Operations management in Italy

Alberto De Toni
Department of Electrical and Mechanical Engineering and Management, University of Udine, Italy, and
Roberto Filippini
Institute of Management and Engineering, University of Padua, Italy

The beginnings of operations management: some historical notes

Some credit for the development of both study and training in the field of operations management (OM) in Italy, should go to the "Training within Industry" programme, which was part of the Marshall Plan in the 1950s. Through this programme, firms received funding for pilot programmes aimed at the reorganization of production and the work organization, projects that were carried out with the aid of a new figure introduced at the time: plant managers. The Italian state set up a "Comitato Nazionale per la Produttività" (National Committee for Productivity) and the Chambers of Commerce, in their turn, set up centri per la produttività (productivity centres) which, initially, offered courses for production technicians especially in the areas of work measurement, layout, materials management and scheduling. The productivity centres in two regions, the Veneto and Liguria, are still closely involved in training.

In the same decade, the 1950s, three schools of management where OM was an important part of teaching, were also set up. First, the Istituto per gli Studi di Organizzazione Aziendale, IPSOA (Institute for the Study of Company Organization), which was founded in 1953, in Turin, which was supported by the major firms in the region (Fiat and Olivetti): in its early years most teachers were temporarily recruited abroad and the OM teachers came from Harvard. Next, the National Committee for Productivity was involved in setting up two other schools, Istituto per gli Studi in Direzione Aziendale, ISIDA (Institute for the Management Studies), in 1956 in Palermo, Sicily and the Consorzio Universitario per gli studi di Organizzazione Aziendale, CUOA, (University Consortium for Management Studies), which was founded the following year, 1957, at the University of Padua. The first researchers and teachers in the field of OM were trained in these early schools. During the 1970s and 1980s there were many other initiatives regarding OM, but most developments in the discipline took place within the Italian universities themselves.

A specific OM course began at the Faculty of Engineering in the University of Bologna in 1963 and, soon after, a similar course was introduced in the Faculty of Engineering at the University of Padua. The same faculty, this time in Pisa, soon followed suit, as did the Polytechnic of Milan where courses in OM

International Journal of Operations & Production Management, Vol. 18 No. 7, 1998, pp. 644-648,

were introduced into the curricula of the Faculty of Mechanical Engineering. Other universities began to introduce OM studies and they became part of the course that led to a degree in "engineering and management", which trained industrial engineers in skills related to management and economics and which, from the 1980s on, became increasingly popular.

Until the 1980s very little was published in Italy regarding OM, most of the literature was translated from American, for example works by Buffa, and there were a few publications by Italian researchers. In 1980, Professor Giorgio Pagliarani, became the first full Professor of Operations Management in Italy, in the Faculty of Engineering at the University of Padua.

Operations management research

Operations management really took off in Italy at the end of the 1980s and there was a rapid increase in the numbers of both teachers, researchers and publications in the OM field. Links were established with European, US and Japanese universities and research centres.

The fact that OM has developed within an engineering context has had a considerable influence on the way in which OM researchers carry out their work. Some elements of this approach can be summed up as follows:

- content of research: a great deal of attention is paid to the question of technological innovation – phenomena arising from technological development and scientific progress are studied from a variety of viewpoints and perspectives with particular attention paid to both the content and the process of innovation in all aspects, economic, organizational and managerial;
- the approach adopted: system logic, ability to combine empirical with theoretical research; and
- rigour of research methods adopted.

Studies are supported by a modelling approach and by close attention to problem solving, project formulation and normative proposals for real organizations. It should be stressed that, in the scientific tradition, the model, whether it is formalised or not, permits elaboration of accurate research hypotheses which can then be validated by rigorous empirical research.

Italian OM research is marked by up-to-date research methodologies and tools. Such quantitative methodologies, which are often borrowed from other disciplines, are considered a means to an end, but OM content is the focus of the research.

The most commonly adopted research methods are, surveys, case studies, modelling and simulation. There are also theoretical and conceptual studies.

As mentioned above, almost all OM researchers work inside engineering faculties, largely because of the development of engineering and management as a discipline in which OM plays an important part. The main research structures where OM researchers operate are:

- Centre for Engineering and Management (University of Bologna – BO);
- Department of Economics and Production (Polytechnic of Milan – MI);
- Organization and Technological Innovation Centre (University of Naples – NA);
- Department of Mechanical Innovation and Management (University of Padua – PD);
- Department of Production and Economics (Polytechnic of Turin – TO);
- Department of Industrial Design and Production (University of Basilicata – PT);
- Department of Electrical and Mechanical Engineering and Management (University of Udine – UD);
- Institute of Management and Engineering (University of Padua – Vicenza, VI).

From this list it is easy to see that OM researchers work in an interdisciplinary environment with engineering, management and, in some cases, industrial organization disciplines. This has permitted cross-fertilzation, both at the level of the contents and of the methodologies adopted for research.

Some of the professors (full and associate) and assistant professors (lecturers) who are involved in OM research are: Albino, V. (PT), Bartezzaghi, E. (MI), Bernardi, G. (PD), Brandolese, A. (MI), Capaldo, G. (NA), Caputo, M. (Salerno), Da Villa, F. (PD), De Toni, A. (UD), Esposito, E. (NA), Filippini, R. (VI), Forza, C. (VI), Garavelli, A. (PT), Giacomazzi, F. (MI), Macri', D. (BO), Merlino, M. (Genoa), Muffatto, M. (PD), Nassimbeni, G. (UD), Pagliarini, G. (VI), Panizzolo, R. (PD), Pratali, P. (Pisa), Raffa, M. (NA), Rossetto, S. (TO), Roversi, A. (MI), Spina, L. (MI), Tonchia, S. (UD), Turco, F. (MI), Verganti, R. (MI), Vinelli, A. (VI), Zanoni, A. (BO).

The research topics most often taken up by Italian researchers are: world class manufacturing, lean production, best practices and performances, manufacturing strategy, performance measurement systems, supply chain management, product development, production planning and control, flexible manufacturing systems, logistics, just in time, total quality management, service management and project management.

Teaching operations management

In Italy, OM is taught mainly in engineering faculties, also in MBA and PhD courses.

OM is most exhaustively taught on engineering and management degree courses. As mentioned above, these five-year degree courses aim to train engineers who are able to plan, manage and analyse complex industrial systems not only from the technological and economic standpoints but also from those of organization and management.

In Italy, this specialization emerged in the 1980s (the first degree course offered was that at the Faculty of Engineering, Udine, in 1980) and reflected the growing need to modify, or update, Italian industrial systems in the face of, on the one hand, technological innovation and, on the other, of the globalization of markets.

The management engineer is a systems engineer, an expert in technology, organization and management, whose skills encompass the operational phases of the value chain: design, purchasing, production and distribution. Unlike the traditional engineer, who designs parts, apparatuses and structures, the management engineer designs technico-economic systems using multi-disciplinary skills.

The managerial skills of a management engineer include the area of OM: from production strategy to just in time, from total quality management to product development.

Management engineers are involved, both directly and indirectly, in many areas: designing production systems, materials management, choosing technologies, production planning, value analysis, maintenance, accounting, manufacturing and business strategy, logistics and marketing, technological innovation projects and management of services.

OM is an important factor in the training curriculum of management engineers, both in terms of content and of method.

Employment opportunities available for engineers with OM skills

In today's firms, a whole series of roles and of tasks can be found in the OM area that are very different from those a traditional engineer would be able to carry out and which are best undertaken by a management engineer, either employee or consultant.

For example:

- *Logistics*: planning and managing the entire flow of materials, from purchasing to delivery of the finished product and which must combine the needs of the commercial function with those of production and of design.
- *Quality management*: which has taken on a transverse role when compared with its traditional function in the firm because now the concept of quality is built up from the earliest, planning, phase of the product design and managed throughout all the steps that end with the final customer.
- *Processes and methods*: an area where new production systems must be designed, systems based on flexible automation, which integrate a variety of skills: production management, informatics, economic analysis of costs, and analysis of the entire competitive environment.

Even within the more traditional technical functions, for example, design, the special multidisciplinary skills of an engineer with expertise in OM, are greatly

appreciated. In product development projects, the needs formulated by marketing must be interpreted within the limitations imposed by production. More recent approaches, such as quality function deployment and the development of product platform architecture have now been introduced.

None of these new requirements can be found among the skills of the more traditional engineer but, as has been empirically noted, the management engineer is able to meet the new challenges posed today.

Organized OM study and events in Italy

For some years universities have offered PhD programmes in the engineering and management field. OM is being taught on these courses. Every year a summer school is held in Bressanone (Alto Adige, Italy) for PhD students in engineering and management. Every three years the summer school focuses on OM.

Over the past few years OM research groups have carried out many studies, often in collaboration with international organizations.

Many events have been held, among which, in the past two years, are:

- EurOMA Workshop on Survey Research in OM (Vicenza).
- Workshop on Supply Chain (Bologna).
- Symposium on Logistics (Padua).
- Management and Engineering Conference on New Production Systems (Udine).
- IPSERA Conference on the Supply Chain (Naples).

In the near future there will be an EIASM Conference on Product Development, in Como, organized by the Polytechnic of Milan which, together with the University of Padua (Vicenza) will organize the 6th EurOMA International Conference in Venice, in 1999.