

France Stratégie's series of debates: "Technological Transformations, Social Transformations"

The Digital Revolution – An Industrial Revolution?

Inaugural debate, 13 October 2015

Richard Venturi*

Over the past two decades the digital revolution has wrought fundamental and wide-reaching changes in the way people communicate and do business the world over.

The much-touted Internet of Things (IoT) exemplifies the magnitude of the potential impact on society: according to France Stratégie, wireless technology will connect some 80 billion objects by 2020.

Exponential advances in digital technology underpin progress made in leaps and bounds in fields such as artificial intelligence, electronics and medicine.

These technological transformations have led to innovations that have often become hot-button issues and have sparked social change. At the same time, it is also true that previous shifts in social mores and values created a fertile terrain on which to sow the ideas that led to these very technology breakthroughs.

The societal shift brought on by digital technology is often referred to as **the third industrial revolution**. This is in reference to the first, which began in England in the 18th century with the steam engine and mechanization of the textile industry, and the second, which saw the advent of electricity and the age of mass production in the 20th century.

With this in mind, France Stratégie has organized a series of monthly debates entitled "Technological Transformations, Social Transformations" to explore the scope of the change taking place and its impact on both society and the economy.

The first debate was held on 13 October and introduced by **Sylvain Allano**, director, science and future technology, PSA Peugeot Citroën, and **Pierre-Cyrille Hautcoeur**, president, EHESS (School for Advanced Studies in the Social Sciences). A group of experts and specialists from the public and private sectors and the academic world gathered to examine the question of **whether or not digital technology is indeed powering a third industrial revolution**.

*Journalist, France Stratégie

Looking to the past

As alluded to above, it is certain that the dramatic changes digital technology has led to over the past two decades can be better understood by looking at the important societal transformations that preceded them.

The industrial revolution in England was taken as an example to illustrate this. The classic explanation of its root causes focuses on technological progress, innovations and the resulting productivity gains in textiles and transportation, which lowered the cost of living and grew the economy.

However, it was pointed out this is only half the picture. The **stage was set for the technological advances by three previous developments**: 1) a rise in population; 2) an increase in consumption; and 3) the participation of women and children in the labour market for the first time.

As detailed by Jan de Vries in *The Industrious Revolution*, increasing consumer demand drove innovation (abstinence from consumption was no longer desirable), with the supply of labour depressing wages. Only later did wages begin to rise as the labour force decreased.

The situation today was then examined. The question of increased working hours, wage stagnation and international competition was underlined. Furthermore, the importance of consumers and their lifestyle choices in driving technological innovation was also raised.

Finally, it was stressed that there is **a need today to rethink the way we measure the economy**, which was developed from the 1930s to the 1950s and based on closed national systems, with a focus on agriculture and industry. The increase in services and forms of work has rendered this outdated. Moreover, this has fundamentally changed social attitudes and habits.

Automobiles and the man-machine interface

The central question of the debate was whether digital technology has thoroughly transformed our economy. More specifically, is industry being revolutionized?

To answer this, **the auto industry** was chosen as an example.

It could be argued the automobile embodies the very spirit of the 20th century in the West. Not only was it made possible by a quintessential technology of the second industrial revolution, the internal combustion engine, but they also offered the masses something hitherto almost unthinkable: individual mobility.

It was pointed out that in the early days of the industry – in the late 19th and early 20th centuries – electric engines were favoured due to their reliability and lack of noise. However, the internal combustion engine soon took over largely thanks to its use in aeronautics.

The irony, of course, is over a century later there is a reversal underway: the age of the internal combustion engine finally seems to be reaching a close – only to be replaced by none other than the electric motor.

Today, the industry is facing a paradigm shift brought on by new composite materials and mechanics. Moreover, as **electronics powered by digital technology render automobiles increasingly autonomous**, the question of the man-machine interface has become central.

Indeed, it was stressed this is where the new revolution lies. The development of this **artificial intelligence** will have the last word, it was stated, with total security being the objective. Issues such as cybersecurity and freedom of movement – i.e. who controls the vehicle – are consequently taking on heightened importance.

The industry has adapted to the changes brought on by digital technology by seeking to **open up innovation**, developing open laboratories, for example. The extent to which it has embraced openness was questioned, however. One thing is sure, the demand for highly-skilled workers will remain high as industry continues to adapt and innovate.

This issue also touches on the **centrality of data** and their usage. Information concerning things such as the state of roads is considered open, while data on aspects like the durability of the vehicle remains the property of the manufacturer.

A key point raised was that the content of the data was not all that important. What mattered was being able to capture them and transmit them to third parties, who would then exploit them.

All of the above hinge on the value chain. It was highlighted that digital technology would significantly impact it; value itself was set to change, and the **value chain would shift**.

New industry players that draw heavily on digital technologies are also shifting value. Tesla Motors, for example, is trying to change the manufacturing landscape by working to make affordable electric vehicles pervasive in the marketplace.

As mentioned above, changes in behaviour have been part and parcel of the technological transformations. The so-called **sharing economy** illustrates this. It has quite simply changed the relationship the automobile industry has with its clients, now

seen more as users than customers. For example, vehicles are designed to be shared, as is increasingly the case via platforms such as France's BlaBlaCar.

In addition to this, there is direct contact with end users today. Whereas in the past marketing would determine the type of vehicle, and the company would then seek out customers, today, **interaction with users directly affects the final product**. The challenge for car makers lies in ensuring they continue to enjoy a direct link to their customers despite other players vying to take their place.