

|              |   |
|--------------|---|
| Title        | How to Create Holistic Standardization of Business Decision-Making in Production Management   |
| Author(s)    | Vojko, POTOČAN  |
| Citation     |   |
| Issue Date   | 2005-11   |
| Type         | Conference Paper  |
| Text version | publisher   |
| URL          | <a href="http://hdl.handle.net/10119/3888">http://hdl.handle.net/10119/3888</a>   |
| Rights       | 2005 JAIST Press  |
| Description  | The original publication is available at JAIST Press <a href="http://www.jaist.ac.jp/library/jaist-press/index.html">http://www.jaist.ac.jp/library/jaist-press/index.html</a> , IFSR 2005 : Proceedings of the First World Congress of the International Federation for Systems Research : The New Roles of Systems Sciences For a Knowledge-based Society : Nov. 14-17, 2008, Kobe, Japan, Symposium 3, Session 5 : Intelligent Information Technology and Applications Evaluation and Standard |

# How to Create Holistic Standardization of Business Decision-Making in Production Management

Dr. Vojko POTOČAN

University of Maribor, Faculty of Economics and Business  
SI-2000 MARIBOR, Razlagova 14, SLOVENIA

## ABSTRACT

Enterprise as business system (BS) ensures its own existence and development by a high quality of its business especially in the field of the production management (PM), which is the least developed and investigated area of production. Its business results can be considerably improved with standardization of its decision-making (DM). The paper discusses two theses. The first thesis: standardization enables possibilities of creation and implementation of a dialectical system of standard DM processes, which provides for a high quality of business DM and its requisite methodological uniformity in different BSs. The second thesis: control over functioning of the business DM (BDM) can become deeper, once humans understand the complex and complicated reality of business operation and BDM in PM.

**Keywords:** business decision making, standardization, holistic standardization, requisite holism.

## 1. INTRODUCTION

The existence and development of the BSs (business systems) depend on the excellent running of the production process [6; 19; 1]. When production factors are restrictedly available and operating conditions are given, business operation can mainly be positively influenced by the improvement of the autonomous part of its management, e.g. decision making [8; 4; 6; 3].

BDM (business decision-making) is the central phase of the management process; it takes place in all phases of the business operation process [14; 17]. Important impacts of BDM on business operation result from its integration and standardizing role, interdisciplinary nature, and important impacts on the BS's relations. BDM in a BS significantly influences the BS's choice of objectives, goals, processes, and BS's construction of its own components and

structure, as well as its own use of monetary, material, and human resources.

The problem of implementation of BDM concerns its quality [5; 9]. Opportunities to improve BDM quality include [14; 15]: 1) implementation of the idea of BDM standardization, and 2) within the standardization, establishment of standardized DM, and development of a system of standardized DM processes in the BS. But when we are dealing with DM, we are faced with a central problem of standardization: to which level, both desirable and possible, can DM attain standardization and be unified in its methods, at least, and achieve a requisite holism, at the very least?

The problem-solving process concerning the chosen BDM problem, therefore, involves the examination of: role and importance of standardization of business decision-making, "holistic standardization" of BDM in production management, and creation of the system of BDM of production management.

## 2. STANDARDIZATION OF BDM

Standardization of products, spare parts, and process-related procedures of manufacturing and other work, if routine-based, has been beneficially applied for a long time. A framework standardization of creative work is possible as a part of results of the Dialectical Systems Theory [10; 12; 13].

In order to provide beneficial consequences, BDM needs to be as holistic as both possible and necessary (= requisitely holistic). This causes BDM to face the issues of entanglement of itself and of its topic under consideration as well as entanglement of its environment [14; 15; 16]. Because BDM is a creative work, we must standardize creative work procedure (e.g. by USOMID methodology [10; 11; 12; 18]). For our work, we can assume that BDM can be standardized on a level, which

lies in the interval between the total standardization and the total uniqueness [11; 16; 17].

The level of a possible standardization is, objectively and largely, determined by the criteria of holism of consideration and by entanglement of the situation, process and trend at stake. Subjectively, the level of DM standardization is determined by one's decision: what to take into consideration. The interval of holism of consideration and BDM is, on one hand, limited by a total one-sidedness and, on the other hand, by a total holism. In practice, we must find a middle way, which will be requisitely holistic from the aspect of content and of requisite quality in its application.

What about entanglement? We are trying to conceptualize standardization of DM in a way that will make possible an appropriate consideration of the entanglement of the phenomenon under consideration. Realistically, no total level of entanglement can be detected and mastered. The practical level of consideration of entanglement lies in the interval between the total entanglement (respected) and total simplicity/over-simplification. The interval of the requisite level of consideration of entanglement lies between "requisite simplicity" and "requisite entanglement" selected. They provide for consideration of all essential relations of DM under consideration (its complexity) and of all important components of DM (its complicatedness).

In order to achieve a requisite level of consideration of entanglement, BDM can only be simplified in general terms, not in details. This requisite level is usually a sufficient level of simplification for the work to be done efficiently and effectively. According to such an approach, we can form framework algorithms of BDM and operation, which support decision-makers' creativity, but no algorithm should substitute for decision-makers' creativity, and interdisciplinary co-operation.

In the real business conditions, it is logical and reasonable to detect and choose a requisite level of entanglement of consideration of reality. Defining of this level of entanglement of consideration of reality is a creative process that is synergistically influenced by characteristics of both the object under consideration and the decision-makers as well as by the objective and other conditions and preconditions of their work.

On the basis of findings about holism and entanglement of both DM and the situation one decides in and about, we

can define the level of BDM standardization. One can conclude that one can determine a requisite level of standardization on the basis of both the requisite holism of consideration and the entanglement of situation in reality. It includes, at least: 1) The selected starting points for the consideration of the DM standardization; 2) The object under consideration; 3) Decision maker/s, and 4) Synergetic entity of the object under consideration and decision-maker/s.

Conclusion: One can determine the requisite level of BDM standardization from the viewpoints of both its methods and its contents. If DM is standardized on the level of requisite holism, the creative and systemic as well as systematic thinking receives an additional impetus in its striving toward holism in human thinking, DM, and action that follows. How holistic can BDM standardization be?

### **3. "HOLISTIC STANDARDIZATION" OF BDM IN PRODUCTION MANAGEMENT**

Results of the BSs' operation can be significantly improved through the formation of the dialectical system of the standard DM processes, which provides for a higher quality of BDM and its (requisite) methodological unification in different BSs. When setting up standardization, we proceed as follows, in a summary [14; 15; 17].

The USOMID methodology enables creative problem-solving by application of the Dialectical Systems Theory together with the apt methodologies and methods. In addition, we can, e.g., use software from "program-base" and the framework process models from the programoteque as the tool for planning and development of the standardized methodology within the framework of the formation of the standardized methodology of the BDM. In this process, BDM is considered a creative process, which contains some framework-defined procedures, to which details of each specific situation are added in the concrete cases. Persons who work on BDM can receive help of USOMID methodologists to write their own experiences concerning their procedures applied, then to critically think about them, and to innovate them before finalizing programoteque. Its general program provides for a framework linking all specific / detailed programs per phases and procedures. In a next similar situation, one can retrieve a suitable program and complete it up with specific details of the given new situation. Thus, there is neither a need to

discover America again nor to run against an iceberg on one's routine way; one can flexibly go around it.

Within the standardization process of DM, a standardized methodology of BDM is created, standardization of DM is implemented, and a dialectical system is developed consisting of standardized DM processes in a BS. The general part of the starting points of the investigation contains the uniform part of characteristics concerning the understanding of business operation and the treatment of the operational aspects.

The DM factors can be defined by the examination of the objective starting points (needs, possibilities) and the subjective (knowledge, values) starting points that determine the role and importance of the factors as well as their linkage to the nature of the business operation. These characteristics are defined for the functional aspect of DM as a process. They are connected with the concept, treatment, and running of the DM process. The above starting points of the systems aspect of DM present characteristics of its concepts and organization. The quality of DM is determined by closely examining the overall quality of business operation, by evaluating the decision, by evaluating the impact of the DM results on the quality of business, and by the development of the systemic quality of DM and its impact on the quality of business operation and its innovation.

BDM is unified by a requisitely holistic methodology and, partially, by content standardization. BDM is defined on the basis of a comprehensive systems research that embraces both the institutional and functional aspect as well as the aspects of BDM standardization.

Solving of the selected problem is completed by the standardization of the BDM, which contains the concepts of the standardized methodology of DM, its application and development of BDM under investigation. Standardized methodology is created on the basis of cognition of (1) standardized starting points for DM, (2) standardized examination, (3) standardized solution, and on the models of the standardized DM solutions.

Through standardization, the links of the processes and the BDM on production management are uniformly defined, and classified into groups of its standardized external and internal relations. New entities are investigated and their standard structures conceived. Considering the cognition of the methodological and content standardization of DM, we can develop a

corresponding DM system, including both internal and external relations. The new partial systems are developed through their inclusion in the target system of the standardized DM.

Through the development of a standardized BDM for production management, the creation of BDM methodology for its practical implementation as a requisitely uniform DM is completed. The standardized methodology, so formed, enables a requisitely uniform definition, treatment, and comparison of DM in different BSs.

These findings about DM provide for a basis for a further investigation and definition of fundamental characteristics of a general model of BDM in production management.

Production management is uniformly studied and defined on the basis of the general systems of production management concept. Thus, we endeavor to ensure: 1) a requisitely standardized treatment of production management, 2) comparability of results of different examinations (various fields, different enterprises), and 3) starting points for a further treatment of BDM.

The development of the BDM model is based on the general business operation model constructed by cognition of the aspects and the areas of the production management. A general production management model can be, from the content point of view, defined as a synergetic entity, i.e. a dialectical system of essential aspects, areas, factors, processes, tools, and relations. Three aspects (economics, ethics, and image) enable its definition and determine its requisitely holistic quality level.

In terms of this discussion, the production management can be, from the content aspect, defined as the entity comprising areas within production management (determination of basic production characteristics), production engineering preparation (definition of major activities for the adequate production implementation), and operation of production.

The individual areas of the production management can be, on a framework basis and on the basis of characteristics of their operation and organization, restructured into permanently standard areas. The areas with the same or similar activities, having similar or equal parts of operation and organization, can be defined in some models of DM. Processes are the basis of

organizational structures rather than vice versa.

According to the process concept of production, a production process can be defined as a whole consisting of the three partial processes of production management (basic - physical, management, and information process). Production management can also be defined as a system from the structural aspect. It can be treated as an entity of the three soft partial production systems, i.e. basic, management and information systems, or as an entity composed of a different number of partial systems or sub-systems that are specialized - purposefully created - to match the specific needs and requirements of work. The production management factors also represent an important (sub)field of the general model and practice of production management. All subjects and objects, which directly and indirectly participate in (and have an impact on) the operation and organization of the production management, are included. In compliance with their

characteristics (i.e. role, importance, form, and mode of participation in management) the factors are defined as components and/or other factors of production management.

In general system (like in all systems), there are links between the aspects, areas, processes and tools here; they are defined as relation of the production management. The analytical discussion of business relations (internal, external) extends beyond the selected framework of this contribution.

On the basis of the above understanding the presented concept of production management can serve as a general model of production management. In an enterprise, one can use various models for the implementation of such a general management model. A model of the management of the standardized production, presented in the Figure 1, was created for the requirements of work.

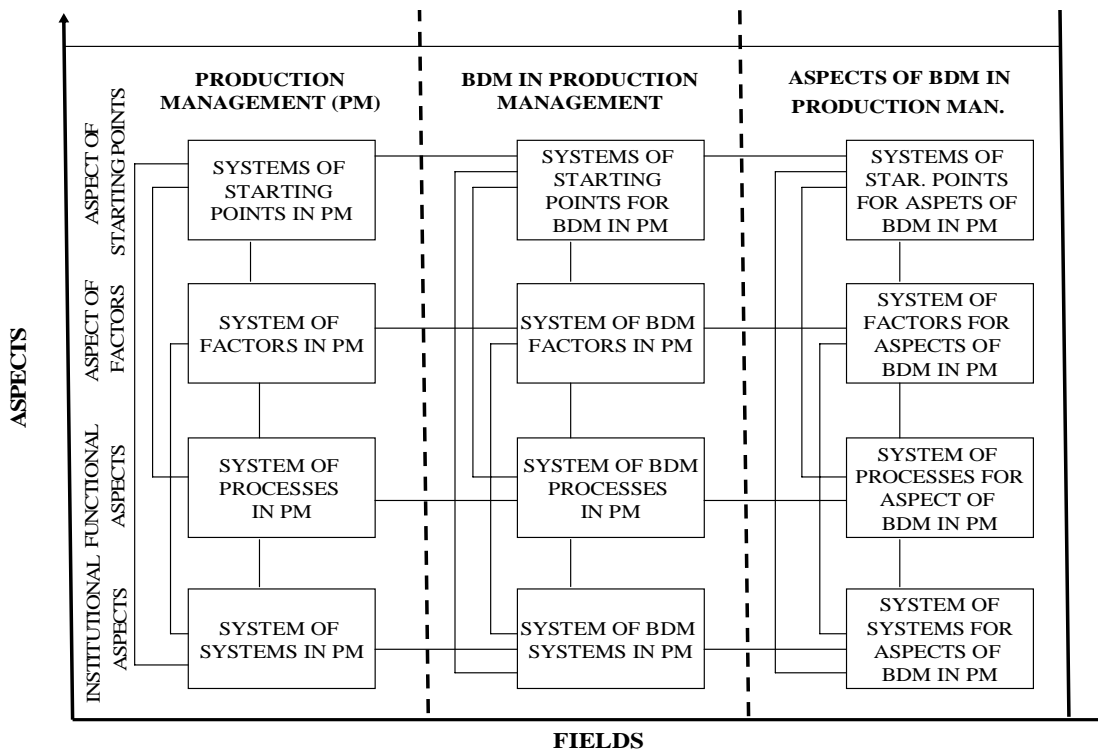


Figure 1: A model of the general management system of the standardized production (synergies are not explicitly included!)

Its fundamental characteristics include: 1) Central area of its operation is the BDM on directing and balancing of production towards an agreed-upon business goal; 2) The model contains standardized areas for planning the volume of output, measuring the necessary material

inputs, stock management, planning of means of production, operation scheduling, monitoring of production and generating accounts of production; 3) The model includes the treatment of the time aspect of management for the scheduled period T, which is broken

down to six equal time periods -  $T_i$  - for the needs of the analytical (statistical) examination.

The production management model presents the starting point(s) for a further treatment of the role and significance of the BDM in production. It is, namely, limited to the general part of its attributes. In practice, all three parts of attributes (general, group, individual) are interdependent, of course.

#### 4. HOW TO IMPLEMENT "HOLISTIC STANDARDIZATION" OF BDM IN PRODUCTION MANAGEMENT

BDM may be seen as the core area of production management. Results of numerous investigations carried

out indicate the great importance of DM in management [2; 7; 1; 19; 17].

The areas essential for the further development of the DM system for BDM in production management include [6; 19; 17]: 1) determination of the role of DM in production management, 2) definition of fundamental characteristics of decision-making (choice of aspects, selection of areas of expected synergies), and 3) the selection of starting points for the development of the BDM.

We defined BDM in production management as a basic process and modeled it as a management system. In accordance with the dialectical systems approach, BDM presents a soft and partial production management system that includes all its components but only the selected DM relations, anyway.

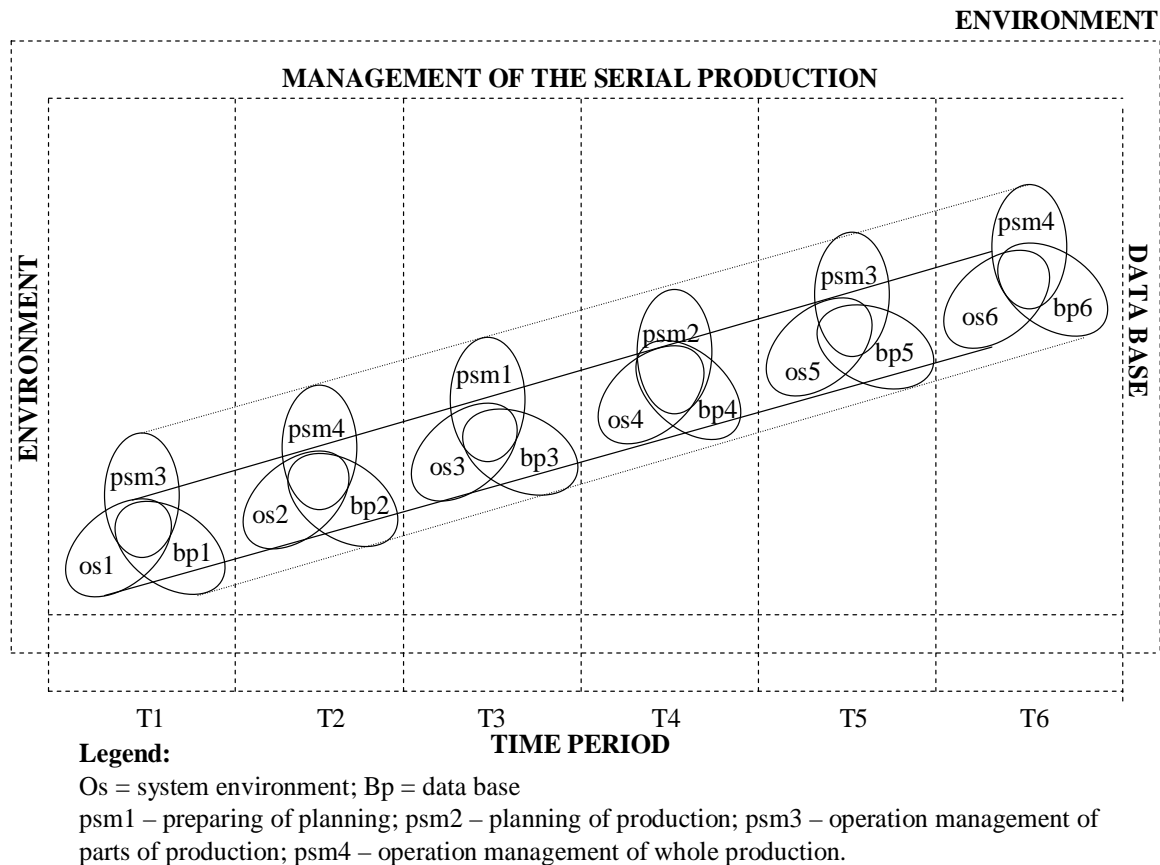


Figure 2: Model of a dynamic management system of standardized serial production

In the mode-implementation phase, BDM in production management can be defined on the basis of the examination of the majority of significant areas of DM, e.g. factors, processes, tools, and their synergies. It is examined by means of thorough preparation and by the direct implementation of research.

During preparation for implementation we define the DM aspects (e.g. economics, ethics) together with the DM areas (standard areas of DM). A model of BDM systems as illustrated by Figure 2 can also present cognitions of BDM.

This model: 1) presents DM model included into the selected DM practice; 2) uniformly defines their role and importance based on the aspects and the areas of examination; 3) presents their mutual relations, especially co-dependence.

The model for DM processes is selected from the dialectical system of all DM models available for a further examination. The evolution of the selected system is based on the standardized DM research, which involves a decomposition of the existing DM and a composition of a

new DM system.

The overall DM is analyzed by decomposition to the essential parts (e.g. fundamental areas, areas, parts of areas, procedures, acts of decision-makings); the recognized parts are then defined by a standard examination and appropriately presented. Decomposition of DM is carried out by the "block method" of DM and by the DM classification.

But an innovation-and-knowledge driven economy also requires from management and its BDM to strive at excellence, which is attainable by permanent innovation. To make this change happen, BDM must, in terms of its content, include the innovation potential factors rather than routine-based production running only.

Different authors [2; 5; 6; 7; 13; 17; 19] identified different number (from 20 to 100) factors influencing the BS's invention / innovation potential. Many of them classified factors in groups such as in Figure 3:

|                             |   |
|-----------------------------|---|
| Factor under BS's control   | <ul style="list-style-type: none"> <li>• BS's vision, politics, and strategy – BS governance</li> <li>• BS's management and organization</li> <li>• BS's staff and their knowledge, skills, experience, motivation</li> <li>• BS's culture and climate</li> <li>• BS's research and development linked with marketing as well as other business functions</li> <li>• BS's technology</li> <li>• BS's networking with its business environment</li> <li>• BS's other available resources and capacity to gain them</li> <li>• BS's other attributes such as size, industry, location, export, previous business success</li> </ul> |
| Factor outside BS's control | <ul style="list-style-type: none"> <li>• Invention &amp; innovation infrastructure, policies and factors outside BS</li> <li>• Markets' attributes</li> <li>• Random events and (good or bad) luck</li> </ul>   |

Figure 3: Invention and innovation potential factors in overview

A BS can influence factors in Figure 3, if allowed or even invited, only. It can influence them more directly or less directly. Both action possibility and its outcome depend on the BS's absorption capacity, which in turn depends on the network/system of knowledge and values of the influential individuals and bodies in a given BS.

The above-mentioned cognitions show the bases for the research and development of the entire (requisitely

holistic) system of DM processes in a BS. However, details surpass the chosen framework of discussion in the present paper.

## 5. SOME CONCLUSIONS

A BS ensures its own continued existence and development through its high quality of business. It can

considerably improve its business results with standardization of its DM. Our experience allows for a general conclusion that standardization of BDM can take place on a level between a total one-sidedness and a total holism. We apply criteria of the requisite holism. A requisite level of BDM unification may result. BS can improve its results, if BS creates its dialectical system of its standard BDM processes, which provides for a high quality of BDM. Within standardization, we establish both a standardized dialectical system of processes and a standardization of contents of standardized BDM in the BS.

We implement standardization in Production Management. Production is a partial system of the business operation that, with the synergetic operation of all business areas, provides an adequate production in accordance with the selected purpose and objective of business operation. Basic areas of the production management are: design, engineering and running. Formation is a conceptualisation process by which processes, systems and results of production are coordinated.

Within management, we consciously take into account its impact on factors, operation and organisation of production management. DM on production management can be designed as a general system of BDM, which makes possible a uniform treatment, a more extensive comparability of results and better control of production.

To meet the needs of research, a general system is defined as a synergetic whole of corresponding aspects, areas, factors, processes, systems and relations of the production management. Herein, we examine selected areas (formation, implementation, management) along with selected aspects. General system of BDM is used for the application of a dynamic model of the standardised production management.

BDM in the production management is, from the content aspect, determined by the presentation of its role and importance. The BDM area is a crucial part of the production management and constitutes its crucial process and the soft partial system. The position of the investigated DM system, within the framework of the overall business operation is determined by the application of the systems model of BDM in production management. In this model we present important DM systems for production management, and uniformly define the role and significance of the individual systems (based

on the aspects and the nature of treatment). We determine their mutual relations and the position of the investigated DM systems. The basic characteristics of the DM are determined on the basis of the decomposition of the existing DM and on the research of the DM (by composition of a new whole).

## REFERENCES

- [1] Cole, G. (2004). *Management: Theory and Practice*. Thomson, London.
- [2] Daft, R. (2001). *Organization Theory and Design*. South-Western, Mason.
- [3] Daft, R. (2003). *Management*. Dryden Press, New York.
- [4] Donnelly, J., Gibson, J. (2000). *Management*. McGraw Hill, Boston.
- [5] Fly, F., Stoner, C. (2000). *Business: An integrative Approach*. McGraw Hill, Boston.
- [6] Harman, W., Porter, M. (2001). *The New Business of Business*. Berret-Hoehler, San Francisco.
- [7] Harmon, P. (2003). *Business Process Change*. Morgan Kaufmann, San Francisco.
- [8] Harrison, F. (1999). *The managerial decision-making process*. Houghton Mifflin, Boston.
- [9] Koontz, H., Weihrich, H. (2002). *Essentials of Management*. McGraw Hill, Boston.
- [10] Mulej, M. (1974). *The Dialectical Theory*. University of Ljubljana, School of Sports, Ljubljana.
- [11] Mulej, M. (et al.) (2000). *Basic of Systems Theory*. FEB, Maribor.
- [12] Mulej, M. (at al.) (2003). Informal systems thinking. *Cybernetic Systems*, 34/2 (pp. 71-92).
- [13] Mulej, M., Zenko, Z. (2004). *Introduction to systems thinking*. Management forum, Maribor.
- [14] Potocan, V. (2000). Systems of the standard DMP. *Management*, Vol. 7, No. 1, pp. 12 – 30.
- [15] Potocan, V. (2003). *Business Organization (in Slovene)*. Doba, Maribor.
- [16] Potocan, V., Mulej, M. (2003). On Requisitely Holistic Understanding of SD. *SPAR*, 6/16, pp. 421-436.
- [17] Potocan, V. (2004). *Operations Management (In Slovene)*. EPF, Maribor.
- [18] Rebernik, M., Mulej, M. (2000). Requisite holism, isolating mechanism and entrepreneurship. *Kybernetes*, 29/9, pp. 1126-1140.
- [19] Waller, D. (2003). *Operations Management*. Thomson, London.



