The Contents of Operations Management Courses in Terms of the Quality of Potential Human Resources and Research in Turkish Universities

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ABSTRACT
Human is the main factor in all businesses that aim high success today. Therefore, businesses pay much more attention to increase their human resources portfolio with individuals who have modern knowledge and skills. The enrichment of knowledge and skills of human resources on production management is directly associated with the "the content of operations management course" involved in undergraduate programs. In this study, the descriptions of operations management courses in the business and industrial engineering departments in big universities of Turkey will be evaluated by content analysis. Also, they will be examined by their similar and distinct aspects in terms of qualifications they intend to provide the students who are the potential human resources for the businesses. The survival of both service and industrial businesses in crisis environment will be provided by their innovator and creative presence in "production". In this context, the quality of operations management education and training has great importance.

Key Words: Operations management, Production Operations, Career Opportunities and Competence.
JEL Classification Codes: M12,O15

Potansiyel İnsan Kaynaklarının Niteliği Açısından Üretim Yönetimi Ders İçerikleri ve Türkiye'deki Üniversitelerde Bir Araştırma

Özet
Günümüzde yüksek başarıyı hedefleyen tüm işletmelerde temel faktör insandır. Bu yüzden işletmeler, insan kaynakları portföyünü, modern bilgi ve becerilerle donatılmış bireylerle zenginleştirmeye büyük önem vermektedir. İnsan kaynağının üretim yönetimi konusunda bilgi ve becerilerinin zenginleştirilmesi lisans programlarında yer alan "üretim yönetimi ders içeriği" ile doğrudan ilişkilidir. Üretim yönetimi, hammadde girişinden, ürünün son kullanıcıya teslim edildiği noktaya kadar devam eden bir süreçtir. Etkin bir üretim yönetimi sisteminden bahsedebilmek için tüm süreçlerde modern işletmecilik tekniklerinin kullanılması gerekmektedir. Üretim yönetimi en alt kademeden en üst kademeye tüm çalışanlara yol gösterici niteliktedir. Bu araştırmada, Türkiye'de ki büyük üniversitelerin isletme bölümleri ile endüstri mühendisliği bölümlerinde okutulan üretim yönetimi ders tanımları içerik analiziyle incelenecektir, benzer ve farklı yönleri ile işletmeler için potansiyel insan kaynağı olan öğrencilere kazandıracağı nitelikler açısından irdelenecektir. Hem hizmet işletmeleri hem de sanayi işletmelerinin kriz ortamında yaşamlarını sürdürebilmesi "üretimde" yenilikçi ve yaratıcı olmalarıyla

sağlanabilecektir. Bu bağlamda üretim yönetimi öğretimi ve eğitiminin niteliği büyük önem taşımaktadır.

Anahtar Kelimeler: Üretim Yönetimi, Üretim İşlemleri, Kariyer Fırsatları ve Yetkinlik.

1. Introduction

Well-managed businesses that achieved their aims are the businesses that use their resources rationally. The effective usage of the resources has had many ways during the historical process. However, an integrity (integration) exists in general and specific means when the event is examined for today.

Globalization has created a cruel competitive environment for the businesses. Within this competition, four basic variables have a vital importance for the businesses. These variables are low cost, high quality, product delivery rate and more product diversity.

Operations management is the activity of the design, practice and management of the transformation period in which the inputs are converted into outputs of high value. Also, production management is a technically-dominant function that is prerequisite for the enterprise. Operations management involves structural development, product and service design, process and technology selection, equipment layout, demand forecasting, production planning, supply chain management and high quality achievement.

2. Operations Management

Operations management is the management and control of the processes that convert inputs into product and services. With product management, it is aimed to fulfill the process of converting inputs such as material, labour, machine and capital into outputs as product and service and also to achieve a greater value than the total value of inputs used (Russell , 2009).

Operations management is described as the approximation of materials, machines and human power resources of the enterprise in a way to manufacture just in-time with the lowest cost (Kobu, 2003).

It's beneficial to address operations management from all aspects in detail instead of focusing on one of the abovementioned descriptions. Operations management was defined in the literature in several aspects. The common points in the indicated descriptions can be ordered as follows:

- Operations management is the management and control of the processes that convert inputs into product and services.
- Operations management is the effective practice of the process that converts the inputs such as material, labour, machine and capital into outputs as product and service.
- Operations management is the superiority of the output value achieved over total value of the inputs used.
- Operations management provides the approximation of machines and human power resources in a way to manufacture just in-time and with the possible lowest cost.

- Operations management is the business activity that fulfills the design and operation of the systems.

"The business activity that fulfills the design and operation of the production systems is called operations management". The operating units are called systems (Şahin, 2008). The food eaten, the movies seen, the shops, the books read and shortly, all products that meet the requirements of the people in daily life are produced by people working in different systems. There are production managers in almost everywhere. For example; there are production and operation managers in banks, hospitals, factories, private and public sector.

Production managers design the systems, determine the quality, ensure the manufacturing of the products and fulfill the services. In addition, they have a continuous relationship with global businesses, input providers, consumers and advanced technology producers. Another function of the production managers is to analyze the issues regarding production systems, re-design production systems, make innovations and integrate production procedures. Performing the manufacturing process is more difficult than the planning and auditing. The reason is the obligation to provide zero error in quality and for the lowest cost, fastest product delivery and excellence in procedures. Unless they are not fulfilled, the superiority is given to the rivals and as a result, the enterprise fails.

Manufacturing processes are generally defined as the transformation process (Şahin, 2008). During transformation process, input elements such as raw material, material, machine, labour, management, capital, etc. are converted into outputs as product and service. In the meanwhile, requirements of the system and feedback from consumers are connected to input unit and transformation process through private communication channels. Thus, collaboration and adaptations that are required for the input elements and transformation processes are performed. The purpose of the management in manufacturing systems is to achieve a greater output value than the total value of the inputs by providing efficiency during transformation process (Russell, 2009). Shortly, the purpose of operations management is to create a value. Operations management can be viewed as the various procedures and steps in the value-creation chain running from input providers towards consumers. When considered from this aspect, any procedure or step that does not contribute to create a value in the aforementioned chain should be considered as unnecessary and eliminated from the process. Main areas involved in operations management concept are as follows: (Şahin, 2008).

2.1. Following Integrated Production Strategy

Production strategy is required in order to achieve good results in operations management. Deviations from the targets of the enterprise are prevented by the conversion of these strategies into consistent action plans comprising the entire enterprise during practice. The structure of manufacturing should be consistent with the integrated structure of the

enterprise and should play a significant role in the competitive power of the enterprise (Şahin, 2008). E-technology has revolutionized the conventional manufacturing technologies and created very new management opportunities. Manufacturing has become the center of structural administration in global e-management. It is beneficial to indicate that manufacturing involves the production of concrete goods, the production of discrete goods as in marketing and the production of information with a huge added-value.

2.2. The Production of Actual Product, Service and Information

As it is well known, the starting point in the traditional operations management is the design of enterprise-oriented product and service. Since the global production is less than global demand, businesses have believed that they would definitely sell all they manufacture. Besides, the famous economist Joan Babtise Say has made a law as " Supply creates its own demand". Actually, this law has become entirely reversed. Today, the rule "Demand creates its own supply" is valid (Russell, 2009). The starting point of current operations management is to convert the consumers' requirements regarding product, service and information into design. During this design, more advanced product quality, more advanced product functionality and lower production cost are fulfilled compared to the opponent businesses.

2.3. The Use of Current Manufacturing Technologies and Processes

After the design of consumer-oriented product, service or information, it is the time for the constitution of physical processes that will perform the manufacturing and distribution (Russell, 2009). The flow of raw material, excipient and enterprise resource is planned; the type and quality of the labour is designated; production software and equipments are selected and a decision is made on how the process would run. Available manufacturing processes are analyzed especially by doing necessary alterations in the traditional technology and strategy and they are restructured based on the current productivity approaches.

2.4. Execution of the Best Layout

After the design of manufacturing technology and process, it is the time for the physical location of the designed processes and the technology that each needs to the settlement place (Stevenson, 2009). During this placement, it is necessary for the product or service to flow as effective as possible. Therefore, considering the relationships between the processes, their location should be tried repeatedly and ideal layout should be provided in the settlement place. The purpose of the current equipment layout is to achieve the minimum cycle time while providing a steady production flow.

2.5. Project Management

As different from the traditional, production is actually viewed as a project. To design a new product, to develop a new strategy, to start a new service, to begin a new scientific research, to produce a new software, to establish a new facility and likewise are the examples of the projects (Sahin,

2008). Any of the aforementioned projects requires very careful planning and coordination. Project management intends a management ability predominating from a technical aspect. Dissociation of complex processes, timing of actions and procedures and completion of the project within estimated time and cost are among the most important activities of the project management.

2.6. Input Management

After the layout issues are resolved, it should be decided that which production inputs will be provided from which resource, when and under which conditions. The number of the input providers is quite a lot and their locations within the global world are complex. Therefore, it requires to be closely acquainted with the structure and running of aforementioned channels. Input management requires to know all layouts, functions and actions during the manufacturing and distribution of product and service that will be purchased from suppliers to consumers in detail (Russell, 2009).

2.7. Identifying the Demand for Product, Service and Information

One of the main operations management issues is to estimate without error that which product will be manufactured, how many and when (Sahin ,2008). As it is known, this forecasting determines the consumers' demand. Many quantitative and qualitative methods are used to estimate the consumers' demand. It is essential to have an extensive knowledge, experience and technical knowledge to decide on which methods will be used in which situations. An error during the demand prediction negatively affects all plans of the enterprise. The reason is that all other plans and programs of the enterprise are based on the demand prediction.

2.8. Planning and Timing of the Actual Production

In order to meet the predicted demand, it is essential to make a production planning that involves many consecutive decisions. Aforementioned consecutive decisions are related with answering mainly the following questions (Stevenson, 2009): How many raw material, excipient, enterprise material and piece should be ordered and when? How many people of which type and quality should be employed temporarily or permanently? Which employee should be given to which job, machine or process and when? How much inventory should be kept in stock and where in order to prevent wasting time? How much stock should be provided in each step in order to meet the consumers' demand in time without keeping goods in stock? Current information technology is of benefit during production planning and timing. Especially Corporate Resource Planning and Stockless Production System are among the mostly used software and approaches in this field. Production planning and timing is one of the greatest fields of occupation of operations management.

2.9.Quality Assurance

The quality assurance principle is in the basis of the function of operations management. Deficiency in product, service and information

quality means failure in global market. Entrepreneurs look for the ways and methods of distributing what kind of product, service or information to the consumer with which type of service mentality in advance, and make a decision. The design of the abovementioned product, service and information, the design of the manufacturing processes, manufacturing equipment and layout, determination of work and operational activities, supply chain management, planning and timing of production flows in the entire manufacturing system and all other areas of operations management depend on quality (Sahin, 2009). Therefore, in operations management, especially integrated quality management concepts, techniques and applications must be considered without compromising. Ensuring quality assurance requires to establish an integrated quality management system, to perform a statistical quality control, to develop a supracompetitive consumer services and to perform a rational human resources management.

3. Operations Management Competence In Terms Of Human Resources

Competence is the observable behaviours that involve knowledge, skills and personal characteristics (attitude) that are distinctive in achieving the excellent performance within an organization. The determination of the changing ways of doing business and changing human resources competence profiles helps to elicit a high work performance during working processes within the enterprise.

Whether people desire to work in production field or not, there are many reasons to learn operations management regarding career. The first one is that the production affects all expectations of the enterprise. Production and sales are important functions in a business organization (Stevenson, 2009). The other functions such as accounting, finance, marketing, information technology and others support these two functions. The businesses relevant to service, e.g. financial services (stock market analyst, broker, banker), marketing services (market analyst, market researcher, advertisement director and production manager), accounting services (company accountant, private accountant and budget analyst), and information services (business intelligence, library service, management information system design service), are also relevant to the production.

One of the other reasons is the comprehensibility of the global commitment of businesses and nations by eliciting the production and supply chain (Ureten, 2002). Why the businesses are successful or not and especially the importance of working with others are better understood. Since operations management is the central function in all business organizations, it is the basic course that the management students should take. Moreover, certain courses (as accounting and marketing) have limited concentration in practice. There is an association in functional areas such as information exchange and decision-making association. For example; the three main functions in the businesses are used for distinct businesses and the decisions made in these functions affect the other decisions in the organization.

There are many career opportunities in the fields of operations management and supply chain (Wild, 2002). Therefore, a wide range of job titles are available: production manager, production analyst, industrial engineer, time study analyst, stock manager, purchasing manager, planning manager, distribution engineer, supply chain manager, quality analyst and quality manager.

The people working in production field should have both personal and knowledge skills. Personal skills are political awareness, consulting ability and cooperation, negotiation and communication skills (Stevenson, 2009). Knowledge skills are so crucial for decision making; they are industry, global environmental knowledge, finance and accounting skills.

The main responsibility of a production manager is planning and decision-making. While making decision, there are many alternatives available. These alternatives have several effects on cost and profit. Therefore, informative decision-making is very important.

Production managers make some decisions that affect the entire organization. These are the following (Stevenson, 2009):

What: Which resources are needed and how much?

When: When is this resource required? When was the task that should be one planned? When were the materials and needs ordered? When will the right move be done?

Where: Where will the task be done?

How: How will the product and service be designed? How will the task be completed (organization, materials, methods)? How will the resources be distributed?

Who: Who will perform the task?

The competence of the managers who can make these decisions aright and more effectively is very important and knowledge that they acquired through their education plays a crucial role in their competence. From this point of view, a research was carried out by content analysis that is a qualitative research method on the contents of operations management courses.

4. The study

In this study on the contents of operations management courses, whether there are management and industrial engineering departments in public universities and if available, whether there is operations management course were investigated from the websites as the first step. The course contents were determined from the official websites of available departments. The contents of operations management statements were evaluated by grouping in terms of operations management themes determined in both departments.

4.1. The purpose of the study

In context of "Operations management" competence knowledge skill that is required for the human resources who will work in manufacturing field, the answers for the questions as "What is the content of it in undergraduate level?" and "How much it appears in the current operations management course contents?" were sought. In this study, the findings regarding management and industrial engineering departments in public universities were compared.

4.2. The method of the study

The contents of operations management-oriented courses of the management and industrial engineering departments that are available in the official websites of the universities were analyzed by "content analysis" method, and numerical analysis of qualitative data was performed.

The main purpose in content analysis is to figure out the concepts and relationships that can explain the collected data. The data that were summarized and interpreted in descriptive analysis are subjected to a more extensive processing; and the concepts and themes that could not be distinguished in content analysis can be explored by the end of this analysis.

For this purpose, it is necessary to conceptualize the collected data first, and then to arrange them validly based on emerged concepts and accordingly, to determine the themes that explain the data. Content analysis can be explained as analyzing a written, oral text or a symbol and converting it to numerals and then, making a comment on these numerals. In other words, it is the transformation of the numerals into the sentences. The fundamental process in content analysis is to approximate the similar data within the frame of specific concepts and themes and to interpret by arranging these in a fashion that the reader can understand (Bilgin, 2006).

The basic themes of the content analysis were prepared by using the study of Stevenson in 2009 as base and by screening Turkish and foreign literature relevant to the topic. The theme list was turned into the final version after taking the opinions of two independent experts.

94 public universities in Turkey were included in the study. The universities which have management and industrial engineering departments were determined by examining the websites of all universities. The sample was composed of 109 departments.

The limitations of the study were that it was performed by the data from websites and the subthemes were not included in the study.

4.3. The results of the study

The primary findings of the study were as follows:

Table 1. The Management and Industrial Engineering Departments in the Public Universities included in the Study

	f	%
Department of Management	76	70
Department of Industrial Engineering	33	30
Total	109	100

The department of management was present in 76, and industrial engineering was present in 33 out of 94 public universities included in the study.

Table 2. The Titles of "Operations management-oriented" Courses

	f	**%**
Operations management	28	39
Operations management 1	14	19
Operations management 2	14	19
Production Planning	1	1
Operations management and Systems	1	1
Operations management and Systems 1	2	3
Operations management and Systems 2	2	3
Production and Operations Management I	1	1
Production and Operations Management II	1	1
Fundamentals of Operations management	1	1
Production Systems Analysis	1	1
Production Planning and Control I	2	3
Production Planning and Control II	2	3
Production Planning and Stock Control	1	1
Production Information Systems	1	1
Production Planning I	1	1
Production Planning II	1	1
Basic Production Methods	1	1
Total	75	100

The vast majority of the courses included in the study bear the name "operations management". There were 14 departments that give the course in two semestrs as I-II. No concentration on the other course titles was observed.

When viewed as worldwide, the title of the course appears as operations management. Although there are no differences in the course contents and sources used, the globally-known title of this course is operations management. Therefore, most of the universities in Turkey use this title.

Table 3. Accessibility of the Course Contents on Internet

	f	%
Content is available on internet	63	58
Content is not available on internet	46	42
Total	109	100

The contents of 58% of the courses included in the study could be accessed on internet. The contents of 42% were not available on their official web sites on internet.

In parallel to the developments in information and communication technologies, the universities use their websites for communication, cooperation and participation and to better introduce themselves and provide information and service. Although some universities do not use their websites very actively, most of them actively use them. Inactive web sites are under construction and they are supposed to be activated more recently.

Table 4. Involvement of Current Operations management Topics in Course Contents

Operations Management Concepts	Department of Management		Departmen of Industrial Engineering	
	f	%	f	%
Product and Service	0	0	1	3
Operations management	1	1	0	0
Competition Strategy	0	0	0	0
Productivity	2	3	2	5
Prediction (forecasting)	18	27	11	28
Capacity planning	15	22	10	25
System design	0	0	0	0
Process	8	12	3	8
Location planning	0	0	0	0
Quality management	4	6	1	3
Supply chain management	3	4	3	8
Stock management, Planning	0	0	0	0
MRP-ERP	2	3	5	13
Lean Production	0	0	3	8
Project Management	4	6	1	3
Decision-making	11	16	0	0
Industrial and Global Perspective	0	0	0	0

Financial Accounting Information	0	0	0	0
Human Resources Information	0	0	0	0
Total	68	100	40	100

The course contents in the management departments included in this research were concentrated on forecasting, capacity planning, decision-making, process management, quality and project management, supply chain management, performance and MRP-ERP, respectively. In industrial engineering departments, it was ordered as forecasting, capacity planning, MRP-ERP, process management, supply chain management, lean production, productivity and project management by production and service concepts.

Although there is not a big discrepancy between both departments, the difference between the engineering and social sciences manifest itself by the concentration on technical subjects. Concentrating on the subjects especially such as project management, stock management and supply chain management is crucial in terms of seizing the update. Focusing more on the topics that the businesses need and work on will become an important factor that will employ the students who are seen as the potential human resource.

5. Conclusion and Suggestions

The majority of the courses included in the research bear the name "operations management" in general. It was seen that the statements under the operations management title were not different from the course descriptions in the management and industrial engineering departments in the big universities of Turkey. However, it is obvious that the contents of the operations management courses in both undergraduate studies fall behind the update or they are inable to reflect the update to the their course contents. The production of the product or service as innovatory with the lowest cost and highest quality in time relies primarily on the informational background of the human resource on this subject. Of course, in context of competence, attainment of the information does not come true only by education. The knowledge gained on work can not be denied. Within the narrowing business environment created by the crisis, the human resource is required to be competent about the product and service production processes. The contribution of the development of competencies that are expressed as the personal skills such as communication and consulting and the knowledge skill that constitutes the center of our study such as "operations management" competence, to the performance of the enterprise and to the conversion of the students who are seen as the potential employee into the available human resources of the businesses can not be denied. Competition is getting harder in todays business world and it's becoming an obligation for the businesses to enrich their human resources portfolio with the individuals equipped with modern knowledge and skills. High-performance organizations depend on high-performance human resources. Competent

individuals make up the most important part of it. Facilitation and activation of this process may be possible by updating the universities and their different affiliated programs continuously by new information. The departments which reflect the novelties to their course contents just in time complete the most important part required to raise high-performance individuals and thus they will get ahead in the competition.

The important constraint of the study can be resolved by the enrichment of the theme list designated in the future studies with sub-themes. Besides, more detailed data than the ones obtained from the official websites can be achieved if the study is repeated by the aid of a survey prepared by a quantitative method and a face-to-face interview. The increase in similar studies will result in a surge in course contents and thus, in quality of the courses. In conclusion, the individuals who are qualified in terms of operations management will be able to achieve qualified work.

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