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Artificial intelligence, transitions, and enabling skills

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We find ourselves within a technological revolution that also represents a wider paradigm shift: an ongoing transition from the present to possible futures. How does human-machine collaboration change? How can organizations benefit?

Digitization is not a strictly technological issue, but a strategic one, implying a radical transformation of the way of doing business, of business models, of skills, of ways of conceiving and delivering services, of ways of working. In order to steer strategies, we need a deep understanding of how people and technologies can work well together. To enable not only new skills but also a minsdet that is adequate and open to the new, at all levels in the organization. Artificial Intelligence (AI), machine learning and deep learning are the words of the moment. 56% of large Italian companies has started AI projects (compared to 70% in France and Germany). Any repetitive pattern-based task, even if it seems creative, could be done by AI.

Artificial intelligence can be understood as a paradigm of the multiple possible transitions between present and future. From this point of view, the recently acquired AI opens up a season of technological applications and cognitive achievements that only a few years ago would have been beyond the bounds of possibility. We are in the middle of an exploration of a new world characterized by uncertainty and complexity and of which not all maps are available; thus, maps that we must draw from scratch. To do so, however, it will be necessary to reconsider how we think about the world in which we live. AI can actually present itself as an opportunity that helps us better understand the world and that, therefore, can help us change it for the better.

Why can’t artificial intelligence be only understood as a technology issue? Created to study the theoretical foundations underlying human knowledge and reasoning, and at the same time to build computerized systems capable of solving problems and carrying out the reasoning typical of human beings, early artificial intelligence was the object of simulations in restricted areas and was organized by separate vertical domains. Among the latter, to mention the most relevant only, let us recall: the representation of knowledge and reasoning based on automated deduction; automated planning; cognitive models of natural language processing; artificial vision; speech recognition.

The transition to a more complete phase of AI occurs when its theoretical foundations and its domains are applied to real world problems and according to a methodological approach based on

strong integration. It is precisely in this transition that artificial intelligence takes the path of interaction with people and the surrounding environment and moves to the unprecedented level of complexity represented by the challenge of mutual recognition and collaboration. From that moment, the mission of artificial intelligence is no longer “only” the technical one of replicating functions typical of human intelligence but it becomes the “anthropotechnical” one of interacting with uhmans also taking into account the cognitive and emotional characteristics of the latter. The strong man-machine interaction, enriched by increasingly effective sensors and almost unlimited computational power, achieves however its apotheosis in machine learning techniques based on different hierarchical layers of representation. Thus, AI reveals the signature of its irreducibility to technology alone, opening up new evolutionary horizons for the human species.

The AI evolution stages are marked by the variable of its relationship with humans and with the environment. Today this variable is subjected to forces that are not always convergent and must therefore be well understood and governed. In fact, if the “laws” of modern AI tell us that the probabilistic models on which it is based work much better than those adopted previously; they also tell us that these models – working in the same way as deep neural networks do – are “opaque” , very difficult to understand, and can generate a lot of uncertainty. The recent examples of this uncertainty are countless and sometimes tragic. They represent a warning on how delicate the ongoing transition is. It is therefore urgent to adopt new adaptive skills capable of transforming AI into a real opportunity for more effective and efficient cognitive and operational solutions. These new adaptive skills stem from the concreteness of the humans-AI relationship. This source must be protected with principles inspired by human dignity, the conscious acceptance of the dimension of complexity and with interdisciplinary knowledge systems.

With respect to this scenario, FBK works for an AI that will ensure an economic and social impact that can be measured especially in terms of benefits to people. An AI that is aware of the needs of human beings and their dignity, that will learn, therefore, not only from data and procedures but also from the inclusive relationship with people in their multiple social and cultural expressions. Starting from the contents of the 2018-2027 Strategic Plan, whose time horizon aligns with the Horizon Europe Framework Program, FBK is “designing” an AI that will make cities and the local area more livable and safe; that will allow for healthy lifestyles and prevent diseases as well as cure them; that will allow machines and people to work together in not only more productive and safe but also more pleasant and livable contexts; that will protect and enhance natural resources by optimizing energy management. This vision materializes both through the integration of different kinds of knowledge and disciplines and through a strong interaction between research, business, political institutions and associative organizations, whose role is that of co-designing and implementing experimental and innovative solutions in open and certifiable living labs. The human resources function is responsible for accompanying this change by investing in adaptive skills and in enabling context conditions in relation to which the value of human capital finds in AI a decisive multiplier factor.

FBK has stood out as an agent of change for the region in the transition from a rural and mountain economy to an industrial economy, first, and to the tertiary one, later; and, more recently, to the circular economy of knowledge. In all this, AI and the integration between technical and scientific knowledge and the human and social sciences can undoubtedly – by acting as drivers – make the difference in a logic of continued adaptation to the demand for well-being and future.

This article was written by Giancarlo Sciascia based on the publication on Data Manager of “Fondazione Bruno Kessler, human aware AI”, by Alessandro Dalla Torre.

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