ROOTS

What could emerge out of thinking and acting networked roots as design?

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“Let us be grateful to the people who make us happy; they are the charming gardeners who make our souls blossom.”
— Marcel Proust (Proust, 2017)

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Kindly,
Cecilia Barry
Abstract

ROOTS – What Could Emerge Out of Thinking and Acting
Networked ROOTS as Design?

This bachelor’s thesis uses ROOTS as a method designed to engage in both thinking and acting inside networks, by creating a hydroponic gardening network. As a designer one engages in many different fields of design. The most complicated design is designing networks with function, interlaced and embedded in everyday life. This is known as accountability, to be accountable to one’s decisions and to act on many perspectives when designing. Accountability is designing from somewhere, and being aware of where that somewhere stems from. ROOTS visualizes accountability in a network, as accountability entails thinking and acting inside a network, and by doing so one actively engages in thinking about futures and design as a whole. When asking oneself what could emerge out of thinking and acting networked ROOTS as design, one begins to speculate in matters of vast networked complexity. From observation using methods such as ANT, the technologic extension T-ANT and also conducting a study in messiness, information is created and from the information, valuing becomes present, from valuing knowledge grows, from knowledge comes accountability and the network creates another cycle of ROOTS.

Keywords: Design, Network, Accountability, Complexity
**ROOTS – Vad skulle kunna uppstå av att tänka och agera utifrån rotade nätverk som design?**

ROOTS är en metod som är utformad för att engagera sig både i tänkande och agerande på nätverk, genom att skapa ett hydroponiskt trädgårdsnätverk. Som designer engageras design sig i många olika fält. Den mest komplicerade designen är att designa nätverk med funktion, sammanflätat och inbäddat i vardagen. Detta fenomen även känt som ansvarighet, inbegriper att vara ansvarig för sina beslut och att agera på många perspektiv vid en utformningen och design. Ansvaret är att utforma och designa från någonstans, och vara medveten om var det någonstans härstammar. ROOTS visualiserar ansvarsskyldigheten i ett nätverk, eftersom ansvarsskyldigheten innebär att tänka och agera inom ett nätverk och därmed aktivt engagera sig i att tänka på framtider och design som helhet. Att begrunda vad som kan hända utifrån att tänka och agera i nätverk ROOTS som design, börjar spekulerandet i frågor som rör stor nätverkskomplexitet. Från observation med hjälp av metoder som ANT, den tekniska förlängningen T-ANT och även en studie i sk. messiness skapas information och från den information skapas ett värderande, och från värderingen gror kunskap, och från kunskapen kommer ansvar och slutligen skapar nätverket en ytterligare cykel av ROOTS.

**Nyckelord: Nätverk, Design, Ansvar, Komplexitet**
**Background**

X: Who are you?
Y: I am ROOTS
X: Roots as in plants?
Y: No, ROOTS as in a network, ROOTS as in life. ROOTS as in everything between, becoming every day.
X: How did you decide to write about this then?
Y: I don’t think I ever decided, it just happened. I began asking questions, wondering why most of my adult life seemed to base itself off of things I’ve already encountered. So I started writing it all down, and suddenly, I was looking at a web of ideas, thoughts, concepts, quotes, scholars. I was looking at my network.

The dialogue above is a Meta text. The dialog presents what ideas and questions prevalent in the different chapters. Much like in conversational dialogue, there is a whole other level of conversation going on in the internal networks of the brain. This way of depicting dialogue and text as networked and visible is another level of networking I have worked on with ROOTS. The dialogues present the themes, the questions and the content of the chapters to come, but also the background, the visible entities and the acted networks. The X and Y represent to entities of thoughts and concepts; they are guidelines of sorts. The chapters represent the merging of X and Y.

So I begin my journey. This bachelor thesis does not have a set course of action, there is nothing to be proved that I, the author and the adventurer, knows of in advance. Let us plant an idea, sow a seed, and maybe in the end there will have grown something marvelous. I engage in creating value, creating networks to and from my knowledge and myself. My aim in this bachelor thesis is to engage in a creative process of investigating knowledge and questioning matter of sorts.

I have received many questions regarding my project; some are easier to answer than others. For example the question ”What does ROOTS mean?” is simple at first but the more time I spend on thinking about the answer, the more complex it becomes. So,
what does ROOTS mean and why am I so obsessed with the answer? The noun roots is defined by many different contexts, and for the sake of the bachelor thesis I have chosen a few, which I believe, represent this project as a whole. Roots could mean the usually underground part of a seed body that originates the plant, and also functions as an organ of absorption. Roots could also, by abstraction, mean an origin or perhaps a source, even one or more progenitors of a group of descendants. Roots could be defined as an underlying support, the basis of existence, the essential core, or to further use the organ metaphor, the heart. Roots could entail a close relationship with a specific environment, or maybe even a level of access system in a computer, a root directory. Roots are roots, with the aforementioned possible definitions. ROOTS however is the name of the project, furthermore the phenomenon of thinking and acting rooted networks as design.

Apart from considering the networked way of life, ROOTS also deals with the cause of value. Value, quite interestingly, could also be defined contextually. There are plenty of meanings of value; Value can be something socially defined as what is beautiful or important, based on the material or monetary aspects, it can be used to identify the results of creating a commodity. Both modes of value are important, because in the space between them there is a balance between resources, a network of value, worth and design is created. However, a problem that emerges in the term value is that there is a strong connection to the financial. Value is much more than a ratio number; it is more than a label for a transaction. Value is more than just a convergence theory in the lines between worth and myth, meaning it is more than just an opinion in favor of any other. Networks are in symbiosis with value, as they create themselves iteratively in relation to each other. Value bases itself off of the things that humans desire, materiality, and the act of selecting one or another course of action. (Hakken, Teli, & Andrews, 2016 p. 126)

Roots create networks, information, definitions, and support. ROOTS extend a rooted base, beating, pulsating through veins, creating new directories, categories, and networks. I consider myself a part of an ongoing network perpetually developing new connections (Barad 2014), new ways of distributing information, interaction and rooted-acting* (Barad 2014).
*Rooted-Acting; A word cut apart to create an action. Rooted-action means that acting is connected and transparent. Rooted-action is also acting on multitudes, trans-dimensionally. Trans means movement. An act is to move. Rooted-acting is moving transparently across networks. In this scenario it is a conscious way to consume, by contemplating and comparing consequences outside a direct network or roots.

Thinking and acting together with ROOTS is to regard it as a choice. I am choosing something over the other. A choice of consumption, any choice, is up to one and other, and the outcome is highly personal. However the point I am trying to make is that choosing or ROOTing is not that simple at all. Like my thoughts about the answer to the question about ROOTS, it is a complex network. We, human, animals, plants, organisms, are all interconnected in one way or another and this is something to take into account. The act of being, and existing and perpetually moving in networks creates ripples in the surroundings. Roots are everywhere, in everyone, all around, and acted upon daily. As I consider myself a visual being, my project aims to visualize networks, using ROOTS (networks) as a design element. What would emerge out of thinking and acting (networked) ROOTS as design?

**Research Question**
What could emerge out of acting and thinking (networked) ROOTS as design?

**Aim / Purpose Statement**
This bachelor’s thesis will:

- Provide a framework for thinking and acting network design in both technical and philosophical aspects.
- Provide methods for network futuring.

Further more, the purpose of this bachelor’s thesis is to create a visual manifestation of thinking and acting inside a network. By using network design I investigate, engage and visualize acting on roots by creating visible manifestations and hydroponic gardening networks.
**Research**

**Design and Networks**

X: When I think of design, I think of fashion, or magazines. Or like abstract art, like at that museum in Copenhagen. What is it called……?

Y: Louisiana?

X: Yeah that’s it!

Y: Yes! I agree! But I still think design has a greater purpose than just making things look pleasing, or feel pleasing.

X: How come? Why can’t things just be pretty?

Y: I don’t think it is about removing the “pretty”. When I think about design nowadays I think about pretty much anything, and the better it feels in connection to my surroundings the “prettier” the design feels.

There are several ways of engaging in design and the purpose of this chapter is to highlight specific ways that I have engaged in design. Design according to the editors of *Adversarial Design* Ken Friedman and Erik Stolteman (Disalvo, 2015) is making things to serve a useful goal. In ancient history, it was the creation of tools that made us human. We designed rocks and sticks to fulfill a purpose. Placing design in a broader spectrum has lead Herbert Simon to conclude that there are two key aspects of design. The first is that design is a hallmark of any professional activity; that policy, medicine, management, engineering and architecture all engage in design. The second is that design is concerned with the artificial, meaning how things might be, and not with the natural, how things are (Disalvo, 2015).

Design in this sense that it engages in how things might be is to create something by design. In “How We Intend to Future” the opening lines states a comment from Samar Akkach, he notes that the Arabic word for design derives from the term for strong, decisive intent (Tonkinwise, 2014). Intention is what it means to be rooted, acting by design. Design is also action-oriented, and it makes ideas, beliefs and capacities for action experientially accessible and known (Disalvo, 2015). Any practice whose actions actively (or passively) shape the future has to be brought into account and become visible. Design is merely one of those practices in need of
scrutiny. This means that when designing, the consequences of the design must be thought of. Design entails an action-oriented, conscious decision making in choosing something over the other. When something is “designed” it suggests that there is some thoughtful exploration going on (Bleeker, 2009).

To understand network and realize its full potential the method needs to be understood by its vocabulary meaning at first. A network is an arrangement of intersecting lines, both horizontally and vertically. A network is where design acts. Networks are circulating entities, and in the spaces between is where design emerges. Circulating entities means that they are created iteratively, new information expands and refurbishes the network, creating new space, new folds, reassembling connections, new lines are drawn and intersected. However, the term network is unfortunately a watered down term, or as Bruno Latour refers to it as a technical metaphor without much substance. It has become a pop-science term, but in this bachelors thesis the term network is used as a phenomenon (Latour, 1998). Networks when thought of are webs, often containing information. Examples of different networks are telecommunications and organic networks such as forests. Complexity is embedded in networks, as networks have a multitude of layers. Engaging in networks is to engage in complex matters. Henceforth, this understanding of networks, with an embedded complexity - that the basic understanding of networks is complex, saturated with various layers, dimensions and possible entrances, will be included when discussing networks. Returning again to the circulating nature of a network, it transforms itself iteratively and creates new spaces for design and ROOTS.

**ROOTS and Technology**

X: Why have you included technology?
Y: Because technology is all around us, just like ROOTS the project and roots the noun. ROOTS has interacted with technology in a way.
X: Okay… but how?
Y: Well… That question is hard to answer, or at least I think it is. But I believe technology has been used to create networks in knowledge, information and value…

Technology is an extension out of ROOTS and this chapter will engage in technologies in relation to ROOTS to create networks. In *Shifting Paradigms: From Technocrat to Planetary Person 2011* by Alan Drengson a comparison between technology, nature, and social life is made. As Drengson continues, we seem to embrace and welcome digital technologies (DTs) and their advantages, but we also acknowledge their shortcomings. I would like to include DTs in ROOTS because I believe in utilizing technology in rethinking network and design. Much like Drengson notes about thinking technologies with advantages and disadvantages, I’d like to reconfigure that analysis so that it extends further onto networks. DTs are complex organized networks that process data, information, and analysis, in a procedural manner. This might not seem like a groundbreaking observation, but they do so because humans programmed them to. One situation that engages in the matter of observing and analyzing organized networks as complex is the Complex Adaptive Systems (CAS): Complex systems or networks cannot be reduced to basic elements, such connections and networks need to be studied as whole entities and networks or patterns of behavior. CAS is a lens used to analyze technologies by observing networks and organizational structures. Much like Actor-Network theory, but by including networked complexity as an actor as well. CAS are neural-like networks of interacting, interdependent agents who are bonded by common goals, outlooks and needs (Benn, & Baker, 2017). Complexity is what occurs when design and network engage with each other. In other words DTs have networks designed into their functionality, and yet this is not acted on. Even the assumption that the individual elements of networks can be identified in order to establish relationships needs to be rethought (Benn, & Baker, 2017). Instead Drengson (2011) presents a technique that is often used to create knowledge and understanding; the technique includes reassembling words, parts, ideas, concepts, methods, technologies, organic matter, machines, and networks and compiling it to its smallest, most simple parts, the exact opposite of CAS. Drengson (2011) states that the same technique, to dissect and observe parts as single entities creates a shortage in our understanding. (Drengson,
The CAS metaphor describes the interconnection between large organizations and even larger technologic organization where they are located (Benn, & Baker, 2017). CAS observes itself in connection to the surroundings. Simply dissecting parts and entities to observe them as phenomenon by themselves hence does not create knowledge, but rather data points and basic information (Hakken, Teli, & Andrews, 2016). This means something in the terms that instead of simply hoarding information and specific data points of interests, focus should shift onto knowledge design and networking from data. Information is useless if it is not directed to something or someone. (Hakken, Teli, & Andrews, 2016). The knowledge relevant for understanding networks as complex as they in reality are, is created when reassembling separate parts, data and information and designing them into a network. In order to shift focus, the development process needs to be re-assembled rather than dissected further. The development needs to be networked with knowledge, values, organization, and the surroundings (Benn, & Baker, 2017).

Another way to metaphorically visualize dealing with complex networks is by situating complexity in ROOTS and what the actual dealing with it entails. ROOTS came about when I was in the grocery store one evening doing my weekly shopping. I stood by the fruit and trying to decide what apples I was going to take home with me.

“Perhaps the ones from Italy”, I thought to myself.

“I wonder how far from Sweden Italy is… ” I continued, “I wonder how these apples have been transported…probably in a truck of some sort. I wonder…” I reached for my phone and searched for Italy in the maps app. Over 1900 km to Italy… My thoughts began to race.

“If I buy apples from Italy every week… that means 1900km back and forth at least 52 times a year. Let me just do the math...” I opened the calculator app on my phone. 1900x2= 3800. 3800km a week for my apple shopping. My body started to feel funny… 3800x52= 197600. My jaw dropped, and so I firmly returned the apple to its carton case and walked away. What is exciting to think about in this case is that I used my phone to do basic math in regards to how far an apple has travelled. I did not need to do complex calculations, I used the apps I had in my phone, and somehow found a way to integrate my shopping patterns in a greater context, or network. Because by choosing not to buy that apple from Italy based on calculations I made on my phone, I engaged in not just one, but also many networks of information. I used
GPS technologies to determine the distance travelled, I used calculations to map out the distance in a context relevant for my situation and understanding by thinking my grocery shopping as a frequent pattern, and lastly I used my prior knowledge about climate change and carbon emissions to draw a very simple conclusion; A truck travels 197600km per year for me to buy an apple from Italy; This is not okay. I need to act on this feeling, I need to act in my “network” and make a change. So I did. I buy apples from Sweden, and I make sure that they are produced in a reasonable perimeter, and that reasonable perimeter is basically trying to keep the distance under 1900km per year.

Thinking and Acting ROOTS

X: Why is there a difference between thinking and acting ROOTS?
Y: Because sometimes we think, and do not act. And sometimes we act, and do not think. I believe there is a difference.
X: I thought ROOTs was an action…
Y: It is, and an action is also a thought…

This chapter aims to provide an overview of the differences in thinking ROOTS and acting ROOTS. ROOTS are intertwined, connected, fully operable talkative networks. Much like a brain where the neurons speak with each other, ROOTS send precious information back and forth, locating themselves, sharing nutrients and sharing stories. It seems like being human has consequences much more troubling than I would like to admit to myself, much less to others. My actions uproot rooted beings; upheave relations of vast importance for survival. If you always use the same ROOTS, then no new ones are re-created, which in time means a larger risk for malnutrition of the networked roots. There are many ways of thinking about ROOTS, but the most important factor to keep in mind is the fact that thinking together with ROOTS means acting on networks instead of observing them.
1.1 As I look at the rose, I become a rose, and the rose becomes human. We materialize and network together.

In a philosophical way of thinking about ROOTS, network and design there is a tendency to observe. Observation is an incomplete way of creating knowledge and acting upon design since it in many ways searches for a way to enter intrinsic and networked matters as an observer, without the basic understanding of observation itself. Observation is thinking and acting simultaneously. Observation is not objective; it creates a certain located phenomena, in a specific collection of circumstance, which brings out a specific set of results (Barad, 2014). As Barad mentioned, the observation, in this case a designed network, measures a hypothesized set of outcomes, altering the result as we alter the circumstances of observation. Thus reworking this alleged conflict into an understanding of difference not as an absolute boundary between object and subject when we observe; not engaging in dividing the past, present, or the future, but rather investigating an observation as an engaged activity as observation is designing a situation, a phenomenon, and the result of it. Design comes "from somewhere" as opposed to being "from nowhere" (Suchman, 2000) abandoning the idea that designers hold sole knowledge, and questioning the designer/user opposition and engaging in networking observation, understanding, and design (Hakken, Teli, & Andrews, 2016).
Re-ROOTING

X: I feel like I understand what you are saying, but not what you mean.
Y: So do I. Sometimes research and thoughts change what we know. I feel like a gardener, getting ready for spring, aerating all the soil, cleaning the pots.
X: Yes… My mind feels a bit cleared.
Y: Let us breathe. I never said ROOTS would be an easy matter to tend to, it never occurred to me though that it could be this confusing.
X: But I still feel like there is something missing… Like I’ve picked at something inside myself. It feels like I am uprooting all my previous knowledge about what being and becoming is like, what thinking, acting, and designing and all that means…
Y: How is it that all these years, I have never even once contemplated on the greater scheme of it all; it as in becoming; it as in thinking, acting; it as in ROOTS.

This section aims to relate network design to different phenomenon, as Rooted-Acting.

It is time to re-root the uprooted; to make sense, to organize, to network; to act and think ROOT. With the help from Karen Barad I begin investigating the term ‘Re-rooting’, a term parallel to the act of re-turning. Re-turning as Barad (2014) puts it, is a mode of intra-acting with diffraction, by shifting internal actions in the way subjects and objects are observed. Networks re-root themselves, as networking is an active figuration, an ongoing phenomenon (Barad, 2014). The ROOTed experience is not to be understood as an isolated thing. It evokes an awareness of a wider web of knowledge and technology. It exposes how mind is alienated and unattached to networks and matter. ROOTS could instead be thought of as perceiving, thinking and acting. Where humans and non-humans in the world of nature are networked, and become co-creators and co-evolving with networks (Schroll & Greenwood, 2011). Rooted-Acting; where the calling to action engages in entering the conscious act of personal growth as a process, a phenomenon. ROOTing refers to the co-evolution and the conscious acting it entails. Rooted-Acting means to become with an observation, to become with a network, to become with oneself and other.
**Methods**

X: How have you done all of this? It feels like you’ve just been thinking a lot…

Y: Well yes, I have been thinking. A lot. Actually quite a bit to be honest, perhaps even too much... But I have been observing, contemplating observation, filming, sketching, testing theories and methods…

X: Methods?

Y: Yes, theoretical and practical ways of engaging in my surroundings. Let me tell you about is, I think it’s quite exciting!

This chapter aims to provide an overview of what ROOTS has manifested in, furthermore how ROOTed engagement evolves when in contact with multiple sources of nutrients and stimulants. ROOTS ; The Hydroponic Gardening Network is a visualization and process of cultivating and subediting, which means altering miniscule entities inside a network, theories and concepts of networks and design as a hybrid.

**ROOTING**

My hybrid method to create and distribute knowledge within myself is something I have divided up into several steps, which are not to be followed mindlessly (even for myself) but are to be regarded as pointers in acting upon said information.

**Wandering**

*I move in and out of networks, engaging in many and a few. I am wandering to become something, not someone. I am wandering and moving, engaging in the act of being and becoming.*

First off, I let complex issues stay complex. Much like John Law presents in After
Methods, it is important to consider networked issues as they are, which is complex (Law, 2010). ROOTing is becoming with the network. In this project for example, I have been dealing with many complex networks and designs such as the political, the financial, the judicial, the ecological and lastly the natural. These matters are engrained in my very existence, which makes distancing and objectively looking at complex designs and networks even more difficult. By thinking about networked issues in their complex form is to create a context where I actively engage in valuing. ROOTS is a network, or rather a way of processing and organizing value, in relation to sustainability and digital technologies. These are two highly networked frameworks to think inside and to relate to, which is why it often becomes messy and overwhelming. But by valuing that messiness becomes a visualization of networked matters, rather than a simple replication or representation of something I observe (Law, 2010). Designed networks are whether I have wandered into them or not, all around. The matter only becomes interesting once I actively convey something or someone. I am actively contributing to all aforementioned networks without contemplating my mode of engagement, which brings me to the second phase.

**Acknowledging**

*I acknowledge myself as wandering in and out. I am engaging in acknowledging my surroundings by creating my own patterns and networks around them. I acknowledge my perspectives, thus creating context for my knowledging.

This I might say is the fun part and since I like to include my own version of knowledge I would like to share my take on the word acknowledge. Or rather ac-knowledge. Ac-knowlegde is derived from two words. It is Active and Knowledge. Active in this word means engagement, turning in towards knowledge, becoming active in knowledgeing. By turning in, I mean shifting my focus toward creating knowledge rather than observing knowledge. To actively pursue knowledgeing I must engage in my surroundings and begin to regard myself, and matters around me as networking.

Actor Network Theory (ANT) is a method that created substantial analytical data for the first modes of engagement in ROOTS, primarily when acknowledging the
surroundings. ANT, created originally by Michel Callon has been primarily used for organizational analysis, in schools, non-profit organizations, corporate constellations, by observing interaction between actors. Or, as John Law describes, Actor Network Theory is a method of analysis that treats everything in both social and natural worlds which creates an effect of the webs of relations (Turner, 2016). What is signifying, and also special, about ANT is that it places agency in artifacts as well as humans, creating a level playing field (or a network if I may) between human and non-human actors. There are four categories in ANT methodology, creating a flowchart for analysis in solution-oriented contexts (Tresch, 2013).

1. **Problematization**
   a. An act or actors defines the problem so that other actors recognize it as their own problem
      i. *Climate change – more concretely carbon emissions is a phenomenon that is created by humans interacting with carbon-fueled technology.*
      ii. *The apple I eat is produced in Italy, which means for every apple I eat there are resources used (water, soil, land, fuel and so on) and emissions are accumulating in the atmosphere. By choosing to buy an apple produced in Sweden I reduce my emissions drastically.*

2. **Intrèssement**
   a. Devices through which actors detach or reattach to link allies into the problematization.
      i. *Informating design and networks*
      ii. *All humans who eat apples are equally accountable* to the amount of emissions produced.*

3. **Enrollment**
   a. The successful outcome of problematization or intrèssement whereby more allies are attached.
      i. *Reduce carbon emissions – Positive Climate Change*

4. **Mobilization**
   a. Maintaining the network by persuading the actors that their interests
are the same as the translator.

i. *Continue to eat delicious apples, for the environment and for you!*

ii. *Not only does locally produced apples help reduce carbon emissions; it also stimulates local economy, biodiversity and helps local communities and workers to engage in better decisions.*

During recent years there has been methods developed to formulate new ways to engage and include ANT in fields of digital technologies (Hakken, Teli and Andrews, 2016). Building on the previous method, ANT, technology actor network theory (T-ANT) creates a framework to observe and analyze technologic organization. These types of organization include fields of computer engineering, where networks are created from code and programming, and where computational objects and structuring are regarded as actors with agency. T-ANT and ROOTS complement each other creating a relevant context in digital technologies, and since a part of ROOTS futuring involves full embodiment of technology, hybridization\(^1\) of physical and digital contexts, T-ANT presents a way to analyze these two parameters equally in a network.

*Networking*

*I am becoming ever so aware of my acknowledgements and also my wandering. These acts create movement, leading me into a state of mind where I am networking, actively creating connections between myself, my surroundings, my prior knowledge, and knowledge anew. ANT as well as the extension T-ANT brings meaning in actively investigating networks as a means of knowledge, value and design.*

ANT and ROOTS meet when engaging in analyzing how different social structures, large bodies of human to non-human interaction and where it occurs. This was used primarily in the beginning of my research to create a framework for ROOTS. ANT is a method, but not really a method, it is more like a thought or a breath of air, as an entrance in my observations on human networks and also my excursions. It is also

\(^1\) Hybrid –result of mixing elements, crossbred, - a becoming between two or more.
relevant since it has been used to examine and analyze networks, organizations –
figurations with include structure and functions that manifest in different ways
(Latour, 1998). However, ANT has been used as an abstract concept to grasp the
beginnings of research, of thinking networks as designed entities, but ANT is actually
really not a primarily abstract concept to work alongside as it is primarily grounded in
empirical cases (Turner, 2016). I have been thinking, ANT and it’s many shapes and
forms are heavily critiqued by Latour himself, because it is not a theory, it is not a
way to approach network, it is a thought and an action of being, pure being,
furthermore becoming (Brown, 2017). As I understand my readings of the researched
companions in this bachelors thesis, the notion of being pure being (Brown, 2017),
becomes clear once I am engaging in a network outside of my own being, that is
ROOTS – the hydroponic gardening network.

So ANT, as a means to observe has been meaningful for me to understand the basis of
observing not being, and by understanding this very simple change, the difference
between being and becoming, future and futuring, network and networking, I also
begin to understand what actual thinking and acting in designed networks entail.

**Futuring**

X: Futuring is not a word now is it?
Y: Letters are words, but perhaps you mean that futuring does not have
meaning?
X: Well okay, but it still isn’t a word.
Y: You are right, Futuring is a function, a practice, an action to become with
the present in order to engage in the future.
X: Like utopia?
Y: Yes and no, the difference between utopia and futuring is in the value of
creation, acting and engagement. Utopia is dead. Futuring is alive. Utopia
exists in the far away, futuring exists in the now.

This chapter aims to provide a framework for working with futuring in network
design.

In the lecture by Damian White on Bound & Unbound; The Sites of Utopia 2015
futuring as a practice occurs when critical theory begins to engage in design fiction
with an utopian agenda. The idea of creating utopia was to escape despair and to
instigate hope. This kind of idealistic thinking is prevalent in all human beings, to want to actively change surrounding, making life - past, present, future - more beneficial and satisfactory (Ambjörnsson, 2011). But the fault of utopia is that same mode of engagement; the same drive to create something better for people alike creates situations where discussions and ideals tend to halt in being wrong or being right (Harvard GSD, 2016). Each time we discuss the notion of utopia, a binary discussion occurs. Utopia and dystopia are somewhat the same depending on who is observing or engaging with the phenomenon. One example of an alternative way to network past, present, and future is by design fiction.

Design fiction is a different genre of design; a genre that is forward looking, beyond incremental and makes an effort to explore new kinds of social interaction rituals. Design fiction understands constraints differently, it engages in creative provocation, raising questions, innovation, and exploration (Bleeker, 2009). In this way design fiction is a hybrid and focuses hands-on practice that operates in the spaces between ideas of the future and their materialization, as well as projections and anticipations of the designed futures (Bleeker, 2009). A so called acting on ones values, thoughts and roots becomes prevalent. Futuring is in many ways more practical since it places the observer or the scholar right in the acutely aware midst of the now, as well as the future. And its conflicting nature between the here and now, the there and then, becomes another condition of futuring. Futuring engages to include a complexity in which human beings as well as problems are saturated with diverse levels, networks and roots.

Critical making deals with combining theoretical and pragmatic modes of engagement, critical theory which is typically understood as conceptual and linguistic based work and physical making which entail goal-based material work. Critical making engages in explicitly focusing on transforming the imagination and opening up perspectives to designers (Ratto, 2011). With its emphasis on critique and expression rather than technical sophistication and function, critical making has much in common with conceptual art and design practice, as well as recent work in the area of human-computer interaction (HCI) (Ratto, 2011).

Design fiction and critical making invites scholars and many alike to engage in
Futuring. To engage in the action of re-evaluating design and action and engage in values is to change the discourse from binary to speculative. Instead of anticipating the future, we could engage in creating it. By thinking and acting networked roots as design one actively engages in futuring, this means that the future is created procedurally with a specific set of values in mind (Hakken, Teli, & Andrews, 2016). If one were to actively engage in futuring, as it is set out to be a middle ground for utopia and ideology and practice, the issue of sustainability becomes a core (Harvard GSD, 2016). Investigating ROOTSs and visualization, but also about thinking and acting together with networks as design, creates a specific way of engaging in futures. By situating ROOTS in both analogue and digital forms, it creates a network stretching from the analogue and physical world, to the technological and digital world, systematically creating hybrids, instead of presenting different terms as static, they are presented as an action with function.

Value becomes Valuing.
Future becomes Futuring.
Nouns become verbs.

In "Collaborative futuring with and by makers” (Hyysalo et al., 2017) a phenomenon of thinking and acting inside a network specifically to design potential uses of public spaces in Finland, Helsinki is brought to the surface. Power to actively engage was given to the people. The study was focused on targeting the maker space in Finland, with a mixture of both highly trained and professional makers, and maker enthusiasts. The workshop was arranged to speculate in future public spaces, and to anticipate what problems and demands the common citizen in Helsinki might have by the year 2020. The trend statements concluded that learning, open data, sharing platforms, and networks were some of the most important themes to take into account when engaging in thinking, planning, and acting toward the future. The study concluded that collaborative futuring with participants appeared to provide relevant and substantive information for planning future developments. In other words, futuring in a similar manner means to democratically involve those affected by futures (Hyysalo et al., 2017).
ROOTS: the Hydroponic Gardening Network

X: So is this your project?
Y: Yes, it is. So is this text.
X: Um, okay. But what is a hydroponic gardening network? What does it do?
Y: It’s a garden placed in pipes with water flowing continuously. It has no soil, so it reduces water usage. It grows plants!

1.2 Hydroponic Gardening Network

The pictures above is one of the first drafts for ROOTS: The Hydroponic Gardening Network. I took inspiration from industrial prototypes and systems for the shape and look. Later on I decided not to go with the cascading style with the plants organized in steps, but rather to have them as a tower. The decision was based on two primary points. The first was due to water efficiency, a tower system with a water drip is much more sustainable and water efficient than a cascading system with a pump. The second reason has to do with space and resources. It is more practical to have a vertical tower network with just as much space for growing which has a lower need for extra resources, since the pipes used as “pots” are also pipes used for the base.

The entities:
Pipes
Plants
Grow material
Water
Sunlight
Nutrients

For it all to work I need to assemble but also, more importantly, reassemble all the entities. Just by picking apart all these different concepts and organizing them into separate beings, we seem to also limit our understanding for them as networked (Drengson, 2011). A pipe is a pipe and a plant is a plant, but by re-assembling them they take on a new form. This is what I am trying to visualize, that by re-assembling ideas, concepts, separate words and parts, they take on a new form, function and meaning. Hydroponics, the network, is based on mutual function, active valuing and caring. It mimics the function of other network, basing itself on participation; this particular kind of participatory design is called participatory infrastructuring (Hakken,
Teli, & Andrews, 2016). Hydroponics is a designed network and infrastructure, and as a network there is nothing which is more important, or valuable, than the other. A hydroponic network cannot function without plants, since the absence of plants would render the whole network obsolete. A hydroponic network cannot function without water, since plants need water. A hydroponic network cannot function without light, nutrients, or care. Humans systemize. Meaning our daily life is built upon creating other networks as mentioned earlier. We are prone to organizing and structuring things, concepts, knowledge, and other beings in networks that make ”sense”.

Returning to Valuing. Using networks to create a commonwealth of valuing, we participate in creating knowledge of how and what to value. Valuing is not a discourse, it is not limited to either or, valuable not valuable, in a network, a culture, and each node is value. To be even more clear. In a hydroponic network, there is no soil. Soil needs water to stay hydrated, often more water than the plant itself. Water is a shared Value - A resource often included in our daily act of valuing. What do I mean by this? Value is nothing without movement, the dynamic shift between one value and the other. Hence valuing becoming a more relevant term. But what does valuing entail? It could mean that we participate actively in agreeing on what common, shared, values are at one specific point in time, thus creating a context - situating value (Hakken, Teli, & Andrews, 2016). What lies within the creation of valuing in regards to networks? Thinking valuing in a network creates a value in regards to other values, networked values. Here it is important to distinguish between worth and value- as worth entails sentimental value; labor; subjective; opinionated value, whereas value in disregard to economic value, as it during modern day almost always implies, value is not ”This is more valuable than that” but rather ”This in regards to this has value”. Values thus become a process of networking between knowledge, values, organization, technology and the environment (Benn, & Baker, 2017). Hydroponic gardening thus removes the use of SOIL to maintain a minimal use of water. The plant still grows.

**Conclusion and Discussion**

X: So plants, networks, futures… It seems like you are creating your own utopia?
Y: Yes, I can understand that observation. However I am actually not, because utopias are, I feel, stuck in time. I want to do something, to really create.
X: Hmm. But what does this all mean?
Y: It means that things are to be thought of as actions, as doing, as creating, instead of just over-theorizing…
X: I’m feeling a bit creative, should we act on this thought then?

**Dictionary**

**Roots:**
connected, underground, a base. The literal meaning of roots, like plants, or heritage. Roots as a noun.

**Network:**
Circulating entities, re-assembling and assembling information in a horizontal and vertical fashion, creating connections, becoming connections all at once.

**Design:**
strong, intentional, decision regarding the form, function and interconnected networks of an entity, regardless.

**Value:**
the relation between entities in motion, with consequences of past, present and future taken into account.

**ROOTS:**
the act of becoming with networks, thinking and acting accountable, designing for networking and engaging in futuring.

The whole point of doing this research was to find out if there is any use or any hope in trying to be accountable in technology, design and networks, how we use it and how we or I interact with it as a designer, or a media technician (Suchman 2000). What does ROOTS mean? It means being accountable and acting on roots, so for me that would be realizing that I am female, I live in Sweden, I study media technology, I am vegan and an environmental activist, I engage in politics and making policies actively. My roots; my bias; are all these different aspects boiled down to decisions in
the here and now. ROOTS means futuring, because it does not separate the past and the future, it engages in the now, the past, and the future in a network. ROOTS is a phenomenon. ROOTS visualizes the meaningful hybridization of technology and the social. It emphasizes the accountableness of creating value, to create value in symbiosis of knowledge; thus creating networked knowledge as design.

When I started this bachelor’s thesis I thought I was headed toward creating some sort of utopia, because I engaged in thinking rather idealistically about the future. “When it’s my turn to design the future I’ll do it this way, I’ll make sure that there are no roads in cities, I’ll make the production of produce local, the era of the farmers market will once again reign, etc….” The idea of a utopia faded away when I began to understand the practicalities of being utopian, in a classical sense. To me, the notion of a utopia, seemed too static, too excluding, too fixed. It does not engage in the future, but in the now, it is not a network. Utopia did not seem to engage in anything other than critique of the now, and I wanted to create. So I turned away from utopia, by its definition, and instead looked towards others who had begun to formulate circumstances for futures, who did so in a manner I could relate to with ROOTS in mind. Lucy Suchman (2000) writes about located accountabilities in technology production, which relates to ROOTS since it engages in acknowledging that “Design is from somewhere” that there are consequences to take into account while designing, engaging, creating, participating in any sorts of production. Donna Haraway (Haraway, 1988) also engages in futuring, but by setting the tone for accountability and disregarding the notion of Objectivity as a practice, and instead suggesting that one becomes with ones biases, ones subjectivities and partial perspectives. These are all phenomenon that run parallel with ROOTS. Karen Barad (2011) also deals with futuring and ROOTS, as well as defining objectivity as an immersive experience where one engages in the observation as a reflection of ones own ROOTS, discussing responsibility as a relation that presents itself within the intention of the action of engaging in observation. Perhaps this could be understood as designing knowledge, or maybe even designing the perception of being and becoming. Either one of these modes of definitions could be applicable to being, but the matter is not being, but rather being responsible, accountable, becoming. Even though Karen Barad makes the point of responsibility not being something to perform, but rather becoming interwoven in the network of being (intra-action), it could still be an alternative to
thinking about ROOTS and futuring, since accountability is differentiated from responsibility. And this differentiation could be not a separation, but rather a mode of engagement in creating a context where connections and networking occurs.

To view human networks as co-evolutionary, it is necessary to understand that beyond the intertwined nature of human and networks is the fact that human networks are self-reflexive as they circulate and evolve as the designers evolve and self-aware, meaning that humans are inherently self-aware. Ecological networks are not, meaning that networked design is not a suggestion, but rather a responsibility. To design is to be accountable, to lend strength to the future by being in the now, to enable co-evolution through networks.

By thinking and acting something in a broader sense rather than thinking just oneself (Barad, 2014), is to engage in futuring. By thinking and acting networked roots as design means becoming an accountable (Suchman, 2000) actor in a network (Latour, 1998). Networks and ROOTS is an extension out of accountability, furthermore praxis on the embedding of accountability. Because networks are interconnected, netted workings, working nets, which entails an action, networks expresses a concept of needs and action to be worked on and from. And of course there is more networkings to be thought of in this dilemma of accountability. It is not merely about creating relations and connections with material objects (Suchman 2000) but also about extending that relationship onto futuring, that an object, as well as humans, are entities connected to a network of time. The relations of human practice and technical artifacts are tremendously networked, interwoven. Because at the same time that technological practices and networks focus on concealing the inner workings and layers, it has become increasingly important to find actual relations within these relations. Or as Suchman (2000) states that the assimilation of lived experience to technique goes both ways, which only makes the project of re-imagining technological objects the more urgent (Suchman, 2000) meaning, in broad terms, that how interaction and networking occur within technique is by creating an alternative way of thinking about objects, relations and networks, and lastly ROOTs. ROOTS is a means of existence, a hybridization of digital as well as non-digital life. It is a means to become together as one designed, rooted, network.
**Why ROOTS And Futuring?**

Well, its because I believe in something, something that has been forgotten. When I was a young child I used to build cities and towns out of old shoeboxes, I made clothes for my dolls and used my car sets to create elaborate roads and traffic networks all over my room. Playtime was my favorite time because I was able to invent my own future; I was always creating new things from old things, always trying to solve problems and actually think about how I wanted my life to look like. I believe that many people were like this, if not all people, at some point in their lives. Humans are born designing, futuring, the world around us just by having open eyes, just by becoming. I believe that the will to design for oneself fades into something else later on. Design and futuring is not only about the aesthetics of the world, or even the practicalities, it is about perceiving, thinking and acting with all prior knowledge and experience one has. It is about thinking and acting networked ROOTS.

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**Technical Specifications**

X: So I guess that’s it then.
Y: Not really, I’m still networking, every second, everyday.
X: How do you keep track of everything?
Y: The same way I’ve been working on this project, by filming, sketching, mind mapping, drawing, writing… the list goes on and on.

This chapter aims to provide an overview of what technical tools have been used. I have used photography and cinematography to document ROOTS. The camera has been used as an extension of myself and my stimuli, as I engage in my surrounding in a more decisive manner while behind the camera. I have also used illustrations and...
sketches while documenting excursions and thought processes, in both analogue and
digital form. The reason for this is to once again test engaging in observation,
furthermore to actively reflect on my observations. The editing of clips has been done
in Adobe Premier Pro; The editing for photography has been in Adobe Photoshop;
Illustrations has been created in Adobe Illustrator. I have used these tools as I am
most familiar with them. The documentation has led to an installation of ROOTS;
where the actual roots have been collected, curated and designed into a cohesive
network, where they all maintain value in relation to each other.

List

Adobe After Effects CC (2017)
Software for video effects. Used in this project for creating effects,
experimenting with visual networks

Adobe Illustrator CC (2017)
Software for digital illustrations. Used in this project for creating illustrations,
mind maps and mood boards.

Adobe Premiere Pro CC (2017)
Software for editing film. Used in this project for compiling video footage and
documentation.

List of References

Adobe, Creative Suite, (2017)
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Post Scriptum
All of a sudden it is as if the lights
Have been turned on,
I can see again!

This time,
The world is brighter
More saturated
Blooming
Iridescent

The ROOTS are all around us,
Looming in the midst of it all.

Designing
Creating
Networks

- Cecilia