

Learning from Ecology: a Systemic Skill Management Approach for the Innovation Economy

STEFANO SETTI

Abstract «Digital and non-cognitive skills are becoming increasingly necessary to seize emerging job opportunities». In the *Industry 4.0* era, that can conveniently be redefined in a broader approach as *Innovation Economy*, beside the technological issues the international community has recognized that People and Processes must be developed as well. Artificial Intelligence is quite mature - not banished anymore in research laboratories, but embedded in most application used from billions of people - and more and more jobs will be completely transformed by automation. So the skill management challenge is becoming even more crucial and cannot be faced at a private/local level anymore: an ecosystemic approach is needed. Ecology metaphores and lessons are easy to understand and to apply to other knowledge areas, that's why we can try to derive a new paradigm from that to draw a new skill management systemic approach.

Keywords: • Skill • Innovation • Human Resource • Organization •

1 Introduction

What is a “skill”? What does “skill development” mean and what are the new challenges for L&D (Learning & Development) in the *innovation economy*? each of us is living a *continuous learning* process, but what should be the driver? What kind of competencies do we have to develop for future jobs? Who are the actors responsible for doing this? Is it still a matter of HR department only? What is the role of the individual in determining his own growth path?

The meanings of some keywords are not completely aligned in all the different languages, anyway for the purpose of this paper let’s assume that:

Talent – is referring to all that is structured, deep, typical of the nature of a person (metaphorically the *hardware*); it’s hard or ineffective or, worst, manipulative to change it.

Skill – is referring to competencies, all that can be added, learned, dismantled (metaphorically the *software*); it’s less hard to change it.

In the following the focus of this reasoning will be on skills, something that we can develop, while talent is something we have to detect in others, to comprehend, respect, harmonize, exploit according to a generative approach.

2 Competence to compete

2.1 The redundancy of competing

To face disruptive changes and business transformation challenges all the (can we still call them *soft*?) skills related to change management, project management, risk management, stakeholders & requirements management, etc. have become more and more important: non-cognitive skills are considered to be crucial, as well as the digital ones. Each organization on one hand is struggling to understand what skills are crucial, who and how should develop them, on the other hand is investing in acquiring them from the market, the business schools, the consultants, the internet, etc. But the traditional concept of competition does not seem to be efficient on a large scale: each competitor in a specific market must privately own all the necessary skills at the maximum level. This does not appear to be efficient at all in the global system, and sometimes neither effective. According to the etymological meaning of *competition* (from latin language *competerere*: establish a goal and trying to reach it together), it’s time now to reinforce the idea of co-operation, reaching a systemic balancing in skills development.

coming to skills economy [Stiglitz, Greenwald (2014)], or Angelique Del Rey, about the shortsightedness and the related risks of an HR system based too strictly on individual assessment [Del Rey (2013)], can help us in perceiving the limits and the damages of an performance-based HR management culture.

2.3 *Unitas multiplex*

Following the long path of the works of the French philosopher Edgar Morin, especially synthesized in “*Les sept savoirs nécessaires à l'éducation du futur*”, each human being is complex and brings in himself various bipolar antagonisms: rational/irrational, body/language, self/others, etc. [Morin (2000)]. We can add here the digital/non-cognitive bipolarism. According to Edgar Morin, each man is at the same time homo *ludens*, *imaginarius*, *poeticus*, *consumans*, *demens* as well as *sapiens*. People in the organizations must be supported in reaching and keeping their *unitas*, struggling against fragmentation. Overestimating the power of hard metrics assessment will help the dis-integration, pushing people to separate knowledges in order to reach specific target, in spite of the necessary integration and sharing of the *big picture*. Decomposition of knowledge (what we can call “catalogue” effect), and, consequently of learning & development, risks to destroy the necessary individual *unitas*. The manifesto distilled from the Sciences of Complexity throughout the XX century has to be considered, in what Morin calls the *New Humanism* and applied to individual and team development.

3 The Changing Nature of Work

“*The Changing Nature Of Work and skill in the digital age*” was published by the European Commission in 2019. New technologies such as Robotics and AI are expected to have a strong and wide-ranging impact on the quantity, nature and organization of work, as well as on skills and of education system. Skills needs are shifting towards digital and non-cognitive skills, showing that education systems need to adapt to address labor market. Technology transforms, destroys and creates jobs, leading to profound labor market changes.

New technologies will reshape millions of jobs in the EU, some jobs are highly vulnerable to automation. According to European Community recent studies, workers will need non-cognitive skills to cope in an ever-changing workplace. 'New jobs' may not have the same characteristics or emerge in the same industries and places as the 'old jobs' that are being destroyed.

The EU labour market is already demanding more non-cognitive and digital skills, and specifically a combination of both.

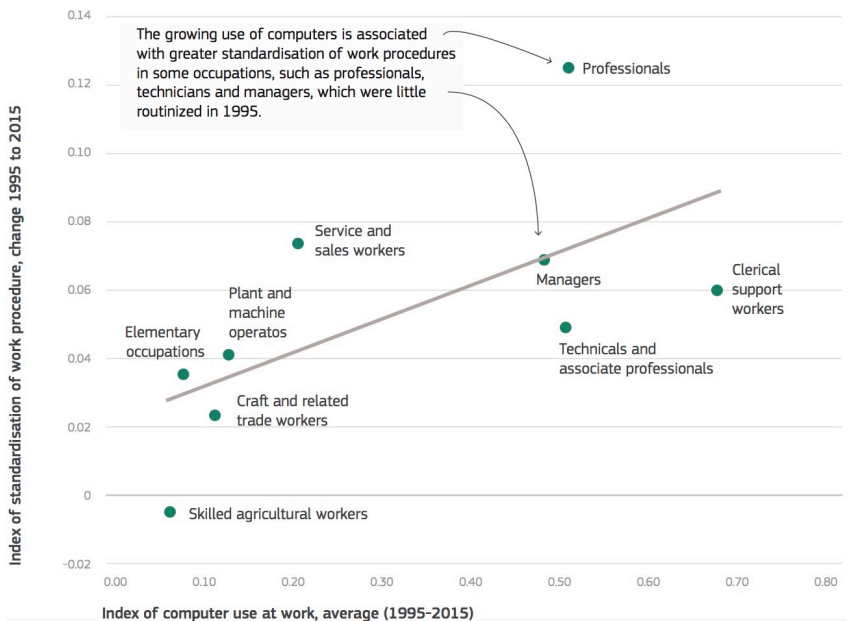


Figure 1: Linking the rise of computer use at work with the standardisation of work

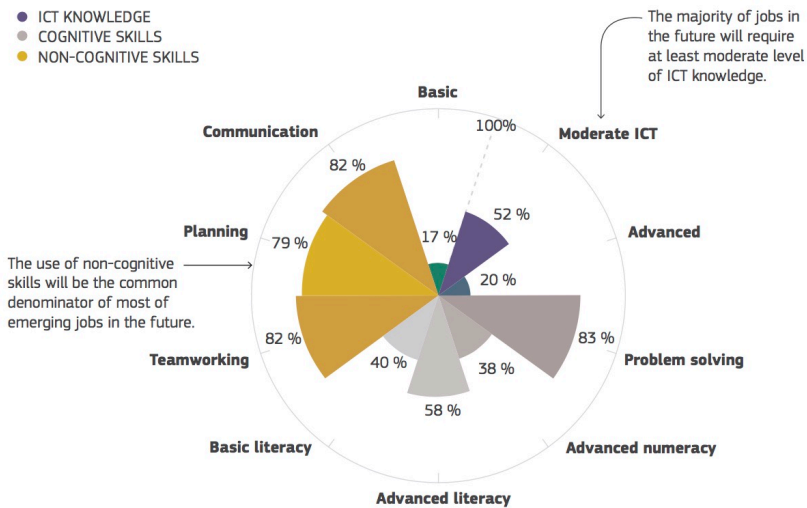
Source: JRC from Bisello et al (2019)

From THE CHANGING NATURE OF WORK AND SKILLS IN THE DIGITAL AGE
UE (2019)

According to EU studies, “Technology is a key driver of new forms of work”: whilst the previous expansion of temporary and part-time employment was only partially driven by technological change, the role of the latest wave of technological development in facilitating the emergence of newer forms of work is clear. In particular, technology is leading to a stronger work standardization while facilitating job matching and reducing monitoring and supervisory costs. This gives employers incentives to contract out work while enabling workers to work remotely, both as employees and freelancers. This changing nature of work must be accompanied by a change in learning & developing approaches, contents, methodologies and techniques.

According to PMI (Project Management Institute)Pulse of the Profession 2019

The following graph shows the average degree of importance of skills across jobs with a positive employment outlook, 2015-25, EU28



THE CHANGING NATURE OF WORK AND SKILLS IN THE DIGITAL AGE.

Note: The levels of skills were self-declared by surveyed workers.

Source: JRC from Cedefop (2016a); Cedefop European skills and jobs survey; Cedefop European skills forecasts.

Understanding the nature and the magnitude of the impact of AI is crucial in order to be able to decide in which direction to invest for future jobs, and how to develop the skill system. Yet, even if we *cannot name* the jobs that will appear in the future, we may be in a better position to describe what workers will be doing in these jobs. For instance, as suggested by many researchers, some of the AI-related professions by employers may be:

- *Trainers* – workers managing large amounts of data and designing algorithms to train AI systems;
- *Explainers* – workers able to interpret the outcomes of AI systems;
- *Architects* – workers responsible for organising AI systems and seizing opportunities for AI adoption;
- *Ethicists* – workers responsible for setting guidelines and ensuring they are upheld so that AI systems are accountable both internally and externally.

4 Learning from Ecology

What specific lessons we can derive from Ecology?

a. The first lesson is to adopt the 5 level: Organism → Population → Community → Ecosystem → Biosphere.

In order to think at different levels with a holistic, systemic approach.

b. Avoid waste: we should apply the same culture and methodologies we use in Lean Production, also to avoid “skill” waste, striving for sustainability, looking for the maximum skill sharing and cooperation, inside and outside the boundaries of the company. Learning from Non-value-adding work (*Muda*), Overburden (*Muri*) and Unevenness (*Mura*) [Womack, Jones (2013)].

c. Systemic approach: all the stakeholder, public, private, entrepreneurs, association, professionals, must be focused, aligned and active. A new cooperation paradigm between schools and organizations must be drawn; the first responsibility is in charge to national education and industry ministries, but a huge space of opportunities can be exploited by companies and individuals with new, disruptive, win-win alliances.

d. Individual responsibility: the personal engagement is essential for being successful in the era of Life Long Learning. Too often the individual is passively waiting for development initiatives, in a sort of welfare-centered condition. Once more the 2008 crisis has given a chance to a revolutionary shift towards a new deal. The reasoning can be linked to the United Nations Sustainable development goals (Quality Education (4), Decent work and Economic Growth (8), Industry Innovation and Infrastructure (9), Reduced Inequalities (10), Partnership for the goals (17)). Just like in ecology, the small contribution of each single person is crucial and cannot be delegated to anyone else.

5 Organizational skills management

At the end, what about our companies? which applications of this paradigm are possible and sustainable on a medium and long term? Can we suggest any tips and tricks to our HR managers and entrepreneurs?

a. Let's focus on non-cognitive skills: non-cognitive skills help individuals to adapt better to the changing work and life environment. Let's balance technical education with soft skills, human centered education.

Educating individuals in non-cognitive skills means to have a purposeful life and pursue personal well-being. Digital skills and non-cognitive skills are linked to larger wage premiums.

b. Confront and combine the huge skills spectrum that is typical of many disciplines (i.e. Project Management), with other related (or unrelated) disciplines (i.e. Business Analysis, Change Management, General Management skill) striving for synergy, defining a common language, avoiding waste, overlapping, ambiguity.

c. Get the balance between two extreme principles:

- The *ologrammatic* principle, in which every individual has all the necessary basic skills, and they are exchangeable at a high degree. This produce a virtuous robustness (like in *Complex Adapitve Systems*) but at the cost of a high redundancy.

- The *specialistic* principle: each individual is fully specialized and hardly replaceable (less costly, but highly risky)

d. Find a place for *leadership*: the demand for this quality, far away from the easiest and ineffective interpretations of this abused word, is increasing in order to lead or support change; many different dimensions of being a leader can be conveniently explored: interpersonal, organizational, strategic, mission-related, self-related [Meyer, Meijers (2018)].

6 Conclusions

After the 2008 crisis and in the perspective of the advent of massive AI applications and thinking machines, a new and revised alliance must be signed between schools, organizations and employees for individuals learning and development.

In the opinion of the author of this paper, these are the priorities to face:

- Redefine the actors of skills development at a systemic level
- Comprehend which are today the skills crucial for future business transformation, balancing digital and non-cognitive ones
- Analise and reduce skill waste in operations and projects
- Foster individual awareness and willingness to grow and learn
- Investigate the limits of assessment
- Strive for a new alliance between individuals and organizations

Acknowledgments

Thanks to Gabriella Caselli, Alessandro Melioli, Dalia Vodice (BluPeak Consulting team), Bernhard Konzet (Blulink), Erika Morri, Chiara Montanari and all the members of *The Learning Agility Lab*.

References

- European Community (2009), *The Changing Nature Of Work and skill in the digital age*.
- Beers, S. (1974), *Designing Freedom*. Wiley
- Bion, W.R. (1972). *Learning from Experience*. Jason Aronson Inc. Publishers
- Brinkerhoff, R.O., Apking, A. M. (2001). *High impact learning*. Perseus
- Del Rey, A. (2013) *La tyrannie de l'évaluation*. La découverte, Paris
- Del Rey, A. (2013) *À l'école des compétences. De l'éducation à la fabrique de l'élève performant*. La découverte, Paris.
- Goleman, D. (1996). *Emotional Intelligence: why it can matter more than IQ*. Routledge
- Jarvis, P. (1995). *Adult and continuing education. Theory and practice*. Routledge
- Jarvis, P., Griffin, C., Halford, J. (1998). *The Theory and practice of Learning*. Kogan Page
- Kayes, A.A., Kayes, D.C., Kolb, A. Y., Kolb D. A (2004). *The Kolb team learning experience: improving team effectiveness through structured learning experience*. Hay Resources Direct
- Lancaster, A. (2012). *Driving Performance Through Learning: Using Learning & Development to Improve Performance, Productivity and Profits*
- Meyer, R., Meijers, R. E. (2018). *Leadership Agility. Developing your Repertoire of Leadership Styles*. Routledge
- Morin, E. (2000). *Les sept savoirs nécessaires à l'éducation du future*. Seuil
- Morin, E. (1990). *Introduction à la pensée complexe*. Seuil
- Neelen, M., Kirschner, P. A. (2020) *Evidence-informed Learning Design: Creating Training to Improve Performance*. Kogan Page
- Pearce, C., Conger, J. (2003). *Shared Leadership: reframing the Hows and Whys of Leadership*. Thousand Oaks
- Schonberger, R. J. (1986). *World Class Manufacturing. The lessons of simplicity applied*. The Free Press
- Sen, S. (2020). *Digital Hr Strategy: Achieving Sustainable Transformation in the Digital Age*. Kogan Page
- Shackleton-Jones, N. (2019). *How People Learn. Designing education and training that works to improve performance*, Kogan Page
- Stiglitz J.E., Greenwald, B.C. (2014). *Creating a Learning society*. Columbia Univ Pr
- Van Merriënboer, J.J.G., Kirschner, P.A., (2018, 3rd Edition). *Ten Steps to Complex Learning. A Systematic Approach to Four Component Instructional Design*. Kogan Page
- Thaler, R. H., Sunstein, C. R. (2008) *Nudge: Improving Decisions about Health Wealth and Happiness*. Yale University Press
- Young, M. (1958). *The rise of Meritocracy*. Transaction Publisher, New Jersey
- Weinstein, A., Sumeracki, M., Caviglioli, O. (2018) *Understanding How We Learn: A Visual Guide* (Inglese). David Fulotn Book.
- Womack, J. P., Jones, D.T (2013) *Lean Thinking*. Free Press.