On knowledge, Technology and Society

Fabio Di Certo

University of London International programmes
London School of Economics and Political Science

Student

BSc in Information Systems and Management

Global Peter Drucker Challenge 2014

online essay submission (3786 words)

~~~~

(R)evolution

What we are living may be considered as a new revolution. Perhaps, analysing it deeply we can recognise in its background the pattern of an evolutionary process started long time ago: one that departing from the agricultural society, through the industrial revolution and the later information age has, however, exhibited a leading thread: a progressive journey towards the intangible. Then, we may consider that 'since the ancient times all societies have been, each in its own way, knowledge societies' (UNESCO, 2005), our today may be regarded as just another version of the same story. We may also convene that 'knowledge is our most powerful engine of production' (Marshall, 1890) and agree that, therefore not from now, it has been recognised as a valuable resource. Yet, in times of high uncertainty and global competition, knowledge is perhaps the most resilient asset we have.

According to Drucker, knowledge is 'systematic, purposeful, organised information' (Drucker, 1969, p. 36). So, information is the atomic element of our story upon which knowledge is built: combinable, reusable, almost infinitely and in infinitely ways. It is not exhausted in consumption, once stored it haves negligible marginal costs and survive to the products it has created, being independent from them. But for the former to emerge, the latter should be, at least, relevant and actable. In substance, plenty availability of information does not suffice: the ability to skim, select and assimilate it constitutes a key prerogative. Relevant knowledge is likely to emerge from relevant and understood information.

As Elton Mayo wrote, *'the social order changes as man advances to new powers and social relationships'* (Mayo, 1919) but, as Drucker suggests (Drucker, 1961), *what brought about the explosive change in the human condition* is *a fundamental change in the concept of technology*. Seemingly, we have two great enablers that reinforce each other: knowledge, that *changed its meaning form being 'understanding' to being 'control'* (Drucker, 1961) and technology, that became not marginal nor a distinct aspect of our lives (Drucker, 1969, p. 36).

The (Global) Arena we all live in - Knowledge society 3.0

The digital wonderland we all live in is one of great instability and social tensions. Faster business cycles, growing uncertainty and global competition are common nowadays. As Peter Drucker claims:

> *In new mental geography […] there is only one economy and only one market. One consequence of this is that every business must become globally competitive, even if it manufactures or sells only within a local region or market. Competition […] knows no boundaries* - (Drucker, 1999)

Our distinguishing technology is (not surprisingly) the information technology. The internet is the backbone and the 'levelling factor' (Ciborra, 2002, p. 33) in which we operate and information and knowledge spread.
~~~~

Conceptually, three critical evolutionary levels may be identified. The 1.0 era: characterised by static online-pushed data and from the emergence of the first, still internal, business intelligence. Consumption began to be digitised; the initial focus of firms was on how to transact value.

Afterwards, the emergence of the 2.0 era moved the game further: increased dynamism, *boundaries blurring* and *open ecosystems* from the firm side, and collaboration, enriched experience and *prosumering* from the consumer side. This is the era of *Big Data*, system integration, customer empowerment and a shift from *push* to *pull* models.

This is still the era we are living in, yet, we are already some steps forward. A 3.0 era may indeed be characterised by general increased interconnections between humans, and between the human and the technological domains: augmented reality and *geosocialocalisation*, fostered semantics, the so called analytics 3.0 based on enriched *Linked Data* (Pedrinaci C, 2010), the *Internet of Things*, *mashups* of products and services… Knowledge and analytics now, are embedded in almost every product, service or decisions. Flexibility, modularity, e-value networks and the so called *Open IT* shape the present and delineate our future.

Collective intelligence (Wikipedia, 2014) and the 'crowd' give new power for both businesses and people: the former, can exploits them to gain better insights and in some cases to develop new solutions (for instance supporting *developers communities* with a limited effort). The latter, now as never before, have by one side, some tools to influence businesses behaviours: comparison services, commenting, reviewing and 'showrooming' (Kotler, 2012), just to mention four. By the other side, setting up a new business and (crowd)funding it has become increasingly affordable: Innovation now, is able to emerges from the bottom.

Notably, plenty of new business models, unfeasible or unprofitable before, have been enabled by the modern information technology. However, at the same time customers have acquired greater power, firms have been allured in permeating the customer experiencing-value side, at the research of the holy grail of customer delighting (PwC, 2013). Unsurprisingly, the resulting context is an unstable one in which opportunistic behaviour is well likely to emerge in outcome-maximising actors, as we are.

Unlikely, what we ought to learn from the past is that knowledge has widely been used as a mean of segregation and control among cultures and societies. The more we live in an interconnected environment, the more the situation becomes unsustainable. The so-called *knowledge divide* has two main aspects: one is technological and relates to the lack of infrastructures, the other is cognitive and relates to the ability to assimilate information and knowledge, that is: education. But overall, it results in imbalances and social frictions.

It is often claimed that one way to prosper and fill the inequalities gap is to allow for knowledge to spread. But, how knowledge relates with another key aspect of a growing society, that is, innovation? If we accept innovation as the result of an entrepreneurships effort upon invention and knowledge (UNESCO, 2005, p. 58), (Drucker, 201x) Does perhaps, a free-circulating knowledge-world, ultimately mine the willingness in producing knowledge itself (i.e. innovate)? Does not innovation, risks to be stifled, in a word where its fruits are not exclusively assigned to its creator?

If we accept the economic viewpoint that a *monopolist* may have better incentives and better resources in innovate, in the measure of it will exclusively enjoy the resultant benefits (Witztum, 2005, pp. 343,4), we then may question if a *monopolised knowledge* too may be an effective setup to foster our ultimate desired outcome. But in that case, what happens to the spread of knowledge itself? How to reach the critical knowledgeable-mass required by our society to be balanced if knowledge is monopolised?

By contrast, in a *competitive* setting - one in which technology, reducing transaction costs act in favour of the market as right coordination mechanism (Cordella, 2006) - an efficient outcome will be probably reached[1] regardless the initial property rights allocation[2]. But here, what about innovation?

---

1) http://en.wikipedia.org/wiki/Coase_theorem

About the validity of the *shumpeterian hypothesis* mentioned above the debate is still open (Witztum, 2005, p. 344). However, if one believe in innovation as the 'capitalistic outcome of a continuing process of creative destruction'[3] (Ciborra, 2002), then, it may be believed that a cyclic process of *'transition from a competitive to a monopolistic market'* will be put in place (Wikipedia, 2014) and so that, eventually, knowledge will be made available. But in that case, it will be perhaps *too late*?[4]

Where do we want to go; and how?

Suppliers sometimes aim at pushing the *technological production frontier* onwards. Yet, are we really producing on it? That is, are we really fully utilising what we already have? Do we really need to push it further on? Or perhaps it is starting to appear evident that a growth model based only on a constant growth may be, simply, unsustainable? I believe we are far behind that frontier and that our real journey should be indeed, towards it. To this respect, the concepts that build the future I would aim at are: **awareness and participation**; **reuse** (that is optimise) and ***pervasion***. Each of them is detailed below and accompanied by a representative story. Indeed, to build a virtuous circle to a differently prosper society is possible. A lot of evidences support the idea that this path has already been taken. I believe that, each story in its own very different way, may embeds the view of a networked, informed, responsible and participative, knowledge society we should aim at.

i) Awareness and Participation

In this arena we all have a double role: we are (each in its own way) *knowledge workers* and furthermore, we are *knowledge citizens*. We have great power that in turn calls for greater responsibility. We are interconnected actors of a global society, even if we fear it, or we don't want, or we prefer to keeps things simpler, unlikely, we can't. Even the true essence of the social settings our predecessors have fought for - democracy - is threatened by our changing times and calls for us: indeed, if to be effective democracy requires informed participation, 'conscious consensus, educated and responsible people', (Goede, 2011) it follows that delegation and ignorance are harmful. To this end, education, as also UNESCO stress in its 2005 report, plays a great role in pursuing equality and well-being. But before, we have to recognise that we need it. We have to equip ourselves with the tools that allow us to understand the world around, we need knowledge. Interestingly enough, knowledge need us.

1st Story - 'conflicts minerals'

Intel campaign against 'conflicts minerals' (Intel, 2014) lift the veils about who actually pays for rich society lifestyles to be sustained and suggest how, being socially responsible is a need that may carry on not only from companies but also from informed, participative citizens. As they wrote:

> *We've all heard about "blood diamonds," but conflict minerals are not yet as widely recognized or understood. One of the biggest challenges we face is raising awareness of the issue and inspiring action on a large scale. Once informed, no one is OK with this situation. With the facts, we become more powerful citizens and consumers.*
> *Intel® products are at the heart of many mineral dependent devices. We believe we can make a difference, together with our partners, by working to eliminate conflict minerals that fund violence from our supply chain.*
> *The smallest things can have the biggest impact*, they point out.

2nd Story - 'Airbnb'

The worldwide boomed Airbnb.com is a web-based community for holiday rents in which people offer its own facilities to guests. As illustrated in the official website:

---

[2] Notably, IP mechanisms are constantly threatened by the pace at which knowledge may flow, often, almost uncontrollably. Despite this, patenting still seems to remain considered as a relevant 'strategic weapon' (Samsung SDS, 2013).

[3] Incessantly destroying the old, incessantly creating new one (Wikipedia, 2014).

[4] As the UNESCO Report point out, one solution could be consider at least the scientific knowledge as a *public good* and therefore made it 'as widely available and affordable as possible' (UNESCO, 2005, p. 172).

> *Airbnb is a community marketplace where guests can book spaces from hosts, connecting people who have space to spare with those who are looking for a place to stay. Through their experiences on Airbnb, guests and hosts build real connections with real people from all over the globe.* (Airbnb, 2014)

To build reputation and trust among guests, airbnb relies on social connections, recommendation and user reviews. To encourage private hosts in renting their facilities, it also offer a set of security features even included a sort of 'insurance' coverage from damages and vandalism.
So, airbinb is yet another example of how a technology-enabled network society may exhibit unpredicted outcomes. Even if not totally new in its idea - it may be regarded as the 2.0 representation of the bed&breakfast culture - for many, aibnb has become a convenient way to cope with the financial crisis of their country.

It is also a disruptor: by one side, it offers a value proposition based on community sense, informality, friendly relationships among participants and a more 'real' holiday experience, by the other side, it do business differently from traditional hotels as it […] *'scales not by scaling inventory, but by increasing the hosts and travelers and matching them with each other'* (Wikipedia, 2014). Notably, a disruptor may be initially regarded as marginal, as *'it starts offering cheaper and inferior alternatives to product sold by established players'* (the New York Times, 2014) but then, once it has reached a critical mass of users, it embeds the potential to suddenly grow and actually threaten competitors. Think for instance, at the real estate bubble in Spain, the grounding cause of the social crisis of that country: there, lot of resistance is made by the traditional Hotels to counteract Airbnb. But, what emerges at the time of writing, is another common path of innovation: the absence of an effective applicable regulatory framework. Again, another evidence of how innovation, technology and knowledge are unlikely to be harnessed.

ii) Do not waste; (and) reuse

We waste simply too much. Is a luxury we cannot actually concede to us. Resources cost inequalities and conflicts, waste them may be regarded as immoral. Therefore, to pursue a responsible usage may be *simply* a rational behaviour. Reuse is also matter of efficacy, in almost all sectors of our lives: in information technology it allows for better flexibility and for a, perhaps more effective today, *sense-and-respond* approach[5], in programming, reuse of code allow for scalability and fasten cycles, in industry it allows for cost optimisation and contributes in gaining a better social image. For many it may be a mean to free from established settings.

3rd Story - 'the strike of money'

In a world where, according to recent FAO estimates:

> *..one third of the food produced worldwide is wasted: it means 1.3 billion tons per year. In particular in Europe wastage touch the 40-50% of the food in commerce. Every European throws away 179 pounds of food each year. And along with these foods go to waste energy and water served to produce them.* (Linkiesta, 2014)

and the rate of human growth seems to have slowed down - which may suggest at least increasing imbalances if not also a reaching saturation - Raphael Fellmer (Fellmer, 2014) claims to become active part of the change, towards a *'society where waste is minimized'*.

Then, he proposes: to reject money as convenient mean of exchange and to avoid (among the others) food wastage. Even if this may seem fairly provocative, it emerges from the genuine recognition that we have arrived at a turning point. The *'save the food idea'* - that is, to collect wasted food (because not good to be sold) from the bins, use and distributes it - is amplified and operationalized through to the 3.0 networked society, recognised as valid as it collect followers, becoming a movement that spread knowledge and get consensus. Ultimately, it may becomes a

---

5) *Hacking* and *bricolage* approaches to information systems development (Ciborra, 2002, p. 49).
Technology may be seen as an *artefact shaped by the use made of it* and *change* regarded as *emergent* and *enacted* by the behaviour of actors, as they *improvise* and *opportunistically behave* to accommodate the evolving nature of their job. (Orlikowsky, 2000).

new win-win business even for the food stores, if it saves them from paying a space for their wasted items (provided that the regulation framework allow for that exchange).

iii) Pervasion

Technology may enable great outcomes, it not *will* do; it *may* do. Indeed, as among the others also Peter Drucker wrote:

> *…nor will technology by itself generate higher productivity. […] In knowledge and service work, they* (technology and capital) *are tools of production. […] whether tools help productivity or harm it depends on what people do with them…* [emphasis added] (Drucker Peter, 1991)

Yet, technology *pervades* our lives; it *invades* our social domain, increasingly seamlessly. Smartphones and tablets, the tendency towards the *'nano'*, the reduction in hardware's costs and the rise of the *Internet of Things* have reconciled the world of the desktop-bounded e-experience with that of the on-the-move life, freeing us from mouse and keyboards and giving a new dexterity to our interactions, thus opening at, once again, new possibilities and, as always, new threats.

Embrace this pervasiveness and exploit it with a clear social aim in mind may be led positive results in our journey towards a sustainable society. But to being able in doing so, we should first understand the social implications of technology that surround us. In not doing so, two major glitters may dazzle us.

First: becoming technological addicted for its own sake, constantly looking for the new, constantly expecting the amazing novelty. In that way we not improve our inefficiencies neither proceed towards a sustainable wealth. I therefore believe that the still fashionable assumption that 'the more technology is better', is unproductive and fundamentally wrong.

Second: becoming an entertainment society, rather than learning one. (UNESCO, 2005, p. 55) It is surprisingly easy to lose the focus in a world that offer a huge amount of almost everything as never before. Therefore, here resides another challenge we have to face.

Also the so-called *dark side* enjoys unprecedented available tools, and it should not rely on one more: our distraction. It is obvious a wide and deep theme, but what is generally recognised today is that, before being technical the problem is, in its essence social.

What follow are just two simple stories of what is, or could be, an intelligent, informed, and focused use of what surround us.

Internet of Things stories

#1 The municipality of *Capannori*, in Tuscany (Italy) implements a rfid-based wastes collection system. Each family in the municipality is identified with a unique id-code so that the relative environmental tax can be charged. Then, the id-code is reported in each waste-bag families use for garbage. When the municipality collect the garbage, by automatically scanning the garbage bags it is therefore able to measure the amount - and type - of wastes produced by its citizens. This is yet another example of a win-win trade-off in which a technology-enabled services successfully improve the quality of life of an informed and participative community: the municipality reach its goals of waste recovery services optimisation and undifferentiated garbage reduction (90% reached), while citizens may enjoy tax reduction depending on their virtuosity. (Wireless for innovation, 2013) (Eco dalle città, 2012).

#2 The Smart Highway concept[6] *'proposes using signs that are painted on the roads and appear only below a certain temperature to display warnings*' (PwC, 2013) under relevant meteorological conditions. The general claim is that *'when these warnings appear on static year-round signs, they are more likely to be ignored'* as that they are unrelated with the present environmental conditions. *'Lane markers, such as those designating carpool lanes or express lanes that skip some exits, could also be made digital, so they change with*

6) For more information, see http://www.studioroosegaarde.net/project/smart-highway/photo/#smart-highway

traffic flow and volume; they could be made with photosensitive materials that keep them lit at night and charged via solar power during the day. Streetlights could have detectors so they turn on only when cars are nearby'.
As then PwC suggests, '*in augmenting the experience, businesses are empowering their customers to achieve their goals more effectively than they could on their own. By creating seamlessness between the physical and digital spaces, businesses create a real-time feedback loop between the context of consumer actions and the progress toward their personal goals'.* In doing so business can now permeates the customer side where products are experienced, value is created and loyalty and trust hopefully built. Again, enabling technologies make profitable businesses and behavior unfeasible before, and hopefully, socially desirable.

Conclusions

Trying to predict the future is an enjoying exercise. It allows for creativity and for our desires to emerge. As no one can have the right vision at-hand, what could be done is trying to analyses how the past shape the present, and identifying what, breaking form the established, will shake the forthcoming, or to saying it *a la* Drucker, analyzing the continuities looking for new trends.

All we can ever predict is continuity which extends yesterday's trends into tomorrow. What has already happened is the only thing we can project and the only thing that can be quantified. But these continuing trends, however important, are only one dimension of the future, only one aspect of the reality. The most accurate quantitative projection never predicts the truly important: the meaning of the facts and figures, in the context of a different tomorrow. (Drucker, 1969)

Finding a path in our digital wonderland may be indeed, a kind of explorative journey like this. Amazingly enough, we, socially speaking, hold our past and future, in our present[7].

BIBLIOGRAPHY

Airbnb, 2014. *Airbnb.* [Online]
Available at: https://www.airbnb.com/help/question/1
[Accessed 20 06 2014].

Ciborra, C., 2002. *The labirint of information - Challenging the wisdom of systems.* s.l.:Oxford University Press.

Cordella, A., 2006. Transaction costs and information systems: does IT add up?. *Journal of Information Technology,* 21(3), pp. 195-202.

Drucker Peter, F., 1991. The new productivity challenge. *Harvad Business Review,* Volume November-December, pp. 69-79.

Drucker, P. F., 1961. The technological revolution: notes on the relationship of technology, science and culture. *Technology and Culture,* 2(4), pp. 342-351.

Drucker, P. F., 1966. The first technological revulution and its lessons. *Technology and Culture,* 7(2), pp. 143-151.

Drucker, P. F., 1969. *The Age of Discontinuity - guidelines to out changing society.* London: William Heinermann Ltd.

Drucker, P. F., 1989. The futures that have already happened. *The Economist.*

Drucker, P. F., 1999. Beyond the information revolution. *The Atlantic Monthly,* 284(4), pp. 47-57.

Drucker, P. F., 2001. The next society. *The Economist.*

Drucker, P. F., 201x. *Modern Prophets: Shumpeter and Keynes?.* [Online]
Available at: http://www.druckersociety.at/index.php/peterdruckerhome/texts/modern-prophets-schumpeter-or-keynes
[Accessed 23 06 2014].

Eco dalle città, 2012. *Capannori al 90% delal raccolta indifferenziata.* [Online]
Available at: http://www.ecodallecitta.it/notizie.php?id=111562
[Accessed 23 06 2014].

7) (Mayo, 1919)

Fellmer, R., 2014. *Raphael Fellmer.* [Online]
Available at: http://www.raphaelfellmer.de/
[Accessed 19 06 2014].

Goede, M., 2011. The wise society: beyond the knowledge economy. *Foresight,* 13(1), pp. 36-45.

Intel, 2014. *Conflict-free minerals and Intel.* [Online]
Available at: http://www.intel.com/content/www/us/en/corporate-responsibility/conflict-free-minerals.html#!
[Accessed 19 06 2014].

Kotler, P., 2012. *Principle of Marketing.* 15 ed. s.l.:Prentice hall.

Linkiesta, 2014. *"Non ho un conto né soldi, vivere senza denaro si può".* [Online]
Available at: http://www.linkiesta.it/non-ho-un-conto-ne-soldi-vivere-senza-denaro-si-puo
[Accessed 19 06 2014].

Marshall, A., 1890. *Principles of economics.* London: Macmillan.

Mayo, E., 1919. *Democracy and Freedom.* Melbourne: MacMillan & Co, Ltd.

Orlikowsky, W., 2000. Using technology and constituting structures: A practice lens for studyng technology in organisations. *Organization Science,* 11(4), pp. 404-428.

Pedrinaci C, D. J., 2010. *Web services are dead. Long live to internet services.* [Online]
Available at: www.soa4all.eu
[Accessed 2014].

PwC, 2013. *Creating posttransaction customer value,* s.l.: PwC.

PwC, 2013. *Technology Forecast Issue One: evolving transactions into relationships,* s.l.: PwC.

Samsung SDS, 2013. *IT Mega Trends Samsung SDS.* [Online]
Available at: http://www.sds.samsung.com/knowledge/megatrend/megaTrend.jsp
[Accessed 23 06 2014].

the New York Times, 2014. *Innovation,* NY: the New York Times.

UNESCO, 2005. *Towards knowledge society,* Paris: UNESCO.

Wikipedia, 2014. *Airbnb - Wikipedia, the free encyclopedia.* [Online]
Available at: http://en.wikipedia.org/wiki/Airbnb
[Accessed 20 06 2014].

Wikipedia, 2014. *Collective Intelligence.* [Online]
Available at: http://en.wikipedia.org/wiki/Collective_intelligence
[Accessed 23 06 2014].

Wikipedia, 2014. *Creative destruction.* [Online]
Available at: http://en.wikipedia.org/w/index.php?title=Creative_destruction
[Accessed 24 6 2014].

Wireless for innovation, 2013. *Tassa rifiuti più equa con i tag RFId sui sacchetti.* [Online]
Available at: http://www.wireless4innovation.it/business-case/tassa-rifiuti-piu-equa-con-i-tag-rfid-sui-sacchetti_43672151638.htm
[Accessed 23 06 2014].

Witztum, A., 2005. *Economics: an analytical introduction.* s.l.:Oxford university Press.