# NEW CHALLENGES & OPPORTUNITIES FOR OPERATIONS PRACTITIONERS IN THE NEW MILLENNIUM

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## ABSTRACT

The scope of Operations Management (OM) has changed significantly in the last several decades. Starting from Re-order Point (ROP) to Enterprise Resources Planning (ERP) and Supply Chain Management (SCM), OM has gone through a long way in terms of scope and techniques being used. JIT philosophy, lean production, and agile manufacturing have significantly changed the ways how we design and analyze the operations. Recently, OM and logistics fields get closer, since there is no way to separate those functions any longer from the operational process perspective. Traditional OM's focus is about to move from a function of the organization to the supply chain, starting from suppliers of suppliers to customers of customers. Along the supply chain, not only goods and services but also all sources of cash, credit, and information need to be managed. Technological innovations are another facet of the discussion and the real power behind this integration. It may not be wrong to express those trends in OM with a quotation as "Unite (integrate) and conquer".

The profile of the operations managers has also changed a lot through those developments in OM. Teaming, cross-functional training, leadership, employee involvement, commitment, and couching are just a few skills to name here to remain in demand in future. The measures for customer satisfaction on cost, response time, variability, quality, flexibility and service in future's operations are sure to be high and strict. To match the expectations, well-integrated technological solutions would be only aid of OM practitioners. In this study, the issues mentioned above will be explored systematically and the challenges of the new era as well as the new skills required to cope with those will be discussed.

# 1. Introduction

All organizations; private or public, manufacturing or service, have four basic management responsibilities: Money management, demand management, design management, and operations management [Schonberger et al., 1997]. Based on the size of the company those responsibilities may be viewed under the different names as

finance/accounting departments for money management, marketing/sales departments for demand management, research &development/design departments for design management, operations/production departments for operations management. Human resources, materials management, purchasing, maintenance, and so on are all support departments [Schonberger et al., 1997]. This division of the management responsibilities is the result of the functional thought. In the last decade, this functional consideration of the organization has received heavy criticism. According to Hammer, originator of the reengineering principles, functional division or grouping of the tasks was not a natural breakdown of how we are doing our jobs. A process oriented thought was introduced as a new substitute for the 90's and has received an overwhelming acceptance from the practitioners. This new approach to the organizations, of course, requires a new set of tools, skills and infrastructure to grow up. At the beginning of new millennium, we are in the process of implementing this approach as well as constructing its infrastructure. Current technological advancements and innovations also contribute to this transformation.

Concentration to the processes basically results with the integration of many crossfunctional tasks traditionally performed by different functional departments. This integration creates many challenges for the stakeholders of the work including employees, employers, work environment, and work itself. Of course, the shift of concentration to the processes, not to the functions would make most of the tools developed for the functional areas absolute. New skills, and expertise areas would be necessary. New millennium starts with this transformation on the organizations inherited from the last decade of the 20<sup>th</sup> century.

On the other side, business world changes as the customers' wants and needs change. Technological innovations always open new horizons to the solution of old problems while creating new ones. The future is full of new opportunities about how to fulfill customer requirements through new innovative design of business processes. Internet, e-business, new communication technologies are just a few to recall here.

In this study, we like to explore the new challenges for the managers of the future. We will first identify the current trends in the field of Operations Management (OM) and focus to its expanded scope. New features on the work system characteristics as well as business environment and stakeholders' expectations in the future will be discussed in the following sections respectively. Based on those future expectations, we will work to specify the winning characteristics of the future's operation managers, then, speculate on how to remain in demand.

#### 2. Expansion on The Scope of Operations Management

In recent years, the new areas which are not considered traditionally within the OM field or the topics which OM has showed limited attention previously have gained quite a bit interest. Among those; design of goods and services, utilization and compensation of human resources, maintenance, quality, and service sector can be counted

OM is a set of activities that creates goods and services through the transformation of inputs into outputs [Heizer et al., 1999]. In the past; developments on scientific management, organizational behavior, quantitative modeling, computing technology and Total Quality Management (TQM) have initiated significant changes on OM respectively. In recent years, OM practices have seriously increased in the service sector. Logistics as activities associated with the management of freight and distribution systems among the parties in the supply chain [Schonberger et al., 1997], is highly visibility partner of OM. Customer service, demand forecasting, inventory management, material handling, order processing, plant and warehouse site selection are among the major logistics activities [Lambert et al., 1993]. Almost all of

those are very traditional OM subjects as well [Nahmias, 1993]. This makes clear how recent developments help both OM and logistics to merge. This is even more obvious with the definition of The Council of Logistics Management (CLM):

"The process of planning, implementing and controlling the efficient, effective flow and storage of goods, services, and related information <u>from point of origin to point of</u> <u>consumption</u> for the purpose of conforming to customer requirement."

Logistics may be called alternatively as channel management, material management, physical distribution, Supply Chain Management (SCM) [Lambert et al., 1993]. As one of the recent buzz terms in the business world, Stanford Global Supply Chain Forum defines SCM as follows:

"Supply chain management deals with the management of <u>materials</u>, information and <u>financial flows</u> in a network consisting <u>of suppliers</u>, <u>manufacturers</u>, <u>distributors</u>, <u>and</u> <u>customers</u>. It is important that the information, material and financial flows are coordinated effectively in a supply chain. Material flows involve both physical product flows from suppliers to customers through the chain, as well as the reverse flows via product returns, servicing, recycling and disposal. Information flows involve order transmission and delivery status. Financial flows involve credit terms, payment schedules, and consignment and title ownership arrangements."

Both definitions highlight the scope of the chain as all type of flows moving from point of origin to point of consumption. Basically this covers all functions of the organization. After seen as disparate specialists for a long time [Schonberger et al., 1997], both OM and logistics are unavoidable components of a value chain today as seen from the definitions above. This makes OM responsible from all kind of interactions on a value-chain from supplier's supplier to customer's customer (Figure 1) and refers to a significant expansion on the scope of OM.

Along with OM and Logistics cooperation above, Three Letter Acronyms (TLA) used in OM for the last three decades may give an idea about the expansion on the area of OM. Re-Order Point (ROP) systems were one of the early methodologies for the replenishment of stocks. With high-speed computers on business applications, Materials Requirements Planning (MRP) was introduced to production planning arena as a long expected solution for dependent demand. Later, Materials Resources Planning (MRP II) has added resources planning models as Capacity Requirements Planning (CRP), shop activity control, purchasing, and customer service into basic MRP. 80's along with the developments on MRP technology were about to introduce another new philosophy to the field of operations from the East: Just-In-Time (JIT). In contrast to MRP, JIT has brought a different perspective to the operations. In order to deal with production problems, JIT had questioned everything done up to that point including human resources, processes, organizations and so on and concentrated to the details. After the success of Japanese companies, their western counterparts have started to look for the ways to regain their market positions. Total Quality Management (TOM) with lean production has considered an attempt towards to catch up the market leadership. Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) were the steps going to Computer Integrated Manufacturing (CIM). Enterprise Resources Planning (ERP) has been an attempt to integrate the functional areas of the organization on the backbone of MRP. After enterprise-wide integration through ERP packages, the new natural target is to integrate different organizations serving on the same supply chain, starting from supplier's supplier to customer's customer: SCM. With the new technological innovations, electronic Business Process Optimization (eBPO) is just about to be a new topic on our agenda as a next

generation of TLAs on OM. These milestones simply point out that integration moves into whole enterprise even to the whole supply chain. TLAs, starting from ROP to SCM, are clear indication of this process.

In contrast to the traditional division of the task and functions, today's world runs towards to integration of the functional areas with the collaboration of the technological advancements. The reasons behind integration are as follows [Bowersox et al., 1996]:

- There is considerable interdependence between areas of logistical requirements.
- Narrow/restricted functional approach may create dysfunctional behavior and result with sup optimum.
- Control requirements for each individual aspect of operations are similar.
- Significant trade-offs exists between manufacturing economies and marketing requirements. These can be reconciled only by a soundly designed logistical capability.
- Complexity of future logistics will require innovative arrangements.

All those works show that OM field has expanded from a function of the organization to an enterprise-wide processes and even crossing the border of the enterprise to the all supply chain of the sector. Today, product design is an integral part of OM; because it shapes heavily how to design our manufacturing processes and determines our competitiveness. Marketing is important part of OM since knowing customer wants & needs on the first hand is the first step towards to the competitive edge. HRM has strong influence on the operations, because the programs like employee-involvement, operator ownership can't be possible without it. On this new era, the key word is integration. In contrast to old saying, "Divide and conquer", the new substitute for the next millennium is, "Unite (integrate) and conquer".

# 3. New Features on The Work System Characteristics

New trends emerging in OM and challenges waiting the organizations are listed by Heizer et al., [1999] as follows:

- Global focus,
- JIT performance,
- Supply chain partnering,
- Rapid product development,
- Mass customization,
- Empowered employees.

Krajewski et al., [1996] expresses the trends in OM in a different way:

- Growing service sector
- Productivity changes
- Global competitiveness
- Quality, time, technology, change

It is possible to add green markets and e-business to these lists as well.

The influence of all those on organizations may be analyzed according to the business system diamond of Hammer et al., [1994] as shown on the center of the Figure 1. Any business system has the following four components:

- *Processes:* The way how the work gets done
- *Jobs & Structures:* Nature of people's job and how the people performing these jobs are grouped and organized.
- *Management & Measurement Systems:* Compensation of the people, and performance evaluation and measurement.
- Values and Beliefs: Corporate culture.

Let's look at closely to each of those components and highlight the challenges on each one.

## **3.1. Processes**

This is itself a new challenge for many businesses. In contrast to the traditional, functional organizations; process-oriented approach initiates a set of changes in the jobs and structures, management styles, measurement systems and corporate cultures. Tasks should be performed by <u>process-oriented teams</u>, which should carry the whole responsibility of the process with no ambiguity at all. Each process should be designed as a set of <u>value-added activities</u> that transforms inputs into outputs. Processes should eliminate any source of waste. Fail-safing (Pokayoke) is to be a common practice to observe on all those processes. Processes in the future will possibly be large in contrast to today's ones since the several jobs are combined into one. While designing the processes, one should take into consideration the utilization of the <u>newest technology</u>, <u>self-initiative</u> and <u>employee-involvement</u> ideas as much as possible.

## 3.2. Jobs & Structures

As a result of the processes defined above, jobs and their structures also change. Larger processes enhance the jobs and their contents as well. While eliminating checks and controls from the processes, those responsibilities are left to the line workers. Only multidimensional and cross-trained workforces may be capable of carrying these administrative responsibilities. Eventually the result of such jobs and structures is flat organizations with a few hierarchies.

## 3.3. Management & Measurement Systems

In this new world of processes, managers' role moves from supervisors to coaches, from scorekeepers to leaders [Hammer et al., 1994]. <u>Empowerment</u> is the natural consequences of the shift on the new role of managers. Empowerment can be implemented with cross-trained, multi-ability employees. Maintenance under TQM is a good client for those studies. While team play is the key component of managing the processes, leadership through couching has gained even more importance. Skill based payment should be the new fair pay rule to support those efforts. Compensation in such a system shifts from activity to results, while advancement criteria change from performance to ability [Hammer et al., 1994].



Figure 1: A Typical Supply Chain

### **3.4.** Values and Beliefs

The system of values and beliefs constructing corporate culture of the organization moves from protective to productive through partnering, outsourcing and so on. Critical components of the core values are achievement, teamwork, entrepreneurship and commitment. Company values may be formulated using those components accordingly. Corporate culture helps to construct an infrastructure to be used on all the organization, but especially in implementing employee-involvement policies.

#### 4. Business Environment and Stakeholders' Expectations in Future

Future's business environment would be very different from today. Technology grows very rapidly and makes possible to do so many things, which we never think before going to be realized. In the past, there were so many excuses to be short on the customer satisfaction like difficulties to predict the customer preferences/demands properly and fulfill them on time from a competitive price. Internet technology has already changed our daily life and how we do business. With the 3<sup>rd</sup> generation of *Internet*, we need to some how deal more with *e*-*business* concepts. Customers right now can follow the whole order receiving, processing, fulfillment, handling, delivery, customer service and support processes on-line through Internet.

In the past, the shortage of right and timely data was one of the main complaints on decision-making processes. The speed of the computers has increased tremendously in recent years. *Quick Response (QR)* and *Efficient Consumer Response (ECR)* technologies are all available to collect consumer data. Information super highway through Internet provides data not only about your customers but also your competitors and even their customers all over the world. Those developments clearly bring two issues into our attention: First, too many data to manage in contrast to too little in the part. We need to find ways to eliminate the unnecessary

ones. It seems like it would be a real challenge for near future. Second, where and how to use that many data to stay competitive. This is even more important because competition in the future will be more on the non-price base. The one who understands and interprets the data better will have clear lead on the competition.

*Globalization* is another facet of the future business environment. Companies with a wellstructured global supply chain have a clear distinction from their competitors. Technological advancements create new opportunities about the location of the facilities in a global world. Virtual presence instead of physical one reshapes the all supply chains to take advantage of the economies of scale. Designing, producing, and manufacturing in different countries and distributing, and serving world-wide create altogether a new perspective in OM. Of course, those are only possible with an excellent logistics management.

*Green market* [Lambert et al., 1993] is a natural consequence of environmental conciseness. Operations manager should not only deal with their supply chain out of their own organization but also manage the environmental factors. This first reminds the reverse logistics flows. In logistics plans of the future, reverse flows will have an important impact. Those types of concerns should be considered in the design of products. In case of globally located products, environmentally friendly policies need to be implemented along the all supply chain. More strict restrictions on environmental side as well as new standards like ISO 14000 are quite likely.

Process oriented approaches with an integration of the supply chain activities in mind may cause to think that the companies in the future will be huge. Probably it won't. Outsourcing and partnering are the keys for the integration in the future. Each organization will operate observing more on their economies of scales.

Customers as one of the main stakeholders of the organizations focus on six basic wants and needs [Schonberger et al., 1997]: Costs, response times, variability, quality, flexibility, and service. Cost based competition is likely to be more severe. Globalization and the advancements on communication technologies may create a global competition even for the companies that produce and sell locally. It is quite likely to expect that supply chain efficiency will be main determinant of the cost. It is not hard to guess that response times will play an important role on the global competition. With e-business, internet and new communication tools, timeliness may move to the top of list of priorities. Through global standardization, we can expect that variability and product tolerances need to be very tight. Quality, flexibility and service levels are other dimensions of the competition. It is quite likely that direction of the competition will move to those. To satisfy those wants and needs, *mass customization* is the key for success. Even though both mass and customized production at the same time sound like little ridiculous, *delayed differentiation* is the solution. There is a need for further studies on that.

Another component of our stakeholders is our employees. We have already expressed many features of the future's employees like cross-trained, empowered, well educated and so on. But, in the new millennium, "employee-focused" will be heard more. The reason is obvious. If the employees start to think and act as an employer, they sure implement "customer-focused" ideas with no problem at all.

Process of change is far form finished. Business world, customer requirements and preferences, valid performance measures are all changing very quickly. To stay competitive all the time in OM field, the organization needs to exercise *agile manufacturing* principles, and implements *robust* criteria on its decisions, and copes with the new technological innovations.

#### 5. How to Remain In Demand Now and In Future

OM field has passed through several stages where quality, time based competition, globalization, and flexibility have played a dominant role. We are now about to enter a new era where technology and high-speed communication tools will reshape almost all business applications. Data processing and knowledge acquisition are possible be on the center of the developments. With increasing speed of technological advancements and data collection systems available, customer order fulfillment process is going to be redesigned and current body of knowledge on OM is soon to be renewed. Schonberger et al., [1997] lists the winning strategies for organizations as strong benchmarking and competitive analysis, supplier and consumer partnership, global presence, extensive continues training, ethnic variety, and highly involved employees skilled at getting things done right the first time. Under these circumstances, only way for operations managers to remain in demand in the millennium is to learn how to learn and accept the change as a life style. Key competitive qualifications for OM practitioners are cross training on different functional areas of organization, teamworking, high communication skills, high intellectual ability, skills developed on continuous benchmarking and global involvement.

#### 6. Conclusion

Process oriented organizational structures have initiated so many discussions related with jobs, measurement and compensational systems, and corporate culture. One thing is clear that the idea is valid and applicable. Recent developments also support this approach. Activity Based Costing (ABC), Statistical Process Control (IPC) techniques, recent discussions on organizational theory, essence of SCM are all steps towards to this direction. Technological innovations and tools like Internet, QR and ECR with ERP and SCM packages provide the backbone for future developments on OM and logistics. Common trend on all those is the integration of traditional functional tasks into one under a process serving to a specific objective, customer satisfaction. This trend may be followed through the scope of OM and Logistics over the time. It may not be wrong to replace the quotation, "Divide and conquer", with a new one for the new millennium, "Unite (integrate) and conquer".

It seems likely that the following terms will be frequently pronounced in future and help to reshape operations management world: Teaming, value-added activities, fail-safing (PokaYoke), self-initiative, employee involvement, operator ownership, empowerment, commitment, QR, ECR, supply chain, value chain, globalization, green marketing, mass customization, delayed differentiation, lean production, agile manufacturing, robustness, ... Those are all efforts for customer satisfaction. The measures for customer satisfaction on cost, response time, variability, quality, flexibility and service in future's operations are sure to be high and strict. To match the expectations, well-integrated technological solutions would be only aid of OM practitioners. To remain in demand in future for operations managers is closely related with the development of the skill portfolio on the topics mentioned above.

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