Annals of DAAAM for 2010 & Proceedings of the 21st International DAAAM Symposium, Volume 21, No. 1, ISSN 1726-9679
ISBN 978-3-901509-73-5, Editor B. Katalinic, Published by DAAAM International, Vienna, Austria, EU, 2010
Make Harmony Between Technology and Nature, and Your Mind will Fly Free as a Bird
Annals of DAAAM International

POSSIBILITIES OF INFORMATION LOGISTICS UTILIZATION IN PRACTICE

KISS, I[mrich]; SLOBODA, A[urel] & WESSELY, E[mil]

Abstract: *The core of this contribution consists of the information on the possible utilization of the logistic push - pullprinciple in a specific production system. A new perspective on defined transforming point (TP) is presented. The significance of logistic concept of management for the transition from the stochastic to the deterministic principle is interpreted. The interpretation and results of specific studied issues make part of this contribution.*
Key words: *Economy of Working Processes, Deterministic and Stochastic Approach, Handling and Storage Costs, Decoupling and Transforming Point, Push, Pull, Independent and Dependent Requirements*

1. INTRODUCTION

With the analysis of the working processes economy, resultant effect of the production according to the orders was determined to be favourable, in respect to the production in accordance with the predicted data. The reason might be that all the production processes can be planned, organized, managed and controlled according to the deterministic data; they can be effectuated with minimum orders, shipping, production, and handling and storage costs. Acomplex analysis of this issue applied to the conditions of the management of material flows in the logistic chain was executed in the concern of Philips, where, based on the results of the analytical work, a concept of the decoupling point (DP) of the logistic chain by the customer order originated.

2. TRANSFORMING POINT CONCEPT

It turns up, however, that in the DP no decoupling arises, but a fundamental change of the management of the material flows in the logistic chain concept appears. The management according to the prognoses, i.e. stochastic, transfers into the management according to the customer orders, i.e. deterministic. Therefore, the term decoupling point becomes substituted by the term transforming point (TP). Its basic function, i.e. the measure of the influence of the TP position in the decisive points of thecustomer orders penetration in the logistic chain on the main characteristics of production and logistic processes, can be illustrated with the data in the Table 1 and with the Graph in the Figure 1.

Consequently, TP specifies two decisive areas, one of them lies from the TP towards the customer (independent requirements) and the second in the opposite direction towards the supplier (dependent requirements). Risks of the decision-making result from the economic impacts of not satisfied customer orders and from the false decisionregarding the purchase of useless and dead stocks.

Since TP definesthe penetration depthof the customer order, the identification of its place in the logistic chain plays a decisive role in the decision-making risk cut-down in the logistic processes management. It was stated that it is a place from which customers are served directly, i.e. the last place of stocks in the logistic chain.

Order evaluation according to the TP method conformsfollowing principles:

- Independent requirement is comprehended as a final consumption market demand, in the form of precisely specified requirements (orders) or in the form of the prognosis of the marketing market research.
- Dependent requirement is comprehended as production consumption and it concerns the purchase of all production processes inputs. This requirement is strictly set according to the production documentation.
- The proposition on the change of the independent requirement to the dependent requirement in the TP might be comprehended in a relative connection of tendencies of the elasticity growth and the production individualization by the production doses reduction (e.g. Japanese concept – dose = 1 piece), than by the possibility of the TP shifting towards and against the material flow, regarding the demands of the final consumption market requirements and regarding theinternal production dispositions, amount of the stockcosts and material flow, productivity and the character of the production (piece, series) and the distribution of final products.
- In general, the shift of the TP against the material flow direction results in:

Position of the TP	Place of the TP	Characteristic of the Production Process	Characteristic of the Logistic Process Management
1	Distribution Shed	Production and Stock Expedition	Push – Interrupted Material Flow Chain
2	Stock of Finished Products	Production for Stocks	Prevalent Push + Pull
3	Buffer Stocks	Ordered Installation	Prevalent Pull + Push
4	Stock of Semi-articles and Semi-products	Ordered Production	Pull – Continual Material Flow Chain
5	Stock of Material Input Suppliers	Material Purchase and Ordered Production	Pull – Synchronous Material Flow Chain

Tab.1. Direct Effects of the TP on the Production and Logistic Processes

- the total of continuous times of working processes along the stream of material flow into the TP shall be smaller than the delivery date of the final product,
- the dispersion of continuous times that can cause the unreliability in deliveries,
- complicated, insecure, specific activities are placed behind the TP,
- activities with a short continuous time and high added value are placed before the TP,
- stocks are the more expensive the closer they are to the customer, as they "carry" a long expense chain,
- unreliability of the stock forecasting causes a raised safety stocks,
- the wider a range of production the higher risk of dead stocks,
- the smaller number of customers the higher risk of dead stocks,
- the TP comes before the high-cost processes.

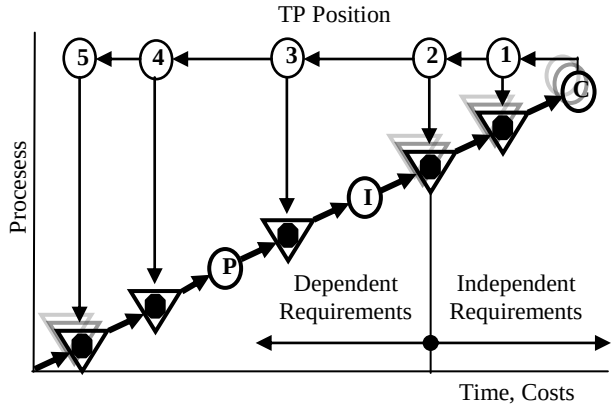

Fig. 1. Characteristics of the TP Logistic Chain
P - Components production, I - Final installation, C - Customer

3. THE ORDERS EVALUATION

The orders placed by the customers are being evaluated by the sequential order-sorting algorithm through the classifiers functioning as the filters of the selection and production of various databases (DB) of orders in accordance to technical-economic parameters of production availability in individual stages of production process. Stages are defined by the TP of the logistic chain.

Sorting begins with the input of orders to the database (DB 1) from which are being "out-filtrated" the so-called irrelevant orders not corresponding to the line structure of the supplier's production programme. Irrelevant orders may be consulted with customers or they may be completed or repaired after the arrangement with the customer so that they become, as relevant databases (DB 2), suitable to the conditions of classifiers in other stages of the sorting algorithm.

A classifier, with the conditions of specified parameters of product stored in the distribution shed, selects from the database (DB 2) two groups of orders. Orders of customers, specifications of which are identical to the specifications of classifier, i.e. they correspond to immediate supplying conditions from the distribution shed at the position TP 1. This is the final step of provided line of algorithm.

Second group of orders creates a database (DB 3), from which are selected orders to which cannot be reacted directly with the delivery command from the Stock of finished products, which is situated at the TP 2 position of the logistic chain.

Orders that cannot be dealt with the direct delivery from the Stock of finished products are cumulated into the database (DB 4) which is forwarded to the next sorting round. Steps of this round, as well as of the next rounds (for the remaining DB 5 and DB 6) are identical to the steps of previous rounds. Obviously, every round has particularities of sorting classifiers which correspond to current disposals of the production process stages (bounds to production disposals of the "ordered production", which can meet the orders from databases DB 4 – installation and shipment, DB 5 – production of components, including the installation and shipment of products, DB 6 – semi-products purchase, production of components, installation and shipment of products). These stages are at the position TP 3 (Stock of the Production in process and purchased semi-products), TP 4 (Stock of input materials) and TP 5 (Stock of suppliers) from the Table 1.

4. CONCLUSION

The findings articulated in this contribution remit to the importance of the management of production and logistic processes in their mutual relativity and dependence. They can be helpful for the needs of mathematic models formation and for their computer securing. Thereby, the supply-customer chain can be increased towards the algorithmization and optimization of corresponding processes and this may be helpful in the process of bases for the complex decisive and managerial process defining.

5. REFERENCES

Bigos,P. & Kiss, I. & Ritók, J. & Kastelovic, E. (2005). *Materiálovétoky (Material Flow and Logistic),* TU, ISBN 80-8073-263-9, Košice

Hoekstra, S. & Romme, J. (1992). *Integral Logistic Structures,* McGRAW-HILL Book Company Europe, ISBN 0-07-707552-8, London

Kiss, I. &Ľašová, M. & Šenkýr, M. &Jamnický, O. (2009). *Informačnésystémy v logistike (Information Systems in Logistic), Multiprint, ISBN 978-80-89282-38-8, Košice*

Lewison, W.A. &Rerick, R.A. (2002). *A Synergic Approach to Minimizing Waste,* ASQ Quality Press, ISBN 0-87389-532-0, Milwauke, Wisconsin

Pernica, P. (1998). *Logistický management(Logistic Management),* Radix, ISBN 80-86031-13-6, Prag