

## **The impact of the Information and Communication Technology on the organization and the competences in the operations area**

The research objective has been to investigate the impact of the Information and Communication Technology (ICT) on the Organization and the Competences in the *operations* Area. The analysis focus consists of the so-called APS Systems (Advanced Planning System), informative systems supporting the planning and operating management of the operations as regards the intra-company framework, as well as of the so-called SCM (Supply Chain Management) systems, informative systems supporting the planning and operating management of the operations at inter-company level.

The desk investigation, on the one hand, and the opinion leaders' replies, on the other, allowed us to build an overall picture with regard to the organizational impact of the ICT technologies concerning the operations. This has supported the drafting of an analysis layout which has been used to conduct eight case studies in companies, representing different commodity sectors, and which had recently completed an ICT implementation project.

The overall analysis allows us to draw some general conclusions as regards the aspects characterizing the ICT innovation in an operations framework. Such considerations concern two different aspects: the technological characteristics of the ICT innovations and the functional support that the ICT technology offers in an operations framework.

As far as the technological characteristics are concerned, the most significant elements emerged from the analysis are: a remarkable *increase in the calculation capacity*, linked to the possibility to have access to the low cost RAM memory; the start of the *RFID* (Radio Frequency Identification), *technology* applications (for the time being especially at a pilot project level), which make possible the decentration of the calculation capacity and of the decisions; finally, the spreading of *low cost standards* enabling the communication between the Supply Chain actors. Moreover, from a general viewpoint, three characteristic aspects emerge which have a strong impact on the organization and the company management: the miniaturization, the portability (namely, the possibility to establish a "one-to-one" relationship between technology and individual) and the convergence of different digital signals.

Concerning the functional support offered by the new ICT technologies, the analysis confirms its evolution both in an inter-company framework and a relationship between the Supply Chain actors framework.

As regards the *intra-company* aspect, it was noticed a development of the Supply Chain Event Management (SCEM) solutions which allow to manage the company productive-logistic process on the grounds of the events occurring. This management logic is perfectly in line with the turbulence and unpredictability of the present competitive contexts. Again, as regards the *intra-company* aspect, the ICT systems adequately support the management of multi-site companies through specific modules such as the Supply Chain Network Design or the Distribution Requirements Planning. Moreover, one may notice the recent spreading of less consolidated Product Life-Cycle Management systems, covering the innovation management, meant as product-process-plant planning, which are always paving the way towards the integration with the operations management systems. Finally, inside the company we notice the spreading of instruments for the knowledge management the structure of which usually envisages a portal with documental area, work flow, agenda, all linked to some videos placed in the different working areas.

The evolution of the ITC technologies is a qualifying factor from several viewpoints. On the one hand, the new technologies allow a better information circulation and consequently make the decisional process faster and more effective, creating a potential competitive advantage for those who adopts them. On the other hand, the implementation of such systems allows the integration between systems and processes – even extremely heterogeneous when compared one another – this way facilitating the rationalization of the existing systems, the consequence of which is a potential reduction of the company costs.

The ICT innovations, because of their nature, may represent a huge potential as regards both the exceeding of the organizational trade-off between centralization/de-centralization, and the opposite process of radical centralization of the decisional roles against a progressive impoverishment of the executive roles. During the phase of company surveying both phenomena were identified.

However, generally speaking, in the companies examined you may notice some common trends which were determined by the introduction of new technologies: an improvement in the precision level with which they plan the activities concerning the warehouse, the production, etc. (for instance, you can switch from a monthly planning to a weekly or even a daily planning); moreover, in the companies where they enhanced the horizontal - not hierarchical - relationships, and the multiple dependences increased, there also was an increase in the delegation level about the decisions, thanks to the information accuracy the ICT makes available today. In any case, a de-intermediation process is in progress, namely the possibility to proceed directly to the sources of interest; the process logic is spreading, with the introduction of new areas supporting the supply chain management, and the product companies seem to be more and more frequently looking like service companies, where the quality of information is always what gives a superior added value. The only critical point is represented by the capacity to manage clearly the data so that there can be an enlarged sharing.

The ICT innovations have fostered the development of new professionalism – not of the technical type though - inside the company. On the one hand, the need to have new management roles during the processes implemented with the introduction of the ICT systems, particularly integration roles. On the other hand, the consolidated roles have to develop higher management capacities, a transversal vision, a more strategical approach to the ICT potentiality and – as the marketing and commercial roles, for instance – develop a higher analysis and data interpretation capacity. Generally speaking, at any level it is necessary to be more familiar with the information technologies, because nowadays the inputs and outputs pass through the ICT. Likewise, the ICT functions have to acquire a service logic of the consulting type, and develop a better business sensitivity.

The evolution of the requested professional profiles gives rise to the need to implement some training routes in order to develop some adequate professional requirements in the company staff. Above all, it is essential for everybody to know the *office automation* and *data mining* instruments. Another factor acquiring more importance are the competences concerning the *relationship management* with the suppliers and the customers inside the company, and the knowledge management, at least for big-sized companies distributed in the area. It is vital to acquire new managing and managerial competences, which means they are less and less specialistic and more and more transversal. In addition to that, in order to better take advantage of the ICT instruments potentiality in one's area, it is necessary to understand how these instruments integrate the work flow, namely to what extent and how the way you work changes when a new element is introduced in the operating process. Within this framework, the managers have to develop a higher interest and attention on the ICT, considered as one of the most dramatic instruments improving the business.

Within the scope of the ICT function, one has to develop the capacity to integrate the various offers coming from the different company areas and the different “field” and internal processes, to be really able to understand the different company languages and the functioning of the several processes undergoing technology information. Consequently, the traditional DEC (Data elaboration centre) manager role is having its day. What counts now is the need to know how to coordinate the project team, read the company processes, interpret the demands of the internal customer and the company business. In the ICT area one does not only have to develop the process analysis and service capacities, one has also to acquire a better sensitivity in the evaluation of the organizational behaviour and the impact the ICT solutions may have on people. In conclusion, the training which is now necessary to support the ICT innovation projects is of the integrated kind: technical, managerial, cultural, behavioural and it may use I.T. instruments such as demo, applicatives, virtual environments, etc. Nevertheless, no interesting cases of learning were noticed. Finally, most of this training is linked to change processes. A particularly interesting fact is that during these initiatives the entire company population is involved in “bottom up” routes. However, it is also true that in the cases where the top levels are not involved in this kind of training initiatives, some seriously critical points may arise.