Enlightware – Social impact

Empowering humans at the age of AI

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We describe our social mission through the *impact chain model*. We first describe the problem, which is what is wrong with the current state of the world. We then express our vision of how the world would be if this problem would be solved. Next, we describe the solution, which is how to globally address the problem to reach the vision. Finally, we describe our mission, which is what we are doing to contribute to the solution.

Problem

The problem is that digital products, when aiming at simplification and user retention, can lead to personal impoverishment.

Today, a large fraction of mainstream digital products are built on mechanisms that are harmful at scale[1]:

- The **short-term, external rewards** provided by liking and other simple gamification strategies create addiction and make users **loose intrinsic motivation** and the ability to invest into **long-term rewards**.
- The pervasiveness of **superficial online interactions isolate people** by reducing their capability for deep inter-personal relationships in the real world.
- **Algorithms that filter information** based on their assumption of what the user would want to see reinforce prior beliefs and narrow the user's horizon, inducing **intellectual isolation**.
- **AI that guesses the desires** of its users while limiting their control ultimately links machine learning to **human de-learning**.

Combined together, these effects reduce the capability of people to think creatively and critically. The consequence is an impoverishing of citizen and therefore a threat to personal happiness and to democracy.

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[1]For example, a journal paper in psychology by Ethan Kross et al., Facebook Use Predicts Declines in Subjective Well-Being in Young Adults, Public Library of Science, 2013, and the medical paper, Association of Facebook Use With Compromised Well-Being: A Longitudinal Study by Shakya HB et al., and Association between Social Media Use and Depression among U.S. Young Adults by Lin LY et al. clearly show that Facebook and other social media makes young adults miserable and threatens their mental health and well-being. Similarly, an experiment by The Happiness Research Institute shows that reducing the use of Facebook increases happiness (The Facebook Experiment, 2015). More generally, an OECD study (Students, Computers and Learning, OECD Publishing, 2015) shows that heavy use of modern media has negative effects on learning.

Vision

Our vision is a world in which autonomous citizens enjoy leveraging digital technology to express their creativity and strengthen their independence.

In that world, people invest part of the time gained through more automation to extend their horizon. They understand the underlying economics of "free" content, and choose their products with care in full consciousness of how they affect their desire, their life and others. They gain happiness by leveraging the power of digital technology to grow as free autonomous persons, develop and express their creativity.

Solution

The solution is to empower people with the skills, and help them find their natural desire, to become autonomous, creative and collaborative in the digital world.

For our vision to come true, most citizens must become empowered. They must acquire and steadily practice a set of crucial skills and learn specific knowledge, which is only possible given suitable societal conditions.

Societal conditions. Citizen must be protected, motivated and supported. While protection is mostly a political question, as a company we can contribute to motivation and support.

- **Protection.** Empowered citizen pose a threat to several entities such as oppressive social structures, non-democratic ideologies, and abusive businesses. Therefore, the nurturing of empowering capabilities needs protection, especially for children, for example from aggressive advertisement and entertainment building on addiction. To some extent, these protections are already in place and adaptation to the new threats are on their way.
- **Motivation and support.** Modern digital technology offers an unprecedented potential to empower and educate. It can be realised by designing personalised and adaptive tools, media, and experience, which are examples of enlightware (see *The idea of enlightware* on page 3). To be effective for our vision, these must be broadly and easily accessible.

Crucial skills. The set of crucial skills encompasses personal skills, such as creativity, critical thinking, autonomous decision making, and self reflection. It also includes social skills, such as engaging in collaboration, maintaining deep relationships, and dealing with criticism. It is crucial that citizen have the habit of applying these skills to everyday life. The nurturing of these skills can be facilitated using enlightware.

Specific knowledge. The skills from above complement the knowledge gained from a traditional school and cultural education and amplify its usefulness. Typical deficits of this traditional education, such as the lack of applicable knowledge and well-trained intuition in mathematics[2], statistics[3], computer science, technology, economy, ecology and human psychology, can also be supplemented through suitable enlightware.

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[2]See for example, Evans, J. (2000). Adults' Mathematical Thinking and Emotions. London: Routledge

[3]Innumeracy : mathematical illiteracy and its consequences. New York: Hill and Wang, or Huff, Darrell (1993). How to lie with statistics. New York: Norton

Mission

We empower people by developing digital products that promote autonomy, creativity and collaboration.

In the first step, we will develop accessible tools to aid people in mastering machines and in nurturing their skills and creativity. These tools will allow beginners to intuitively make simple programs, and integrate intelligent tutoring to guide people in a personalised way along the road of mastery to ultimately enable them to program networks of various machines. Our tools will allow collaborative work, foster the creativity of the programmer and adapt to her skills and devices used. We will achieve such a flexibility by leveraging our latest research in artificial intelligence, augmented reality, internet of things and educational sciences.

Evaluation

As our programming tools will be distributed digitally, we will be able to evaluate our social impact by measuring their usage statistics, including metrics of creativity and complexity for the user-created programs. We will also seek external evaluation, either through a third-party organisation or by collaborating with scientists. Additionally, we will add specific features to the software to measure its social impact. Based on the results of these evaluations, we will adapt our strategy.

The idea of enlightware

Modern digital technology offers immense possibilities for providing accessible and personalised lessons, training and experience. These possibilities can be leveraged to design products that empower and educate, and nurture the development of independence and creativity. We call these products enlightware. We focus on enlightware that builds on a beautiful key feature of human psychology, called *intrinsic motivation*[a]. Given the right conditions, the curious human nature provides vast amounts of intrinsic motivation to fuel thinking about, questioning, and understanding the world. For example, it is intrinsic motivation[b] that enabled us as children to master body-control, basic world-understanding, native language, self-awareness and social skills. And we accomplish this impressive amount of learning in only a few years. We are convinced that, given the right tools and support, intrinsic motivation can carry this learning process much further. It can extend it to include the skills that are crucial for an autonomous and collaborative life that brings joy, pleasure and reassurance. In strong contrast, in the current society, *extrinsic* motivation – also called *control* motivation – is used to make people comply with regulation, taboos, threats and competition, usually at the cost of happiness, health and productivity.

[a]An investigation of the unique, synergistic and balanced relationships between basic psychological needs and intrinsic motivation, Dysvik et al., Journal of Applied Psychology, 2017

[b]Intrinsic motivation, curiosity and learning: theory and applications in educational technologies, Oudeyer et al., Progress in brain research, 2015