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TEKNOVATØREN

Creative Destruction

Why do we Resist Change?
The Power of Flags
Planned Obsolescence
Man & Technology
Rage Against The Machine
Disruptive Cases



CONTENT SUMMER 2013

- 03 Editorial *Anniken Nordby*
- 04 Disruptive Cases *Hennum Wendt / Lorentzen / Nordby / Rye Eriksen*
- 06 Creative Destruction *Alexander Myklebust*
- 10 Rage Against the Machine *Nicolai Hennum Wendt*
- 12 Be Creative but Stop Destroying my Food *Einar Jacobsen*
- 14 Matternet - An Internet of Flying Things *Thomas Rye Eriksen*
- 18 Why do we Resist Change? *Mani Hussaini*
- 20 3D Printing and Star Trek- Cooking *Ole Kristian Bergheim*
- 24 Planned Obsolescence *Nicolai Hennum Wendt*
- 27 #Responsible Innovation *Nicolai Hennum Wendt*
- 28 Thorium - A Future Source for Sustainable Nuclear Power? *Ievgen Bilyk*
- 30 Man & Technology *Martin Bredeli*
- 36 Confessions of a Lecturer *Jan Fagerberg*
- 39 Green and Blue *Eirik Lorentzen*
- 40 ...and Where do the Blue Bags Go? *Erland Einbu Wigenstad*
- 42 Are Women Oppressed Through Technology? *Linn Renate Olaussen*
- 44 Flu Attack! - To Vaccinate or Not to Vaccinate, That is the Question *Ulrika Eriksson*
- 46 Keeping the Story Personal *Ievgen Bilyk*
- 48 The Power of Flags *William Cunningham*
- 51 Did you Know - Facts About Innovation *Eirik Lorentzen*
- 52 LinkedIn With the People you Study *Gro Stueland Skorpen*
- 55 Quiz *Eirik Lorentzen*
- 56 From Theory to Practice - From Wine to IT *Maria Kristina Stokke*
- 58 3 From TIK *Birgitte Lunder Ween*

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EDITORIAL

In 1889, the chief of the US Office of Patents said that everything that is to be invented has been invented. This might be one of the most incorrect assumptions ever made about the future. More than a hundred years and thousands of innovations later we feel confident about the fact that most innovations are still to come.

Lately I have experienced that outside the world of innovation studies, the perception of innovation is quite different from what we are taught. Innovation is mainly understood as developing products for economic purposes. When economic gain is the main goal of innovators and entrepreneurs, the concept of innovation is reduced to a simple tool in the hands of capitalists. Before a new product or service is brought to the market the potential value is calculated. But seldom is the value of the potential disruptive powers taken into account. New ways of doing things make old ways and old knowledge redundant. This creative destruction is a natural part of the development cycle, and the ability to adapt to these changes is vital for the sustainability of modern society. The problem occurs when these powers result in products replacing perfectly good solutions and create consumer necessities far beyond real needs. (An example of this may be when natural food is no longer good enough and has to be enhanced in order to be healthy for us, or when one third of consumers replace their functioning products just because a new model is released.)

Our challenge is to understand and take advantage of the potentially disruptive powers of new innovations, accept the uncertainties and create new and sustainable solutions for the world. We have to be brave and dare to demand that innovation is not just used as a tool for economic growth. We need to interrupt bad routines from the past and create new groundbreaking knowledge and alternative responses to solve the challenges of today. Remember, for an invention to become an innovation it is not enough to come up with a good idea. We have to be brave enough to risk the uncertainty, implement the invention and be willing to embrace the changes that follow. This will ultimately lead us to achieving responsible innovation.



- Anniken Nordby



Through 120 years Kodak built one of the worlds most famous brand names, but in 2012 they filed for bankruptcy. At peak in late 1990s Kodak sold about 1 billion roles of film in USA alone. In 2011 it sold 20 million – That is a 98% drop in core business in 10 years. Even after several large-scale restructurings Kodak did not manage to turn the tide and as a result over 100.000 lost their jobs or had to retire between 1990 and 2012. How did Kodak miss the digital revolution, ironically enough after inventing the first digital camera back in 1975? They were i.a. in denial of the disruptive force of digital imagery and the Internet; profitable and high with a bankroll, and confident in their own brand name. With a multi-layered management in a huge and bureaucratic organisation, the mind-set was analogue and there was resistance to change. Despite attempts at digitalization, middle management didn't succeed in linking strategy to operation. On top of this there was distraction from the Polaroid lawsuit, various chemical and pharmaceutical investments, Fuji and Japan competition, and expansion attempts in China – which had already gone digital. All in all they saw themselves as an analogue company and failed to adapt or replace their business model. Kodak didn't understand that it was in the imagery business and not the film business.



Norsk Data was selling minicomputers world-wide, and peaked in 1987. At that time being one of the fastest growing firms in the computer market and being the second largest firm in Norway. Norsk Data managed to increase its turnover by 40% each year between 1973 and 1986 in average. While still being much smaller than its competitors, like IBM with a turnover that was 130 times larger, it could operate much more flexible and were always in the technological frontier in the minicomputer market. With good support from the Norwegian government and thereby receiving many contracts in Norway it established itself in the market. The really big breakthrough internationally happened when CERN in Switzerland decided to buy products of them. This catapulted Norsk Data into the international market, and became recognized as a successful and professional firm world-wide. However technology was changing rapidly and personal computers made its entrance with hardware and software being separated. This made the core competencies of Norsk Data obsolete, and it didn't managed to adapt quickly enough. From being highly innovative and successful in the 80s it quickly fell apart in the early 90s.



Netflix was established in 1997 as a DVD rental-by-mail service. The company sought to establish new solutions in the home entertainment market and soon embraced a business model of flat-fee, unlimited rentals. They worked on creating an online streaming service, but for a while the technology and the market showed to be too immature. In 2006, the birth of YouTube gave the founder of Netflix new motivation. A new user friendly instant streaming service was soon to be established. Instead of building their software into an exclusive Netflix device they decided to incorporate it into existing devices to make their product more accessible for the customers. While DVD-sales started a deep decline because of easy and accessible, though often illegal, peer-to-peer streaming services, Netflix started to grow steadily offering a cheap and legal streaming alternative. Netflix has evolved from being an American distributor of DVDs by mail, to become a global online distributor of digital video content. They exploited an emerging customer need and mid-march 2013 Netflix passed 33 million subscribers.



Amazon.com was established in 1994 and first introduced as a new paradigm in the way books were being distributed, sold and marketed. They peaked financially in 1999 after a massive growth in the stock market. In the early millennium however they got, as so many other companies, affected by the bursting of the so called dotcom-bubble. As one of few companies, Amazon proved to be sustainable enough to work through the crisis, and was in 2008 listed with a value of 32 billion dollars. Amazon.com challenged the traditional ways of merchandise by revolutionizing shopping on the internet. As first movers they soon became marked leaders in the new trade of internet-shopping. A lot of spin-offs emerged and contributed to the so called "golden age of dotcom" in the mid and late 90's. The effects of internet-shopping affected the traditional forms for merchandising but it also created new opportunities for both companies and customers. Amazon.com went from being an online book-store to become an online store with a wide variety of products and several large warehouses around the world. Amazon.com is beside being a ground breaker one of the biggest and most successful online-merchandisers and Dotcom companies to ever emerge.

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Creative destruction

Stories of previously major companies who now are heading towards bankruptcy, such as Kodak, Blockbusters and Borders have led to a lot of focus on the disruptive character of new businesses and innovations. These companies are some of the victims of an ever recurring process that is known under the name “creative destruction”. But what is it that is being destroyed or created, and why does this happen? These questions have for decades been lying at the heart of innovation studies.

Austrian economist Joseph Schumpeter (1883-1950) is best known as one of the central foundational thinkers in the field of innovation studies. In contrast to mainstream economic theory, he was not interested in market equilibrium. Instead, he saw economic development as inherently unpredictable, and emphasized the importance of those who dare to think in novel ways and do things that have not been done before. These people are the entrepreneurs and the innovators, recognized by their desire and ability to use existing knowledge and technology to produce something entirely new. Even though innovations in essence are the result of the creative process of a small number of people, they also tend to have large disruptive effects on the markets they enter. In his, perhaps, most widely read book, *Capitalism, Socialism and Democracy*, Schumpeter shows how this process of creative destruction drives the economic and technological development in capitalist societies. Even though innovation studies have come a long way since Schumpeter introduced his views, it is still his basic ideas and concepts that guide them, and set them apart from other ways of understanding economic development.

The society as continuously evolving

Schumpeter was to a large extent inspired by Karl Marx (even though he by no means can be called a Marxist), who understood modern society's stride towards socialism as a historical progress. In Schumpeter's account of how the capitalist system of his day came about as a result of the collapse of



“This means that the evolution has two sides, one that can be measured in the form of economic growth, and another in terms of technological development”

feudalism, the move away from capitalism would be a continuation of the same narrative. With this framework in mind, it is obvious that capitalism cannot be static, but instead continuously evolving, as Schumpeter would have put it. In *Capitalism, Socialism and Democracy* he explains how closely interconnected capitalistic and technological developments are:

“It is therefore quite wrong to say ... that capitalist enterprise was one, and technological progress a second, distinct factor in the observed development of output, they were essentially one and the same thing or, as we may also put it, the former was the propelling force of the latter.”

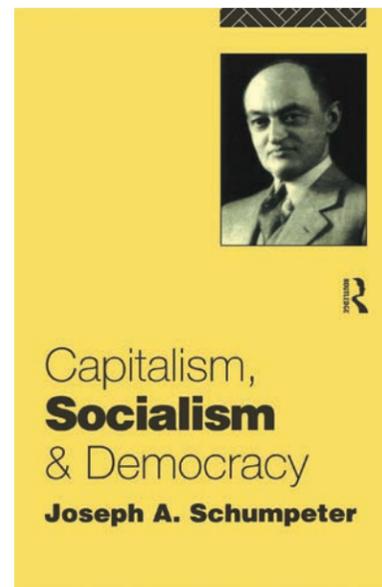
For Schumpeter capitalism is a remarkably rational way to organize societies, because it administers the means of production according to the demands of the market. As such it is also thought to be inherently democratic, since it allows each

individual to express himself, his needs and wants, through the market place, by buying the products and services that he finds the most suitable for his needs. Therefore it is in the interest of the suppliers of all kinds of goods that what is offered at the market to an as large extent as possible serve the potential buyers, so as to be able to maximize profits.

Growth in the capitalist economy is in Schumpeter's view closely tied to the introduction of new goods to the market, and is therefore dependent on constant innovation made possible by virtue of capitalist's willingness to put their money at risk for a potential future profit. A result is that capitalism also provide beneficial economic foundations for new technological innovations, because it allows for capitalists to invest their money in people who have an ability to “think outside of the box”, and therefore create something entirely new. These people, the innovators, do this without any other goals than

the actual realization of their ideas, and do not care about making any considerable profit for themselves, or making society as a whole progress, even though their work might do both these things.

This is the reason why both the entrepreneur and the innovator are so important in the Schumpeterian view. Both challenge the existing status quo of the market by introducing new ideas, in form of new products and new



methods of production etc. As such they represent both the creative and destructive forces of society and economy. They are disruptive powers that shake the foundations of the equilibrium in their industries and create a new period of growth, and innovation. This, however, creates uncertain

destruction of the innovator, according to Schumpeter, since they will have more, cheaper and better goods to choose from than before. For them the market has only changed for the better. The destructive part of an innovation is actually something that happens through the acts of the

workforce may be reduced temporarily, and some lose their jobs as a result. Many examples of this can be found in nineteenth century England where the textile industry saw a wealth of new innovations that greatly increased the efficiency of labor; 2) if a new product is introduced

“It is the choice of the consumers to turn away from the old products that they used to buy, in favor of the new products, which in the end destroys the economic foundations of those who used to make a profit.”

times for those businesses that are not able to adapt to the new reality. This means that the evolution has two sides, one that can be measured in the form of economic growth, and another in terms of technological development.

Consequences and benefits of destruction

So what is it that is being destroyed in these acts of creative destruction, and who is being affected? Is it the consumers, employees or the existing businesses?

The consumers actually only benefit from the creative

consumers, and not directly by the innovator, since he merely provides the market with something which was not available before. It is the choice of the consumers to turn away from the old products that they used to buy, in favor of the new products, which in the end destroys the economic foundations of those who used to make a profit.

To some degree employees might suffer some setbacks when the present system is disrupted, because of two possible reasons that lead to fewer jobs: 1) In some cases the innovation can be a new and more effective way of producing an old product, and the needed

to the market that is so disruptive to the current market that it makes another product redundant. In most cases, however, the market will stabilize itself and there will become a new increase in the demand for labor force. (For more on this topic see Nicolai Hennem Wendt's article on Luddism)

Those who suffer the hardest under the destructive power of the innovator and the entrepreneur are the businesses that prior to the new innovation used to make a profit in the market. They stand with the choice of pursuing their own innovations, imitate others or lose the competition with other companies.

Rage Against the Machine

When a new and disruptive technology comes around, whole knowledge bases can become outdated; rendering products, investments and workers obsolete. During the industrial revolution “the Luddites” fought technological change to defend their jobs. Today the “neo-Luddites” remind us that technology is never neutral.

When machines started to replace workers on the factory floor, bands of workers - even whole guilds - feared for their livelihood, as wages plummeted and jobs disappeared. In Britain, machine-vandalizing rioters chased away inventors and their “activism” inhibited the diffusion and development of certain machinery for several years. Between 1811 and 1816, “the Luddites” burned factories and smashed looms and frames in the thousands before they were stopped. Ultimately, “the Luddites” were unsuccessful in halting the technological progress, but neither their ideas, nor their name were forgotten.

The contemporary Luddite movement emerged during the 1970s, as technology’s role in

shaping the human condition became increasingly questioned. Like their 19th century predecessors, modern day Luddites fear technological unemployment. Furthermore, they call for a more serious discussion on the role of technology in society. Though largely confined to the fringes of intellectual discourse, their position has gained a lot of mainstream support over the last decade. Unfortunately, “neo-luddites” also come in extremist variants, such as the Una-bomber, who are fearing that the advance in technology will lead to our destruction.

However, this fear of intellectual hubris is nothing new and can be found in old stories such as Icarus and Frankenstein.

The Luddite fallacy

One particular critique of the Luddite ideology is of the notion that technological change inevitably leads to structural unemployment, and have a negative socio-economical effect. This criticism from neo-classical economists is centered on the argument that technological change doesn’t cause unemployment; it only changes the composition and distribution of jobs in the economy.

“If this continues we might reach a critical mass, where the job market no longer is able to absorb the unemployed.”

The neo-classical claim that unemployment cannot be caused by technological development is only (partially, if at all) true at the macroeconomic level. New technologies may not cause systemic unemployment, but it does disrupt the careers of individuals and the health of particular firms who do not possess the skills to utilize new technologies. People will find new jobs in new industries, although possibly after long periods of onerous reeducation. Unfortunately, faced with today’s rate of change, and its encompassing character, many workers find themselves unable to adapt and end up obsolete. Regardless of whether the cries of structural unemployment or the claims of fallacy win through, technological change is affecting employment.

Running out of jobs?

Over the past two decades the west has seen a downward trend regarding the creation of unskilled jobs in the tradable sectors. The root causes are threefold. Firstly, technological change in the shape of automation replace workers both in routine- and non-routine jobs. Secondly, through removal of intermediate links in the production chain, mundane tasks e.g. in the service sector are pushed over on the consumer. Thirdly, “atomization” of the global supply chain, i.e. relocating jobs

to exploit the reduced cost of remoteness.

Until recently the market has absorbed and reallocated the unemployed, but we are beginning to see less flexibility in the market structure. Mechanization is expanding to locations where labor has been relatively cheap, and as we experience “across the board” automation in labor-intensive sectors low-skilled workers have an increasingly hard time finding new employment, since other sectors are either saturated or mechanized as well.

Tipping Point?

Reeducation and retraining might mitigate the problem for a while. However, improving human capital would only be a temporary solution, as technological change also affects high-skilled work. Ever more efficient machines threaten jobs across several sectors and levels of education. If this continues we might reach a critical point, where the job market no longer is able to provide jobs for the unemployed. Already we see an increasing inequality resulting from these changes. With enough capital-biased technological change structural unemployment becomes feasible, as capital investments in robots replace labor in the production of “value added”.

So, should we all “go Luddite”?

How should we handle the potential of structural unemployment? Some might call for a transition to a different market structure, some might argue for social innovation, or government intervention, in order to care for the jobless. Most people, however, would probably remain undecided until the toothless face of structural unemployment stared them in their face. If it came to that I bet they would begin smashing looms and frames like scared little Luddites in no time - Terminator IV.

Even if the market system would break down before we reach structural unemployment it should be in every ones interest to prepare for more than one eventuality, no matter how implausible either extreme sounds. The growing amount of technology we surround ourselves with and integrate in our lives often have unintended social, environmental, political and economic effects. The more invasive technological change is, and the faster the pace, the more we need to take heed of the precautionary principle.

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Be creative, but stop destroying my food!

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The food market is quite a peculiar thing. Everyone needs food. Demand is thus ensured as long as there is sufficient buying power. However, the limit of calories humans need on a daily basis puts a natural cap on the market's growth potential. So, how can this limit be overcome and allow for market expansion?

A cunning and creative way to overcome the limits to growth is to add "value" by increasing the level of processing. This may involve anything from wrapping the food in plastic to inserting additives and promoting it as healthy. Some absurd examples can be seen in food products in which the natural constituents are replaced with alien substances with unpronounceable names. This is a common practice of the producer Mills Vita Hjertego. Consider their products resembling Crème fraîche and cream. In these products allegedly unhealthy saturated fats are substituted with the allegedly healthy fats from canola and sunflower oils. A minor problem, however, is that there is no scientific evidence to back the claim that saturated fat is

dangerous¹. On the contrary, the particular combination of these vegetable oils yields a very unbalanced fatty acid ratio. The Omega-6 content is almost ten times as high as that of Omega-3. In comparison, the fatty acid ratio in the diet humans have evolved with is assumed to be 2:1. Excessive levels of Omega-6 are associated with a wide range of diseases like cancer, inflammation and cardiovascular diseases. Interestingly enough, Omega-6 and carbohydrate rich diets are commonly used by researchers to induce lifestyle diseases in animals. Nevertheless these products are promoted as healthy by official health authorities and labelled with the LHL logo²; symbolizing a healthy choice.

Foodies who are less concerned about health issues should still be upset about what is being done to the food

they eat. The inevitable result of removing the natural compounds is of course the complete absence of natural colour and flavour. In order to resemble the food's original properties, calcium chloride, sodium nitrate, potassium sorbate, hydrolyzed starch, tocopherol, tripotassium phosphate, carrageenan, polyoxyethylen-sorbitan-monostearat and other tongue twisting compounds from the laboratory are added. Looking up

one of the compounds on Wikipedia we can read the following about sodium nitrate: "Studies have shown a link between increased levels of nitrates and increased deaths from certain diseases including Alzheimer's, diabetes mellitus and Parkinson's, possibly through the damaging effect of nitrosamines on DNA". In comparison to the Vita Hjertego products, Crème fraîche and cream contain only one ingredient: cream.

A couple of weeks ago Vita Hjertego was reported to the Norwegian Food Authorities with charges of deceptive marketing³. Food is far

too important to be left in the hands of a profit-hungry food industry assisted by scientists. If food has to go through several chemical engineering processes to be eaten with a clean conscience, it's about time we revise our ideas about healthy food. The creativity of the food industry and scientists is destructive in a very literal sense by being harmful to both body and mind. As shown above, it poses a great

threat to people's health, as well as corrupting the ideas we have about food with its deceptive marketing. Eventually, we risk ending up alien and oblivious to what flavoursome food and a good life are all about. The latter is exemplified by a review of cheeses in an online consumer magazine. The winner was ironically not even a cheese but Vita Hjertego Gul, which is a yellow lump of skimmed milk, hydrolysed vegetable oils and a generous amount of additives. It got the prize because of its supposedly healthy effects.

Sources:

¹) <http://www.reuters.com/article/2010/02/04/us-fat-heart-idUSTRE61341020100204>

²) Landsforeningen for hjerte- og lungesyke (Norwegian Cardiac Patients Association)

³) <http://www.aftenposten.no/okonomi/Mener-reklame-spiller-pa-folks-frykt-7141980.html#.UV7edaJ7KSo>



Matternet

– An internet
of flying things

Somewhere in Haiti, a child is lying still in her mother's arms. Her cheeks are burning from fever, and the crying has now ceased to be the mother's concern. She directs her ears to the wind, listening for the sound of relief. But there is no flapping from hovering helicopters or heavy sounds from a jeep forcing its way through the mud. The heavy fog makes it impossible for a helicopter to land; the rain turns the roads of dirt into hazardous quicksand. But there, finally! A low buzzing sound can be heard somewhere in the distance as it approaches. She's gazing at the fog, trying to locate the source of the sound with her eyes. Does it know its way; does it know where her baby is in need of help?



Matternet challenge our perception of the internet

A small flying object is hovering within a few feet of the relieved mother. It makes a beeping sound, signaling to the mother that she can approach. The winds are heavy, and the object is adjusting its angle to compensate against the powerful blows. The object remains almost perfectly still, carrying a small package, held underneath its body. The object is so small that it could be placed in her hand and concealed if she made a fist. But she knows to be careful, and gently removes the package with her rough and worn hands. She shifts the child's weight to free one hand and waves it off goodbye as it disappears into the fog. Now there is no more time to lose, she runs into her cabin and puts her child on the bed. The pack contains three different types of medicines. She already knows what to do by the instructions she had been given on phone a couple of hours earlier. One shot straight in the vein. One pill carefully placed properly by hand. Another pill when the child recovers a little. Not very difficult when the alternative is something she can't or won't envisage.



This is Matternet, an internet of flying drones. They are organized and inspired by the internet, small packages of matter carried from one station to another. But they are not made of zeroes and ones. They are of material flesh, made out of light metal, plastic and electronics. They have an amazing carrying capacity despite their small size, and they can incorporate and carry heavier objects together if necessary. They fly by the hand of outer space. Satellites pinpoint directions, grids and levels. But the object itself chooses a path, making sure to reach its target with a minimum of risk. Small measuring apparatuses feed advanced programs which mathematically calculate crosswinds and the density of the rain. It can decide that it's time to turn around, or if it should ascend or descend into better conditions.

A bright idea turned into an ambition, which turned into the project

It all began as a part of the Singularity University in 2011, a 10 week summer school at the NASA Research Park in Silicon Valley. Some of the smartest, most creative and innovative engineers and entrepreneurs

were assembled to discuss how they could save the world, or at least address some of its many challenges. One of the challenges identified was a lack of adequate communication and transport in large parts of the third world, making important supplies of medicine and food unavailable to large parts of the population, especially in times of disaster or catastrophe. Some bright people got a bright idea, and that idea turned into an ambition that turned into the project now known as Matternet. Founded by Andreas Raptopoulos, Paola Santana, Dimitar Pachov and Darlene Damm, Matternet was seen as a potential and radical solution to a lot of the transport challenges the world was faced with. But its ambitions did not stop there. The team sought to radically revolutionize transport once and for all. It was a project of creative destruction.

Back in the cold breeze of the northern hemisphere you are getting a little bit hungry. Your fat fingers typing on a computer start a chain reaction. A taco is being prepared at the local Taco Bell and four drones fly in from the nearest base station to pick up the package. They ascend to about 30 meters and fly all the way to your doorbell. One of the drones sends a message reaching your phone about 7 seconds later. You anxiously open the entrance door and are met by the sweet sound of mechanical bees mixed with the smell of your spicy taco. You reach in your pocket for a tip, but then quickly remember that is no longer necessary. You still say goodbye and return to your sofa filled with lust and desires for your next meal – a drone-delivered taco.



This is not science fiction

The Haiti-drone was part of a field test developed and implemented by Matternet in September 2012. The TacoCopter was another innovative project originating from the same assembly at the Singularity University in summer 2011, and tested by Taco Bell, but soon blocked by the American government. One of the founders of the TacoCopter, Star Simpson, points out the irony: "using UAVs [Unmanned Aerial Vehicles, like drones] for commercial purposes at the moment... Honestly I think it's not totally unreasonable to regulate something as potentially dangerous as having flying robots slinging tacos over people's heads ... On the other hand, it's a little bit ironic that that's the case in a country where you can be killed by drone with no judicial review."

Drones present us with one of the most radical transport innovations since the car or airplane were implemented in modern society. Moreover, its nature of

reversed innovation, (where the focus is usually on adapting products from the developing world for the developed world) might have an interesting twist where the developing world is innovative ground for the developed world. Best case scenario: The child-saving drone might indirectly save the climate by reducing CO2 emissions created by traditional ways of transport. The biggest challenges are policy-related and have a touch of the old and familiar path dependency; or as Andreas Raptopoulos himself puts it: "*If a need is so urgent, people and authorities are willing to take calculated risks, as in Haiti. But in the U.S., no. Sure, we could use Matternet in San Francisco. But there are already very reliable ways to transport things there. But in Haiti, no. There is leapfrog potential there — we need to do much less to have a transformational outcome in Haiti.*"

This is matter in the making

Back in Haiti: The child has now grown a couple of days older.

The mother is heating up a mixture of milk powder and water for her baby. The water, so often hazardous due to the chemicals being leaked from an up-stream factory, has now been cleared by a drone. It has picked up a small sample of water and brought it back to the lab for analysis. In a nearby valley, some fire-drones are helping the fire-fighters strategize their extinguishing of a large fire. Other drones are searching the ruins of an already extinguished building, still too frail and risky to be searched by human hands. This is matter in the making. Actors in the software industry have been both radically and incrementally innovating its products at a groundbreaking pace for the last 20 or 30 years. We have all heard about "the Instagram success stories". Now the time might have come for the hardware industry. It's a first sign – a first sign of creative destruction to come.

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Why do We Resist Change?

The notion of “resistance to change” seems to be so true that it is not even necessary to question. But where does this resistance stem from? And are people really so afraid of change that they must oppose it?

In fact it is equally true to say that people are adaptable to change just as much as that they are opposed to change. Of course people are adapted to both. On one hand we have a

basic need for stability, predictability, a place to belong and a need for security and oversight. On the other hand we have a need for challenges and self-improvement, a need to aspire

and test our limits, an eager to learn and to make use of our resources and skills and to be creative, innovative and curious. This is apparently a paradox. But the fact is that no normal, wholesome person has a need only for the former or for the later, and the two sides reinforces each other. Secure, stable, integrated individuals with a strong identity usually endure more challenges



and transformation than insecure people. It is important to acknowledge that people can take both positions when it comes to change. The transformation enhances by stimulating people's needs for challenges rather than by fighting their need for stability.

Biologically one might argue that humans are not resistant to sudden change. For example, when Columbus with his crew discovered America and brought along diseases that caused mass deaths of the natives. The native Taino of Hispaniola, where Columbus began a rudimentary tribute system for gold and cotton, disappeared rapidly after contact with the Spanish because of European diseases. This might be a good example of how evolution works; biology enhances slow change. Darwin summarizes it in the following manner: “It is not the strongest of the species that survives, or the most intelligent that survives. It is the one that is the most adaptable to change”.

Many claims that the “resistance to change” is an explanation consultants and managers end up with in their failed attempts to transform organizations and people. Perhaps much of the resistance to change is provoked, and primarily is a response to the treatment the target gets?

One of the most common mistakes “transformation agents” do is to put people in a defensive position. Eager leaders, advisers and consultants can often be considered as know-it-all-persons and moralists. They can be perceived as a bunch that do not show adequate respect to the people they are put in charge to transform. People's honor and

dignity can easily be neglected. When people feel insulted they mobilize a defense system and a resistance base, not necessarily because of the issues at hand, but because of the way the transformation is handled. We remember how rebellious we as children and adolescents could be when our parents were ‘moralizing’ towards us. We could use most of our energy to sabotage their moralistic intentions. One could think that our defiance decreased over the years, but that is actually not the case. Our need to be shown respect certainly lasts for the rest of our life.

Organizations can easily get in a defensive position, almost in the same way as humans. Ignoring or provoking a culture or a history of an organization could easily be the main reason for a transformation process to failure. According to the psychologist Paul Watzlawick the ambition to avoid bringing people in a defensive position is elemental in therapy. But how can one initiate a transformation process while avoiding bringing people and organizations in a defensive position?

The key to success in a transformation process is very much about how an organization / business leadership manage the transformation process. Indeed the leadership assignment largely involves management of transformation processes. The leadership must have high

legitimacy among their employees, they must have expertise in transformation management, and they must cope with the employees' mourning process and deal with the employees' fear of the new and the unknown.

“It is not the strongest of the species that survives, or the most intelligent that survives. It is the one that is the most adaptable to change”.
Charles Darwin

In addition, there must be an open and honest communication between the leadership and the employees.

One might initially assume that the human being desire change for the better, but as experience has shown the road to better can be intimidating as it can be perceived as unfamiliar and difficult, and thus preventing the change. At the same time it is an undeniable fact that people throughout the human history have been adaptable to incremental and radical changes, otherwise we would remained in the Stone Age.

The future is finally here! Or is it?

3D-Printing and Star Trek- cooking

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By adding a third dimension to printers, 3D-printing enables the creation of physical 3D-objects from digital models. This radical innovation gives life to the dream of making almost whatever we want, by the push of a button.

FACTS ON 3D-PRINTING

- Printing in three dimensions
- An additive manufacturing process where polymers is added layer by layer
- Opposite of the more traditional process of subtractive manufacturing, like drilling or cutting.
- Makes it possible to create 3D-objects from digital models
- It also makes it possible to create more complex objects and shapes than before
- The MakerBot™ Replicator, a household 3D-printer, was released in 2012
- Still a relatively expensive technology

Perceived as a revolutionizing and world-changing technology, 3D-printing has challenged peoples' imagination for more than 30 years. Today the future possibility of this technology still remains as only a topic of fascination; just think of the science fiction appearance and wow-factor created by the replicator presented in the Star Trek-series, an unrealistic and almost unimaginable technological device at the time. It was capable of creating any inanimate matter almost instantly, just by telling it what to make. The concept of 3D-printing is similar, except of the functional dependence on inks, the time-consuming process of designing and printing a product, and the fact that the printer itself is rather expensive.

An emerging market

The idea of customized manufacturing was realized first of all by Chuck Hull and his company, 3D Systems. His wish was to create a device that could produce pro-

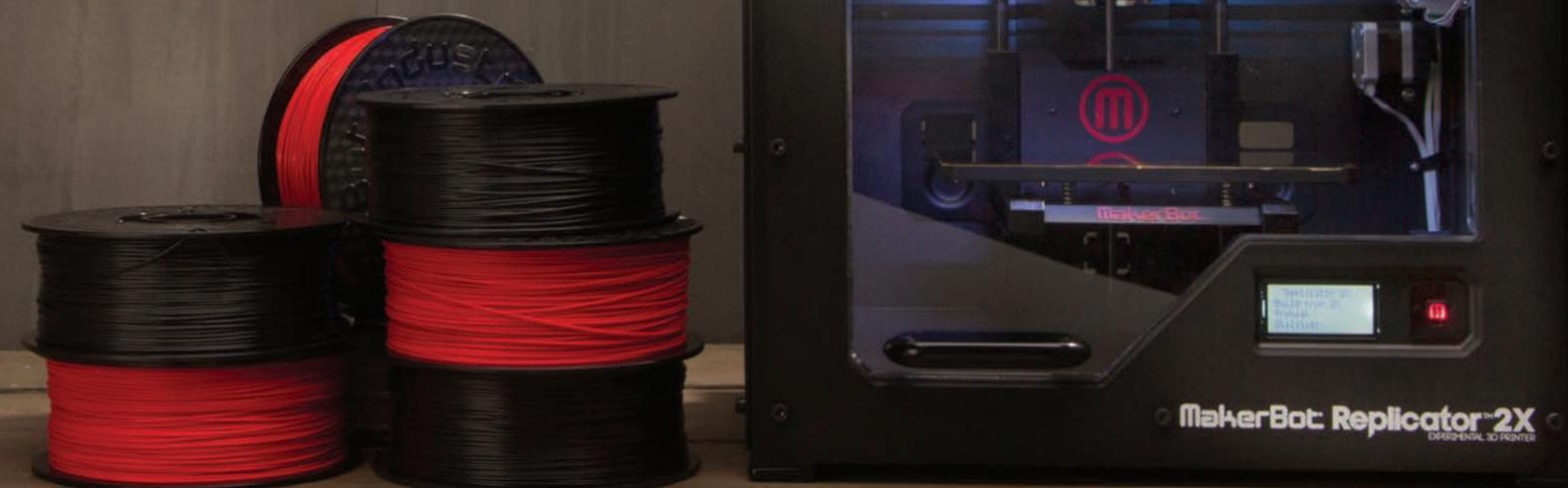
totypes, models, and spare parts on demand, without relying on external suppliers. The concept of stereolithography, also known as 3D-printing, was then coined and patented by Hull as early as 1986.

Almost 30 years later, 3D-printing has evolved into being the most important technological contributor in the field of rapid prototyping and mass customization. Consumers can use 'web-based' customization software to create unique objects such as toys, jewellery and spare parts. These objects, as digital models, can then be printed in a 3D-printer by specialized companies. An example is the well-preserved Oseberg Ship at the Viking Ship Museum in Oslo. It was in need of a support part to prevent it from falling over, and

it had to be invisible for the museum's visitors. Traditional support beams were no good for this purpose so they decided to 3D-print it. This turned out to work like a charm.

Adding the third dimension

In the 1970s, when the first personal computers made their appearance in companies and in people's homes, few imagined the innovation possibilities of this technology. Accompanied by the birth of the Internet, it would change the world in just a couple of decades. Within this computerized network of innovation,





The food industry revolution

This technology is taking a step, or a giant leap, even further by making its way into the food industry. Restaurant visits with long queues, hourly waits, bad food and noisy guests may be history. 3D-printing could even be a solution to global challenges such as sustainable food production and pollutions resulting from the production chain of the food industry. Researchers predict that

3D-printing of food will revolutionize world industry and change the way we live. This could even result in private households purchasing bioinks and print-recipes, inputting them into their printers and producing gourmet dishes of their desires¹.

From ink to bioink

With a new technology comes new challenges. With 3D-printing used for food manufacturing new challenges could emerge in the field of food transportation, farming and grocery shopping. These industries may have to

we saw the emergence and development of other new technologies. One of these was the inkjet printer. However, the limitation of printing in only two dimensions limited the innovative areas of inkjet printers primarily to speed, quality, cost and design. When a third dimension is added to this process, it enables the creation of physical 3D-objects from digital models. Technically, the process of 3D-printing is about adding different ingredients layer by layer until you have a finished object. This is called additive manufacturing, the opposite of the more traditional method of subtractive manufacturing which traditionally is removal

ethylene and nylon, and natural polymeric materials, such as cellulose.

Lately printers have become smaller and more effective through incremental, technological innovations, opening up the possibility for them to enter private households. At the Massachusetts Institute of Technology (MIT) they've transformed the idea of Star-Trek manufacturing to life with the MakerBot Replicator™ first presented in January 2012, and with the MakerBot Replicator™2 – Desktop 3D Printer, a

of material by methods such as drilling or cutting. The printers' input ingredients may be of both synthetic polymers, such as pol-

home-printer introduced in September 2012. The latter comes at a starting price of roughly \$2200, excluding the input polymers.

shift towards activities related to production and transportation of bioinks. In addition, this new technology imposes challenges

“3D-printing with bioinks means no prepping of fresh ingredients, resulting in no food waste, which in the last century has been one of the biggest contributors to the environmental footprint made by food production.”

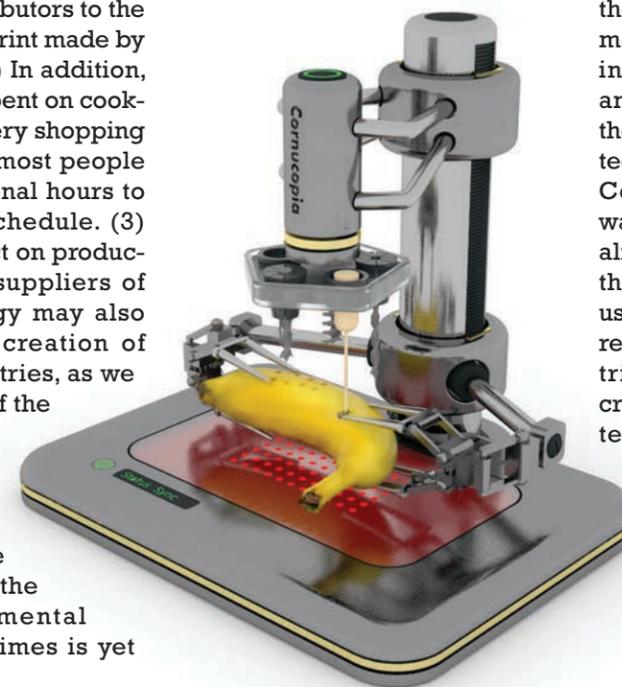
to other areas of the food producing industry; it could make conventional technologies of food production obsolete. Food production based on 3D-printing can create positive outcomes for:

- Pollution issues (1)
- The way we live (2)
- The economy in general (3)

For example, bioinks share the main functional purpose as ordinary printer-ink, and may consist of liquid organic nutrients, or spheroids made out of thousands of cells. (1) This means no prepping of fresh ingredients, resulting in no food waste, which in the last century has been one of the biggest contributors to the environmental footprint made by food production. (2) In addition, by removing time spent on cooking meals and grocery shopping from the equation, most people are granted additional hours to their spare time schedule. (3) The disruptive effect on producers, retailers and suppliers of this new technology may also contribute to the creation of new jobs and industries, as we saw with the birth of the computer industry.

The question of whether 3D-printing may hold the answer to some of the greatest environmental issues in modern times is yet

to be answered. By changing the way we construct shapes and objects, organic or not, 3D-printing has definitely made an impact in certain industries. In the construction and architecture industries, it has lowered the costs and time spent on the production of objects consisting of one or two components, e.g. metal, plastic or wood. However, by reducing the input composition and complexity of bioinks in 3D-printers, the technology may revolutionize the food industry. If this is not emphasized, some experts say that these bioinks are likely to become just another target for environmental questions and issues concerning the sustainability



of production, shifting from food towards bioinks².

Live long to see it prosper

No wonder 3D-printing is an extraordinary technology that has provided companies in many industries with the opportunity to be innovative and to become technological pioneers in their field. The technology also has the potential of streamlining customized manufacturing and challenging the long-lasting regime of standardized mass production. 3D-printing is a potential game changer. It may transform the food industry into a low emission, no waste, bio-ink industry. Furthermore, the thought of being our own craftsmen and gourmet-chefs is both intriguing and mind-blowing, and we may say that the sky is the limit for the future use of this technology.

Cooking meals the Star Trek-way may seem too futuristic and alien even 30 years later, given the lack of material input when using the Star Trek-replicator. To realize it, household and industrial printers must be able to create matter similar to the matter created with the Big Bang. The waiting time for this will probably be long, but as they say: Good things come to those who wait!

Planned Obsolescence

Did you know that the majority of the durable goods you buy most likely has a “death date”, and that many products you buy today, such as light bulbs and nylon stockings, has been re-engineered into inferior products with much shorter life cycles than necessary, all in order to sell you more?

Survival of the fittest

Through selection the market will always revitalize itself by shifting resources from failing businesses to newer, more productive ones. When a new technology comes along it can leave a landslide of obsolete products in its wake. The fear of ending on the losing side of such creative destruction incentivizes companies to invest in new technology to ensure their own survival. The debate on planned obsolescence is several decades old. However, today's increased emphasis on continuous product development that leads to shorter durables replacement- and disposal cycles have again put the topic on the agenda.

Why?

The economic rationale to implement planned obsolescence is the same as it was in the 1930's, when it was proposed as a means of combat the economic crisis. When products are made

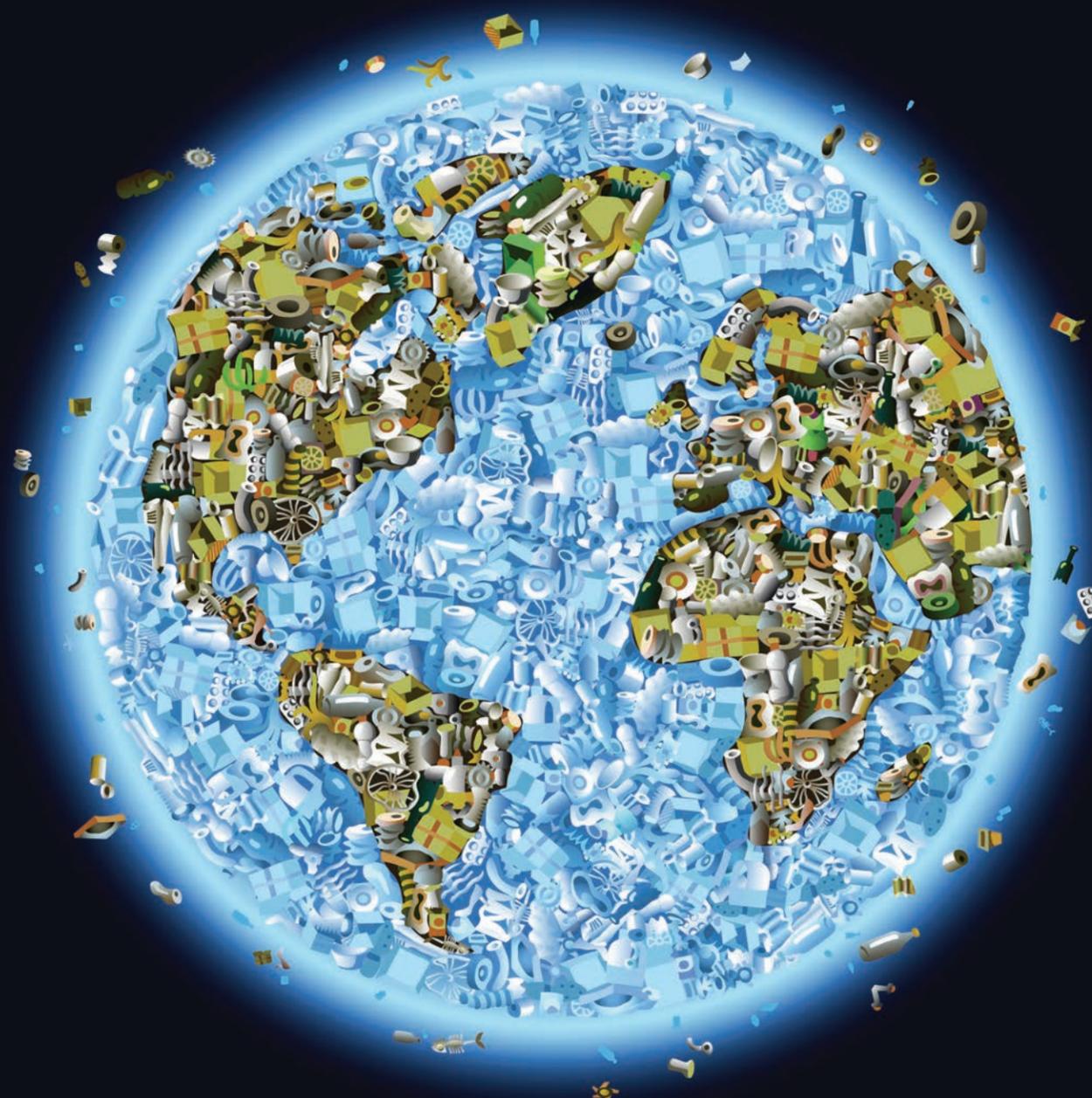
to last forever the market will eventually become saturated, and demand will fade. This is known as the “the durables problem”. In addition to this, competition can also be a driver for planned obsolescence by pressuring producers to invest in new technologies that improve production-to-market time, or that diversify the products, e.g. by quality, design or functionality. These investments amplifies economies of scale and scope, which in turn can only be realized through increased output, i.e. shorter replacement and disposal cycles.

With the industrial revolution a wide variety of products became available to everybody, as production cost diminished and the production volume increased. However, the machines produced faster than the consumers wore products out, and producers began safeguarding themselves against “the durables problem”, by replacing their products with inferior versions. During the 1950's and

60's, figuring out just how short a life cycle a product could have, while still retaining the customers' brand loyalty became an exact science. An example of this kind of “death dating” can be found in electronics with software that instruct the device to malfunction after N number of, say, print outs, or photo copies. In fact, ink cartridges have been known to stop as soon as the print count exceeds a predefined limit, even though there is still up to 40% ink left.

How?

Death dating is only one kind of planned obsolescence and is usually classified as a “physical obsolescence”. Within the same category are also “design for limited repair” (e.g. uni-body design welded together, or with unique screws), and “design aesthetics” that lead to reduced satisfaction over time (e.g. scratchable shiny surfaces etc.). The Apple iDevices are good examples of the former (and latter) as you need special



#ResponsibleInnovation

“Is it a good innovation as long as it leads to economic gains for the firm, even in cases where consumer or societal costs are high?”

equipment to open them up, and face limited options to replacement as components known to fail are soldered together.

“Technological obsolescence”, on the other hand, does not force the consumer to replace the product, but relies on advertised standards to condition the consumer into perceiving a product as obsolete. By craving the newest model for either its “fashionable design” or its “added or upgraded features”, the consumer is voluntarily replacing a functioning product before necessity calls for it. Here, the garment industry a clear example of the former, while cell phone development demonstrates the latter.

Negative innovation?

On the other side of the debate the traditional arguments are that it is unethical to design products that wear out “prematurely”, and that mass-consumption have a strong negative effect on the environment.

When the replacement and disposal cycles shorten the waste production increase. When we throw something away we are actually adding to a mountain of garbage already produced, just to make the stuff we are now replacing. For every domestic

garbage-can the average American fill up, there are already 70 more upstream. It does not improve the matter that this trash often is unused or well functioning. Though hard to measure, the World Bank estimates that our current global waste production is at 1.3 billion tons each year. Furthermore, they calculate that as a consequence of population growth and growth in GDP/c, the waste production is likely to pass 2.2 billion tons per year by 2025. Yes, that is 2,200,000,000,000 kilos of waste per year.

This tendency is strongly connected to our environmental challenges. Not only does all this consumption threaten our ecosystems and climate through hazardous waste and greenhouse emissions, but we are also straining our scarce and finite resources. Although we “create” these resources by using materials in new contexts and introducing them into our economy, it is no secret that we are extracting more and more and deplete source after source, as demand for the latest gizmo keeps growing.

The way innovation is applied in these cases feels wrong to me as I am used to thinking of innovation not only as a source of economic growth, but also the betterment of something - A new

and improved way of doing or making something as opposed to reducing quality and degenerate. How can an innovation be good if it deceives you and leads you to work more just in order to replace products faster? Would we have the same level of development without the consumer mentality advocated by planned obsolescence? Is it a good innovation as long as it leads to economic gains for the firm, even in cases where consumer or societal costs are high? Or does a good innovation require a “positive externality”? I guess it all depends on where you stand. Hopefully more firms will implement the trending concept of responsible innovation, as public pressure for ethically sound and environmentally sustainable innovation increases.

To me at least, it has become clear that some things really were better in the good old days.

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Technologies have profound effects on economy, society, politics and culture. The huge time lags between the implementation and diffusion of an innovation, identification of their wider impacts, and subsequent regulation has caused a public call for more precautionary and adaptive approaches that promote a more responsible innovation.

Responsible innovation has been defined in several ways but among the most used are Rene von Shombergers’. He describes a “transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products”.

Personally I’m a fan of Hillary Sutcliffes adaption of Gro Harlem Brundtlands sustainable development; “Responsible innovation is innovation that helps fulfil our needs and hopes without compromising the ability of others, now and in the future, to fulfill their own”.

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Curious on updates from WRI’s Oslo Research Group on #ResponsibleInnovation <http://tinyurl.com/c5lo6yq>
Teknovatoren @Teknovatoren



#ResponsibleInnovation : a shared #ethics of #innovation bit.ly/12W45pL via @guardian
Fondapol @Fondapol



Reflecting on need for #publicethics in #responsibleinnovation and his #SIP13 panel (open for papers) @PeterFRMills <http://flip.it/vn4j0>
Beverley Gibbs @bevgibbs



Why does #responsibleinnovation need public ethics? Reflections on the RI concept in new @Nuffbioethics blog post: <http://bit.ly/ZeCbVx>
Peter Mills @PeterFRMills

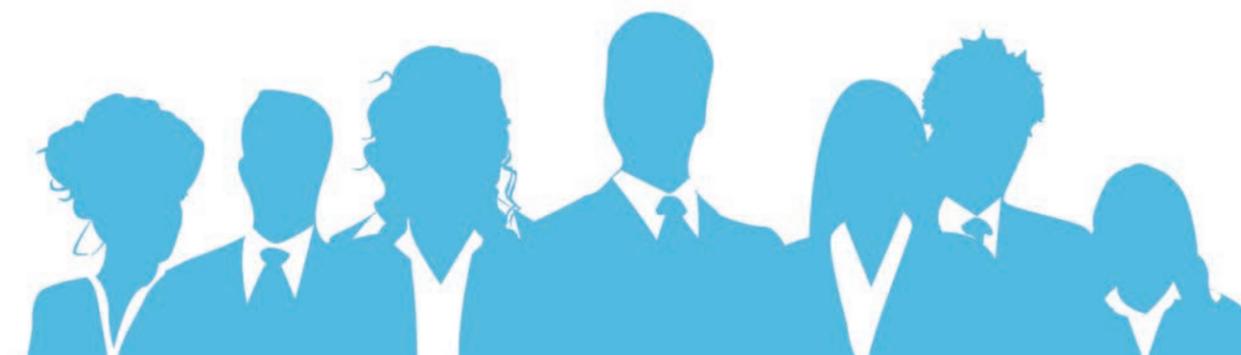
-Google Trends indicates that the search phrase “responsible innovation” has grown markedly in popularity over the last three years.

-60% of the EU population raises concerns over their safety if CCS facilities should be installed in their neighborhood. (Eurobarometer)

-Google Search revealed 66,100 hits for “responsible innovation”

-Tropical diseases and tuberculosis account for 12% of the global disease burden. In the period 1975-2004 a total of 1,556 new medicines were developed. Only 1.3% (21) of these medicines were against tropical diseases. (Chirac P, Torrelee E., 2006)

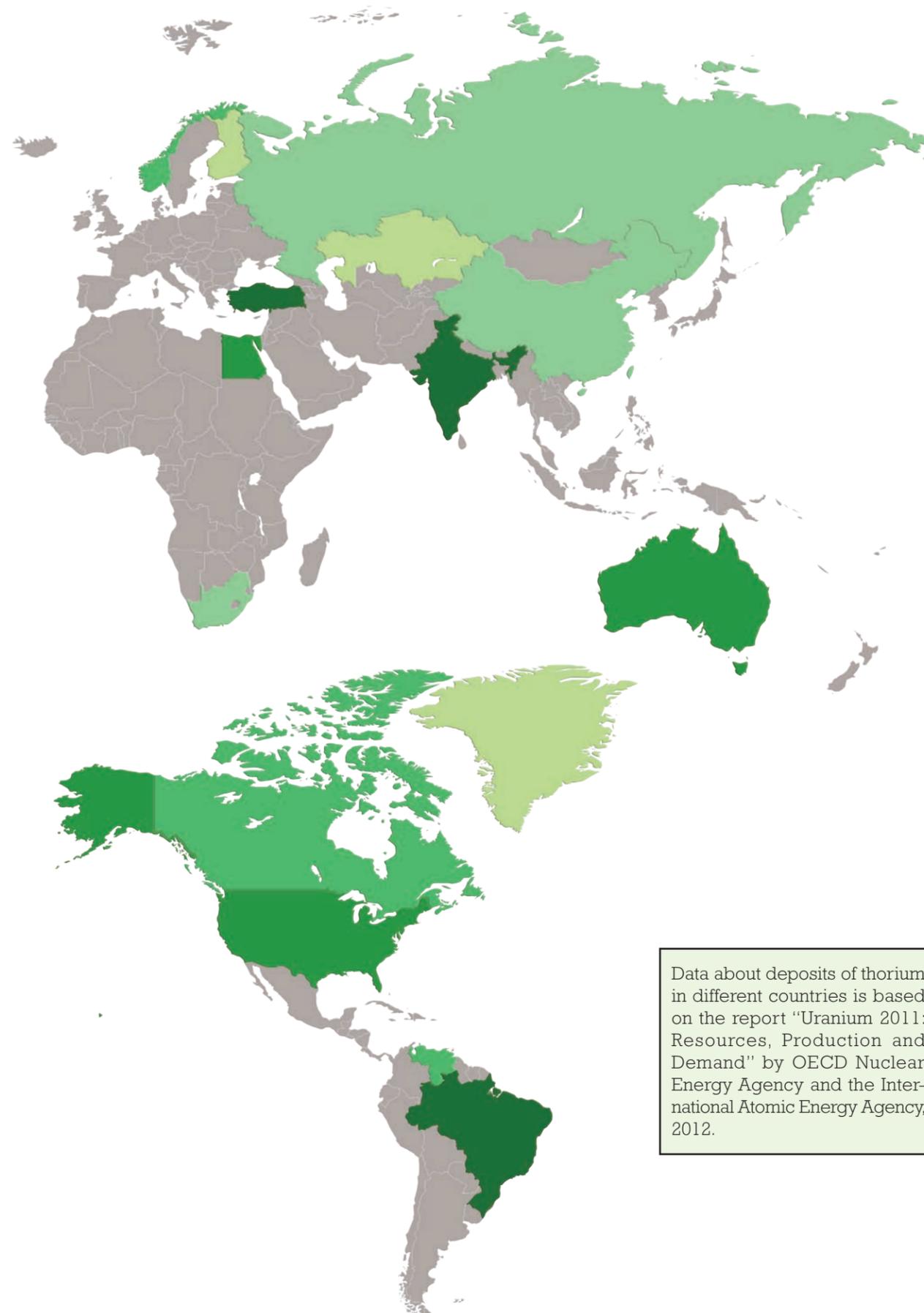
-Google Scholar referred to 682 academic research papers and articles on responsible innovation



Thorium

-A future source for sustainable nuclear power?

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Thorium-based nuclear energy is an old technology enjoying new interest today. Main strengths of thorium as a nuclear material is its abundance in the earth crust, low radioactivity, and the possibility to use in existing reactors. Also, it is difficult to create nuclear weapons based on thorium, which used to be the reason for the USA to abandon its utilization during the Cold War. In our days, such non-weaponization is widely regarded as another positive property. On this map, the color of a country signifies the amount of thorium on their territory in 2011.

| Country | Tonnes | % of Total | Color |
|-----------------|--------|------------|-------------|
| India | 846 | 16 | Dark Green |
| Turkey | 744 | 14 | Dark Green |
| Brazil | 606 | 11 | Dark Green |
| Australia | 521 | 10 | Dark Green |
| USA | 434 | 8 | Dark Green |
| Egypt | 380 | 7 | Dark Green |
| Norway | 320 | 6 | Dark Green |
| Venezuela | 300 | 6 | Dark Green |
| Canada | 172 | 3 | Dark Green |
| Russia | 155 | 3 | Light Green |
| South Africa | 148 | 3 | Light Green |
| China | 100 | 2 | Light Green |
| Greenland | 86 | 2 | Light Green |
| Finland | 60 | 1 | Light Green |
| Kazakhstan | 50 | 1 | Light Green |
| Other countries | 463 | 9 | Grey |
| World total | 5,385 | 100 | |

Data about deposits of thorium in different countries is based on the report "Uranium 2011: Resources, Production and Demand" by OECD Nuclear Energy Agency and the International Atomic Energy Agency, 2012.

Man & Technology

-An Encounter With the Mongolian Nomadic Culture



-Technological “drive” is one of the characteristics of industrial civilizations. In modern societies today, the satisfaction of understanding technology is becoming less easy to achieve. How our tablets can synch with the clouds, or how our coats can be both wind and rainproof while still breathing is difficult to understand for most.

When we encounter people from less advanced societies than our own, the belief is usually that our technological progress is superior and our own culture represents a higher stage of “civilization”. An encounter with a different type of living made me reflect on the technology we are becoming dependent on.

than I had ever done before.

I planned the trip in full to be a journey with simple means; the motorbikes I chose were easy to maintain without advanced technology, the chosen route was off the beaten track and we only carried the essentials in equipment. The trip itself was a way to test the limits of technology

foundly on its nomadic heritage and didn't seem to be affected by the overall technological progress dominating more modern civilizations. This seemed to be the case, even though the country itself is surrounded by technologically progressive civilizations such as Japan, South Korea and China.

I was impressed by how simply - not poorly - the Mongolian nomads lived their life, and how technologically undeveloped they were. They had a whole different understanding of what is necessary for sustainable living. A horse, some yak bulls, a couple of goats, an antenna for a poor TV-signal, a Ger (nomadic

“We develop technology to better manage everyday life, but since technology has become so advanced we are not only less capable of understanding it today, but also less capable of managing it in its simplest form.”

In the second half of 2011, two of my friends and I drove vintage motorbikes from China to Norway through Mongolia, Russia, Kazakhstan and Eastern Europe. After a career climb in a global company, I was driven by an urge to get away from this shallow life I felt I was dragged into, and to disconnect from the protections offered by society. I wanted to expose myself to simple living and connect with nature on a much deeper level

and I wanted to challenge myself by making a long journey over a sparsely populated, wild and diverse terrain. In an unsophisticated manner we sought nature and the people who live with it in such an interconnected and intimate way.

During our Mongolian leg we encountered the nomadic people. I experienced them to be hospitable and friendly. Their culture appeared to rest pro-

tent) with a fireplace in the middle to do their cooking, benches/beds along the walls, and no installed water system or power supply. Apart from these bare essentials they didn't seem to need more than what they had. And they were good at utilizing their limited resources, by making the most of the technology they possessed. They provided for themselves by preserving their food based on old practices such as salting and drying,



Top photo: I hit a rock 30 km west of Tosontsengel, and both the bike and myself got turned upside down. Apart from the ones leading in to the capital city (Ulanbaator), Mongolia has no roads, and we had to drive in wild terrain navigating in the old fashioned way: map and compass.



Bottom photo: Our trip from China to Norway lasted 4 months, and I spent most of my time on this bike (when not repairing them). Nothing exceeds the feeling of freedom you get from travelling under open sky on an old motorbike.



At white lake near Tariat in central Mongolia we stayed with a nomadic family, and could observe the Mongolian daily life close up.



Ali (2years) herding his family's cattle. His family hosted us one night in Tsaaganuur close to the Russian border.

continuously moving their location in search of better grazing for their cattle, and efficiently re-building their houses year by year, season by season. Even their two-year old children could herd. Their tough mindset and naturally developed skill sets made Bear Grylls¹ seem cosmopolitan in comparison.

Their lifestyle and traditions are passed down through generations where self-sustainability is central as they move around in step with what nature can offer them. Contrary to a farmer who tills and cultivates the same field, the nomads migrate between various fertile lands. This way they are more submissive to

nature as they barely utilize technology to manipulate it, but rather use what nature already provides.

This way of co-existence is as harmonized with nature as man has ever been. For millennia, this was the only lifestyle known to humans.

It is only recently in human existence that we have learned to manipulate nature and overcome harsh conditions using technologies. The need to travel around in search of better conditions is no longer there and we can now create everything we need in one place.

This was the start of modern civilization as we know it today. Only a few human cultures have remained nomadic, making them outcasts in our modern technological world.

One cannot help being astounded that this reality still co-exists right in the middle of our “technified” globe.

We are often surprised when we encounter societies that don't have the same need for sophisticated technological innovations to get through daily life. It's almost as if we think it's impossible to live with less. We take advanced technology for granted, and seemingly can't

live without it.

I think there is an important value that wears away along our technological progress.

The satisfaction of comprehending technology seems to decrease as technological progress steams ahead. On the contrary, a lot of people experience a feeling of uneasiness about our technological being-in-the-world. It seems as if we have lost something important and more and more people feel alienated by technology. It is as if man has lost control of his own instruments, and that technology dominates our way of life.

Even though Mongolia, with its remote and harsh nature and almost total lack of infrastructure, gave us tougher challenges than I had ever dreamed of, it was by far the highlight of the trip.

We could only rely on ourselves and our capabilities of dealing with nature. There were no road signs telling us in which direction to go, there were no modern repair shops where we could stop when we encountered technical problems, and there were no serviced gas stations with automated fuel pumps – when we did find a gas station, the pumps were all operated manually. It was us against nature.

My trip awoke some important values that I had forgotten and gave me a sense of purpose and control.

This feeling is hard to achieve in modern technological societies. We develop technology to better manage everyday life, but since technology has become so advanced we are not only less capable of understanding it today, but also less capable of managing it in its simplest form. This is unfortunate as that is the most satisfying feeling of all.

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¹⁾ Bear Grylls is a British adventurer, writer and television presenter. He is best known for his television series Man vs. Wild, known as Born Survivor in the United Kingdom



Confessions of a Lecturer



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Forty years ago I was a first year student of economics at the University of Bergen. One day there were books on sale in the University bookshop and I found a book with the enticing title “Capitalism, Socialism and Democracy” (CSD). Although I didn’t know the author, somebody called Schumpeter, the theme attracted my interest so I bought it. The price was 18 kroner, down from 36, a real bargain! The book has followed me since, on my various moves between different universities in Norway, Scandinavia, Europe and the US.

At first the style and content of the book looked a bit strange and it took a decade or so before I started study it seriously. Then I had worked for some time in various governmental departments, long enough to find “real life” hard (especially in the mornings) and unattractive. After

a while I applied for and got as three year scholarship from the research council to study the issue international competitiveness. For this topic Schumpeter suddenly appeared very relevant, and in one of my first published papers, in the journal NOPEK in 1984, I quoted a passage from CSD at length. Here Schumpeter argues that the true nature of capitalist competition is not price competition, as envisaged in traditional economics textbooks, but technological competition:

“... in capitalist reality as distinguished from its textbook picture, it is not that kind of competition that counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization (...) – competition which commands a decisive cost or quality advantage and which

strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives.” (CSD, p. 84)

This passage from CSD is from a short chapter (5-6 pages) entitled “The Process of Creative Destruction”, and as the reader probably knows, the notion “Creative Destruction” is what Schumpeter is most well known for: A search on “Schumpeter & Creative Destruction” in Google returned 226 000 hits. However, I must confess (this is where the “confessions” come in) that I have always been a bit uneasy about the identification of Schumpeter’s central message with the notion “Creative Destruction”. To the best of my knowledge this is the first and only time Schumpeter uses this term (but the reader should feel free to correct me!). Moreover, in contrast to many of his

other central concepts, such as innovation, entrepreneur, technological revolution etc., he does not really take care to define it in a proper manner. It appears to me that for him this was a catchy term, which he found useful in this specific context (he saw CSD as popular work, not as an original scientific contribution), but that he did not attach much importance to. It may also be that he did not consider the notion to be very novel (and therefore in need of a proper explanation) but rather a reiteration of something others had said many times before. At least this is the claim made in an entry in Wikipedia (http://en.wikipedia.org/wiki/Creative_destruction), which traces the origins of the notion back to Sombart, Nietzsche, Marx etc.

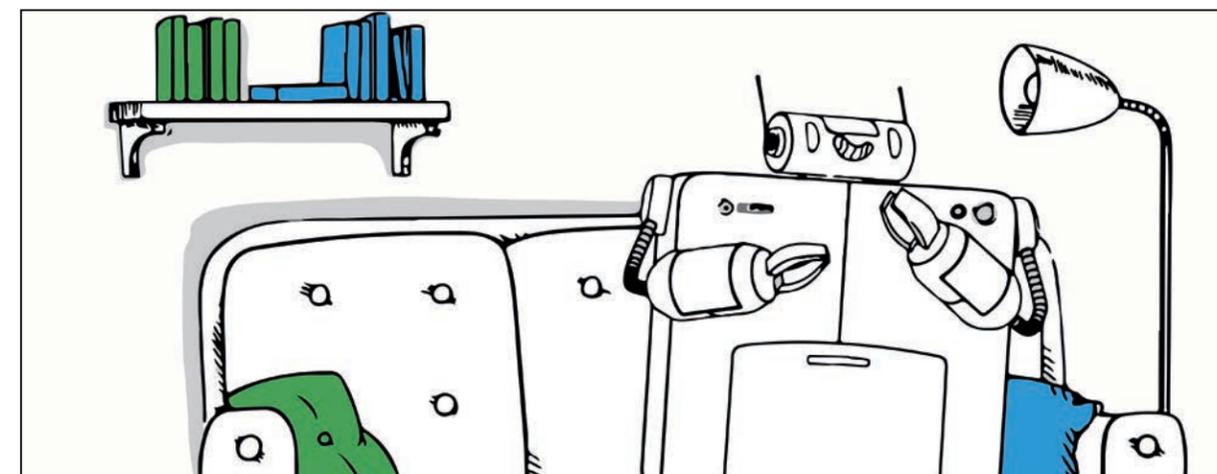
Leaving this at it may, what did Schumpeter mean with the term “creative destruc-

tion” in CSD? It seems clear that he uses it as synonym for “economic evolution”, or innovation-driven change. He also equates it with “industrial mutation” (p.83). Hence, what he is talking about is the emergence of something new based on a transformation of the existing (knowledge, technology, institutions, resources etc.). Through this process the existing set-up (knowledge etc.) will also be changed and in this sense the existing set-up is “destroyed”. It is this continuous innovation-driven transformation of knowledge, technology, institutions, resources etc. that Schumpeter has in mind with the notion “creative destruction”. However, the notion may also, and this is why I am a bit uneasy about it, lead the analyst astray because the “destruction” part of the argument may easily be misunderstood. It isn’t a normative

statement saying that the old has to be destroyed for the new to emerge. Rather is about understanding transformation processes, through which the old is changed (so that in the end it may be difficult to recognize its origins), and the roles of various actors, organizations and institutions in this transformation. Although he was concerned with social inertia, and emphasized the need to fight it, he never subscribed to the simplistic view that “destruction” in itself leads to “creation”. Moreover, to understand transformation processes, Schumpeter teaches us, a historical perspective is essential (CSD, p. 83).

Living Green and Blue

Our increasing consumption of non-renewable resources like oil can't go on forever, nor do we want to live in a world full of waste around every corner. The solution has never been to sweep the dust under the carpet; we have a responsibility to ourselves and the next generations. In 2012, Oslo began with waste recycling. Being coined the blue and green city because of its water and forests, Oslo certainly needed to take a step forward to meet the challenges of the future.



Recycling what we throw away is certainly preferable to just letting it stack up. For instance, for every kilo of plastic recycled we save two kilos of oil and, through recycling, Oslo produces heat for 84 000 households. Even though it might be a no-brainer to most people that recycling is helping us, it does demand a tiny sacrifice from each one of us. To have effective sorting we need to separate different types of garbage from each other. The first recycling plan was too optimistic; people failed the challenge of throwing their bags in different bins. So how did the municipal of Oslo manage to accomplish waste sorting?

The answer was simple - "Bagsy", the optical sorting robot. The largest of its kind, all people have to do is to put their waste into different colored bags. The bags can then be thrown into the same garbage

bin. When the different bags are given to Bagsy he uses an optical camera to sort out each bag by its color. So the solution was to give people different colored bags, blue for plastic and green for food, instead of different bins. The technology is outstanding so we know we can trust it. However, this has not stopped some people from not sorting their garbage correctly.

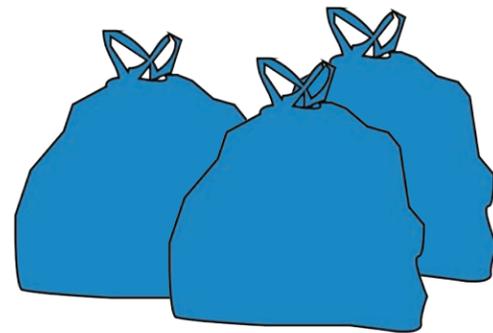
The technology was not enough; Oslo also needed to convince its citizens. At first the participation was low and most people did not sort at all. If everything was to be thrown in the same bin anyway what was the point? Oslo had this big and outstanding optical sorting robot but its citizens did not seem to understand the benefits. The leaders in charge soon understood that technological development was not only driven by technology alone, a social aspect had to be

involved as well. People needed to be a part of it. A need for visualization of the process had to be fulfilled in order to understand the benefits and the simplicity of the sorting robot. This is how the idea of the likeable robot Bagsy was born. The city was soon full of commercials regarding recycling. To begin with, information and colored bags were sent to every household. By including everyone, and constantly reminding us of the overall benefits, participation has started to grow. And it is still steadily increasing as people acquire more knowledge and become more willing and competent. Maybe one day we can hope for a technology to sort away our short-sightedness. Until that day we better try to include more than the technical into the diffusion and use of the technology.

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Sources: grontpunkt.no, energigjenvinningsetaten.oslo.kommune.no

...And where do the blue bags go?



When «Bagsy» have sorted the blue and green bags, the blue bags are sent all the way to Germany. How can this be beneficial for our environment?

Hard to understand

The plastic waste from Norwegian households is sent to ALBA and GAR, which are two big waste sorting facilities in Germany. Østfoldforsk is a research unit in Norway, and in cooperation with Grønt Punkt they published a report on the “life cycle” of the Norwegian plastic waste in 2011. The purpose of the report was to map the climate effects of sorting Norwegian waste. The plastic waste from Norway is transported for a distance of 1253 kilometres to Germany. It might be hard to understand how this can be a good solution

for lowering the CO₂-emissions.

Research gives answers

In short terms Østfoldforsk divides the plastic waste in two categories; 1) recycling of pure plastic and 2) recycling of plastic as part of residual waste. The intention of recycling pure plastic is to use the materials to produce new plastic while exploiting energy through combustion of waste as a substitution to for instance oil is the basic argument to mix plastic waste with other types of residual waste.

Not surprisingly the environment benefits from developing plastic into new materials, though the level of substituted energy sources becomes lower. The numbers in the report tells us that treating 1 kg of plastic as part of residual waste result in between 1 and 1,8 kg of CO₂. In comparison 1 kg of recycled plastic developed into new materials scores -0,9 at the same scale. At the same time emissions from transportation to Germany nearly don't affect the overall results. This can among various reasons be explained by the fact that transformational methods are carefully planned. About half

of the transportation is carried out by trains, and the waste is not shipped until the consignment reaches a certain weight.

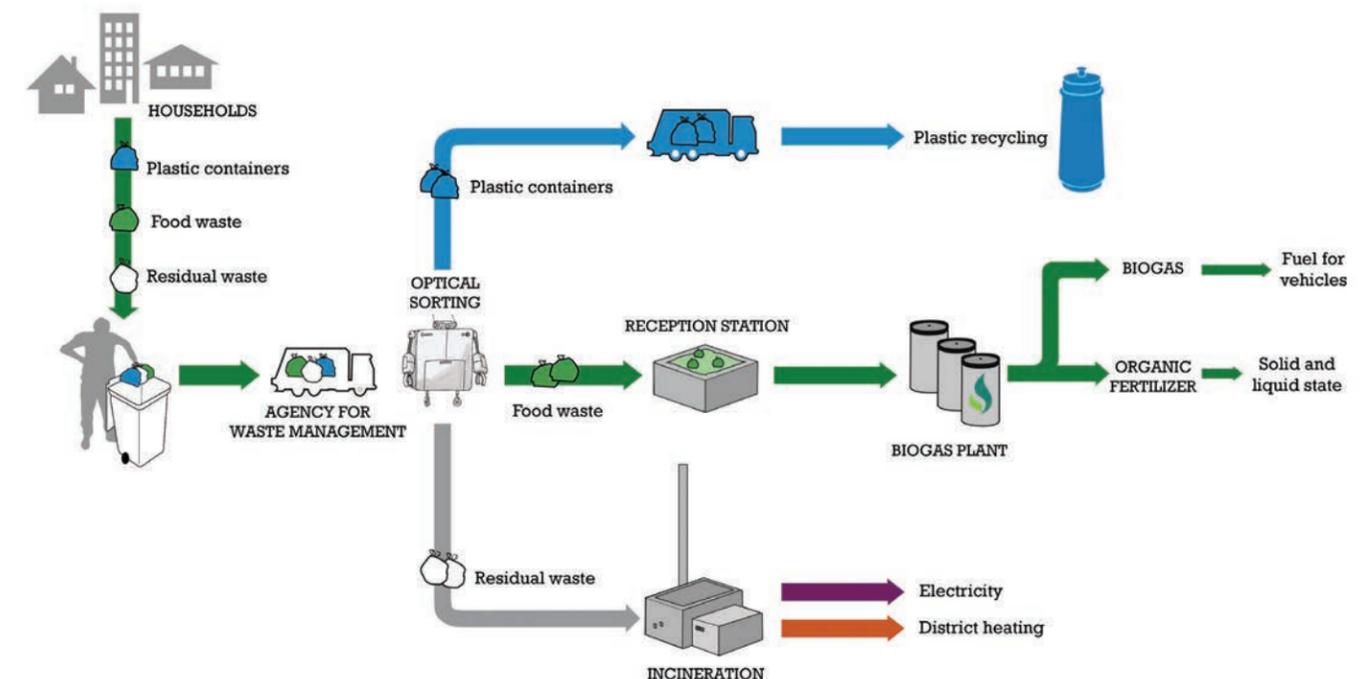
An environmental paradox

When it comes to recycling we have the choice of throwing our plastic waste in blue bags or ordinary bags. If we choose the blue bags, the chain of recycling can seem very energy intensive. First the waste goes to Bagsy and then it is shipped through

several means of transportations. When the waste is recycled it then has to be returned in the same procedure. It is easy to think that this is a cumbersome way to manage our waste, but it is in fact the other way around. If you chose to throw the waste in an ordinary bag, the plastic is sent with the residual waste to facilities closer to our location. Still, in that case the plastic have to be produced from scratch, which demands significantly higher amounts

of energy. So the next time you throw your plastic waste, have in mind the fact that Bagsy and the blue bags decline the total CO₂ emissions.

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Are Women Oppressed Through Technology?

Even the most educated, wealthy and liberated women of the western world do not feel as free as one would expect. And increasingly many of us cannot ignore the feeling that this lack of freedom is caused by the most trivial and banal of things. Issues with clothes, hair, and body shape dictate our behaviour. In the face of shame, guilt and self-denial, some women ask themselves if maybe they are not irrational, not neurotic and completely alone, but that there might be a connection between women's liberation and increasingly oppressive beauty ideals.

Technology shapes how we perceive our gender. Products are created specifically to support a notion of what women want and also how they should be and behave. However, these attempts at gaining control and profit can be accepted or rejected. So the next time you look in the mirror and wish for bigger lips or

smaller thighs, ask yourself: Who makes me feel this way?

It can be said with confidence that as the number of legal and material barriers women have broken through has gone up, we have more mercilessly been weighed down by increasingly impossible beauty ideals.

This is done intentionally and through the means of technology. According to Ellen van Oost, manufacturers embed values and symbols they see as feminine in their products. By creating links between artifacts and culturally acceptable feminine symbols, advertisers hope to seduce women to buy

their products. At the same time they actually construct gender stereotypes. The author Naomi Wolf presses the bold claim that women are intentionally oppressed by beauty ideals. Her book, "The Beauty Myth" deals with how women are dictated by a myth in several important areas of life, and how this is the result of power relations and a wish for profit. The myth is enacted in part through a myriad of oppressing technologies, where skin care, magazines and cosmetic surgery are crucial.

Skin Care Products

Cosmetic cleansing and moisturising products, or "holy oils" as they are called by Wolf, function as religious metaphors to lure women. They are manipulated into believing that their faces are wrong and that their skin needs to be purged of sin. As with sins women have to feel in need of repair in order to pay for expensive fixes. Fixing is not only expensive but also time consuming. Particular rituals are enacted in order to cleanse. Women pay for the services of beauty parlours, where their old identity is removed through special effects: mood lighting, low music, specific smells and touches and cleansing baths. Their eyes are covered with cotton and their skin with sweet smelling substances. This new cleansed self has to be upheld through painstaking activities at home. This includes cleansing and moisturising, together with self-tormenting activities such as scrubbing and applying acids.

According to Wolf the male population do not have to work this "third shift". They do their paid work, and when they come home they do housework. Women have to use their remaining time to work on their beauty, and this exhausts them and hinders them from achieving their life goals.

Women's Magazines

In the 1960s and 70s women's magazines where under serious threat. The second wave of women's liberation had made the interest in clothing and fashion plummet among many urban women. Perhaps in desperation, Vogue released the "Nude Look" in 1969. In the absence of interest in feminising clothes, the focus in magazines was turned to the body. These somewhat body obsessed magazines still represent something important: women's mass culture. Magazines are such a strong technology and the impact it has on women is so great because they lack other channels for advice and information about common women experiences. But, to please the advertisers, stories about how to raise children, survive rape and create your own business are mixed with stories about the beauty myth; mascara and stomach abs. This is the basis for the love-hate relationship many women have towards this form of technology.

Cosmetic Surgery

Women's bodies have been pictured as disease ridden in many ways in modern times. In the

- Until the 1970s "cellulite" was just considered ordinary women's tissue. But in 1973 the magazine Vogue invented a new condition called "cellulitus" which is today an operable shame.

- 33000 American women would rather lose 10-15 lbs. (4,5-7 kg) than achieve any other life goal.

Source: "The Beauty Myth" by Naomi Wolfe.

Victorian age doctors treated pregnancy, menstruation and menopause as diseases. In our time the appearance of women's bodies is a disease in itself. The body is divided into parts where our stomachs, breasts, hips and arms are judged as satisfactory or unacceptable. Problems can be fixed, but for a price of money, pain and blood. The first commandment of medicine's Hippocratic Oath is to do no harm. What cosmetic surgeons do for a living, when they prescribe needless beauty operations, is a direct breach of this. And when women perceive their bodies as wrong, their ambitions are diminished.

How do you feel when you look in the mirror?

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Flu attack!

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“Are we naive to think that the side effects cause a greater damage than the decision not to vaccinate?”

-To vaccinate or not to vaccinate, that is the question

Skepticism towards vaccination is getting stronger. Health authorities encourage mass immunization. Media present us with big health scares advising us to vaccinate and the next day they enhance the dangerous side-effects. Who are the experts? Who should we listen to? And what possible consequences can our decisions bring?

Vaccination as a technological fix

Nutrition, higher standards of living and sanitation have all had positive effects on prolonging our life spans. Many would agree that medical technologies have improved our lives in terms of prolonging them and reducing a great deal of suffering. Vaccination has been one of these technologies successful in hindering several diseases

from spreading to almost being extinguished. Vaccines are contributing to the idea that anything can be treated. Medical technologies have that special value. They bring new hopes and possibilities. Instead of accepting the sickness we expect cures to be found. But people get jaded. The massive background noise blurs the attention to what is of importance. Media and experts, like health authorities, seem to have different opinions on what risk there is when a pandemic alert is ringing.

The debate

In 2009 there was media coverage on a daily basis around swine flu. This pandemic differed from earlier seasonal influenzas in taking the lives of young children. 2,2 million Norwegians were vaccinated. 598,000 of these were children

from the age of six months up to 19 years old. Media coverage shifted from encouraging people to vaccinate to highlighting the side effects from doing so. The mass vaccination of children had serious consequences. A recent study shows that 54 children have gotten narcolepsy after taking the flu shot Pandemrix in 2009 or 2010. Are we naive to think that the side effects cause a greater damage than the decision not to vaccinate? Influenza is not a new phenomenon. It hospitalizes and sometimes kills people. The implementation of mass vaccination had an effect on stopping H1N1 or swine flu from spreading and thereby taking fewer lives than expected. There is always a risk involved when taking vaccinations. At the same time there is a risk of new outbreaks of diseases if people choose not to vaccinate. For example, in 1998 there was

an autism and MMR (mumps, measles, rubella) vaccine controversy in the United Kingdom. A report by Andrew Wakefield was presented with a hypothesized link between MMR vaccination and autism and this became a big public issue. Media coverage and opinion leaders spoke out about their own experiences, influencing people's decision on not vaccinating their children. After the MMR controversy, the percentage of the vaccinated population dropped drastically. New outbreaks of mumps and measles occurred in the UK. We know that autism has a strong genetic basis and that the genetics of autism is complex. Andrew Wakefield eventually lost his medical license after reports following up on his work were unable to find linkages between autism and the MMR vaccine. The Wakefield report was shown to be falsified and dismissed. Is it better to have new outbreaks of diseases vaccines can prevent?

Media plays a crucial role

As a spokesperson for “the people” they give out article after article about health scares around vaccines and do not consider taking responsibility for what possible effects that fear mongering can bring about. Whereas the media usually appeal to the feelings of the public, health authorities reason around scientific rationales. This could be a reason why it is harder to for the authorities to reach the public. The Norwegian Institute of Public Health tries to encourage the population to take vaccines to achieve herd immunity. Community immunity or Herd immunity describes a form of immunity that occurs when a percentage of the population is vaccinated, thus providing protection for individuals that have not developed immunity. When a big part of the population is immune they block the spread of infections that are transmitted from individual to individual.

Paradoxically, this allows parents to choose not to vaccinate their children, thus avoiding the potential side-effects of it, while being protected by the herd immunity.

Are vaccines all bad? What is the best way to prevent viral infections from spreading? The technological fix vaccination has proven to be one but is still questioned. Health authorities maintain that vaccines are safe. If they at the same time take financial responsibility for lifelong medical expenses that affected children accrue, a lot of the work is done. Media need to reflect upon their ability to influence the population in a certain direction. They should be able to repent! What new technological fixes can bring about only the future can tell. As long as people are subject to death and sickness there will be no lack of medical interventions which will always be followed by new controversies.

“As long as people are subject to death and sickness there will be no lack of medical interventions which will always be followed by new controversies.”

Keeping story personal

It happened on February 8, 2013, at 5 p.m. Along with premiering at the Berlinale, director Simon Klose made his movie, *The Pirate Bay – Away from Keyboard*, freely accessible on YouTube. In just 3 hours, more than two thousand seeders were sharing the film on one of the most popular torrent trackers – *The Pirate Bay*. The same site was created by the main characters of the movie and brought them behind bars.

This documentary is about the personalities of three programmers who founded TPB. Its broadcast online in a live mode chimed perfectly with the views of the lead characters. However, some issues demanding to be elaborated further in the movie became shadowed by the focus on the personal level. Specifically, different

perceptions of TPB and its users required more attention from the director.

The Pirate Bay – Away From Keyboard is based on materials collected during the trial process of the initial founders of the site. Three youngsters with bizarre nicknames – brokep, TiAMO, and anakata, were sued in 2009 by a number of respected and powerful

Hollywood companies, such as Warner Bros. Pictures and Columbia. The sum of compensation demanded from the defendants equaled \$13 million. The issue at stake was about assisting other people in breaking copyright laws, or, to put it simply, about running a site that made film and music companies lose a substantial part of their expected revenues. In a nutshell, the technoenthusiasts created a place to share any electronic files



- The Pirate Bay was founded in Sweden in 2003
- The site allows the sharing of information through torrent files
- It earns money by means of placing advertisements and accepting donations
- In 2009, the Swedish creators of the site were sentenced for a year and obliged to pay 30 mil SEK as a result of litigation with Hollywood companies
- In the same year, Asker and Bærum District Court refused to satisfy private appeals for banning TPB in Norway

its users wanted. Unfortunately for the creators of this technology, many users wanted to up- and download information that is illegal to copy.

Let's look at major weak sides of the movie. To begin with, two perceptions of TPB are proposed in the film, but remain undeveloped. The first one is promoted by American corporations – they

those actively using the site for exchange of Hollywood films. It is not shown what the reaction to this proposal is, or how it is discussed afterwards.

The strongest side of the film is that it follows the individual stories of the defendants through the process. This personal depiction, focusing sharply on whom these programmers are

a common comedy, since all the main heroes make fun of the possibility of being imprisoned until the very verdict. In addition, this documentary is a good chance to trace the intricacies of international lawsuits. For those interested, many hidden linkages between the prosecution and plaintiffs are revealed during the trial.



see torrents as another way to violate intellectual property rights. The second one is articulated by Peter Sunde on behalf of the pirate community – they look at new technologies of information sharing as a calling for the reconsideration of obsolete copyright laws. It is a pity that these confronting views are not discussed further. Another slipped topic is raised by the defendants. They advise those companies suing them to bring about trials against common people,

as people, how they perceive the charges and what tensions exist inside their small group is shown in a brilliant way. As action on the screen progresses, it becomes obvious that reasons for introducing and supporting the tracker are different for each of the creators: one simply wants to program, another – to establish “a big site”, and only Peter – to express his political and social standpoints. As a viewer, I witness three divergent personal tragedies mixed with

All in all, we should expect more movies about the file sharing debate in the nearest future. Klose opens this topic with a personalized approach to the issue. There is, though, much more to be told about online exchange, however appealing his film is.

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The Power of Flags

Recent rioting in Belfast showed that, although many of Northern Ireland's worst problems have gone away, historic tensions remain. The IRA bombing campaigns of the 1970s and 1980s, Bloody Sunday, and the many civilian deaths which came with them, were the result of Catholics fighting for civil rights and a wish for a United Ireland. This time it is Protestants making the noise. The threatening symbolism of the restriction of the flying of the British flag over Belfast City Hall to designated days of the year represents a challenge to Protestant hegemony and, ultimately, their position as members of the United Kingdom.

The ugly gaze of the world media was once again set on Belfast before Christmas. A sustained series of rioting turned the city into the kind of war zone many thought was confined to the past. Hardline Protestant Loyalists have engaged in violence and destruction which has brought Belfast to a standstill and led to hundreds of arrests and dozens of injuries. Petrol bombs have destroyed property and cars. Rubber bullets and water cannons have been fired. Death threats have been issued to local councilors. Once again, Belfast burns. And the world is watching.

To the outsider, the reasons for this destruction seem hard to believe. On 3rd December, Belfast City Council voted to restrict the flying of the British flag, the Union Jack, over Belfast City Hall to just 18 designated days a year. Previously, it had flown for all 365 days. While this great symbol of Empire will still be raised on Remembrance Day and Prince Harry's birthday for most of the year the red, white and blue will be left in the box.

Importantly, this was seen in Dublin and Westminster as an

act of democracy. For the first time since the creation of Northern Ireland in 1921, Loyalists do not hold a majority on the Belfast City Council. Bolstered by the Alliance Party from the centre, Sinn Fein, the dominant party seen to represent Catholic Nationalists, has found itself in an unprecedented position of influence. The lowering of the flag, still seen as a repugnant symbol of oppression by many Nationalists, was, in many ways, inevitable.

So why such fuss over when a flag flies? Basic Science and Technology Studies (STS) perspectives show us that objects of the world can be interpreted in different ways. One woman's windmill is another man's bird killer. In some countries, the flag is something to fly on national day or at a football match, the innocent manifestation of unity and pride. In others, it is a meeting point of ideologies, a melting pot of politics and historical resentment and a symbol of power. In Northern Ireland, symbols mean everything.

The Colour Orange

Since the Battle of the Boyne, just north of Dublin, in 1690 where

the Protestant William of Orange, from the Netherlands, defeated the Catholic James in a struggle for the British throne, lines between Catholics and Protestants have been strongly demarcated. The fear of being marginalized by a Catholic government, which led the Protestant Cavalrymen of Ulster to William's side, has remained ever since. To this day, the 'Orange Order', a huge organization loyal to the British crown, marches through the streets of Northern Ireland every year in a show of Protestant supremacy. The 'Orange Men', dressed in bowler hats and orange sashes, insist on maintaining their traditional marching routes, passing through Catholic neighbourhoods, sparking outrage and, usually, violence and destruction. The 'Orange Men' were central to the signing of the 'Ulster Covenant' in 1912, a document of half a million signatures insisting on the maintenance of Ireland's place in the United Kingdom.

Against this backdrop, the colour orange has undergone a dynamic transformation, at the heart of over 300 years of sectarian hatred. On the Protestant side it represents pride and defiance,





the memory of their ancestors' bravery in the protection of their identity. To Catholics, orange is hegemony, discrimination, the enemy. South of the border, where Catholics and Protestants live in relative harmony, this is not the case. Nowhere is this more evident than the flag of the Irish republic on which the tradi-

of the population compared to 48% Protestant, a steady incline which suggests a Catholic majority is only a matter of time. The political stakes could not be higher.

The Good Friday Agreement of 1998, a peace deal involving Loyalists and Nationalists as

north and south of the border. It remains to be seen what kind of majority would be needed for this to happen and, realistically, the prospects of a United Ireland, in this generation, would appear to be slim. Nonetheless, the Catholic ascendancy is making Protestants nervous.

Needless to say, any moves towards Irish unity would not go down well with the Loyalist community. The relatively innocuous lowering of a flag set Belfast ablaze and exposed a wound in Northern Irish society which has never really gone away. One can only expect things to get worse. After 90 years of domination, Loyalists are feeling the heat and nothing sums this up more than the loss of their cultural icon. From symbol of pride to symbol of doom, the Union Jack on Belfast City Hall has undergone an ominous transformation.

Rarely has a flag meant so much.

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"...the traditional nationalist colour of green is separated from Protestant orange with the white of peace."

tional nationalist colour of green is separated from Protestant orange with the white of peace.

Catholic Ascendancy

Since the creation of Northern Ireland, Protestants have been in majority, holding sway over Catholic Nationalists and entrenching the firmly British aspect of the six counties of the region. In recent years this has changed. A 2011 census showed that Catholics now make up 45%

well as the British and Irish governments, was seen by many to bring a lasting peace to Northern Ireland. A clause in this deal allows for a referendum in Northern Ireland over a return to the Irish state at some time in the future. This has not gone unnoticed by Nationalists and, following the announcement of a Scottish independence referendum for 2014, it is beginning to become a topic of discussion. The Sinn Fein party advocates it repeatedly and their influence is growing,

Did you know – facts about innovation

"The fortune cookie was invented in 1916 by George Jung, a Los Angeles noodlemaker."

"Schumpeter was quite controversial both academically and publicly, he was once seen riding with two prostitutes up and down the main street in Vienna to refute a proposal to tone it down from the bank he worked at."

"Innovation is measured in highly different ways. In the Innovation Union Scoreboard, Norway is ranked as number 17th of 40 countries. In the World Competitiveness Scoreboard on the other hand, we are ranked number 8th of 59 countries."

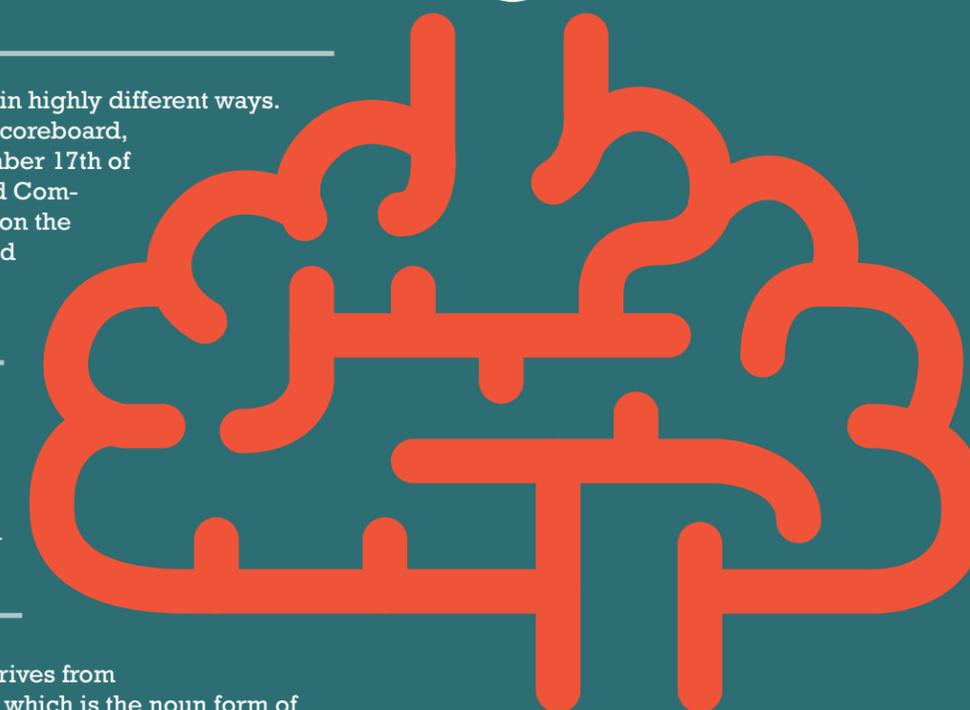
"Albeit the first commercially successful steam engine was made in 1701, the use of steam engines was already proposed back in 10 AD."

"The word innovation derives from the Latin word innovare, which is the noun form of innovare "to renew or change". This is commonly mistaken to be the same as invention, which refers to the creation of the idea or method itself, whereas innovation refers to the actual process of translating the idea into something useful and different than before."

"Xerox was the inventor of the graphical interface for computers, but didn't see the potential. However Apple and Microsoft did so, and became the market leaders in personal computers."



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LinkedIn with the people you study:

Qualitative studies when reality is digital

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Increasingly, we «make friends» on social media with people we know from highly formalised contexts – for instance those we get information from when researching our projects. What is the significance of that?

The accountant for the building where I live has just asked me to link up on LinkedIn. We have never met, she has most likely just hit her keyboard with her lunchtime egg sandwich, so I just get on with my day. But for students across a variety of fields who do qualitative studies for their projects, linking up on social media is one of the ways we enter the digital, and may represent a set of issues it is worth reflecting more closely on.

At the MA courses based at the TIK centre, the vast majority of students write theses that are based on qualitative work in one form or another – as many as 12 out of 13, according to a quick counting of theses handed in in 2011 on duo.uio.no. I will argue that the fact that so much of our data collection takes place in the digital has methodological implications as well as consequences for what ethical consid-

erations we should make.

For one thing, we need to reflect on what understanding of technology we have, as it will influence the problems we identify and write about in our theses. Much writing on «the digital» or the Internet has been focused mainly on technology as something rather wonderful. We are, as a rule, keen on nice computers, apps and other aspects of digital technology. This enthusiasm for digital media as such also seeps into scholarship and master theses. Thrift (1996) calls it «techno-orientalism» when scholarship on information technology becomes an aid to convey the power of that technology.

Rather than think about the digital as smooth, crystalline and purified systems (Thrift 1996: 1468-9), «the digital» can be taken to mean everything that is reducible to the binary code 0 and 1

(Horst and Miller 2012). That is a lot, including the web server in the workplace of the people or the organisation you study – often rather boring stuff, but the stuff that the organisations we study are made up of. Rather than imagining a polished new world in the digital, we must see the digital is a continuation of that part of social life that takes part in the «analogue» or offline world.

So how is it we encounter the digital in the field? Sometimes digital practices are explicitly being studied. Two recent theses from the TIK centre look at academic reading practices in the digital and aesthetics in digital gaming (Geer and Solér respectively, both 2012). Established STS-ers also engage in studies using digital methods, for instance Noortje Marres (with Rogers, 2005) and Tommaso Venturini (2010).

But perhaps more important, we need to be aware of is that many of us set out to study offline worlds, but they turn out to have digital extensions. By that I mean that even when you



“Can you use a person’s friends list on Facebook to trace her networks?”

plan to go and interview a set of people for your thesis, you start by checking out their website. You send them an e-mail, and when you get there you realise that frustration over software or transnational video conferencing take a large chunk of the day of the people you talk to. The digital is an essential co-producer of the encounter with the people you are to study, even when you do not intend to study the digital in itself. And when the subjects of our studies engage in what we have written about them, they are perhaps more likely to write on your Facebook wall than to ring you on a telephone.

Both scenarios, when the digital is being studied and when it is «just there», give us new set of methodological considerations.

In the first instance, we must (to name one) consider where we direct our gaze. Can there be really boring things in the digital that is worthy of study, because it is important for the workings of technology or politics? And relating to the second: How much must we understand of the software and digital interfaces of social media employed by the people we study, in order to understand their practices?

When we enter digital media while researching our master theses, whether «accidentally» or because it is key to our study, we must reflect what sort of version of reality is presented there: A website of an organisation will in most cases be what Goffman called frontstage. Facebook is defined as backstage and private, but it is often a very polished version of

private lives – a fronstaged backstage, if you like. If you interview someone and they befriend you on FB, you may still get access to very private information. This must be handled responsibly. If one of your informants rant about his or her boss on Facebook, you need to reflect on whether you can use that information as data or not. Probably not.

Because ethical considerations abound, too: Can you use Facebook conversations as data? Can you intervene and make people employ new media as part of your project? Can you use a person’s list of friends on Facebook to trace her networks? Being what used to be called «good at computers» and all their relations will be of the essence for student researchers.

So to conclude: Social media gives us new ethical and methodical considerations that we must take the time to raise between ourselves and with our supervisors: What social media output can constitute data? Can we be sure websites of companies give us sound data? Can we be sure we are looking in the right places when we look at digital «stuff»?

Answering such questions starts with a sorting out of what is important digital data and when someone has just hit a keyboard with their sandwich, and continues with taking the digital seriously without being seduced by it.



Quiz



Question 1) Who popularized the term “Creative Destruction”?

- a) Karl Marx
- b) David Ricardo
- c) Joseph Schumpeter
- d) Adam Smith

Question 2) Who were the Luddites?

- a) Movement set out to destroy new technical and industrial machinery
- b) An English tea & breakfast club
- c) Governmental intelligence agency
- d) None of the above

Question 3) Often innovation is about combining existing knowledge to form new ideas. So think thoroughly, what did the US military use to camouflage tanks during the Gulf War in 1990-91?

- a) Sand
- b) Toilet paper
- c) Mirrors
- d) Hijabs

Question 4) How many years after cans were invented, was the can opener invented?

- a) Under 1 year
- b) 10-15 years
- c) 45-50 years
- d) 70-80 years

Question 5) James Bond’s high tech advisory Q always brings out the newest innovations to guide him, what was the latest technical gadget provided to him in the last movie, “Skyfall”?

- a) Pistol and Radio
- b) High-tech laser gun and exploding chewing gum
- c) Stealth cloak and Tranquilizer ring
- d) Pistol and X-ray glasses

Question 6) The late Steve Jobs linked the creative business model of Apple to one group of musicians, who were they?

- a) Wu Tang Clan
- b) Led Zeppelin
- c) Cream
- d) The Beatles

Answers: 1c (however Marx and Engels were the first to describe the term) 2a, 3b, 4c (48 years after), 5a, 6d

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From theory to practice

– From wine to IT –

Christian Guttormsen thinks that TIK/ESST-students should be proud of their knowledge, and confident when entering the job market.

The former TIK-student and founder of Teknovatøren never saw his background from UiO as less relevant for the private sector, rather the other way around. After handing in his master's thesis last year, he landed a trainee position at the IT firm Software Innovation.

– The ESST and TIK-programs provide students with a good basis to contribute in such positions, as they have a holistic, coherent and reflected view on technology. It is not necessary to have technical expertise to work

versity what it was all about. The agenda was also partly personal, as I aimed to promote ESST/TIK-students to the business sector and future employers. To show initiative and to be resourceful is as important as success in your studies. Ambitious employers don't want "yes-people", and know that the "best" must always strive to be better. In order to succeed with this corporate philosophy, companies look out for employees who are prepared to speak their mind and show initiative.

The saying "if it ain't broke, don't

"...one should never accept things as they are, everything can be improved"

for an IT-company. Strategic thinking is important too.

Christian wrote his master thesis on innovation in low tech industries, more precisely the wine industry in Bordeaux¹. Francophile ou Francophone? Pas de tout. But he made his way around the region conducting interviews without any problem. He explains that many of his respondents spoke English well. But I suspect that Christian's way of being open and enthusiastic also played a part. He thinks that one should never accept things as they are, everything can be improved. That is also why he founded "Teknovatøren" while doing his master's degree at the TIK-Centre.

– My motivation was to raise awareness around the TIK-Centre. I came to TIK with a bachelor's degree from political science, a reputable discipline at UiO. I was proud of the TIK-Centre, and wanted to show the rest of the Uni-

fix it" doesn't make sense in the business world then. Companies are constantly on the lookout for new and better methods or products. But can creativity be learnt? Did you become more innovative after studying TIK?

– I think I became more aware of limitations and obstacles to innovation and renewal, and that I can more easily spot conservatism and resistance to change. The worst excuse I know is: "but this is the way we've always done it". Improvement is change. Though change can also be negative of course. However, it's hard to say that TIK has made me more innovative, but maybe a bit more pro-change! And solution oriented.

Trainee

6-months into the trainee-experience, Christian has already explored four different departments of the company, and worked with product manage-

ment, consultancy services and sales. He is backed up by a coach from corporate management, and has a supervisor in each of the departments where he works. After the first year, he will obtain a defined position in the company.

– Being a trainee gives a kick start to the career, I can definitely recommend it. Trainees are respected and recognized in the firm. I feel very lucky to be here, and I get challenged and develop new skills constantly

What drew you towards the IT-world in the first place?

– I came from a very macro-oriented background at political science, and found myself being drawn more towards the micro level and the technology sector. I find dynamic fields interesting, and how technology creates change. And I like to see the results from what I do. I think I will stay in the IT and Software sector, hopefully I can continue to work with innovation and strategy.

Even though Christian got a flying start to his career, he admits that he too has made mistakes.

– But you must not give up, the winners aren't winners because they are the best straight away, but because they never stop trying and learning. After five years at the University you actually know quite a lot, so be proud of that, and also of the openness and adaptability you acquire from being in an inter-disciplinary field at the TIK-Centre.

3 from TIK

Birgitte Lunder Ween
TIK MA Student
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Name:
Marianne
Rist-Larsen
Reime
Program:
TIK
**Graduation
Year:** 2011

1. What did you study before you started at TIK/ESST?

I studied culture and communication. I also have a bachelor degree in dance and pedagogic.

2. What was your thesis about?

'My thesis was a case study of the cluster 'Vannklyngen' in Vestfold. I analyzed how the collaborators successfully established a network through sharing their knowledge

3. What is your current occupation?

Today I am working in the "development department" in The City of Oslo, Agency for Waste Management. We have the responsibility for the development of future solutions and services considering waste.

4. How relevant is TIK/ESST in your current position?

My academic background from TIK is highly relevant in so many ways, and has given me a great base of knowledge to carry out my daily tasks. Development of new technologies and new value chains are some of the things I relate to. Within a few years the waste discourse has shifted away from garbage towards a new technologies, environmental issues, great values and resources. This creates a global network of actors with different interests. Furthermore, I handle everyday bureaucratic challenges such as organizational learning and process innovation.



Name:
Kristoffer
Husøy
Program:
ESST
**Graduation
Year:** 2004

1. What did you study before you started at TIK/ESST?

I studied MSc Engineering Cybernetics, at NTNU

2. What was your thesis about?

My master thesis evaluated if Corporate Social Responsibility initiatives, focusing on UN Global Compact, contribute to an increase in the use of environmentally friendly technologies.

3. What is your current occupation?

I am working as a Research Engineer at ABB Technology & Innovation. I mainly work with user-centred design within the oil and gas industry.

4. How relevant is TIK/ESST in your current position?

The program at TIK was a huge contributory factor of why I got my present job. To have a multidisciplinary background and a deep understanding of the social aspects of technology was seen as highly positive. In user-centred design, the human and social sides of technology play a major role. Methodological approaches from ESST have also come in handy.



Name:
Hans Otto
Haaland
Program:
ESST
**Graduation
Year:** 1998

1. What did you study before you started at TIK/ESST?

I had a degree in Civil Engineering from NTNU. I had also been working 25 years before I took my master at TIK.

2. What was your thesis about?

My thesis was about "enøk-policies". I wanted to find a theoretical framework for the driving forces around public policies. I found the process both incredibly exciting and tiring until I discovered my personal hero, Joseph Gusfield, and his brilliant little book: The Culture of Public Problems: Drinking-Driving and the Symbolic Order. For me it was a "wow-experience" to see that a theory on drunken drivers in the U.S. also was very fitting to use in the analysis of energy efficiency policies in Norway!

3. What is your current occupation?

As I did before I started studying at TIK I still work at "Norges Forskningsråd". They gave me paid leave to get my ESST-degree. Over the last 10 years I have worked with research on green energy, including energy efficiency.

4. How relevant is TIK/ESST in your current position?

To manage our common resources to finance research involves quite complex reasoning about efficiency. My TIK / ESST education gave me a boost in regard to this.

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