Tim Cole / Ossi Urchs

Digital Enlightenment Now!

How the Internet is making us better and smarter and in the process changing just about everything around us!

Forsthaus

Content

Introduction

Living at Internet speed

In “Through the Looking Glass”, Lewis Carrol’s charming little book for children of all ages, the Red Queen takes Alice by the hand and pulls her away, running hard until the little girl is tired and has to stop to catch her breath. To her surprise, she discovers that she is still standing right where she started off. When she complains, the Red Queen replies: “You must come from a slow sort of country! Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!”

Welcome to the land behind the computer screen where we all feel that things are happening much faster than in the real world; so fast we have problems even understanding what is going on. Everything, it seems, is happening at fast forward.

The Internet, we all know, has given us a new way of reckoning time: “Internet Speed”, a time frame some used to define as seven to eight times faster than real life. Which calls “dog’s years” to mind which most of us believe are seven times shorter than a human year.

This is hard for many of us to grasp, and not only the elderly among us. It has more to do with adaptability, flexibility, open-mindedness and willingness to accept change than with mere physical age.

Twitter is a good example. People seem to be divided into two camps when it comes to these tiny snippets of text which someone once described as “Internet telegrams”. On the one hand there are those who think Twitter is just about the stupidest invention ever; the others believe it’s the greatest thing since the telephone.

Twitter allows us to send messages consisting of 140 characters each directly from our PCs or smartphones. You can read these digital memos on Twitter’s website, but since tens of thousands of “tweets” are being sent out every minute no one can hope to keep up. So instead we all get to choose a number of Twitter authors whom we want to “follow”. This means that we only see tweets from people we want to keep an eye on.

You would be surprised how profound and intelligent a message can be that is only 140 characters long! But of course, composing one of these little gems is really hard work, so most of the messages we see on Twitter are boring at best, inane at worst. But very occasionally one will turn up where we say “wow!”

99 percent of all tweets may be pure drivel, but if you catch the single inspired one in a hundred, it’s well worth your time and trouble. At least that’s what fans of Twitter say, and an astonishing number of them are mature adults; members of the “baby boomer” generation rapidly approaching retirement age or already passed their due date.

One of our acquaintances who goes under the Twitter name “@lusches” is in fact the middle-aged owner of a butcher shop who fires off dozens of tweets a day. He describes making his latest batch of bratwurst, tells us how delicious his lamb chops taste or what he is preparing for his next catering job. You would think this guy has his hands full, but

no: somehow he always finds the time to tweet. “It’s become second nature”, he tells us.

I am me and I am here!

Twitter is a heady mixture of self-expression and instant communication. Many of us find this fascinating. “I am me and I am here”: that’s the core message constantly going out through this new conduit, the quintessential “new medium”. In fact, of course, it is just one of thousands of technological innovations that are bringing us closer and closer together and that at the same time are changing our perceptions of reality.

Of course keeping abreast of digital innovation puts pressure on us as individuals. Every attempt to communicate, every e-mail, every short message and every tweet feel like a cry for help: There’s someone out there who desperately wants to get in touch, so please pick up, please send something back, talk to me! And since we are who we are we keep trying to respond to every attempt at establishing contact.

“I’m in a meeting”, someone said recently, but he then went on talking on his mobile for five minutes before hunging up. Heaven knows what the other people in the room were doing in the meanwhile; possibly checking mail or texting.

We all feel it in our bones: our lives are speeding up! We sit chained to our benches rowing to the beat of a drum that is going faster and faster and we can’t even see the drummer who is driving us forward. We are all little Alices, running as fast as we can hoping that we can stay where we are and not fall behind.

The author Ray Kurzweil calls this “accelerated progress”, and he believes we these are still at the very beginning. “The rate of progress of an evolutionary process increases

exponentially over time", he writes in his book "The Age of Spiritual Machines"[1]. If this is true it means that technological progress in the twenty-first century will be equivalent to the progress made by mankind during the last 200 centuries.

But we have a slight problem here: Humans live their lives linearly. Besides, we all know that exponential models have a tendency to collapse. They're all just Ponzi schemes anyway, aren't they? Sometimes the curves on the graphs just keep going up and up as if the laws of gravity have been suspended, but of course they aren't really. Just take the "Dotcom Bubble" that burst in 2001, bringing all our dreams of instant wealth crashing down around our heads, disappearing down the rabbit hole just like little Alice in "Wonderland".

Which brings us, in a roundabout way, back to the story of Alice in the land behind the looking glass and the question of how fast we need to run if we don't want to fall hopelessly behind. Never has Lewis Carrol's cute little story seemed as crucial to understanding the world as it is today; at time when social and psychological change is happening at Internet speed.

Digitalization moves markets

Consider the single biggest "megatrend" of the past two decades, namely digitalization. Everything that can be digitized will be digitized, as we will explain later in this book. The reason is simple: digitalization pushes costs down. So digitalization is rapidly becoming a huge market factor; one that directly impacts both our economies and our lives.

All you need to do is compare pre-digital products with their digital successors and see how prices for digital

merchandise have fallen. A couple of decades ago a vinyl long-playing record cost about $20. Twenty years later, a “semi-digital” CD still costs a pretty packet, possibly $15. But if you are actually willing to pay for digital music you can download the same content directly from a website and it will only cost you a few cents, if anything at all.

Digital products are cheaper because the variable costs of distribution are potentially zero. This affects not only packaging and logistics, but also warehousing and salesrooms, just to name a few of the more important economic factors. That’s why Amazon can challenge classical “stationary” retailers today not only in the digital marketspace, but with analog products, too. After all, their entire business model is based on digitalization.

The price decay brought about by digitalization inevitably leads to more and harsher competition. The only way vendors (including online shops, but “oldworld” manufacturers as well) can hope to cope is by establishing more and more direct contact with their customers, cutting out the middlemen through the increasing use of network technology.

Digitalization doesn’t just mean price degradation: it also causes breathtaking acceleration in all areas of technology, including the media. From Gutenberg’s “invention” of the printing press (actually, the Chinese were using movable type a thousand years ago) to the rise of mass-circulation newspapers in the early 19th century at least 350 years had to pass. Tim Berners-Lee’s idea of a ”World Wide Web” took only five years from its first inception at the CERN laboratory in Geneva to becoming a revolutionary force.

The concept developed by “TBL” (as Internet aficionados call him) was originally meant to connect scientists at CERN and the results of their research with their peers around the world. It was based on longestablished technologies such as

the “HyperCard” software that enabled computers to create digital versions of simple, everyday filing cards that could be connected to each other by “links”.

The stroke of genius here is that on the Web, cards stored on different computers in different parts of the world can be linked together too. In fact, the computers at CERN were already connected through the socalled TCP/IP protocol. All TBL had to do was write a new software “stack” to stick on top of the existing protocols. Thus, “HTML” was born: the Hypertext Markup Language which is still spoken by every Internet device today. And this only took him a couple of days.

The dramatic change brought about by the development of the Web and other, similar software projects was based on the principle of open and easily accessible standards. This strategy of open standard development not only sped up software development but also the developer a big boost in efficiency. By contrast, traditional media are closed and restricted both in quantative term (the speed in which they can be developed and deployed) and qualitatively (the strategy’s “openness”, e.g. its ability to rapidly integrate new technologies and applications).

This is exactly the strategy Tim Berners-Lee chose when he combined the open standards and protocols developed for the Internet with his own unique contributions. His brilliant idea was to use HTTP (“Hyper Text Transfer Protocol”) to allow every single user to query a (web) server which in turn would send back an “answer” in the form of digital data using the same protocol. This changed the world.

To display these data packets on the client’s computer he used standards called “markup languages” which he developed further into HTML. Thus he was able to present a document or image as a digital “page”, a metaphor

borrowed from an earlier age when books and magazines still had paper pages.

This allowed TBL to develop all the important elements of his system for transmitting and displaying digital information through the Web in record time. And because it was based on open standards, other scientists and software programmers could improve and expand the system any way they wanted.

Today, of course, we send and receive not only documents and images, but voice and video files, and we do it in “real time”. Developers can design new ways of displaying data, technicians and programmers can dream up new functions to make Web content more useful or more fun for the user. The Web has proven to be endlessly adaptable and flexible – and therefore superior to any other mass medium in history.

The acceleration caused by digitalization and worldwide networks have produced (or at least fostered) so-called “disruptive” developments in technology; advances that are literally able to dislocate or call in question entire industries and giant corporations as well as their business models.

Take the manufacturers of navigation devices, for example. A few years ago these companies lived in a cozy little niche where they produced relatively simple gadgets, stuffed them with sophisticated software and sold them at a fantastic markup to a market that seemed to be growing steadily. Along came Google with its own maps and software for smartphones and tablets using their proprietary “Android” operating system, and overnight the flourishing navigation device business was almost wiped out, leading Google’s CEO Eric Schmidt to famously describe navigation aids as a “zero-billion dollar business”.

Networking always leads to change

The second gigantic trend today is directly connected with digitalization. Networking on a global scale is changing the world around us. It turns out that change is inevitable in a networked world. It not only affects the systems that are being connected, but the business processes that are run through them as well, along with the people who use them to work or communicate. Everything has to follow the rules of Digital Transformation, about which much more later.

Just as digitalization leads to acceleration, networking leads to change. Both are simply parts of their natures. A good example was provided by Vinton Cerf, the legendary “father of the Internet” and inventor of the TCP/IP protocol which is used all over the Internet today. Vinton was our guest in a TV talk show we both hosted for the German *cnn* affiliate, *ntv.* What would happen, Vinton asked the live audience, if you were to connect an Internet icebox with a pair of Internet-enabled bathroom scales? We don’t really know, he said – except that something will change. Maybe we will come home and find our refrigerator full of diet food, or maybe we won't be able to open the icebox door. Or maybe something completely different will happen, but we can be pretty sure something will.

Networking is changing the way companies do business. However, it isn’t always immediately apparent where this change is going on, what the result will be and how it affects the bottom line. The greatest challenge managers face in a digitalized and networked business world is discovering exactly how these trends are impacting their enterprise and its business environment, and then reacting quickly and intelligently. Those who are best at adapting to Digital Transformation will be the winners, and the race is to the swift.

Digitalization and networking thus prove to be two sides of the same coin; complementary forces that operate at

Internet speed. Not only is the development of technology touched by this, but our entire way of life along with our businesses and our personal wellbeing. Welcome to the Digital World!

---

[1] Kurzweil, Ray, The Age of Spiritual Machines (Penguin Books) 2000

Chapter 1

Why We Need Digital Enlightment

Why We Need Digital Enlightment

“The incredible expansion of knowledge in our times and the rise of new sciences make it hard for us to discover the truth and put it to use”.

Lawrence Durell: Justine, 1957

It has become fashionable to blame the Internet and digital networks for all the ills that face mankind. Cultural pessimists are having a heyday, like the American “computer-artist” Jaron Lanier who gloomily sums up 20-odd years of Internet development with the words: "how we have screwed things up”. In Germany Frank Schirrmacher, the publisher of the prestigious newspaper “Frankfurter Allgemeine Zeitung”, declared a “cognitive crisis” shortly before he died in 2014. The psychologist and bestselling author Manfred Spitzer diagnosed a kind of collective “digital dementia” among heavy Internet users and believes that "the Internet is making us dumb", a sentiment echoed by Harvard Business Review writer Nick Carr who asks, “Is Google making us stupid?”

Cultural pessimists have always been around. Socrates, Plato wrote, bemoaned the introduction of writing which ancient Greeks brought in from Egypt, since it meant that people no longer had to memorize long texts. He worried that this would “plant oblivion in our souls”. In 17th century Britain, the philosopher Robert Burton, author of *The Anatomy of Melancholy,* complained about the flood of books caused by the recent invention of the printing press;

a kind an analog version of “information overload” which cultural pessimists complain about today.

Most of these naysayers see the Information Society strictly in simple mechanical terms. All you have to do, they say, is inundate people with information and pretty soon they'll stop thinking for themselves, stumbling instead through life as though under drugs or remote control. These “critics” of the Internet seem unable to believe that human beings already have (or are in the process of developing) the ability to separate clearly between relevant and irrelevant information. For them, mankind are like cattle contentedly chewing their cuds of information, prodded along by media-savvy herdsman like themselves towards an uncertain future which is beyond their power to control or shape.

What the teapot teaches us

One of the authors of this book once had the honor of being invited into the former home of Konosuke Matsushita, the deceased founder of Panasonic. The villa, which is now a private museum, is located on the outskirts of Osaka, where the Matsushita Corporation has its headquarters. There he attended a traditional tea ceremony during which a tiny lady in a formal green kimono poured tea into his cup with an incomparable grace of movement. Intrigued, he later went out and bought just the kind of high-spouted Japanese teapot she used, but back home, whenever he tried to pour from it, the tea spilled out and formed a puddle on the table. Obviously, he lacked what the Japanese call “wa”; a kind of inner peace and balance that can inhabit not only people but objects and even places, such as the villa of Konosuke Matsushita.

One day, though, the author found that somehow he had mysteriously and unconsciously mastered the art of expertly

pouring tea from a Japanese teapot. At least he no longer spilled most of it. Which leads to a fascinating question: Had he, the human being, learned over time to pour, or had the teapot in fact taught him how?

This is hardly a trivial question in an age where “digital overload” and rewired brains are a popular topic of discussion. The really important question is about human self-empowerment: Are we the masters of our computers or their slaves? Does Google tell us what to think? Is multitasking part of mankind’s adjustment to a rapidly changing communications environment, or can it be described as a form of bodily injury being inflicted on am unwary populace, as Frank Schirrmacher once wrote? Let’s put it another way: Are we being driven, or are we the drivers; free agents and members of a species that is especially adept at modifying itself as a way to adapt to changes in the surroundings?

Norbert Bolz, a good friend of both of us and a professor at the Berlin Technical University, who iswidely considered the leading postmodern philosopher of media science in Germany, gave a convincing answer which he recently posted on the blog *czyslansky.net.* It goes like this:

> *“More and more of us despair of being able to manage their own attention spans. Actually, it’s all about a quite simple question namely: What is really important? In order to reach an answer to this question we need to reduce complexity. In our search for orientation media, technologies act as filters, but in the end it is all about human judgment. Does this mean that digital reading makes our brains turn digital? Behind that kind of question lurks the latest form of cultural pessimism.”*

This wholesale rejection of things new like the Internet or digitalization isn’t especially unique in the history of

thinking about thinking, and it isn't even very original, as the examples we just quoted show. Still, this brand of technical pessimism does manage to ring a bell again and again for a large number of people, especially in times of fundamental social change.

This book does not ask whether the human brain operates “digitally” or not, although an increasing number of cognitive scientists and neurologists do believe that this is so. Instead, we propose to refute the generations of cultural pessimists, from Socrates to Schirrmacher, and in the process contribute to a necessary discussion about what we think of as “Digital Enlightenment”; namely a new intellectual effort to describe the basic requirements for transforming humans and humanity into what we will call the “digital society”.

Understanding the new

The great American thinker and author Robert Anton Wilson divided humans into “neophobes" − people for whom the new and unknown is a cause for angst and doubt − and “neophiles”: people who are eager at all times to explore the new (a fancy way of describing nerds).

While this method of defining mankind may be both helpful and amusing, it doesn’t really increase our understanding of how digitalization and digital networks are causing radical change, much less whether these forces are either productive or useful. Our aim in this book is to show that the “signs of the times” are truly novel and unique, and that instead of assigning values based on old and tired concepts we need to develop a new way of thinking.

Not that we aren’t all constantly modifying our brains as we go along; something which worries the cultural pessimists

no end. Wilson calls this “metaprogramming the human bio-computer”.

“Every time we learn a new fact or skill we are actually rewiring our brains”, writes Steven Pinker, a famous Harvard psychiatry professor and bestselling author, in an essay for the New York Times. But, he continues, “neuronal plasticity does not mean that our brains are lumps of clay that are being slapped into new shapes by every new experience we have.” In other words: Experience doesn’t reduce our brain’s ability to process information. Quite the opposite: it enhances that capability!

Which brings us back to the question of digital overkload. The notion that our brains deteriorate or are being crippled by exposure to too much information and communication is essentially misanthropic. Our brains, like the rest of us, don’t regress, they adapt, adding new capabilities through evolutionary adaptation. This has been going on for as long a mankind has existed and will continue for as long as we humans are around.

The story of the teapot illustrates this very neatly. Of course the teapot had an effect on its “user”. It taught him a new skill, presumably by improving his handeye coordination, and it helped him to pour from it with the necessary “wa”. In the process, hundreds or possible thousands of synapses in his brain were rewired or reprogrammed. So yes, he was the object of an invasion of his personality. But he was definitely not the unwitting victim; in fact he was an active participant in the process.

With this book and the theses it contains we hope to initiate a new school of thought and kick start a social discussion in the spirit of the classical European Enlightenment of the 18th and 19th centuries. Our aim is to ensure that we will collectively be able to approach the future with a new mindset, in the process discovering how we can put the new

to its best possible use, or else determining that it deserves to be thrown onto the trash heap of history instead.

10 Theses on Digital Enlightenment

> ***Thesis 1: Everything that can be digitalized will be digitalized. Everything that can be connected will be. And that changes everything!***

The massive trend towards digitalization, as shown in our introduction, has economic root that reach back to something called, rather confusingly, “Moore’s Law”. What Gordon E. Moore, one of the founders of Intel Corporation, actually described back in 1965 was less a law than a hypothesis, albeit one that has remained valid to this day.

Moore’s “law” simply describes the tendency of digital gadgets to double their capacity approximately every two years. This ability to sustain growth that is exponential (a phenomenon that we will hear more about later) also leads to the halving of costs for digital computing power approximately every two years. More than any other factor such as the elimination of variable costs, this causes priced for digital products to decline rapidly. This fall not only effects microprocessors and digital storage media, but even everyday devices such as refrigerators and washing machines, TV sets and telephones, since they are all loaded with microchips nowadays. Indirectly this also influences the logistical distribution systems and other services these markets depend upon, since they too are increasingly being managed digitally.

As always when markets suffer a massive fall in prices vendors try to find ways to “cut out the middlemen” by reaching out directly to their potential customers. Global

connectivity is the perfect way for them to interact with consumers around the world, so more and more manufacturers, dealers, markets and customers are “going digital” to a degree no one could have imagined in their wildest dreams just a few years back. Together, the ongoing digitalization of the economy and the global networks connecting markets and buyers have fundamentally changed the way the markets – and societies – work.

Thesis 2: Digitalization and networking are not like the common cold – they will never go away!

Digitalization and networking are radically changing the way we live and work, how we educate and entertain ourselves, how we makes purchases and do business, and most especially how we communicate with others. Literally every facet of human existence and most human lives are undergoing fundamental upheaval. We therefore must expect this development to continue far into the foreseeable future.

Thesis 3: The digital world is increasingly invading and becoming part of the real world. As a result, both are changing at breathtaking speed and at an unprecedented rate.

Developments in technology and business are forcing change on society and on our personal lives, and we can’t expect things to ever return to “normal“ again. After all, nobody can rewrite history. We are currently experiencing a totally new and remarkable phenomenon, namely the coming together of the digital and the physical worlds which

used to be strictly separated. In fact, it is getting more and more difficult to tell the two apart.

Navigation aids were once simply used to show us the way from A to B. As the digital world encroaches on the physical, we now expect our gadgets to use digital information to show us the “right” way. This can be for instance the fastest, or possibly the most scenic route, depending on our individual circumstances. “Augmented Reality” does not simply mean “enriching”. It changes our perception and our understanding of reality itself.

What we think of as “real” will increasingly reflect a mixture of digital and physical perceptions and experiences, displayed on smartphones or a tablet computers and enhanced by new, “wearable” devices such as Google’s “Glass” or the Apple Watch. Thus we will become more and more accustomed to navigating something best described as the digital “infosphere” which will surround us just like the physical atmosphere of our home planet.

But don’t worry: This won’t turn us all into zombies marching powerlessly to the drumbeat of our digital masters. Quite the opposite, in fact. But we must develop our abilities to distinguish between relevant and irrelevant information, in effect filtering out the noise and tuning into those sources of information that will enrich our lives and help us become masters of our own destinies. And should some information turn out to distract us, then we need to learn how to be strong and smart enough to simply switch it off.

But being disconnecting from the digital infosphere will be like watching an old black and white movie today. Yes, we may even relish the experience as a form of ascetical and esthetical self-denial. By doing so, we will not only lose a (multi)medial dimension but possibly even heighten our concentration on other aspects of perceived reality. But we

will always be aware that by simply pressing a button we can return to a richer and more satisfying dimension – one in which we will all feel more truly at home.

Thesis 4: Digitalization and networking create new technical, social, cultural and scientific conditions. In order to appreciate these changes fully we first need to categorize them before we can begin to fully describe and understand their new qualities.

We are already at the point where our perceptions of reality have changed in many ways, as have the conditions under which we experience this new reality. Is a computer game less real than a romp through the woods? Is a love affair on Facebook less exciting than a flirt at the hotel bar? Perhaps the realization that digital experiences are based on binary code influences our assumptions; after all, if the only two possible digital conditions are “on” and “off”, then maybe “real” and “unreal” are also just two sides of the same coin. In fact many of us have already learned that digital information can help us to understand the world around us in a more granular and modular way than ever before; without, it is to be hoped, losing sight of their basic unity in the sense of their inherent interconnectedness.

Digitalization and networking obviously influence the way we experience, understand and handle reality. But in fact the conditions under which we do this is undergoing continual change, too. The pace is so rapid and dynamic, our own experience of it so mind shaking, that we are in danger of forgetting to digest what is going around us on both intellectually and conceptually. The wealth of new developments and experiences in technology, society, culture or science demand and deserve a new way of