are entangled in the Silicon Valley phenomenon is shown. Finally, by drawing on ethnographic insights from the first makerspace in Kenya, I elaborate on how much work it is to write stories serving a specific imaginary of science, innovation and technology.

iHub's founding story: The surprising sameness

In the following, I ask you to delve into the founding story of iHub and pay attention to the way in which it is told as a successful story about tech in Kenya. Different sources, including authors, voices and observations, are used in order to reproduce the story of iHub, although I could also cite only a single source, as everyone is telling the same thing. The story goes as follows:

At the end of 2007, a couple of developers gathered in Nairobi in order to build a software with which everyone who had access to the Internet could map the election process in Kenya. Instead, massive violent outbreaks took place after the election, so that Ushahidi (Kiswahili for testimony) was used to follow and comment on the post-election violence in order to make the acts transparent (cf. Marchant, 2015: 8; Manske, 2014: 14; Ushahidi, 2017). The open-source software gained a lot of international recognition, so that today various civil society actors use Ushahidi (see Picture 1), e.g. 'Document Hate' during the US' election in 2016 or humanitarian volunteers during the aftermath of the earthquake in Haiti in 2012 (BBC, 2016).



Picture 1: Screenshot of Ushahidi's website on possible usages of the software.
Source: www.ushahidi.com.

For the first time, a technological innovation developed in Kenya was acknowledged and used by actors throughout the world. While Ushahidi was spreading, the mobile operator Safaricom (supported by the Vodafone Group) introduced M-Pesa in Kenya (Manske, 2014: 10). M-Pesa is a mobile banking platform, which allows people to send money to others via their mobile phone. As this system included people without access to a formal bank for the first time, M-Pesa became very successful (Marchant, 2015: 8). Until 2015, M-Pesa had 13 million active users who made transactions totaling 4.2 trillion Kenyan shillings (42% of

Kenya's GDP) which constitutes 20% of Safaricom's total revenue (Wainaina, 2015). Due to this often-recited example of a successful 'Kenyan' innovation, the international awareness was directed even more so towards the technological scene in Nairobi. Thus, development agencies and international corporations like Google, IBM and Microsoft are investing heavily in Nairobi as a place of technological knowledge production. According to Manske (2014: 14), this international awareness affects the self-image of Kenyans in a positive way: "M-Pesa's success became an identity-forming narrative", so that especially young people feel empowered to make Kenyan innovations possible. The story about tech in Kenya goes on by being reminiscent about how Nairobi's tech-minded people came together and various donors, like Omidyar Network and Hivos, finally funded Ushahidi in order to build a permanent, physical co-working space (Sanderson, 2015: 6). Those investments allowed iHub to emerge in 2010. Since then, it grew from a single Ushahidi office to a variety of different working places in the same building (de Bastion, 2013: 7). Following Erik Hersman, one of the founders of iHub and various tech companies in Nairobi, the iHub feels like "a high-tech community space one could find anywhere in the world, but with a Kenyan flavor" (2013: 62.). Within nine years, Nairobi has been labelled as 'Silicon Savannah', with the iHub as its 'nerve center' (Picture 2).



Picture 2: iHub's home until the beginning of 2017. Source: iHub.

Nowadays, iHub not only stands for physical infrastructures like internet access, stable electricity and delicious coffee, but also for a community of over 17,000 members who are committed to learning and creating new knowledge. Bitange Ndemo, the former Permanent Secretary of the Ministry of Information

and Technology, states that investment into Kenya's tech scene increases, so that "since 2008, over 82 start-ups in Nairobi have been funded" (Ndemo, 2016). Also, Ban Ki-Moon, who visited iHub in 2014, envisions that the application of innovative ideas from iHub will lead to 50 per cent more productivity than in the past (United Nations, 2014). Furthermore, he compares the technologies developed at iHub to the development of steam power which revolutionized Europe, and calls for a global transformation of society by the technological ideas evolving around iHub (ibid.).

Storytelling about science, innovation and technology

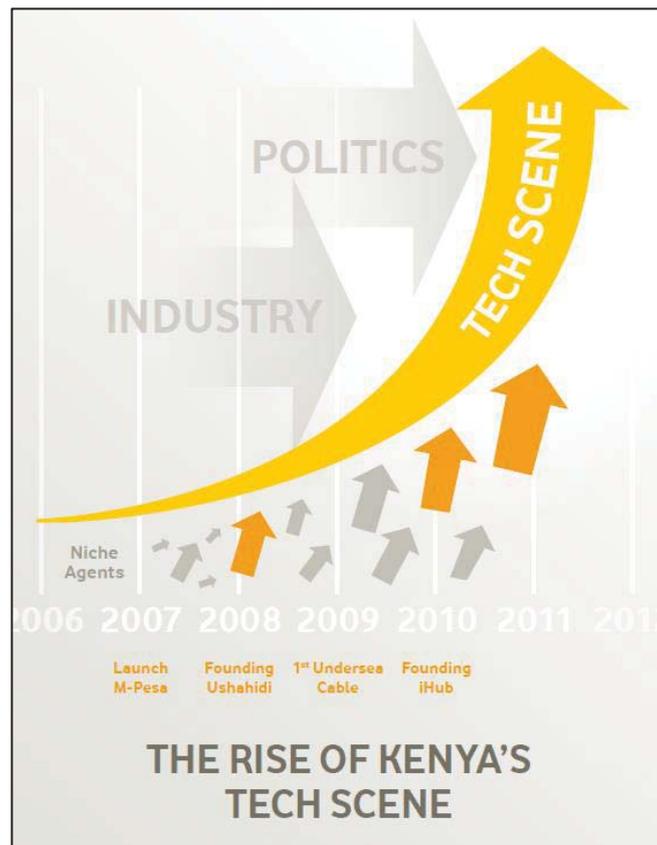
After we have dedicated all of our attention to the reverberant story of iHub, we should now question why it seems to be a solid, linear and singular story. Thus, it is inevitable to ask firstly how the founding story is told. Therefore, characteristics of storytelling following Felt and Fochler's work (2012) on science communication activities are described and then compared to iHub's founding story itself.

Following Felt and Fochler (ibid.: 2f.), "telling stories about science and technology seems to have become a *must* when it comes to claiming [one's] position in the public space". Therefore, they analyzed scientists' stories and came up with specific characteristics of storytelling about innovation, technology and science. First of all, a story about scientific work, like developing an innovative technology, needs to be brief but entertaining and needs to be convincingly relevant but heroic (ibid: 5f.): "[The story] needs a more heroic plot, in which science contributes to shaping societal futures, to realizing societal values and to solving societal problems. In the light of the contemporary discourses around science and innovation, [...] [t]his ties the stories told into broader accounts about progress and innovation, about how more knowledge will necessarily lead to better lives" (ibid: 6). Those "promissory stories" (ibid.) establish a linearity of technological development which is characterized by successful decisions without uncertainties – either told from the retrospective after an innovation successfully entered the market or told anticipatively about a technology that envisions solving societal problems in the future. Through such kinds of storytelling, the innovative project, but also the person(s) behind it, are all portrayed in the same heroic way: innovators are described as "the misfits among us, those who see and do things differently, who challenge the status quo and the power sources that prop it up" (Hersman, 2013: 65); they "are sketched as those who 'have made it'" (Felt and Fochler, 2012: 8). Failures in Silicon Valley, although they are celebrated with the annual conference FailCon, and other daily life issues like boring routines, are left out from stories about innovators. Thus, Schumpeter seems still right when writing almost 80 years ago that "[t]he entrepreneur is this exceptional being who, in hedging his bets on invention and market, knows how to bring an intuition, a discovery, a project, to the commercial stage" (Schumpeter cited by Akrich et al. 2002: 188). That leads to another characteristic of stories about innovation: the

entrepreneur as the main actor being a single (mostly white) person who apparently had the innovative idea on his³ own.

Characteristics of iHub's founding story

Having the characteristics of science stories in mind, how do they fit to the foundation story of iHub? The most apparent characteristic is the linearity of iHub's development. That linearity and the coherence of iHub's story can be well seen in the following diagram (Picture 3):



Picture 3: The Rise of Kenya's Tech Scene.

Source: Manske, 2014: 20.

Every historical incident, e.g. the introduction of M-Pesa to the Kenyan mobile phone customers, the founding of Ushahidi, and infrastructural novelties like the first undersea cable leading to Nairobi, seems to be in a stringent order of events that naturally lead to iHub's foundation. Neither in the diagram, nor in the retrospectively told story, setbacks, barriers or other challenges can be found. Thus, the story becomes brief and polished. And if challenges in Kenya, like violent elections or insufficient access to banks for the rural population, are mentioned, they are only told in order to show how to overcome them through science

3. This masculine possessive pronoun is not generic (cf. Czarniawska, 2004: 42).

and technology (e.g. Ushahidi and M-Pesa). With the references to the widely cited 'increasing mobile phone and internet penetration in East Africa' (see Mutua, 2012: 3 ff.), the story about Nairobi's tech scene becomes relevant to Kenya's economic 'progress'. Furthermore, in the middle of Kenya's challenges, the committed individuals who founded the base for Nairobi's tech community, namely the iHub, are the heroes of the story. They managed to start a movement of innovative people and projects who are developing technology in order to solve the context-specific problems of Kenya. With such an ethical stance, the story about iHub becomes a promissory one, which mobilizes the belief in a possible economic and social development in Kenya through technological solutions to context-specific problems by following the role model of Silicon Valley to become Silicon Savannah.

"From Silicon Valley to Silicon Savannah"⁴

"If we're going to achieve greatness in the twenty-first century, [...] we have to start with some Silicon Valley thinking", said Eric Schmidt, the former CEO of Google, during a conference (cited by Marwick, 2013). This conviction seems like a mantra constantly repeated by the global tech scene. Mutua and Alliy (2012: 58), two tech experts from Nairobi, call it the "globalization of Silicon Valley" – the fact that "[i]n the last few years, the Valley culture has been slowly spreading across the world". For them, it is obvious to take Silicon Valley as a role model, as it is like "a well-oiled machine that keeps on producing innovations that impact the world" (ibid.). Focusing on Silicon Valley as the origin of the most innovative technologies fits perfectly into Marwick's (2013) analyses that the media portrays "Silicon Valley as place where the smartest, most motivated people from around the globe are changing the world for the better". Silicon Valley seems, therefore, to be a promoter for social entrepreneurship, while also boosting "the idea that entrepreneurship is a catch-all solution, and that a startup culture is the best way to solve any problem" (ibid.). In line with those stories about Silicon Valley's technological innovations that foster social progress, iHub also states that it is motivated to spur "a vibrant community of innovators and entrepreneurs to build "best in the world" companies tailored to solving the myriad of problems in Africa and across the developing world" (iHub 2017).

It seems that stories in general, and especially about Silicon Valley in this case, not only represent a certain status quo of people, places and things, but they also affect and materialize (Cameron, 2012: 581, 586). As such, those stories "can move, affect, and produce collectivities" and show how "modes of organizing, assembling, performing, and interpreting those experiences and expressions exceed the personal and particular" (ibid.: 574). Therefore, stories from Silicon Valley can be seen as "sediments of norms and practices" (Czarniawska, 2004: 48) of how technological innovation should be. The normative stance is mobilized

4. De Bastion, 2013: 4.

through stories, but also through programs, like Blackbox Connect. This two-week program is offered to international start-ups by the Silicon Valley-based accelerator Blackbox in order “to learn how to do it best, establish investment and distribution partnerships” according to Bishara (cited by Mulligan, 2015), the founder and CEO of Blackbox. Silicon Valley as role model and ‘best practice’ is furthermore materialized locally in Nairobi, namely in the interior design of innovative places. Remembering Hersman’s claim that the iHub is a global place with Kenyan flavor, Mutua and Alliy (2012: 17) state that the hubs in East Africa have the same function as the garages⁵ in Silicon Valley, where many start-ups started: “The idea is that innovation starts at the grassroots, so to speak; it starts with those two co-founders who have an idea and just need the basics – the right skills, some mentorship, a place to sit, the right environment and an internet connection – to get started. That’s how Google got started, and Yahoo or Facebook or any one of many of the iconic tech giants of today. The hubs also aim at creating the right environment” (ibid.: 180f.). This materialization in working environments in Nairobi is a highly visible consequence of taking Silicon Valley-based companies as role models. However, role models and stories about successful technological innovations also bear more hidden consequences, namely the creation of pressure on persons who tell stories trying to meet the exemplified imaginaries of science, innovation and technology, as well as on the entrepreneurs and ideas who are told about.

***Tell!* – The production of stories about technological development in Nairobi**

“I come from the land of M-Pesa”, stated Sambuli at the panel discussion ‘Digital Human Rights and Development Agencies’ (Stiftung für neue Verantwortung, 9th of September 2015), referring to the international awareness which reduces Kenya’s tech scene to the most famous story about M-Pesa. Following her, this success story and the parallel development of iHub caused every other Technology Hub in Sub-Saharan Africa to closely observe how iHub develops in order to learn from its model. Thus, iHub became a local role model for a place which supports innovative people; all eyes are set on it. The international actors who invest in Kenyan innovations are waiting for the next technological success from Kenya: when is the next ‘revolutionary’ innovation coming? (Interview with Sambuli, 23rd of November 2015) All international actors watching from afar observe the tech development through reading the stories produced by the innovators themselves or by journalists and celebrities visiting iHub for a couple of hours at a time. Suddenly, producing stories about one’s innovative work seems to be as equally important of a practice as the actual innovating, making, coding, etc. It seems that one needs to add *Tell!* to the three other imperatives predominantly

5. It is probably no coincidence that the latest co-working space in Nairobi is called ‘Nairobi Garage’.

found in innovation narratives, namely *Do! Make! Innovate!* The acknowledgment of storytelling as a daily practice in innovative places leads to the awareness that stories are not simply lying around, but are “fabricated, circulated, and contradicted” (Czarniawska, 2004: 48).

One such practice of telling is the production of newsletters which I encountered while working ethnographically at the makerspace called *Engine*⁶ in 2016. This makerspace offers paying members a working place with access to machines for electronic and mechanical engineering, SBU (Safety and Basic Use) trainings, mentoring, etc. in order to prototype a high-quality version of their idea. Engine distinguishes itself from the amateurish stance of many makerspaces around the world by looking especially for professional entrepreneurs who have an idea that can be marketed in Kenya. The broader aim of the makerspace is to develop technologies “Made in Africa, for Africa” and to support an overall “fourth industrial revolution” in Kenya (Birkelo, 2017; Gachigi, 2017). In order to report regularly to the outer world about what happens at their venue, the employees have to compose two monthly newsletters: one for their international funders and one for their paying members.

As I was entrusted with helping to write newsletter stories, I started my task with finding a member of the makerspace who agreed to be written about. I was introduced to John, who works on a locally manufactured version of the ram pump, which is able to direct water from the river to the hilly fields of farmers. We set up an interview date and met two days later. I asked the questions which were collectively compiled with the staff of the makerspace beforehand and recorded the conversation with John. After that, I sat down and listened to the record in order to write down the interesting parts of his story. I defined his background, the challenges he met as an engineer, his project idea, and the benefits he gained from working at a makerspace as interesting. I thought that would provide me with a good overview and a story which would not be too long – three fourths of a Word page was the requirement made by one of the heads of Engine. I wrote a story about John and send it to the makerspace staff. They edited the story and shortened it to one third of a Word page. After that, I sent the edited story to John himself, because we thought it would be appropriate to ask him for his permission to publish the story in the newsletter before actually doing it. That was a good decision, as he had several comments which we needed to correct. The story was edited again and then finally published in the newsletter under the heading “Getting to know Engine members”. The story was titled “John Owino – An Environmental Technologist Who Farms Hibiscus”, showing a picture of him in front of a computer screen with the digital model of his ram pump on it, saying:

“It is all about water, water, water living as a farmer.” Being a farmer himself, John (43) observed the need to gain better access to river water and its distribution to the farmers’ fields. Thus, he sought out to develop a hydraulic ram pump which runs on the kinetic energy of the river water to pump water to different farms and homesteads in his area. In the spirit of

6. The following names of institutions and persons have been altered in order to ensure anonymity.

solving local community problems, John wants to build a locally manufactured version of the ram pump which is adapted to the specific needs of the local environment like the filtering of contaminated water and dropping water levels due to the seasonality of the rivers. [...] Before being a member at [Engine], he explains, he only had access to welding machines, which produced inaccurate work, and to material like PVC, which cracks easily due to the pressure inside of a ram pump. [...]" (Newsletter of Engine, 2nd July 2016).

After that first story, the next newsletter was soon due and we sought to find another member to write about. That was more difficult than expected. As the makerspace was in its beginning phases at that time, paying members were scarce and the existing members did not want to talk to us. I was wondering why until I became the explanation for that phenomenon: the majority of members working at the makerspace are secretive because the application of intellectual property rights in Kenya's tech scene is low due to various reasons. Thus, most of the members do not even interact with staff or other users of the space in order to hide their ideas and prototypes, fearing a loss of their intellectual property. This fact seemed to collide with everything I thought and read about open co-working spaces, where knowledge is created through the exchange with others. Leaving my astonishment aside, I looked for other stories to write about and found (obviously) the other users of the makerspace. Those were mostly interns and, as such, still students enrolled at universities. Nevertheless, they did not seem to be the right material for newsletter stories, as one of the heads of the makerspace told me: the younger people strive to build high-tech Printed Circuit Board (PCB) solutions and not innovations which are marketable to the majority of Kenya, which he called the "bottom of the pyramid market". In his opinion, that behavior is a problem because the students are not ready to think and prototype in business terms. Adding this strong opinion to the other constraints of finding the right story to tell, I felt a bit frustrated because I had no clue what to write about. My colleague seemed to feel the same: "My brain is drained". The newsletter should be published the next day and we were still looking for the "big stories that have to be told to the funders".

These ethnographic insights gained at Nairobi's first makerspace show how stories about science, technology and innovation are produced in daily life. The imperative of telling what you are innovatively creating influences the daily life of people in Nairobi's tech scene, namely for those who (have to) tell the stories. It seems that some contextual circumstances make the writing process complicated when trying to keep up the global imaginary of innovative spaces that facilitate successful innovations with a social impact. This tedious work of telling is neither tackled in any account on innovation, nor is daily life in general a favored plot in stories about science and technology. Felt and Fochler (2012: 8) also gain the impression that "scientific work is portrayed as continuously exciting", although "experimental practice is also full of routine work and setbacks and is connected to being notoriously behind schedule, [...] [with] moments of frustration [...] [being] more common than the rare occasions of thrill and delight when

things do work out". That fits perfectly to the depiction of a story as being entertaining and brief – daily life is usually not exciting and it is briefer to tell a story in a linear and coherent way without tackling failures or reiterations. Failure is "only talked about in the context of reporting about fraud cases, where the scientists involved are staged as culprits [...] violating the scientific ethos" (ibid.). In John's story, his challenges with machines which did not work well enough for him were only told in order to show that they got solved by the makerspace. This storyline emphasizes the success of the makerspace model, namely to empower people to build their ideas through access to high-quality machines. John's idea of a locally manufactured ram pump constitutes a personal success story: the reader can anticipate how the pump will revolutionize the farmer's water problems in hilly areas. The social impact of John's technological solution becomes crystal clear. Nevertheless, what one is not able to see by reading John's story is the fear of losing intellectual property or the pressure to develop technology for the poor. Thus, the norms of how to tell stories about people and their brilliant innovative projects lead to the extinction of daily life, of conflicts and failures and thus contextual specificities. Through looking at the production of newsletters, we have seen how stories become streamlined or better "petrified", as well as the immense "stabilizing work" behind this process (Czarniawska, 2004: 43).

Conclusion

In this paper, I showed why "stories matter" (Cameron, 2012: 586). Stories matter because, by following certain storytelling characteristics, they empower dominant imaginaries of science, innovation and technology, which are deeply connected to beliefs in societal progress through technologies. Stories matter because by telling them in order to get funding, to be accountable or to showcase oneself in the global tech community, storytelling is an equally important daily life practice as innovating itself. And stories matter because, by working for an innovative space in Nairobi, one is engulfed in producing stories that show, contrary to wide-spread assumptions (cf. Mulligan, 2015; Edgerton, 2007), that places situated 'outside' of Silicon Valley also have success stories to tell and role models to exhibit. The expectations are high: the stories should be quick to read, easy to understand and starring a hero who innovated a technology that has social impact by solving a context-specific problem of the poor. And the work is hard: telling a streamlined story of a makerspace as a space which facilitates successful innovations without any difference to the stories about its role models based in Silicon Valley, means eradicating (boring) daily life routines and contextual circumstances. Consequentially, the existing storytelling norms create expectations of how a story has to be, but also expectations of how the next innovation has to be. That means that the story about technological innovation in Silicon Savannah framed by M-Pesa's success creates a certain imaginary of successful innovators

and their projects, which leads to put pressure on how makers, innovators, coders and storytellers in Nairobi should be and act.⁷

Therefore, my conclusive and methodological claim following Akrich et al. (2002: 190) is that, in order to open singularized and coherent stories about science, technology and innovation, the academic world “[...] must not believe for a moment those edifying stories which retrospectively invoke the absence of demand, technical difficulties or inhibitory costs”. Without looking at the production of the stories told about Nairobi’s tech scene, e.g. through newsletters, we would neither grasp the hard work behind it, nor some of the local specificities of innovative working spaces in Nairobi, e.g. the closeness of members due to scant enforcement of intellectual property rights or the need to build things with a social impact in order to serve the market with the majority of Kenyans living in the country-side. We cannot do research about/in the growing tech scene in Nairobi and other places and practices entangled in the Silicon Valley phenomenon just by reading newsletters and online reports, or by joining a daily visitor group through the innovative working places. On the contrary, we need to do participative ethnographic research in order to experience the constant negotiations between the dominant imaginaries of science, technology and innovation and the local daily life practices and how those shape the production and practices of innovative places. Thus, the research of daily life practices, including also “boring things” (Star, 2002: 108), allows us to see different stories as “there are other things next to M-Pesa, there are other tech companies that are not doing flashy stuff but have impact. It may not be as overt, it may not be as flashy. But it’s there.” (Interview with Sambuli, 23rd of November 2015) And even Marc Zuckerberg⁸, the hero of a global innovation from Silicon Valley himself, approves this claim by saying that: “The real story of Facebook is just that we’ve worked so hard for all this time. The real story is actually probably pretty boring, right? We just sat at our computers for six years and coded.” (Interviewed by O’Dell, 2010).

7. The negotiations of tech developers and start-ups between liberating feelings about new work possibilities and restrictive requirements of international funders and investors who still pursue exoticized imaginations of a generalized ‘Africa’, are elaborated in Coban, 2018.

8. Also Mark Zuckerberg visited iHub in order to learn from mobile money start-ups in August 2016. Source: www.qz.com/771809/mark-zuckerberg-has-made-a-surprise-visit-to-nairobi-to-learn-about-mobile-money.

Literature

Akrich, Madeleine, Michel Callon and Bruno Latour (2002) The Key to Success in Innovation Part I: The Art of Interessement. In: *International Journal of Innovation Management* 6 (2): 187–206.

BBC (2016) Kenyan app Ushahidi monitoring US elections. Source: www.bbc.com/news/world-africa-37910068 (20.01.2017).

Birkelo, Paul (2017) Building Makerspaces for the 4th Industrial Revolution. Source: <https://medium.com/@cpbirkelo/building-makerspaces-for-the-4th-industrial-revolution-be51e5d76e22> (05.07.2017).

Cameron, Emilie (2012) New geographies of story and storytelling. In: *Progress of Human Geography* 36(5): 573-592.

Coban, Alev (2018) Making Hardware in Nairobi: Between Revolutionary Practices and Restricting Imaginations. In: *Journal of Peer Production* 12.

Czarniawska, Barbara (2004) *Narratives in Social Science Research*. SAGE Publications: London.

De Bastion, Geraldine (2013) *Technology Hubs - Creating space for change: Africa's technology innovation hubs*. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ): Bonn.

Edgerton, David (2007) Creole technologies and global histories: rethinking how things travel in space and time. In: *HoST* 1: 75-112.

Felt, Ulrike and Maximilian Fochler (2012) *What science stories do: Rethinking the multiple consequences of intensified science communication*. (Re-Print) Department of Social Studies of Science: University of Vienna.

Gachigi, Kamau (2017) Changing gears for the fourth industrial revolution. Source: www.makingitmagazine.net/?p=10250 (05.07.2017).

Gathege, Duncan and Hilda Moraa (2013) *ICT Hubs model: Understanding the Key Factors of the iHub Model, Nairobi Kenya*. Source: www.research.ihub.co.ke/uploads/2013/may/1367834943__374.pdf (23.02.2017).

Hersman, Erik (2013) Mobilizing Tech Entrepreneurs in Africa – Innovations Case Narrative: iHub. In: *Innovations: Technology, Governance, Globalization* 7(4): 59-67.

iHub (2017) www.ihub.co.ke/about (20.01.2017).

Macharia, Joel and Leo Mutuku (2014) *Financing Technology Businesses in Kenya*. Source: www.ihub.co.ke/ihubresearch/jb_FinancingTechnologyBusinesspdf2014-2-7-09-49-09.pdf (20.01.2017).

Manske, Julia (2014) *Innovations out of Africa. The emergence, challenges and potential of the Kenyan Tech Ecosystem*. Vodafone Institute for Society and Communications.

Marchant, Eleanor (2015) Who is ICT Innovation For Challenges to Existing Theories of Innovation, a Kenyan Case Study. CGCS Occasional Paper Series on ICTs, Statebuilding, and Peacebuilding in Africa Nr. 4.

Marwick, Alice (2013) Silicon Valley Isn't a Meritocracy. And It's Dangerous to Hero-Worship Entrepreneurs. Source: www.wired.com/2013/11/silicon-valley-isnt-a-meritocracy-and-the-cult-of-the-entrepreneur-holds-people-back (20.01.2017) Excerpted and edited by: Sonal Chokshi.

Mulligan, Gabriella (2015) Startups "learn how to do it best" in Silicon Valley – Blackbox. Source: www.disrupt-africa.com/2015/02/startups-learn-best-silicon-valley-blackbox (20.01.2017).

Mutua, Will and Mbwana Alliy (2012) Innovative Africa: The new face of Africa. Afrinnovator.com: Nairobi.

Ndemo, Bitange (2016) iHub is evolving to help more start-ups grow and compete. Source: www.nation.co.ke/oped/blogs/dot9/ndemo/2274486-3154012-ojj8bkz/index.html (20.01.2017).

Ndemo, Bitange and Tim Weiss (eds.) (2017) Digital Kenya - An Entrepreneurial Revolution in the Making. Palgrave Macmillan: London.

O'Dell, Jolie (2010) Facebook CEO interviewed on IPO, lawsuit and more. Source: www.edition.cnn.com/2010/TECH/social.media/07/22/facebook.ceo.interview.abc/index.html (20.01.2017).

Okari, Abu (2016) How to Write About Tech in Kenya...and Africa. Source: www.ahntify.com/how-to-write-about-tech-in-kenya-and-africa (20.01.2017).

Sanderson, Owen M. (2015) On Hubs, BRCKs, and Boxes: The Emergence of Kenya's Innovation and Technology Ecosystem. The Fletcher School of Law and Diplomacy.

Star, Susan Leigh (2002) Infrastructure and ethnographic practice - Working on the fringes. In: *Scandinavian Journal of Information Systems* 14(2): 107-122.

United Nations (2014) Secretary-General Praises Kenya's iHub as Continent's 'Silicon Savannah', Future of Africa. Source: www.un.org/press/en/2014/sgsm16300.doc.htm (20.01.2017).

Ushahidi (2017) www.usahidi.com/about (20.01.2017).

Wainaina, Eric (2015) 42% of Kenya GDP Transacted on M-pesa and 9 Takeaways From Safaricom Results. www.techweez.com/2015/05/07/ten-takeaways-safaricom-2015-results (06.01.2016).