

# The BINC Manifesto:

## Technology driven societal change, science policy & stakeholder engagement

Steen Rasmussen<sup>1 2</sup>

<sup>1</sup>Center for Fundamental Living Technology (FLinT), University of Southern Denmark

<sup>2</sup>Santa Fe Institute, New Mexico, USA

steen@sdu.dk

### Abstract

Throughout history, whenever new technologies have emerged that change our means of production and ability to communicate they have tended to transform society. Spearheaded by digitization, followed by emerging living and intelligent technologies, our world is currently being transformed into something we have difficulty imagining. The transition is likely similar in scale to what we experienced moving from an agriculturally based society to the industrial society, although it will occur at a much faster pace. I present key qualities of our emerging societal transition, discuss underpinning scientific issues, and propose a way the scientific community could engage. Finally, I document how part the European Commission, the Danish Parliament and Press as well as interested stakeholders engage (or not) in the process of creating a “brave new world”.

### The postindustrial world

Our political institutions, the rule of law, human rights, the banking system, our education system – and even capitalism as we know it – are mainly a products of the industrial age. Using narratives from the industrial age we have learned to navigate the industrial economy as individuals, and as societies we can exert some control to define its shape and limits. But what comes next, in a postindustrial world?<sup>1</sup> Even in the past decade, digital products and services, the internet and mobile technology have changed our lives. This is mainly the result of accumulated advances over the past 50 years and there is much more to come. For example, recent studies (Frey and Osborne, 2013)<sup>2</sup> indicate that digitization is likely to replace about half of known job functions within 20 years.

Thanks to automation, only a small percentage of the population will be needed to produce and distribute what everybody needs. For example, today less than 3% of the Danish population is engaged in agriculture and fishery<sup>3</sup>, down from almost everybody some 150 years ago – and these 3% can feed several countries the size of Denmark. As technology becomes more life-like (Rasmussen et al., 2011)<sup>4</sup> more components can be recycled, in the same way that materials are within biological systems. With the development of personal fabricators (Girshenfeld, 2003<sup>5</sup> and Packard et al., 2010<sup>5</sup>) – super-advanced 3D-printers – it’s likely citizens will be able to design, share, manufacture and recycle pretty much everything they need locally.

These new technologies are likely to lead to big changes in society, and these could be as drastic as the differences between the Stone Age and the Bronze Age, or between the agricultural society and the scientific age of industry. Inevitably, such a

shift leads to changes in economic and political systems, national sovereignty, balances of power, the environment, the human condition, even religion. But this time the changes will not take place over hundreds of years, but within a generation or so. These changes hold promises for amazing possibilities as well as grand challenges.

### The BINC Manifesto

Because of these ongoing changes, part of the scientific community is in the process of assembling a so-called BINC Manifesto<sup>7</sup> named after the key converging technologies that shape the ongoing changes: the bio-, info-, nano- and cogno (BINC) technologies. The BINC Manifesto calls scientists and interested stakeholders to action to identify and document observables, trends, mechanisms and key issues concerning the emerging mainly technology driven societal transition. (1) The primary mission is to find out how things are (the facts). (2) Secondary - and separately from (1) - we as citizens and scientists may propose possible scenarios for how to develop our new postindustrial societies.

The Manifesto is organized around five cross-cutting issues, each formulated as a list of scientific conjectures that can be falsified or verified:

#### **A) How is the digital economy different from the industrial?**

A1) Digital products and services represent an increasing part of the value creation.

A2) Only the first digital unit requires capital, land and labor, the following copies are practically free of cost. This means profit without production and less need for employees. Further, digital products have no transportation costs, they are global from the moment they are released, so the best products win and take all: there is no market for the second best. However, the threshold is also lower to enter (a fair) market.

A3) The marginal costs of material production approach zero (0) due to automation.

A4) With Personal Fabrication pretty much anything can be manufactured locally (open source software and hardware).

A5) An increasing part of the economy is based on derivative trading (speculation).

A6) Established economic theories are inadequate to address the current reality.

#### **B) Citizens in cyberspace and citizens as biological creatures**

B1) Information and communication technology (ICT) design and infrastructure implementation cements power structures (central or decentralized).

B2) Currently, ICT is mostly implemented with a resulting greater concentration of power (government, communication, banking, platforms for social media).

B3) Big business, governments and international intelligence use the digital infrastructure to access private data from the citizens, which means loss of freedom and power for the citizens.

B4) Massive control of the information flows and the associated perception enables modeling of individuals' decision processes and value chains, which in part determines what it means to be human.

B5) Synthetic biology (SB) increasingly makes it possible to alter our genetic makeup. These technologies in a very direct manner have the potential to impact what it means to be human.

B6) ICT and SB generate a significantly more complex world.

### ***C) In the developed economies the middle class and democracy is eroding***

C1) There is greater return on investment in speculation than in production, you become more wealthy from being rich than from working.

C2) Information, humans and money can travel freely across national borders. On the individual level, everybody increasingly participates in one global job market.

C3) Businesses move to places where they don't need to pay taxes. Nation states compete among each other to provide the lowest taxes.

C4) The middle class is increasingly challenged to provide the tax revenue needed to secure good nation state governance.

C5) Economic elites are taking over the political power and democracy is deteriorating. Economic and hence political power gets concentrated on still fewer hands.

C6) Fair markets are manipulated by search engine algorithms when they have monopoly.

C7) Elections can be manipulated by search engine algorithms.

### ***D) The global interconnectedness also means global interdependency and that no nation state can take care of their citizens alone.***

D1) We have entered the Anthropocene. There is only one environment, e.g. local consumption generates global warming and human impact is causing a mass extinction of species.

D2) The converging bio-, info-, nano- and cogno- (BINC) technologies, which are developed everywhere, will transform the world faster than ever before into something we have difficulty imagining as the pace of these new inventions increases exponentially.

D3) The global population continues to grow and is predicted to reach 9 billion around 2050, accompanied by a wide range of migration issues and cultural clashes. Also the emergence of, and migration to, mega-cities have created new local-global communities.

D4) It becomes increasingly challenging to align radically different economic, cultural and governance structures, i.e. traditional Arabic, industrial Russian and digitized Scandinavian as individuals from previously distant cultures are now mixing.

D5) There are no global institutions in place that can handle this transformation, nor do we have the necessary legal frameworks and theories.

### ***E) The need for new narratives.***

E1) The political spectrum of left and right used to be about capital interests. Left and Right emerged from the industrial society and the struggle for power between workers and capital. Today, increasingly the largest corporations don't own production capital in the traditional sense (e.g. Google, Facebook, AirB&B, Uber, Amazon) and our pensions depends on the performance of the stock market. Today, in the West, from left to right there is consensus about the open society, liberal democracy, market economy, and some measure of public welfare (disagreement on level of taxation and social benefits), but overall, systemic agreement about the model. As a result, voters are uniting along different lines e.g.: globalization; defense; cyberspace privacy; sustainability; new public management; balance of cities and countryside; financial sector regulation.

E2) Postmodern deconstruction, globalization and the above mentioned erosion previous narratives are undermining our grand narratives about reality, which used to keep societies together, i.e. religion, nation and class - and to some extent also science. As they lose their explanatory power, some are re-discovered in totalitarian form.

E3) The only grand narrative that has survived is "the free market", which provides consumer goods efficiently but is incapable of solving any of the problems stated above. In fact, it fuels them.

## **Science, policy and stakeholder engagement**

Experiences from national and international science and technology advisor activities regarding these issues are documented through interviews (film), text and policy initiatives. Further, experiences are discussed regarding stakeholder and citizen engagement. Finally, as an example, it is documented and discussed how and why part of the Danish Parliament and the Press regrettably have detached themselves from part of reality and now live in a post-factual subculture<sup>7</sup> with respect to the impending societal impact of technology.

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