Chapter 9
Fear – The Calculative Making of Technologies

The desire to make professional technologies evokes affects that are perceived as positive and empowering; however, it also evokes fear. In Nairobi, the fear of failure is a common companion during the making of prototypes even though failures are expected in rapid prototyping. Machines such as 3D printers, CNC machines, and laser cutters should materialize ideas quickly (Culpepper interviewed by Nichols 2015), so that technology developers are able to speedily test their prototypes and reiteratively integrate the gathered feedback into the subsequent development process. In this vein, hardware entrepreneurs who work on projects at the pre-commercialization state praise makerspaces because they deal with the financial and logistical challenges of assembling the digital fabrication tools necessary for rapidly prototyping high-tech devices. A makerspace manager explained:

> The biggest contribution that [the makerspace] makes when it comes to spreading innovation and entrepreneurship is reducing the cost of failure. It would not be possible for most of the people in Nairobi to purchase any machine in this room. For less of a fraction of the price of one of those machines, you can access all of them. So that frees you up to spend your money on materials to try stuff out, experiment, fail, iterate, and then try something new. (Interview, November 2015)

The arguments for doing rapid prototyping come from different angles. From a business perspective, rapid prototyping is said to reduce the time and financial risks of developing technology: "[T]ime savings can help organizations gain competitive advantage by bringing new products to market quickly, ahead of competitors. … [And] by enabling detailed physical analysis at an early stage in the development program, rapid prototyping can reduce the risk of costly errors" (Linton 2017: n.p.). This business approach that fosters an efficient engineering process is entangled in the global maker ethos where making is seen as a process of tinkering, characterized by embodied experiences that leave space for imperfection and thus, failure. Sensual affects such as touching and feeling a prototype are welcomed in order to get a sense of how the design could be changed to improve usage, functionality, and aesthetics. Therefore, the successful making of technology is not only based on theoretical knowledge; practical knowledge and prior experience with the unpredictabilities of physical laws is equally necessary for technology development:

> You know, with electronics even if you model it out and it says it will work one way, the physical world introduces random factors that we can't understand. Electrons that are moving around on the circuit board are unpredictable. There is some level of predictability, but it is like your circuit is working on the paper but in the real world it doesn't work. And that's a difficult thing for students to understand until they experience it. We now see more students that come to us with a legitimate understanding of 'I think it's going to work that way but until I try it, I'm not going to know for sure and if it doesn't work than these are the things that I'll try to correct it'. (Interview, hardware company founder, November 2015)

This unpredictability of models highlighted by a hardware company founder has also been analyzed by Richard Sennett (2008: 101), who claims that "a model is a proposal rather than a command. Its excellence can stimulate us, not to imitate, but to innovate". Thus, models implemented in the 'real' world are unpredictable. To handle this unpredictability, various design thinking mantras revolve around fast prototyping in order to test ideas and 'fail early and often':

> Getting it wrong is just another component of success! True success comes when you learn from your failures and improve your ideas. As long as you validate, iterate and improve, success isn't just in the bag, it's inevitable. (Branham 2017: n.p.)

As such, proponents of rapid prototyping herald the failure-intense and iterative process as being the inevitable way of achieving success when making products:

> There is actually a basis for a link between failure and innovation success in the whole "survival of the fittest" thesis. It is not always the strongest of the

> species that survives – it is the one most adaptable to change. … The most successful companies today will be those that are able to embrace failure in all of its forms: They must fail fast, fail early and fail often. Only then will they succeed. (Basulto 2012: n.p.)

These stereotypical design mantras and the imagination of a makerspace where everyone is tinkering with cheap materials and fast prototyping machines had been in my head when I first entered a Kenyan makerspace. Thus, I was surprised at what I actually encountered: most people were sitting in front of their computers, first planning an idea and then calculating and drawing it digitally.

> It's eight months since my last visit to Nairobi. I look into the makerspace: wooden furniture, green plants, and silver-white machines. I am impressed by how stylish and nice everything looks now, but what astonishes me is that people are sitting at their computers working. Is it because they first work on their designs and then delve into rapid prototyping? (Research Diary, June 20, 2016)

Instead of confirming my imagination of makers who embrace failure, the technology developers tried literally everything to circumvent it. The director of the Centre for Intellectual Property and Information Technology Law (CIPIT) in Nairobi made the same observation of failure-averse makers. He had worked as a patent attorney for several years in Silicon Valley before he took up his position in Nairobi and explained the difference between the two tech innovation scenes:

> In Silicon Valley, if you don't fail a few times, people don't take you seriously. Until you've done several startup plans, people don't bother with you. They think you are not serious. I think it should be mandatory for people to understand that failure is not a bad thing at all – it's a way of learning how to do better next time. One of my biggest complaints about Kenya and one of the major differences between Kenya and Silicon Valley is that people here are really afraid of failure. If you fail, people think you are a loser or you are a failure. They equate failure with people being a failure. (Interview, April 2017)

During my research, it became clear that, in Kenya, a failed prototype does not mean valuable feedback for the development process, but a failed materialization of a business idea. In a world of *professional making* where "ideas carry the day" (Interview, UX designer, November 2015), the design of an idea has to be perfect because its prototype functions as 'material evidence' to convince investors and the tech community (Dickel 2019: 47ff.). Therefore, Kenyan technology developers aim to make a "polished" prototype rather than one held together with duct tape, and to own a patent to attract investment and qualify for the market (Interview, makerspace manager, November 2015).

Although the first makerspace in Kenya changed the hardware development sector in Nairobi by creating the possibility of making professional technology, this newly established possibility is fragile. Access to resources is still limited due to their scarce availability and the scant financial means of developers; Kenya still lacks factories for mass manufacturing, and startup funding is fiercely contested. Due to the fact that Kenya is a context where the making of technology is more costly and time-consuming than in places of abundance (see Chapter 7), technology developers in Nairobi do not embrace failure as in the Silicon Valley mantras; rather, they fear the 'back and forth' of rapid prototyping processes because the continuous reiteration of a prototype is extremely resource-intensive.

This chapter depicts the emotion of fear lingering in Nairobi's tech scene. Technology developers fear the failure of their innovative ideas – be it the fear of fabricating an unprofessional prototype due to the lack of resources and human incapability, or the fear of losing an idea through intellectual property theft. The analysis of the empirical data illustrates the specific practices resulting from the fear of failure, namely *calculative making*. I argue that calculative making is the situated form of making in Kenya and thus, a different kind of making than that promulgated in the global maker ethos. Technology developers in Nairobi cannot live up to the rapid prototyping and design thinking mantras that originate from places of abundance as they lack access to the material and components necessary to build high-tech products. Thus, they cannot afford to fail in the same way as someone in Silicon Valley fails. Although rapid prototyping should allow for imperfection and tinkering, Kenyan makers have to perform perfection and professionalism in order to take part in technocapitalism.

9.1 Fear of Unprofessionalism: Calculating Scarcity

Realizing that most of the work at a Kenyan makerspace is done sitting in front of a computer confounded my imagination of a makerspace as a place of failures. Kenyan makerspaces are not workplaces of messy and failure-intense prototyping where cheap heterogeneous material is assembled to build clumsy prototypes. Rather, drawing, testing, and simulating digital models makes up the majority of the work. An electrical engineer explained to me why it is crucial to "test, improve, and polish the design" (Interview, July 2016) before its implementation:

> It's a lot of simulations, it's a lot of thinking that goes into the laying out of the [printed circuit board] tracks, coming up with the right concept, testing it on breadboard[1] before you … [actually construct a] PCB. So the design can take a week or even more and you still not have started on fabrication. The design stage is what normally takes the greatest amount of time because you have to get everything right. Otherwise, you will be wasting your time going through the PCB [production] line, making something that does not work or does not meet the required need. (ibid.)

When striving for perfection, the fabrication of an idea makes prototyping difficult and thus experienced with charged emotions. Sennett (2008: 97) defines the "desire to do something well … [as] a personal litmus test; inadequate personal performance hurts in a different way than inequalities of inherited social position or the externals of wealth: it is about you". A prototype's inadequacies are not simple deficiencies of material; they represent a failure of the self because one was not able to translate the perfection of the design into 'reality'. Therefore, not achieving a polished prototype "corrodes one's sense of self" (ibid.). The resulting fear of failure causes the attempt to eradicate all the human errors that become visible when translating an idea into something tangible (Interview, mechanical engineer, April 2017). Thus, creating a perfect digital file of a preliminary idea – be it a PCB, a water pump, or a piece of furniture – is obligatory before fabricating and materializing the prototype.

However, such careful and time-consuming design work is nothing special. Although rapid prototyping is hyped as a magical tool, there is no button

1 A breadboard is a rectangular plastic board with prefabricated holes and power rails. As such, PCB components can be mounted onto the board without soldering them (Science Buddies 2021: n.p.).

that has to be pushed so that "out pops whatever you want. In reality, that process might take weeks of design … work, and that's not rapid, that's regular engineering" (Culpepper interviewed by Nichols 2015: n.p.). Also, Yana Boeva (2018: 75f.) explains that testing a digital model "through a multiplicity of design renderings that allow for testing without their actual physical fabrication" is a common process. Such digital test runs of a model can be interpreted as a rational engineering process, but:

> [t]here is also a value content. … A structural engineer will perform simulation calculations even for a simple bearing, for which [they] could define the characteristics using [their] know-how alone. Acting in this way gives greater value to [their] action and design work. (Mer 2003: 87)

In Kenya, this greater valuation of work through digital design is observable in the love for computer software that professionalizes the fabrication process of technology (see Chapter 8).

Kenyan technology developers not only draw perfect digital models to achieve a fast and smooth fabrication of professional prototypes, but also to concretely plan what components are necessary to materialize such prototypes, bearing in mind their lack of access to abundant resources. The following vignette is based on research diary entries in March and April 2017 when the makerspace I worked at was a construction site and its making activities concentrated on designing the co-working spaces' furniture. It shows that digital models such as CAD drawings are used primarily as calculative tools to plan the acquisition and costs of a design's implementation.

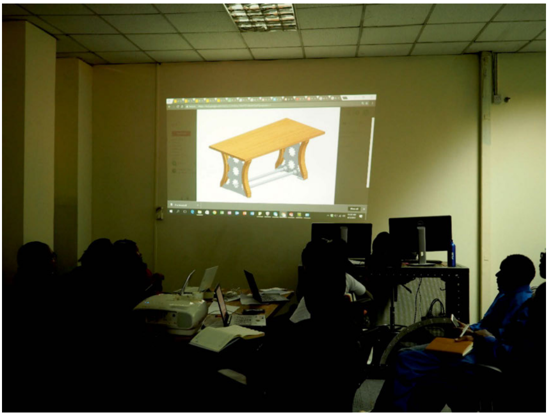
The Calculative Making of a Co-Working Space Table

A daily design meeting at the prospective makerspace looks like this: the staff gather around two large tables at the computer lab, dragging their office chairs behind them. It is dim because not enough lights have been installed yet; only the light of the projector illuminates the room. Two staff members show pictures taken from the internet that inspired them in their task to design furniture for the makerspace. A reception desk, tables for the computer lab, and a coffee table made from a car engine are projected onto the wall. The assembled employees like the ideas, but the higher-ranking staff repeatedly ask about the material proposed to build the furniture. Njeri and Anne ask about the estimated costs, Jethron asks if the material is suitable, as wood cannot easily be shaped into a round, and Fred reminds everyone that the makerspace should produce something professional and not something that "looks beautiful but does not work functionally". After everyone gives their opinion on the suggested designs, the two presenters are sent off to work on the feedback received.

Two days later, one of the managers demands updates about the progress made during the last week. Some people show him the four pictures that we looked at during the design meeting. He is angry: "I have no interest in looking at pictures. It's a waste of time. I want to see drawings. I want to see measurements to assess how the furniture sizes fit together and how it can be placed in the co-working space. I need to know the sizes". He demands a plan of the space to better imagine where everything could be placed in the future. According to him, only with a plan, can the space be measured. He constantly repeats the sentence "I need to know the sizes".

The next day, a makerspace employee presents the CAD drawing of her suggested co-working table design. It has a wooden top, 'legs' made from metal sheets with wooden edging and structural support/footrests from recycled water pipes, so that it has an "industrial look". Njeri asks again about the estimated costs of the material for one table. Fred asks how many metal sheets are required and suggests using recycled wood from the partitions removed downstairs in order to reduce the expenses. He says, "Guys, that's why I ask you to do the measurements. So we can do research about the potential costs. Please, let's have the figures by the end of the day".

Figure 11: Design meeting, 2017 (author's photo).



The recurring questions about the proposed material and furniture measurements during design meetings illustrate that decisions on the material to be used are necessary in order to calculate the potential costs of manufacturing. Surprisingly, design objectives such as fostering collaboration or creating a trendy aesthetic are not the focus of the scrutiny. Instead, CAD drawings are demanded in order to make measurements tangible and assessable. The lack of financial resources to buy materials and the overall limited access to them, make Nairobian technology developers use their material carefully. There is no room for wasteful behavior during prototyping. Therefore, the *calculative making* of technology – or furniture as in the vignette above – includes the choice of local (recycled) material and their exact measures to predict costs. Thus, the daily life of making consists of efficient calculations based on digital models such as CAD drawings and the compilation of lists about where to get the required parts to make a design tangible. A makerspace member stated:

> The challenges lie in the deep details of component selection. Basically, the design consists of selecting components, coming up with a list of those, and getting them. (Interview, July 2016)

The design and manufacturing of a prototype – and, thus, the *possibility* to actually make professional technologies – include the obligatory production of lists documenting the necessary materials and where to get them. The scarcity of electronic components and other prototyping material in Kenya makes it essential for makers to write meticulous lists of the parts required when designing a model and these lists are the basis for the laborious research of where to get the needed material. Thus, the written hardware project documentation at makerspaces is not only done to share open source knowledge about the necessary components and their connections to each other, but also to include a list of where to get them, so that other people in Kenya are able to replicate the projects (Research Diary, July 8, 2016).

In a tech place with scarce resources, the procurement of material is of such importance that it is included in the daily morning routine of the makerspace's mechanical lead:

> In the morning, I have to plan the day. I look at the tasks left over from the day before and why they have not been done. Then I plan the milestones that I need to achieve during the day. I have to plan what the 13 employees under me do. After putting up the schedule of who is doing what for the day, I need to know the material. How will it get to the workshop? Will the process go smoothly? There has to be material, so there has to be a plan. Then we have a meeting. I brief everybody on what he or she should do. After that, I start to follow up on the material and how to get it to the people. (Interview, April 2017)

Usually, the logistics of getting material to build prototypes takes a lot of time as elaborated above. Makers have to call every shop and supplier in town to ask about the availability and costs of each of the necessary parts. If they are available, the journey to Nairobi's central business district starts, usually including long hours of traffic jams. If the material is not available in Nairobi, research has to be done on if an alternative material can be used or from where to expensively import the necessary components. The vignette about the startup BrightVest in Chapter 7 shows the consequence of material being unavailable; the two makers had no access to low-power consumption components to build a wireless device, so they had to rethink their design and "go back to the drawing board" (Interview, co-founder, May 2016). Thus, their process of developing a hardware device was highly time- and money-consuming when thinking about how to get their necessary prototyping material.

Overall, Kenyan tech entrepreneurs stay as long as possible within the infinite realms of computing – drawing models, compiling Excel sheets, and making calculations – to circumvent the costs of experimenting and the danger of failing. These ubiquitous practices of calculative making observed at Kenyan makerspaces are a necessity to compensate for the lack of resources specific to making technology in Nairobi.

9.2 Fear of Theft: Calculating Competition

The scarcity of resources and investment in hardware startups make the Kenyan innovation sector highly competitive although its tech entrepreneurs are committed to maintaining a reciprocal community of tech development (see Chapter 4). As elaborated above, an unprofessional looking prototype or the stalling of an idea due to a lack of resources are perceived as a maker's personal failure. As well as the fear of producing 'unprofessional' technology, tech entrepreneurs additionally fear the loss of their idea (and potential profit) through intellectual property (IP) theft. In the following, I show that makers are responsibilized to take care of their ideas without relying on external support such as the juridical protection of patents. Working in a highly competitive tech sector, makers are advised to protect their ideas by hiding their prototypes from others and by thoroughly planning the implementation of any prototypes.

One day, I stumbled upon a tweet saying: "There are two ways of protecting your intellectual property: Legally or shutting up. [followed by two laughing emojis]" (Birgen 2017: n.p.), meaning either you have to patent your idea or hide it in order to protect it from intellectual property theft. Although the emojis included in the tweet suggested irony, the statement reflects the various occasions on which I encountered the fear of losing a product idea. For example, tech entrepreneurs claim that hackathons and competitions – "an IP lawyer's nightmare" (Interview, director of CIPIT, April 2017) – are THE places to steal others' ideas. During a conversation between two makerspace members, one initially explained an innovation competition to the other as a place where people pitch their ideas. One second later, he refined his explanation by adding that it is also an event where people come and steal the unpatented ideas of the presenters. I expressed my puzzlement about his statement and he further explained that big companies usually sit on the jury or in the audience, listening to the ideas in order to steal them instead of investing in the people pitching. He was convinced that he needed to pitch his idea at some point to gain investment, but wanted to develop his technological idea further in order to patent it before doing so (Research Diary, March 31, 2017). Participation in competitions and hackathons is often unavoidable for young entrepreneurs looking for seed funding. However, the decision to participate is usually considered carefully as the depicted conversation shows.

At a hackathon, I also observed a strategy of participating in a competition while protecting one's idea without a patent. A young engineering student pitched his idea of a novel generator. After his pitch, the jury asked him where the prototype of his generator was and admonished him, saying "you have to build it and show it to us non-believers". He defended himself and said that he had built the generator once at his friend's workshop, but after he saw that it worked, he destroyed it out of fear that someone could steal his idea. The whole audience laughed. However, the amusement quickly faded away as the competitor's seriousness prompted thoughtfulness about the fact that the fear of losing an idea can be so enormous that it drives a tech developer to destroy their prototype (Research Diary, November 5, 2015). I experienced the same thing at makerspaces where openness and the exchange of knowledge should be facilitated, yet members working on a business idea are often secretive (see Chapter 5). The makerspace staff regularly complained about members who ask for advice on using a machine to make something in particular, but refuse to tell the staff about the context and intention of the specific part. This sometimes results in the staff not being able to help those members because they are missing crucial information about the manufacturing process.

Besides the refusal to participate in competitions without having a patent, or in general refusing to talk with others and even destroying and hiding one's work, a legal expert sees a more profound problem in Nairobi's tech scene, namely the belief in a patent system as a panacea:

> People do actually look at the patent system as this panacea of 'Oh, I protect my invention and then I have a successful business'. And that's just blatantly not true. A patent is a tool that sometimes helps your business and sometimes not. The most valuable thing to a company is your drive to make your company succeed no matter what happens. There will always be people copying you; if nobody is copying then what you have done is not worth doing. (Interview, director of CIPIT, April 2017)

The legal expert argued that, most of the time, patents in the tech space are not useful and a waste of money. In the case of software development, for example, the minimum wait-time of eighteen months[2] to get a patent is too long for a software not to run the risk of becoming obsolete, as startups often change their code during iterations. Although IP theft risks have to be determined on a case-by-case basis, the legal expert recommended the "first mover advantage": "have a good product that is well advertised, well branded, and updated frequently, functional, easy to use, all those basic business things. That's much more important in IT than patents" (ibid.). He went on to explain that assessing risks while working on your idea is neither a technological decision, nor a legal one, but a business decision. The director of CIPIT clearly advocated not clinging to patents when it comes to the fast-moving tech development sector. He is not alone in his opinion; the debates in legal studies also swing between the promotion of public regulation and the withdrawal of excessive regulation of new technologies. Although public regulation could be required to constrain "private mechanisms of self-help" (Pagallo cited in Fernández-Barrera et al. 2009: 27), "regulating a new technology at the outset would merely stifle technological progress and eventually prevent the emergence of new and more efficient business solutions" (ibid.: 28). Thus, a founder of a hardware company in Nairobi also favored striving for competitive advantage instead of a complex patent system because:

> even if you have a patent, it doesn't protect you. It doesn't stop someone doing what you are doing. If they do, you have something that says 'I own…' or 'I have first rights to…', but you still have to find whoever is copying you, you have to take him to court, all of that is time and money that most companies don't have. So patenting is mostly to calm investors. (Interview, April 2017)

This startup founder explained why tech entrepreneurs see patenting as a panacea and a must for becoming successful; entrepreneurs have to please investors to gain highly contested investment and the first question that investors ask is if they have already protected their idea. These requirements give entrepreneurs the impression that patenting is necessary for business. However, according to the CIPIT's director, that is not the case: patenting is just "a tool" (Interview, April 2017).

2 Eighteen months for the examination of a patent is the global average. According to the director of CIPIT, the Kenyan patent office is one of the busiest on the continent as it handles a large number of patent applications, particularly compared to South Africa, Nigeria, and Ethiopia.

Working in an emerging hardware innovation sector without the security of legal regulations drives the fear of losing one's ideas:

> Everybody tries to protect their idea. Because you don't want someone to take the idea and run away. Because it's YOUR idea and we are all hungry for ideas, for solutions, for money. You know, to make money at the end of the story. So protection is a concern. (Interview, makerspace employee, April 2017)

This interviewee claimed that fear of IP theft is justified because a good idea for a marketable product has the potential to bring in money. But if a patent is not a suitable guarantor for protecting one's idea, what can calm a maker's mind while caring for their idea? Legal and business experts in Kenya do not recommend relying on legal regulations, but advise makers to self-responsibly care for their ideas in a powerful field of capitalist competition. In this vein, a hardware hackathon competitor confidently answered a question posed by a German investor on the jury: "How will you implement your idea without having a patent?", "Competition will always be there. But I try to grasp the market and I will try hard" (Research Diary, November 5, 2015). This quote and the above cited opinions of tech lawyers and other experts show that the prevailing perception of technology entrepreneurship in Kenya is that every entrepreneur has to delve into an unpredictable market, trying to survive and succeed with the help of business decisions.

The makerspace's mechanical lead and a professor of entrepreneurship at the University of Nairobi agreed that planning is the answer to making this survival easier. The mechanical lead condemned the belief that "you come and have a look at something and then you know everything and can build it" (Research Diary, July 13, 2016). In this regard, the professor emphasized that he knew that "IP is nonsense" as he teaches entrepreneurship (Interview, April 2017). According to him, "[n]obody can steal all of these ideas. Even if you're told to. My mind has to be aligned with what you are doing for me to steal that idea" (ibid.). Both technology experts advised entrepreneurs to concentrate on the research and planning phase before building the prototype of a promising product:

> Few people take the time to steal an idea. Because it's not easy. It's not like waking up and having your tea on the table. It's the process that makes the tea arrive at the table. You have to sit down and research to develop a prod-

> uct. It's not easy and many people do not want that. (Interview, mechanical lead of makerspace, April 2017)

The mechanical engineer illustrates that the development of a technology does not happen all of a sudden, but involves a process that needs time, material resources, and thorough planning. According to her, few people are able to invest such resources into research. Thus, she claims that a thorough research and planning phase of a design guarantees a fast implementation without anyone being able to copy an idea:

> The speed that you will be running with your project is all about the plan that you had before. If you have the right plan for what you want to execute, the execution shouldn't be a problem. If you want to build a car, you cannot build it inside, it has to be outside. So people will see all those things. Your speed should be too fast for me to copy and repeat the manufacturing as you have already done your research; you've already done your to-do-list, the don'ts and the do's. For me to steal it, I have to go through the same process. So if you did not do your research well, you did not plan well, I can steal and beat you in your speed. (ibid.)

The planning phase is only successful if the maker considers carefully what to pass on; only general knowledge and no details. She went on:

> I can tell you about the car that I want to make because cars already exist on the road. They are not something new. But because I don't tell you the details of making that car, you would not even dare to make it and steal that idea. Unless I tell you the whole story of how I want to make the car. Then you can see how it's made and how you can steal my idea. So telling someone about my idea is my responsibility; to know what is important to say, what is not important to say. It's all about packaging and planning. (ibid.)

Listening to the mechanical engineer's descriptions of how planning is a strategy to care for one's idea, it again became clear that the individual makers should take on the responsibility of protecting their ideas. Decisions have to be made carefully: what to tell and what not to tell. Also, a makerspace does not represent a safe space:

> We are just the helping platform, connecting you with people, giving you machines, providing you with the basic knowledge that you will need to

> make a product come true. But it's up to you to take care of your project from other people. Because we can't lock the whole facility for one person. We want to have it open to everybody. So it's up to you how to plan your ideas and how to package them – that's all your responsibility. (ibid.)

Without legal protection or a safe space that gives makers privacy, protecting their ideas becomes difficult. The moment an idea materializes as a tangible and visible prototype constitutes the critical moment when it becomes vulnerable to being stolen and thus, to fail. Therefore, planning is advocated as an entrepreneurial strategy that grants competitive advantage. Planning is recommended over filing a patent because the patent system often cannot keep up with the dynamic development of technologies. As such, makers are responsibilized to take care of their ideas – whether by the destruction of one's functioning prototype or by calculating every step of an idea's implementation. Constantly reflecting on and calculating what to share with others and what not, is the main mode of countering the fear of failure through IP theft.

9.3 Conclusion: The Responsibilization of Surviving in Technocapitalism

Calculative making as the situated form of making technology in Kenya means that the daily agenda of technology developers is determined by the calculation of necessary materials and budgets and the setting up of exact plans for transforming an innovative idea into a prototype. These practices of calculating a perfect (digital) model are necessary to circumvent a resource-intensive prototyping process and intellectual property theft and thus, a failure of one's innovative idea. The thorough planning of a design's competitive advantage highlights the care and calculation that entrepreneurs have to invest in order to survive in technocapitalism. The state, juridical and business experts responsibilize them to take care of their ideas individually without relying on external support.