

My Digital Body

Mie Frey Damgaard

IM Master

Design Academy Eindhoven

Mentors

Oana Rades

Barbara Visser

Vinca Kruk

Koen Kleijn

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Abstract

The registration systems of individuals have grown tremendously within the last 30 years and privacy is today difficult to maintain. Over two-thirds of the UK population no longer trust the government with their personal data.

Soon also our physical body, I hereby refer to our biometrics, will be registered and filed in databases. This phenomenon will redefine the body as digital codes that can be read by a machine. A digital body will be generated and it is the total of all our personal data. As a result privacy and freedom will be even more difficult to maintain.

To maintain our freedom we unseal our data and give up the illusion of privacy we have today. As a consequence, chaos of transparent data will arise. When everyone's data is unsealed our digital body will be what we are understood by.

I have designed a future scenario where the digital body, containing our entire personal data merges together with our physical body. It can be understood as a completed circle where the personal data returns to the individual and the physical body becomes the database of the digital body. In my design I have worked with how to access and maintain an overview of the data in the digital body? How to keep the data up to date? How to create a hierarchy of the data? And how to navigate through it?

My Digital body

In my first thesis I was working with future payment methods. As a result of using biometric technologies money would 'enter' the body. Our body would become the value.

But biometrics can be used for more than just a payment method. Your bank account will not be the only set of data that can be 'accessed' via the body.

In this part of my thesis I will focus on the use of biometrics and the effect it can have on our understanding of our body, our surroundings and ourselves.

Introduction

The definition of biometrics is derived from the Greek: bio meaning "life" and metric being "measurement".

Biometrics as a modern technology utilizing those parts of our body that are unique and can identify who we are.

Biometrics has been divided into two categories, physiological and behavioural. Physiological elements are the iris, the fingerprint, the hand, the shape of the face, retina, odour, earlobe and lips. The signature, keystroke, voice pattern and gait are examples of behavioural patterns that can be identified.¹

The development is fast. Biometric identification technology is a growing industry. It is used in airports, schools, in payment methods, as the key to your home and the access to your computer, just to name a few. As they use elements of our body that are indeed unique, and difficult to copy, biometric technologies seem easier and safer; our biometrics will prove who we are when we travel, consume and enter our home.

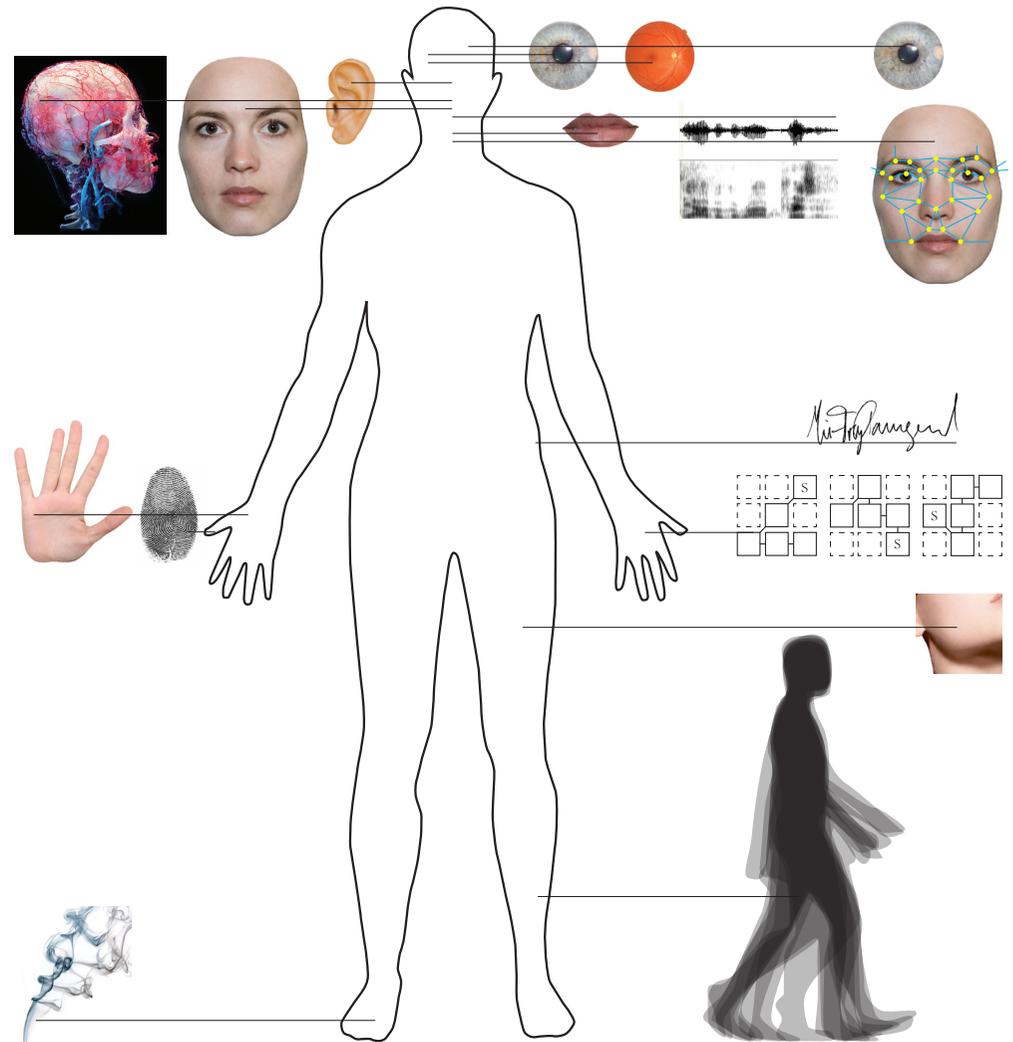
The primary use so far of biometric identification technology is in forensic identification of criminal suspects. It has been accepted as legitimate evidence in many countries, and police organizations have been steadily collecting and storing information of suspects and convicts.

It is not only when we are involved with the police that our biometric data are collected.

Travellers to the US now have to partake in the US-VISIT programme. Their biometric data like fingerprint and iris scan are registered, combined

1 Biometrics - The Wave of the Future? By Gary Daniel

with the data provided by the USA-PNR (passenger name record). This data can and will be used to perform background checks in other databases and watch-lists. The EU also intends to collect biometric data from every passenger flying into the EU.



Definition of the digital body

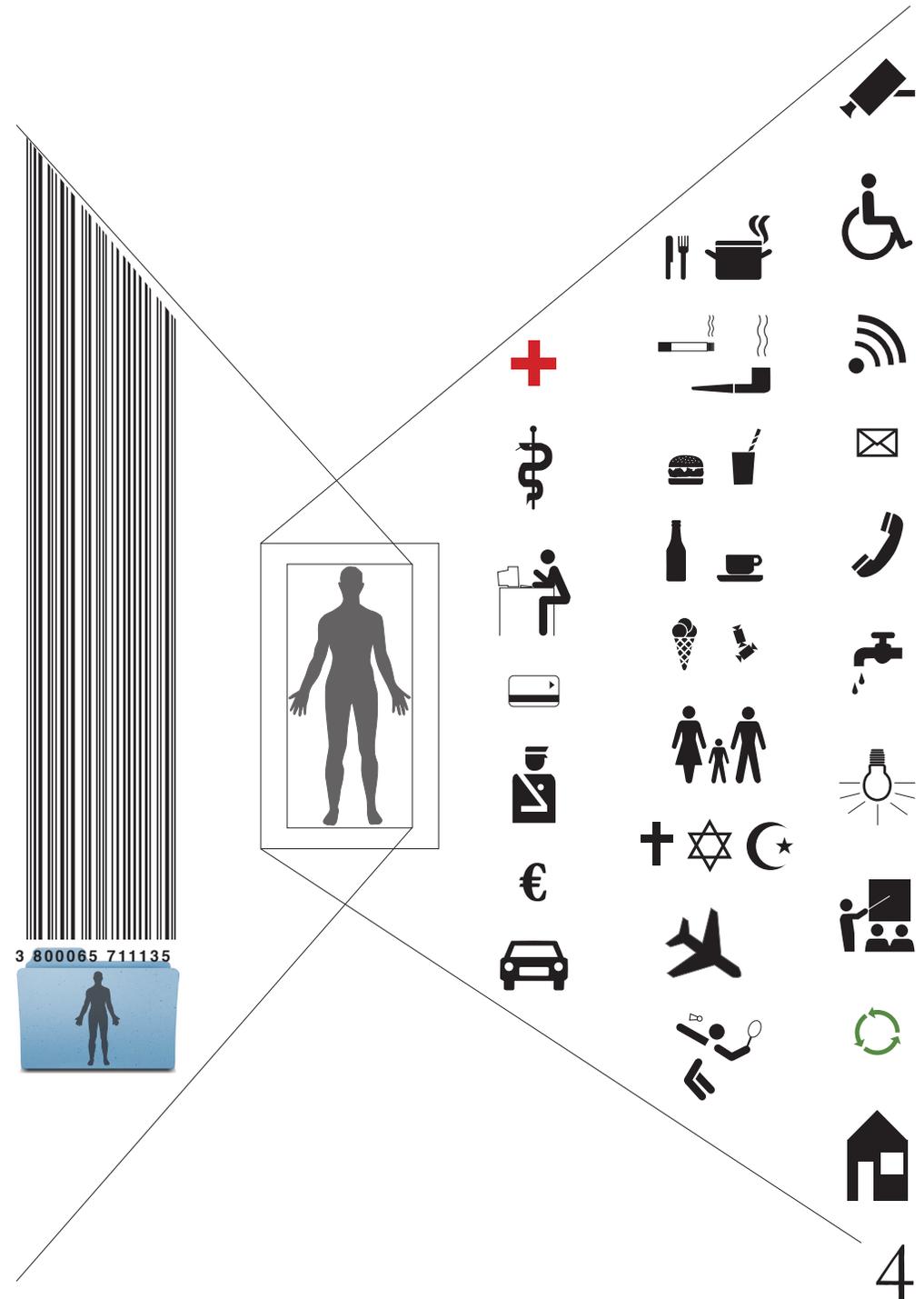
The collecting of our biometric data develops into a database of information from individuals. In this development the human body appears to be redefined as an entity made of information and the physical body acquires digital characteristics.²

The file with 'the digital characteristics of our physical body' will be a key in the web of data about us. Our personal data can be recognised and identified as ours by using the biometric data.

This brings the biometric data to the centre of the databases with personal data. All databases will link to this data for approve and recognition of the individual and it will generate a digital body.

The digital body is the total of our personal data, our registered and filed digital life and person.

The total of our personal data united in one entity creates transparency and accessibility. It will no longer only be specific data that is accessible to specific institutions but all our personal data.



2 Genetics, biometrics and the informatization of the body, by Irma van der Ploeg

Accessibility in databases today

Apart from the biometric databases, we are already a part of a large amount of databases both governmental and private.

October 2007 in the UK, two discs containing a copy of the entire child benefit database were lost. As a result, over two-thirds of the UK population no longer trust the government with their personal data.

An investigation of the governmental databases was commissioned by the Joseph Rowntree reform trust. Of the 46 databases assessed in the investigation only six were OK. 'OK' in the sense that they are broadly in line with the law. Their privacy problems (if any) have a legal basis and are proportionate and necessary in a democratic society.

Nearly twice as many databases are almost certainly illegal under human rights or data protection laws. 29 databases have significant problems, and may be unlawful. Depending on the circumstances, they may need to be smaller, divided, or individuals may have to be given a right to opt out.

An example of a very problematic database is the Detailed Care Record.

This is a Wikipedia model-database where many different health professionals can add to a record, but none of them is responsible for maintaining its quality. The records have been made available to social workers that are not health professionals. As a result, low-income single mothers have been less likely to seek treatment for depression, because they fear that medical information will get visible to those whom decide on benefits.

Another example is ONSET, which is a system that gathers information from many sources and seeks to predict which children will offend in the future. This can mean that children may be stigmatised; for example, if they get involved with the police they may be more likely to be treated as

suspects rather than as victims or witnesses.³

Sharing the data from one database to another can be a violation of privacy. Data mining is an important tool to transform data into information. In data mining patterns are extracted from the data. It is likely to increase even more.

When having enormous amounts of data, categorising becomes a necessity, to maintain an overview.

What will happen if our digital body becomes a part of this tendency?

According to the Danish board of technology biometrics can lead to unnecessary registration and decrease the individuals right to choose who should know what and when.⁴

A person will be judged as normal or abnormal, healthy or unhealthy, legal or illegal, low or high security risk, based on the data that make up our digital body.

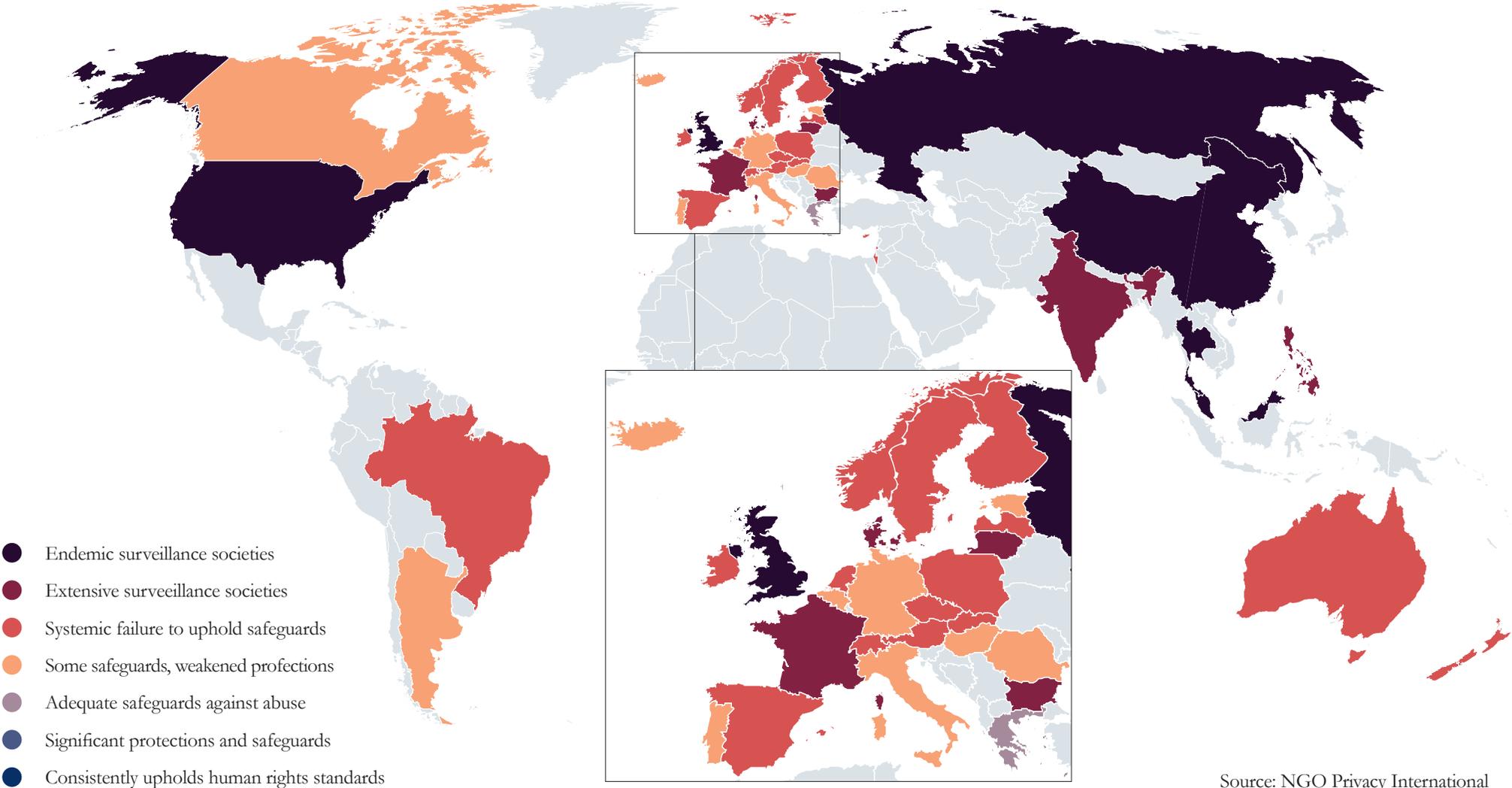
With the growing interconnectedness of networks, cross matching of databases, and sharing of information between agencies and institutions, in the public and private sector, it is worrying that profiles (digital bodies) can be produced from large amounts of data, and social characteristics attributed to persons behind their backs, whether they actually fit the category or not. 'Wrong' digital bodies can become a shadow we would have to face every time we go to the bank, travel and so on.

You are no longer innocent until proven otherwise. You are guilty until you prove that your data are used wrongly.

3 Database state, A report commissioned by Joseph Rowntree reform trust ltd.

4 Biometrics – use of biometric technology in the Danish society, by the Danish board of technology

Surveillance Societies



Source: NGO Privacy International

A transparent future

'If you've got nothing to hide, then you've got nothing to fear', is a saying that loses its meaning in this reality.

It depends on the way the information is used. We do not know if we might have something to hide in the future. We do not have control of the lives of our relatives. We do not know the criteria we will have to fit. We can end up in the wrong category. See "*Stephen's story*" in the appendix.

Today we are transparent to some extent. At New York University a team of scientist are working with methods to protect people against the automatic collection of information on the web by companies like Google. Helen Nissenbaum professor and the main responsible for the team explains that it is possible to reconstitute and reveal the identity of an individual, without using their name, only by using the content of their search terms online.⁵ Our only choice is to trust that it will not be misused.

It is problematic that the only thing we can do is to trust.

When the whole digital body becomes a part of this web, people become transparent to an even greater extent. We need to get back in control of our own information.

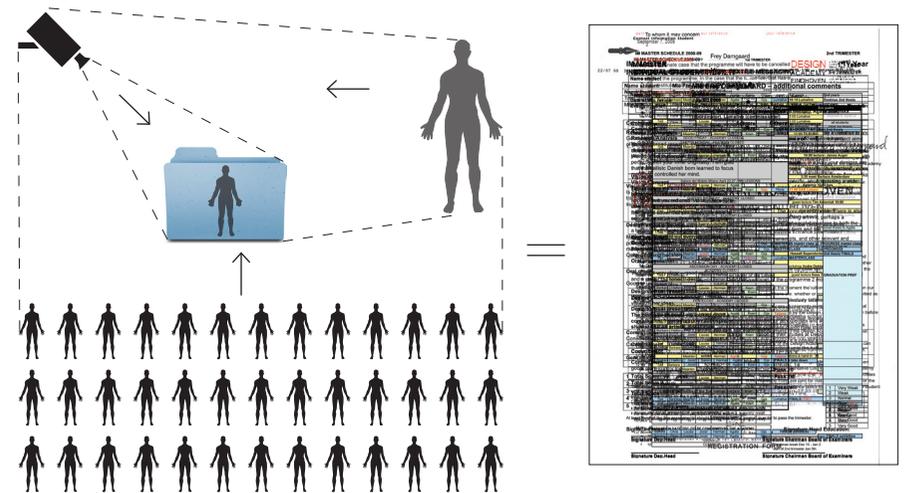
If we are perceived mainly via our digital body, it will affect who we are in real life.

If you are being told that you are a person of risk every time you need to have contact with the government or the private sector you might after too many defeats eventually give up trying, and find other ways to achieve what you aim for. You might become what people assume you are.

That the digital body is accessible and transparent only to government and private sectors will create a surveillance society and privacy will be difficult to maintain. 'They' will know everything about you. You don't know anything about 'them' or what 'they' know about you. The freedom of choice disappears.

To be free we have to know, what 'they' know about us and know how and where they use our data. Unsealing our data we let us become conscious.

This will result in a situation where people are not only transparent to the government and private sectors, but to everyone. With complete transparency you know what is known about you, and you have the possibility to make your decisions based on that. My 'digital body' will be naked and unsealed but so will everybody else's. Complete transparency will also lead to chaos. Therefore it is important how the transparent information is handled.



5 DR1 Horisont - Nettets supermagt, by Denmark's Radio, 22. marts 2010

Hypothesis

The storage of biometric data in a database will transform the physical body into digital codes that can be 'read' by a machine. Next to the physical body a digital body appear, it will be understood in the context it is placed and it will become the centre of our data. ⁶

To set ourselves free, and to not be standardized we unseal our data to everybody. When everyone's data is open our digital body is what we will be understood by.

The context of the transparent digital body will be my design focus.

The first step will be to translate and to portray the physical individual into the context of the digital body.

The second step in my design focus will be a step further into the future. How will the "designed" digital body perform in a society where 'digital data' return to the physical body? The digital and physical body will merge.

6 The illegal body, by Van Der Ploeg

Process and findings

01: Collecting my personal data

The Danish people are one of the most registered people in the world. The main argument for the big amount of public registers is that it is a necessity in a democratic society. The registers help the state to know how much we have to pay in taxes and which benefits we are entitled to. ⁷

The Central Person Register (CPR) has information about all citizens' name, address and personal identification number. The personal identification number can give you access to information about the finances, health, education, social situation and criminal record of the citizens, just to name a few.

My register access from CPR included my personal data as well as information about the public authorities and private companies that automatically receive changes in my personal data.

I used this list as a starting point for collecting my data to get an overview of how much data were filed. In the process of collecting I found that most authorities seemed confused about who had the responsibility of giving me the information. To get my patient record I was sent through 6 private companies only to be sent back to the starting point, CPR. Eventually I ended up in the right place and was able to get my data in hand. It is fair to conclude that my personal data are not as accessible to me as for the public authorities and private companies.

7 Registrering af danskerne er eksploderet, by Peter Lauritsen

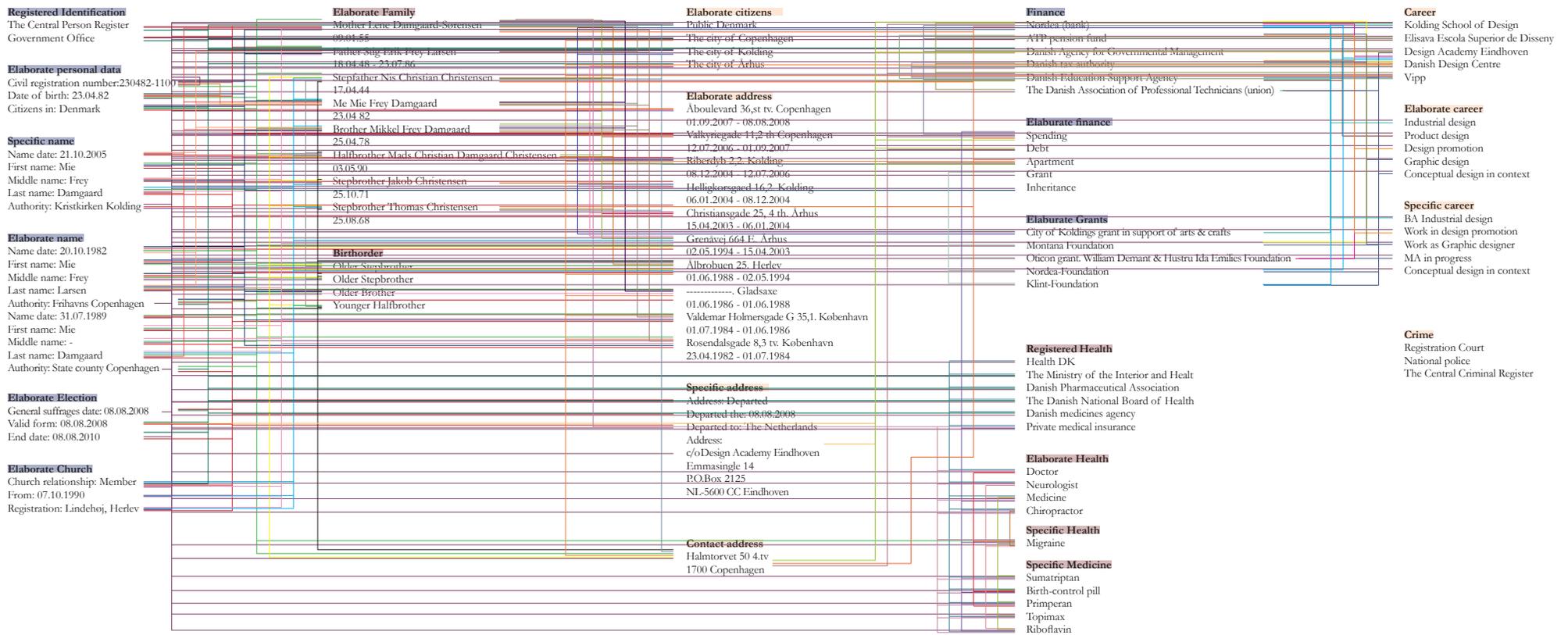
02: Creating overview of my personal data

My data was accumulating. To maintain an overview I filed it by institution.

It was obvious where I was most active. The pile of my patient record was a lot larger than the pile of my union or pension fund.

Arranging the data in this way was problematic. The story of why the data was there in the first place was missing.

I started a data visualisation where the data was broken down and every filed piece stood alone aside from the context of the institution. I reconnected the date again by using the stories within the piece of data instead for the institution who produced it.



03: Designing my personal data – my digital body

This resulted in a complete chaos. Every piece of data produces a lot more connection when it is filed by story. My mother is filed as my mother in 3 institutions, CPR, my bank and my patient record. When she was linked by stories she was connected to 64 other pieces of data.

It was crucial for me to tell the story of the data. So when navigating through the data you would get an experience and idea of why it is there.

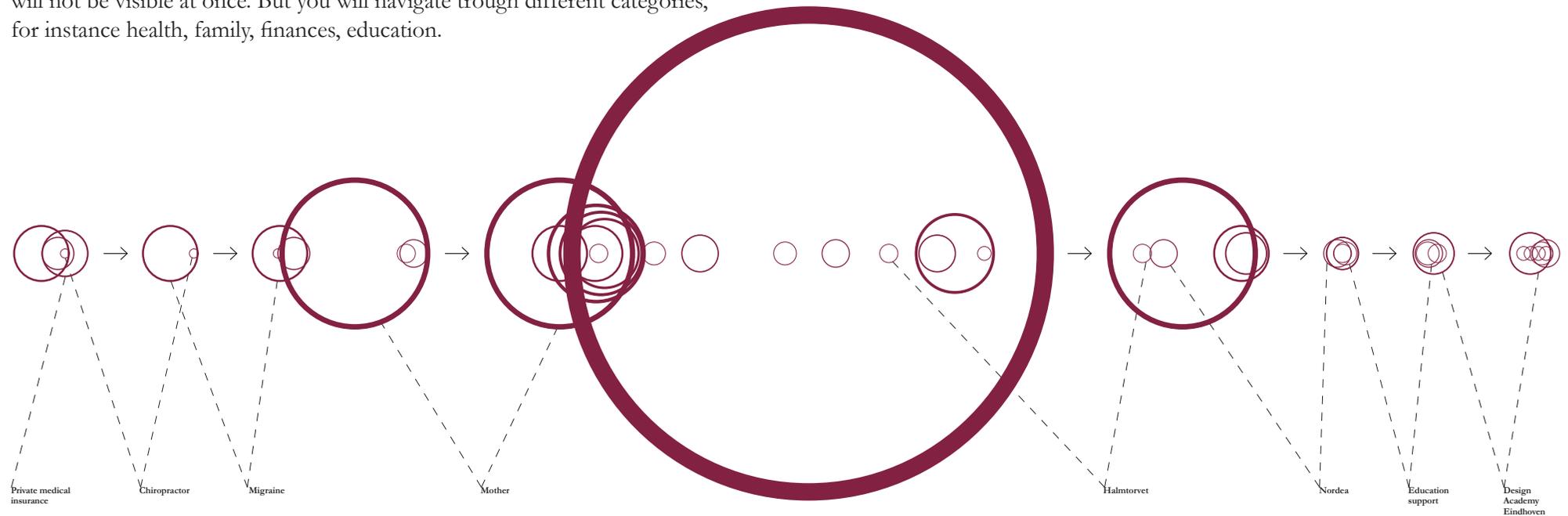
I created a system where I transformed the data into shapes; the size of the shape was defined by how much other data it connected to. The arrangement of the data was defined by the connections between the data.

Thereby when navigating, a complete criminal record or medical history will not be visible at once. But you will navigate through different categories, for instance health, family, finances, education.

By telling the story of the data using connections gives an idea of the importance and development of the data.

But the system was very two dimensional and still quite simple thinking of the future it is designed for. Also it seemed a bit unhandy that there are two quite distant bodies, the digital and the physical.

Can the physical body become the carrier of the database of our personal information and data?



The merger of digital and physical

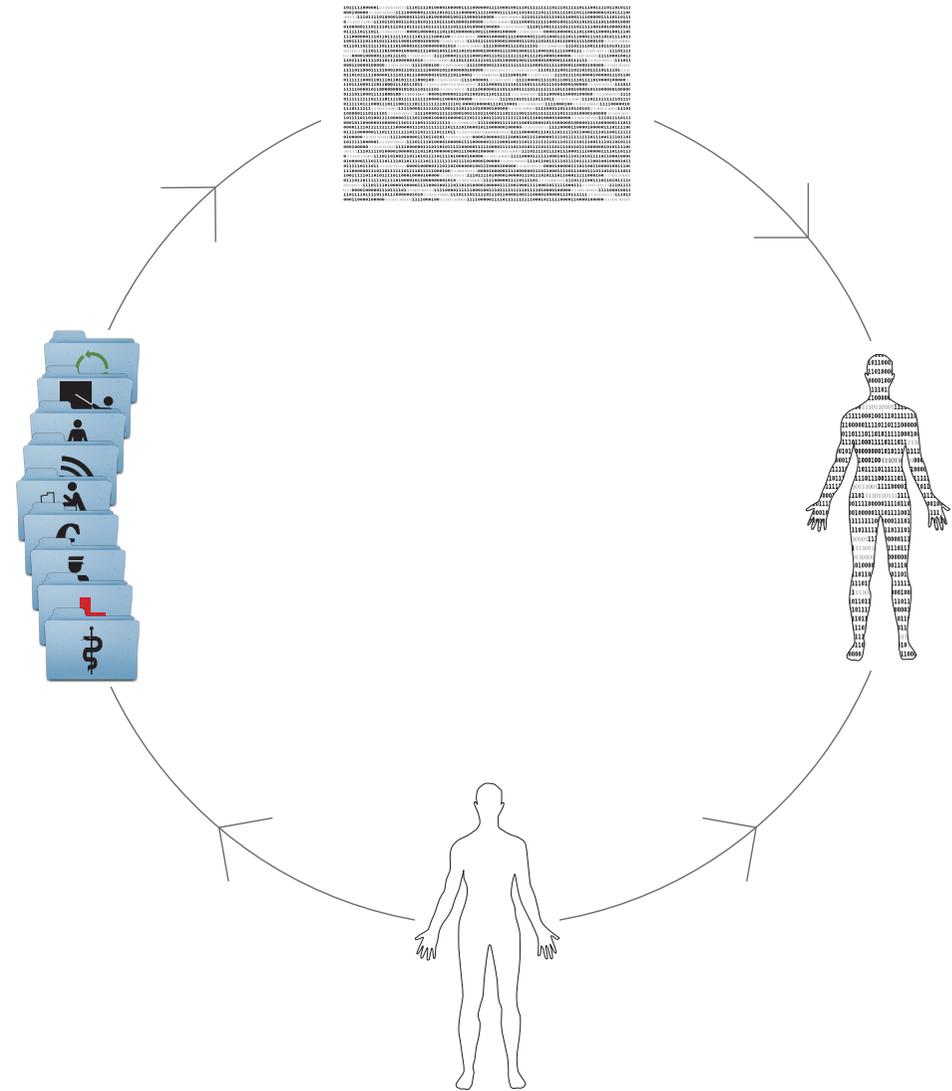
In this second step into the future I intend to let the data and information become a part of the physical body.

It can be seen as a completed circle when the two merge. The information and data about an individual derive from the individual. Today they are filed in various databases. The digital body will unite the data and information in one entity. The merger of the digital and physical body will bring the data and information completely back to the origin, the individual. It is my task to design this merger.

It is important to point out some of the consequences the digital body might have on our society.

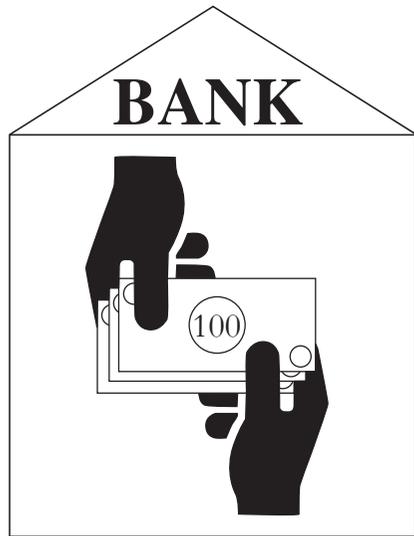
Today there are a lot of activities that no longer need a physical presence; online banking for example. It is problematic if this tendency is pushed even further; from not having to be physically present to not having the possibility or even to be prohibited. Physical actions that do not leave data trails, like paying with cash or producing your own food, could be actions that would be disregarded or suppressed.⁸

In the birth of the digital body a consequence could be that the physical body would be suppressed. Therefore it is important that one cannot exist without the other and let the physical and the digital body merge.



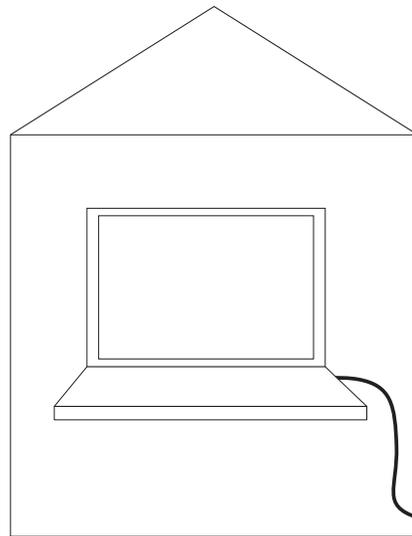
8 World-information.org, Data bodies

Evolution of an action that generates data



Physical present in the action at a specific location

01



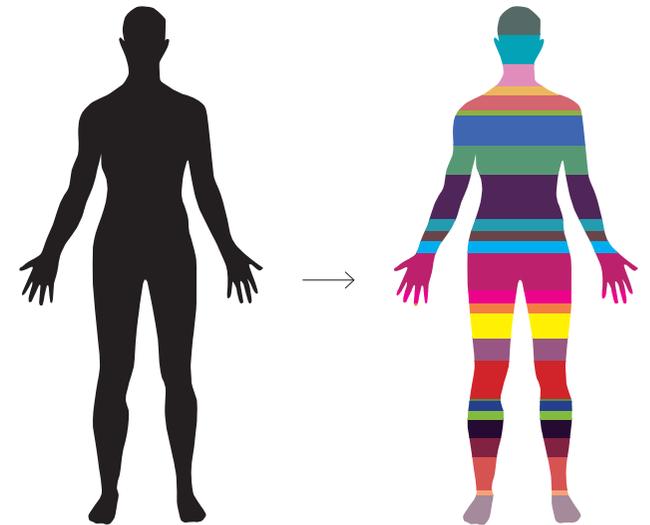
Virtually present in the action at a location with connection access

02



Virtually present in the action at any location

03



Physically and virtually present in the action at any location

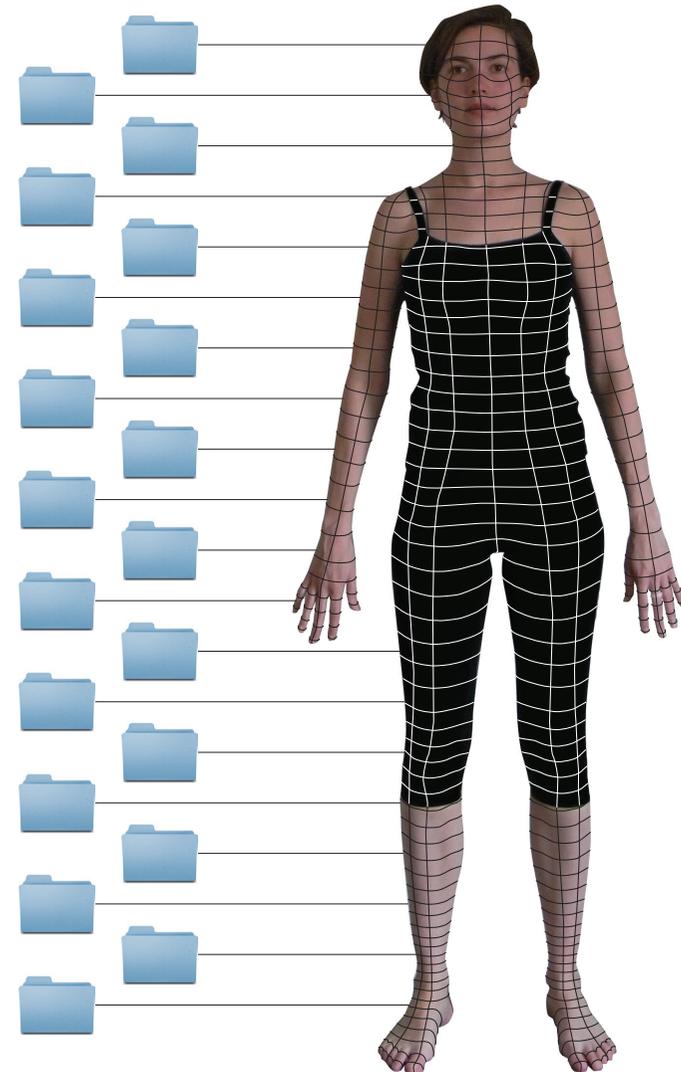
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The physical body becomes the database for the digital body

Singularity

In 1965 the British mathematician Irving J. Good predicted that ultra intelligent machines would be the ultimate creation of man. If the machine is intelligent enough it will improve itself and quickly become more intelligent than its creator. This is known by technological singularity. The term technological singularity is a theoretical point in the evolution of a civilisation, where the technological evolution will accelerate to infinity. The term also reflects the idea that the change may happen suddenly. It is difficult to predict how such a world would operate or if there would be any place for human beings.

The American inventor and futurist Ray Kurzweil does not fear the consequences of this; he believes that the human and the machine will merge within the next 40 years. Instead of competing we will cooperate and build the electronic components of the machines directly into our own brain. This will make it far easier to control the consequences of extreme intelligence since the brain possesses all the human emotions.⁹



Proposal.

How will it work?

There are some questions that have to be addressed in order to understand why it is fair to suggest this as a 'realistic' future scenario.

- How to activate the data? - How to view the data? - How to update the data?

When the physical body becomes the carrier of the digital body, our data will be inserted into our physical body in a chip, then transmitting the data through the physical body.

Researchers at Korea University in Seoul have transmitted data at a rate of 10 megabits per second through a person's arm, between two electrodes placed on their skin 30 cm apart. According to study co-author Sang-Hoon Lee future versions could be embedded beneath the skin for long-term monitoring applications. ¹

In my scenario the body surface will be the platform for accessing the data, a grid will be made of the body surface. Each body part of the grid will function as an activator and access point of specific data.

The chip in our physical body will work as one electrode and the biometric grid of our body surface as the other.

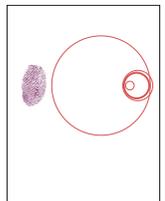
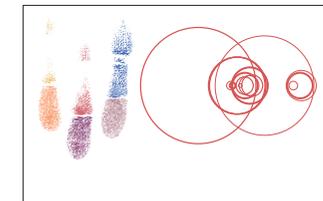
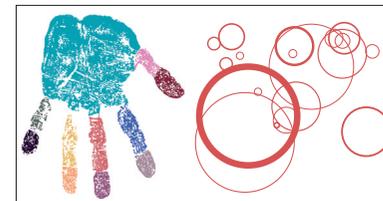
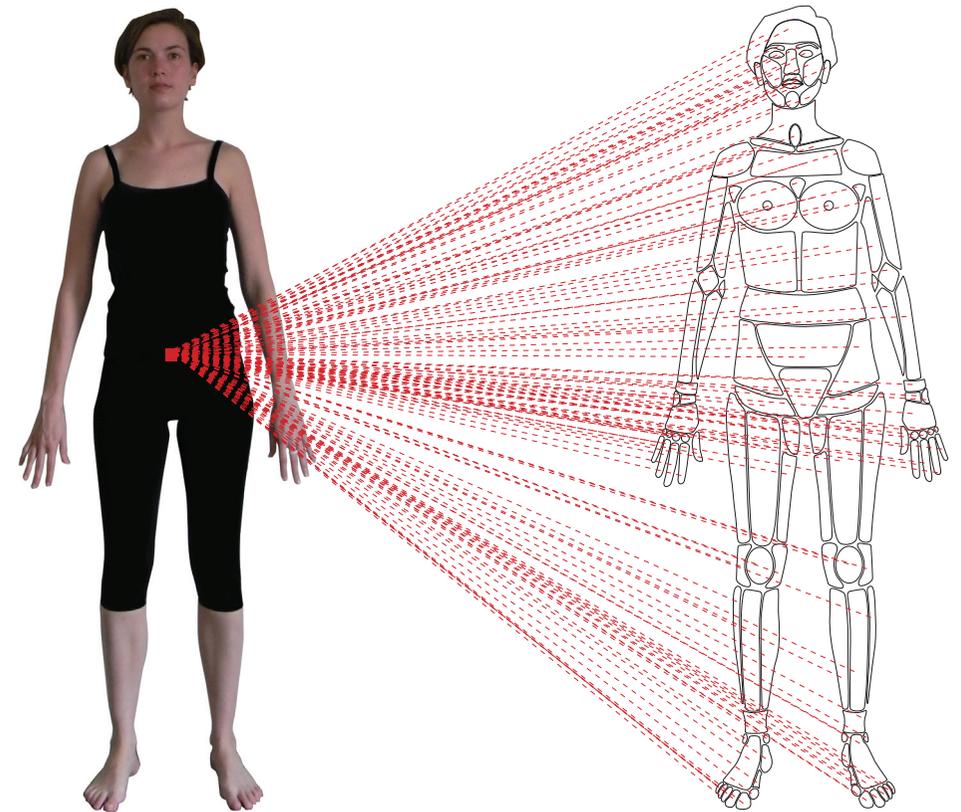
To view specific data you have to focus by eye on a specific grid area of the body.

Apple has filed a patent application for electronic video spectacles that will allow wearers to watch films in 3D on the inside of the glasses. The gadget goes by the name iSpecs. ²

Vuzix, the world leader in video eyewear technology have already put their video glasses, Wrap 920 on the market, with them you can watch movies

1 Human arm transmits broadband by Phil McKenna, New Scientist. 15.03.2010

2 Apple patent application for 3D viewing glasses, physorg.com by Lin Edwards, 16.04.2010



directly in the glasses with a resolution on 428 x 240, a virtual 67-inch screen - as seen from around 3 metres.³

In the future it is fair to suggest that this technology has evolved. You will be able to watch more than just movies and the glasses will become as small as contact lenses, it will be digital lenses.

When wearing digital lenses you can see the digital body of an individual, without you see just the physical body.

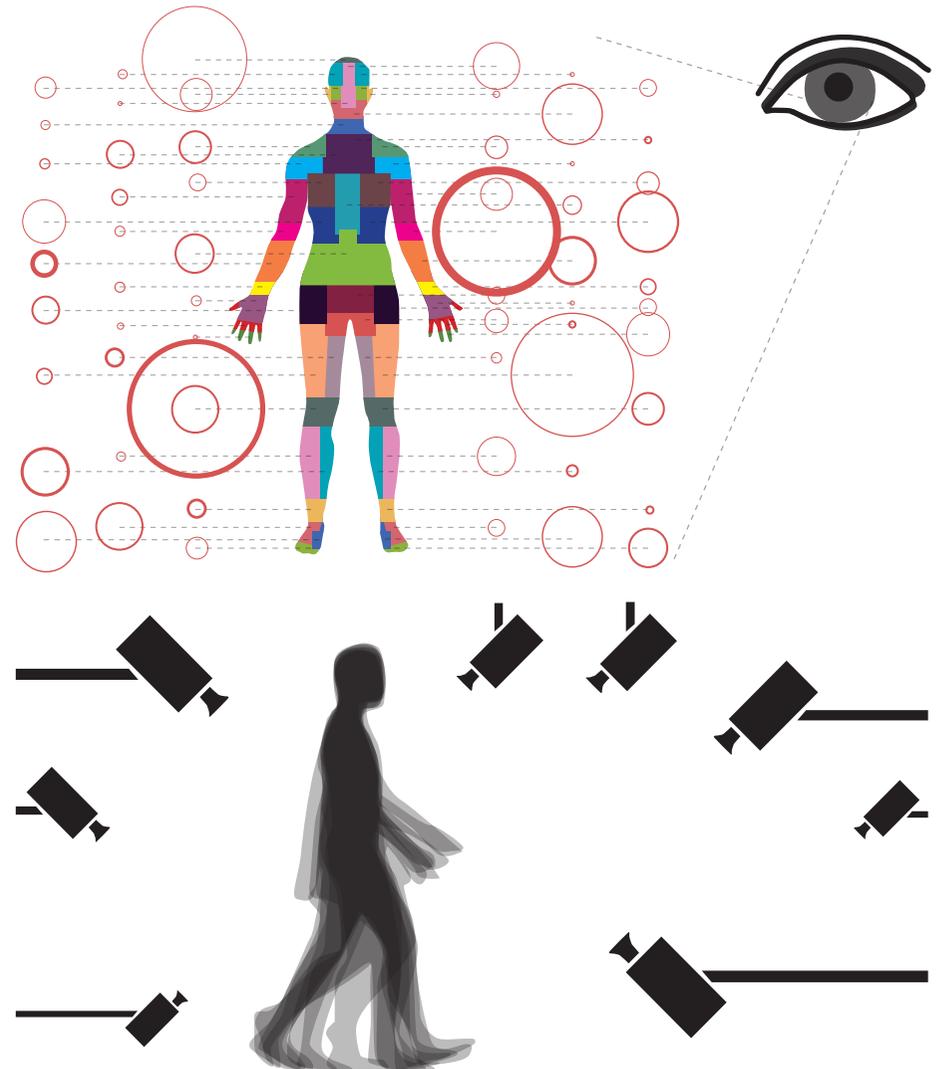
To unseal the data and store it in the body of the individual demands some explanation on how data will be produced and stored. In the scenario, the databases of authorities and institutions will be mirrored to the digital body. There will be one complete database per individual, being the one in the physical body. This means that for instance a doctor will produce data. It will be stored as well as transmitted to the digital body. Like sending an email. Britain has today 4,2 million CCTV cameras - one for every 14 people in the country. These cameras will be the source of transmitting. When a CCTV camera registers the biometrics of your body, it will transmit the data the doctor produced to your digital body. Thereby the digital body will be kept up to data.

There is a big role of a designer in a scenario like this. In my design I will focus on the relation between my data and me.

The data can be seen and treated as a new limb. We will care for this new limb like we care for our physical body. We sleep, eat, exercise, cut hair, nails, use make up, lotion and clothes, just to name a few, we do actions and have tools to take care of the physical body.

What tools and actions will we need to take care of our digital body?

³ Vuzix releases Wrap 920 video eyewear, Techno talks, 10.11.2009

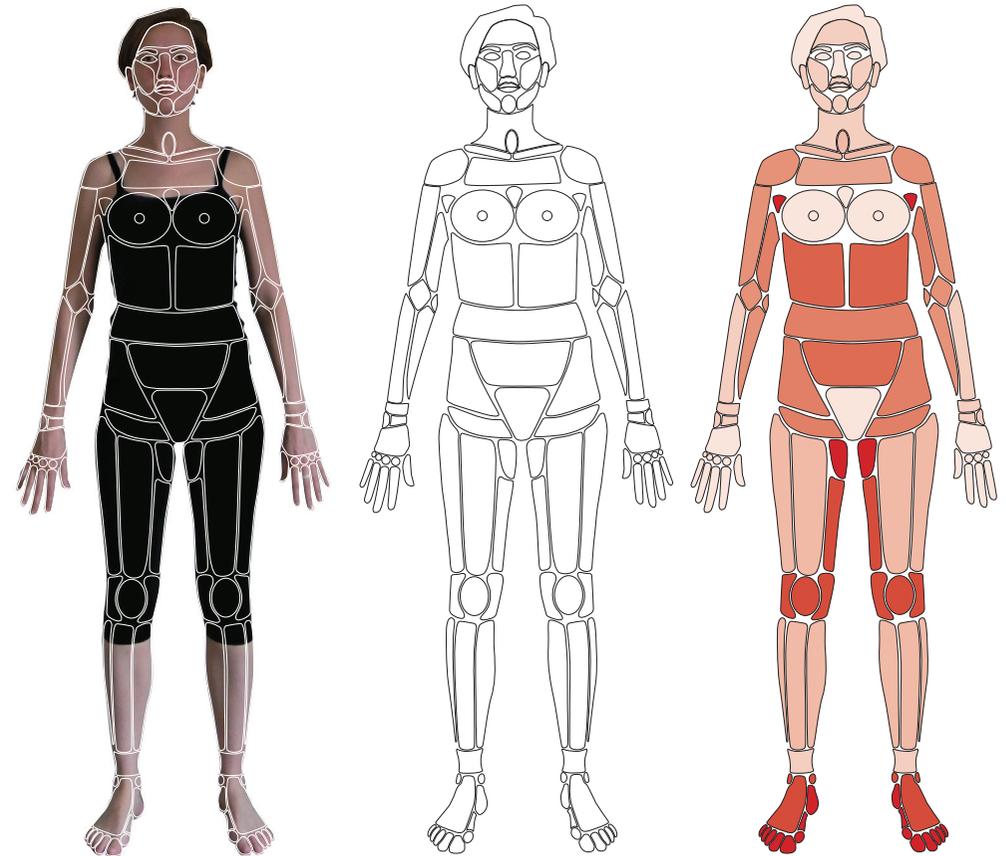


Conclusion

My design is a scenario where we in order to maintain freedom and privacy will unseal our personal data. We will give up the illusion of privacy we have to day.¹⁰

As I have written in this thesis the step is in some way literal. Our physical body becomes the database of our digital body. In the paragraph about singularity I pointed out that the merging of the machine and man is already predicted, and therefore it is fair to suggest that our physical body can be the carrier of our digital body. Throughout the thesis I have clarified the reasons of why to do so. Today we live with an illusion of privacy. Our personal data is a lot more accessible to the institutions filing it, than the individual producing it. There are several cases where the filing in databases has unfortunate consequences for the individual. See appendix As I mentioned earlier only one out of seven governmental databases in the UK are functioning ok. Registration is a growing tendency. A good example is that the register access of my mother and myself is very much alike even though she is 27 years older than me; digital registration has grown tremendously over the last 30 years. My Mother and I have more or less the same amount of data.

The databases and systems we have today have big difficulties to maintain privacy. When our biometric data enters the system, it will function as an identification of us as individuals and all data will link to it and. Privacy will be even more difficult to maintain and therefore the system needs to be redefined and redesigned.



¹⁰ The Transparent Society: Will Technology Force Us to Choose Between Privacy and Freedom?, by David Brin

Appendix

Stephen's story

Stephen is fourteen and lives with his mum in Nottingham. He is listed on all the big databases that every youngster is on nowadays: ContactPoint gives links to all the public services he has used; the NHS Care Record Service has his medical records; the National Pupil Database has his school attendance, disciplinary history and test results; he is on the Child Benefits Database, and also on the National Identity Register since he applied for a passport; the Government Gateway has a record of all his online interactions with public services; and the ITSO smartcard he uses for local bus services and discount rail fares has been tracking him ever since his mum refilled it with her bank card. His mother frets about all this – when she was a teenager in the 1980s, things like medical and school records were all kept on paper. And although the family has always kept its phone number ex-directory and always ticks the ‘no information’ box, they get ever more junk mail. More and more of it is for Stephen. Like millions of children, he is on a few more databases besides. After an operation to remove a bone tumor, he needed an orthopaedic brace for two years, which brought him into the social care system. As his teachers could see from ContactPoint that he was known to social workers, they expected less of him, and he started doing less well at school. The social care system also led to his being scanned for ONSET, a Home Office system that tries to predict which children will become offenders. The Police National Database told ONSET that Stephen's father – who left home when he was two and whom he does not remember – had spent six months in prison for fraud, so the computer decided that Stephen was likely to offend. When he was with some other youths who got in a fight, the police

treated him as a suspect rather than a witness, and he got cautioned for affray. Ten years later, after he thought he had put all this behind him and completed an MSc in vehicle testing technology, Stephen finds that the government's new Extended Background Screening programme picked up his youthful indiscretion and he can not get the job he had hoped for at the Department of Transport. He tries to get jobs in the private sector, but the companies almost all find excuses to demand EBS checks. Two did not, but one of them picked up the fact that he had been treated for cancer; all cancer data is passed to cancer registries whether the patient likes it or not, and made available to all sorts of people and firms for research. Given the decline in the NHS since computerisation, most decent employers offer generous private health insurance – so they are not too keen to hire people who have had serious illnesses.¹¹

11 Database state, A report commissioned by Joseph Rowntree reform trust ltd.

Appendix

Sepideh's story

Sepideh Molodi-Safa is 26 years old. She was born in Iran but her parents fled to Denmark when she was 8 months old. Her parents are political fugitives and can never return to Iran because of its current political regime.

She grew up in Copenhagen and today she lives in one of the oldest residential halls for university students in the centre of Copenhagen. This winter she is graduating in law and is currently volunteering as a legal advisor for refugees and immigrants at The Danish refugee council.

In April 2010 she went for a vacation with her boyfriend to New York. In the passport control she was held back for no obvious reason. Sepideh has a Danish passport and a visa to the US since she did an exchange program in Canada one year before and in that occasion visited the US and that requires a visa. More than that she has been to the US 6 times before.

In the airport in New York they sent her to a custom area without any explanation. She was sent from one area to another before she finally was told that she had to be registered, nothing more than that.

After 2,5 hours of waiting (not knowing why and for what she had to be registered) an officer started to question her; detailed questions about why, where and with who she was visiting the US as well as detailed questions about her background and life. In the end she had a chance to ask why she had to go through this procedure.

The answer was that she because she was born in Iran has been registered in a database of nonimmigrants, a classification of citizens or nationals of Iran, Iraq, Libya, Sudan and Syria.

Nonimmigrant alien visitors subject to NSEERS registration at the Port of

Entry must follow these special procedures will also have to use specially designated ports when they leave the country and report in person to an immigration officer at the designated port on their departure date.¹²

Because of where she was born she has to register with an immigration officer when she enters and leaves the US.

Even though Sepideh is almost done with her law studies and even if she works as a legal advisor for refugees and immigrants, she had never been informed or heard about this law and registration.

12 www.adc.org/PDF/nseerspaper.pdf

Appendix

Pamela Fink's story

After one of her two sisters was found to have breast cancer, Pamela Fink rushed to have a genetic test to see whether she had a predisposition for such cancer, and the answer came back yes.

Soon her other sister also contracted breast cancer and had chemotherapy and a mastectomy. Alarmed by these developments, Ms. Fink, a 39-year-old mother of two who lives in Fairfield, Conn., decided to have a preventive double mastectomy, fearing that she would also contract breast cancer and might die from it.

When she returned from surgery, she said, her company started giving her fewer responsibilities, then demoted her and ultimately fired her.

This week she filed one of the first complaints claiming illegal dismissal under a new federal law that prohibits employers from considering someone's genetic background in firing, hiring or promotions.

"Getting laid off really added insult to injury," said Ms. Fink, who was director of public relations for MXenergy, a natural gas and electricity supplier based in Stamford. "I know that having that surgery was life-saving for me and important for my children and also important for my employer because it meant I was not going to get sick."

The complaint that Ms. Fink filed this week with the Equal Employment Opportunity Commission raises new questions about when and whether employers can fire or demote employees when they learn the employees' genetic information. The Genetic Information Nondiscrimination Act of 2008 prohibits companies and health insurers from requiring genetic testing, asking for genetic information or using it against employees.

Peggy R. Mastroianni, the commission's associate legal counsel, said most of the 80 complaints filed since the genetic law took effect five months ago seemed to involve cases in which employers had improperly acquired or disclosed genetic information. But Ms. Fink's case alleges a more serious offense: an improper firing because of it.

Her lawyers say that if she loses her case, it could discourage other workers from going for genetic testing about particular illnesses and from having surgery in response to such testing — steps that are good for their health.

Sharon F. Terry, chairwoman of the Coalition for Genetic Fairness, a group that pushed to enact the genetic information law, said Ms. Fink's case was the first brought under the law to become public.¹

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