Blog 2 februari 2015

This blog is inspired by a book: The Innovators by Walter Isaacson. It has some 600 pages on the invention of computers and the internet. I am not going to do a summary here, that is impossible. There are so many people and stories involved in the making of the digital revolution, it would not work. But reading the book is fascinating, especially from the angle of art and innovation.

There are three things that I want to share with you:

Innovation seen as the job of a lone genius is no longer tenable
Innovation is a mixture of the scientific approach, the creativity of art and finding use for new technology
The digital revolution came about through the support of the American Department of Defense for research, the 'sharing' and 'everything for free' of the hippie generation and the commercialisation of university entrepeneurs.
Ad 1. Innovation is cooperation

If you read about the string of innovations that led to our handheld computers of today (smartphones/tablets, etc) you see each time a combination of people and their skills which are necessary to complete innovation: it is the combination of inventing, making and designing usability. There have been lone geniuses, but they became footnotes in history, as Isaacson explains in his book. They might have been geniuses in inventing the idea and/or a half-way prototype but they lacked the skill or the mentality to engage those people you need to transform an invention into an innovation. And did you notice that many of these innovators worked in pairs? Steve Jobs and Steve Wozniak within Apple, Bill Gates and Paul Allen of MicroSoft, and Larry Page and Sergey Brin for Google? They all supplemented each other in the beginning with their ideas and skills until one mode of working became dominant and only one person of these pairs became CEO.

And if you read about the enormous number of people who contributed to the digital revolution you realise that they all start with what has done before and build upon it. And some come with almost the same idea at the same time. It depends on the team of people around them who got furthest.

So that is how innovation works: bulding on what exists, developing new ideas, sharing and testing them with others, redefine and develop, start prototyping and building which leads to new questions and alterations, then testing to see if it works and then making it into a product or service that has to appeal to a much bigger audience. Because only then it is an innovation: if it works for a lot of people. It is absolutely teamwork.

Ad 2. Innovation as a mixture of science, art and technology

Most of the ideas that sparked the digital revolution find their origins in universities. That is the place for fundamental research into the workings of transistors and chips, the place for developing new ideas. But especially the place where new ideas are shared, discussed, ripped apart (sorry: constructively criticised), rebuilt and ameliorated. The idea is sharing your ideas to make them better. If there is anly level of trust it will work. And of course there have been fights on the ownership of inventions and thus not disclosing experimental data, and there are those entrepeneurial universities like Stanford where they want to build companies out of ideas, so they keep things secret as much as possible. That happened f.e. with Google, which developed at Stanford University where Larry Page and Sergey Brin postponed publishing their results on the search algorithms as long as possible to prevent others from doing the same. But all in all, science builds on transparency of data and open discussions.

Where does the art come in? Isaacson says that those who were really creative where the people who combined art and science, who believed that beauty mattered. It were those that visited museums, listened to music, who believe in the humanities, that were the most creative ones. Like Steve Jobs. The arts are able to take them into another sphere that helps them to process the difficulties they are dealing with.

Techonology is the big driving force behind all innovations of the digital revolution. It is a necessary but not sufficient condition. Because technology itself is not enough. Fair enough, the first digital products were made by those who understood the mechanics of what is going on inside a chip and what codes go into software. But nowadays that is no longer the essence. It is about making the connection between technology and the needs of people. It is hardware, software and the interface

between those and the person that define succesful innovation.

Ad 3. The mixture of Defense, hippies and entrepeneurs

Internet as we know now, would not have been there if the first person to write the code of a browser had not decided it should be freely available. Also the next version which included the possibility of showing pictures was for free. They were developed at universities and the developers saw these as public domain, so their results were also put in the public domain to promote exchange and cooperation.

From the beginning of the digital revolution a big part of it was linked to the hippie movement of the sixties and its aftermath. Personal computers would free people from supervision and authority. That was also the the idea behind bulletin boards and online forums before: everybody was free to express their ideas, ask their questions, offer each other help, without interference of any authority, without interference of the money economy. It is horizontal communication.

But computers and internet would never have been there without massive government subsidies to develop them. The American government had a policy of stimulating research in this field. Also the Department of Defense developed an interest from WorldWar2 on to use any device that could calculate the trajectory of rockets and other weapons. They had a special office for funding scientific research at universities. So in the end it is the government that made the digital revolution financially possible.

And there are the MicroSofts, Google and many before them that developed business out of university inventions. They came second.

So the digital revolution is a mixture of public subsidy, public domain with free access and hard-selling entrepeneurs. Without that mixture it would not have been what we have now.

The art of innovation

So what do we have here?

Innovation is definitely teamwork, genius is required, but absolutely not sufficient.

It is the mixture of science, art and technology that drives the most succesful ones. And it does not help to only look for entrepeneurs: we need the public sphere, with and without government to start innovation and to make it stick.
And if you really want to know how the digital revolution came about, read the book itself: The innovators, by Walter Isaacson. It is inspiring and fascinating.

PS Did you know that the first idea of a computer was concieved by a woman, Ada Lovelace, in 1843? She loved poetry and mathematics and she used her imagination to look anew at science. She imagined an Analytical Machne that could produce operations not only with numbers, but also with any set of symbols that relate to each other. She even described how to code these operations. So Ada Lovelace was the first to make the step from the idea of a calculator to the idea of what a computer could do. Amazing!