



CONTROLLING IN SUPPLY CHAIN - TOOL FOR PROCESS INTEGRATION

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ABSTRACT. The product value is created as a result of supply, production and distribution processes that using up assets (resources) during value creating in supply chains. The arrangement of proper process's path that reflect strategic aim and eliminating not value added processes is the problem of many companies to achieve high level of efficiency. The increasing product value and enterprise efficiency is sought-after strategy in the rapid changed and competitive market environment - through lack of satisfying profit rate and sale/income volume.

But enterprises may bear excess expenditures that are inappropriate to created value and in this way to lower efficiency of capital and assets.

In the paper are shown results of study of controlling effectiveness as a tool which allow integrate improving company's efficiency and product value at the target market. The company has to integrate shaping his processes and resources to achieve high efficiency at the determined product value. The calculation of key company indicators and pointing their determined value are not enough in a lot of enterprise cases. There is necessary active support of processes management in supply chains. But in many enterprises controlling of efficiency is made by accounting or financial controlling departments which aren't using methods and tools to actively shaping processes and assets.

Key words: controlling, efficiency, supply chain management, integration, planning, process management, performance indicators, mapping, value chain, value management.

INTRODUCTION

The comprehension of business processes interactions along supply chain is an important factor to succeed in the fast changing and competitive business arena. The main role of controlling is to support connection supply with demand in an integrated, coordinated and efficient manner. The supply chain value analysis start from the activities of procurement and supplying of raw materials, through material management at production phase, until distribution and delivery to the customer on the target market.

The most important and most difficult in supply chain management art is to integrate and coordinate material flow in one common (master) plan based on market requirements. The general view on the complexity of supply chain management issues that are important for product value is presented in Figure 1. The controlling system supports planning, organizing and control of supply chain activities to achieve high efficiency of translation from product value to supply chain value.

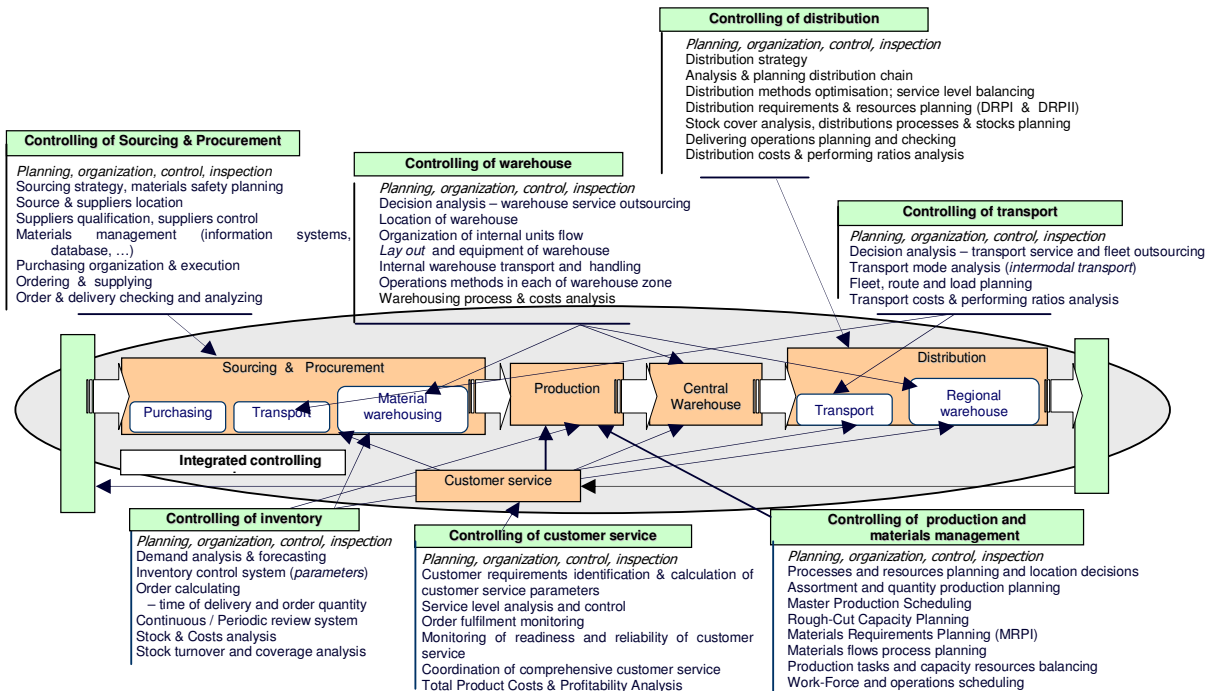


Fig. 1. Supply chain management activity supported and integrated by controlling system.

Rys. 1. Aktywności w zarządzaniu łańcuchem dostaw wspomagane i połączone poprzez system controllingowy.

The value chain analysis is used to identify the possible sources of improved performance and product value. The 84% (results of The Poznań School of Logistics study made in group of 150 managers) cases of non-effective translation product value into supply chain value result from problems with integration and coordination of supply chain processes.

Supply chain performance metrics indicate how well a supply chain performs within SCOR [The Supply Chain Operations Reference-model 2006] categories of performance known as performance attributes - for example:

- delivery reliability, flexibility and responsiveness - from customer side,
- cost and asset management - from enterprise side.

The level of supply chain process efficiency translation product value to supply chain value is measured also by:

- Key Performance Indicators - e.g. average cash turnover cycle, equity capital profitability, direct total costs, ROI, efficiency of using enterprise's assets,
- Key Performance Operations Indicators - e.g. stock rotation, unit costs (of production or transport), standard costs deviation, standard material using, productivity, effectiveness.

The arrangement of proper process's path that reflect strategic aim and eliminating not value added processes is the problem for many companies to achieve high efficiency. Enterprises may bear excess expenditures that are inappropriate to created value and in this way to lower efficiency of capital and assets.

Example: The inventory level is one of important supply chain metrics. From the customer side - guarantee: perfect order fulfilment, short fulfilment lead time and short supply chain response time. From the enterprise side - trigger high costs and low rotation of capital.

A decision regarding to supply chain process and resources can only be made, if all factors and their respective influence have been identified for the various options. The following steps are important for the supply chain controlling that support creation of the product value:

- classification of market requirements within customer segments and in direct comparison with competitors,
- assignment responsibility for product value to supply chain processes,
- identification of the main influencing factors and costs drivers,
- definition of KPIs (in the four perspectives balanced as form of Balanced ScoreCard at operations level); assignment value of KPIs,
- specification of the activities, methods, algorithms, rules, priorities, allocation of resources, etc. that allow reach established values of KPIs,
- prioritization of those steps for implementation purposes.

PRODUCT VALUE TRANSLATED INTO SUPPLY CHAIN VALUE

The market demand is shared between competitors. Managers are fully aware that volume of participation in market share is a result of value that customers receive with product and service level in comparison with competitors. The company's controlling system has to convert the target market demand and customer requirements into appropriate integrated value creation process. The ability to create and increase product value in supply chain depends on the ability to processes control and to integrate them. The group of four basic value assessment criteria in value process creation of supply chain are shown in Figure 2. Criteria presented in Fig. 2 may be described as follows:

- Quality - the product ability to fulfil of customer requirements - e.g.: functionality, price, durability, safety, usefulness; value orientation of quality - how much product features fulfil the customer requirements; (expected value - high),
- Service level - the supply chain ability to identify and fulfil customer requirements; (expected value - high),

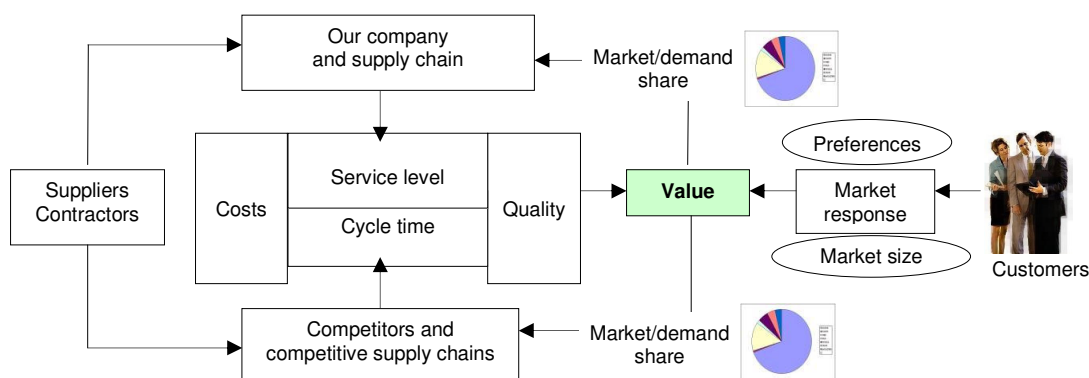


Fig. 2. Four criteria of value assessment in supply chain value creation process.
 Rys. 2. Cztery kryteria wartości w procesie tworzenia wartości łańcucha dostaw.

- Cycle Time - time of customer response, time of reaction on rapid needs and requirements changes (flexibility) that creates value for customer by short cash-to-cash cycle time and short cycle time of working capital (low volume of working capital needs); (expected value - low),

- Costs - beside price that customer pay this criteria include also another costs (have arisen from cooperation with supplier) - e.g.: safety stock costs, control process costs. It means if enterprise wants to create customer value should try to reduce any other customer costs resulted from cooperation with supplier; (expected value - low).

The clear relationship between these value criteria can be expressed as follows:

$$\text{Value} = \frac{\text{Quality} \times \text{Service level}}{\text{Costs} \times \text{Cycle Time}}$$

That is important to see that if quality of product increase (e.g. material quality increases or quality of product design) and other three remain factors stay the same (price and costs at customer doesn't increase) the overall value for customer increase. But if cycle time is longer and the remaining factors stay the same then the overall value will decrease. The integrating role of controlling leads to improved relations at the same time between four mentioned criteria. The controlling activity is aimed at integration and coordination all supply chain processes shown in Fig. 1, according to value criteria influence. This makes it a very powerful competitive weapon.

TRANSLATING OF CUSTOMER NEEDS INTO SUPPLY CHAIN PROCESSES

One of methods that help to understand needs of the customer (end user) with design, development, engineering, manufacturing, and service functions is Quality Function Deployment (QFD). Enterprises aim to integration all customer needs and map them onto processes in supply chain. The QFD method based on logical path of translating customer needs into product/process/resources characteristics, has shown in Figure 3.

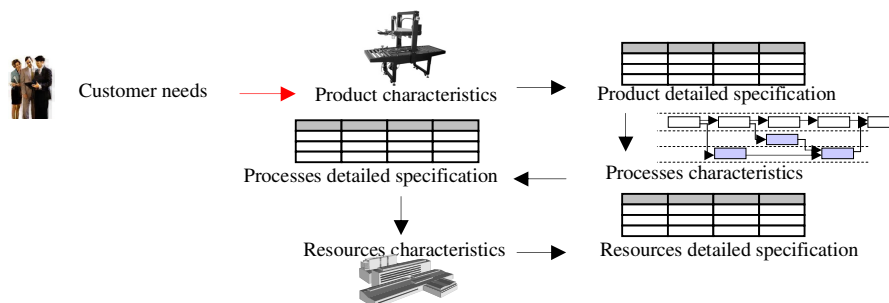


Fig. 3. The QFD translating sequence of customer needs into product/process/resources characteristics.
 Rys. 3. Sekwencja przetwarzania potrzeb konsumenta w charakterystykę produktu/procesu/zasobów.

The QFD method as a tool of operations controlling allows to translate efficiently product requirements into product detailed specifications and customer service level and next onto supply chain (processes and resources) requirements to achieve value chain. An integrating role of controlling with using QFD method implements elements of Systems Thinking as system of comprehensive development process for:

- understanding of customer needs and 'value' meaning for him,
- understanding how customers become interested, choose, and are satisfied,
- analyzing how are known the needs of the customer,

- deciding what features should be to include in product and customer service,
- determining what level of performance to deliver
- intelligently linking of customer needs with design, procurement, supplying, manufacturing, distribution and service processes,

The controller of enterprise has to view and link some critical issues for company in every day activity: the pressure to reduce overall supply chain costs, exploiting company's assets more efficiently, more effectively cooperate with trading partners and improve service level of customer. Those issues have to be integrated as the main goal of supply chain's value added to product in target market.

CONTROLLING IN SUPPLY CHAIN AS A TOOL FOR PROCESS INTEGRATION

The crucial condition of the integrated value analysis in supply chain is decision optimization concerning choosing: process and work flow, resources used to activities execution, the level of engaged resources, resources allocation in supply chain and activity performance.

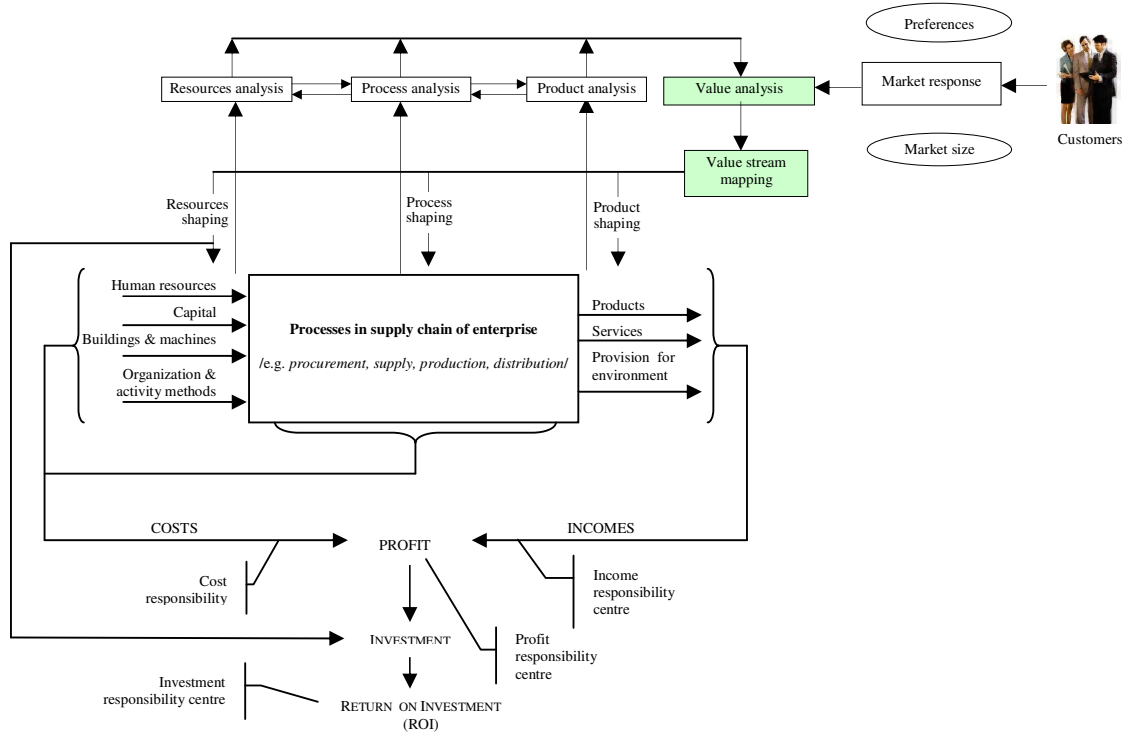


Fig. 4. Value analysis loop-back used by controlling system to integrated shaping of resources/processes/products in supply chain.

Rys. 4. Analiza wartości stosowana w systemie controllingowym w celu zintegrowania zasobów, procesów i produktów w łańcuchu dostaw.

Value analysis provides companies with integrated insight into their supply chain costs and incomes behaviour. The value analysis is used by a company to objectively examine costs attributed to products moving along value chain and incomes attributed to product sale at the target market. In this meaning product is a result of activities that has a particular value for a receiver (customer). The 'value stream in supply chain' is defined as all the steps - both value added and non-value added - required to bring a product from the raw material through production and distribution to the customer.

The value analysis as a controlling tool shows the influence of resources, processes and product on the profit margin. An integrated view allows to better understand what generates costs and incomes in supply chain and better interpret financial measures of enterprise. The operations analysis (resources, processes and products) and loop-back of value analysis (including incomes and costs), making up an important part of real system of value chain management in a company. Such loop-back focused on value stream mapping that integrate and coordinate resources/processes/products shaping in supply chain is presented in Figure 4.

However, to achieve significant performance improvements and value increasing, companies need better support to enable smart, real-time decisions. Collaborative value chain management supported by controlling works with a company's existing data systems and extracting value from the information already there. It measures costs and revenues in the chain to find a mutually acceptable base for value and customer service.

Value analysis and operations shaping is focused on desired achievements of value and financial result of enterprise. The effective processes or resources shaping requires another controlling tool - budgeting procedure - to allocate money assigned to shaping aims and activities (table 1).

Table 1. Operational table for budgeting of shaping activities
 Tabela 1. Tabela budżetowania kształtowania aktywności

Goal	Goal measure	Planned measure value	Action	Budget
1	2	3	4	5
Reducing the stock and better stock allocation Better understanding of customer needs and higher service level Increasing quality and adjustment of products Bigger profit accumulation Higher sales and stock rotation, faster product flow in supply chains Higher assets and capital productivity, shorter investment return period and higher return on investment (ROI) Reducing operating costs of cooperation and load handling Better ability of reaction to market changes and faster response to changes of customer needs				

CONCLUSIONS

The ability to create and increase product value in supply chain depends on the ability to control and actively shaping resources, processes and products based on results of value stream mapping. Presented methods for translating customer value into supply chain value and system loop-back connecting value analysis with value stream mapping allow to integrate value management. Enterprises based on proposed methods and relationships can make rational decision about expenditures that are appropriate to created value and in this way to control efficiency of capital and assets. Presented results of controlling instruments study allow integrate improving company's efficiency and product value at the target market. In this way enterprise can integrate shaping his processes and resources to achieve high efficiency at the determined product value.

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KONTROLLING W ŁAŃCUCHU DOSTAW – NARZĘDZIE DLA INTEGRACJI PROCESÓW

STRESZCZENIE. Wartość produktu dla klienta jest wynikiem realizacji wielu procesów w łańcuchu dostaw - np. zaopatrzenia, produkcji i dystrybucji - i zużywania w tych procesach zasobów. Określenie przebiegu procesu najlepiej realizującego cele przyjętej strategii przedsiębiorstwa i eliminującego działania nie dodające wartości dla klienta, jest problemem wielu przedsiębiorstw w osiąganiu ich wysokiej efektywności działania. W obliczu braku satysfakcjonującego zysku i niskiego poziomu sprzedaży/przychodu w zmiennym i konkurencyjnym otoczeniu rynkowym, skuteczny sposób realizacji strategii wzrostu wartości produktu i wzrostu efektywności, jest bardzo poszukiwany.

Przedsiębiorstwa mogą w realizacji założonej strategii ponosić koszty nieadekwatnie wysokie do tworzonej wartości, obniżając tym samym efektywność posiadanych zasobów i zainwestowanego kapitału.

W treści artykułu przedstawiono wyniki badań efektywności kontrolingu, jako narzędzia pozwalającego w sposób zintegrowany zwiększyć efektywność przedsiębiorstwa i wartość produktu na docelowym rynku. Przedsiębiorstwo, dla osiągnięcia wysokiej efektywności i wartości dla klienta, powinno integrować działania kształtowania procesów i zasobów w łańcuchu dostaw. Określenie kluczowych wskaźników wykonania i ich docelowych wartości jest w przypadkach wielu przedsiębiorstw niewystarczające. Konieczne jest aktywne wsparcie zarządzania procesów łańcucha dostaw przez controlling (głównie operacyjny). Niestety w wielu badanych przedsiębiorstwach controlling efektywności jest wykonywany przez działy F/K lub działy kontrolingu finansowego, nie wykorzystujące w swojej pracy metod i narzędzi kształtowania procesów i zasobów łańcucha dostaw oraz analizy wartości.

Słowa kluczowe: controlling, efektywność, zarządzanie łańcuchem dostaw, planowanie, proces, wskaźniki wykonania, mapowanie, łańcuch wartości, zarządzanie wartością.

LOGISTIKKETTEN - CONTROLLING - WERKZEUGE ZUR PROZESSINTEGRATION

ZUSAMMENFASSUNG. Der Produktwert wird als Ergebnis von Zulieferungs-, Produktions- und Verteilungsprozessen erzeugt, die die Ressourcen während der Wertschöpfung in der logistischen Kette aufbrauchen. Die Einteilung der geeigneten Prozessabläufe, die die strategische Zielsetzung wiedergeben und die nicht wertschöpfenden Prozesse beseitigen, ist das Hauptproblem von Unternehmen, um eine hohe Produktivität zu erreichen. Der ansteigende Produktwert und die Unternehmensrentabilität ist die gefragte Strategie in dem sich schnell ändernden Marktumfeld. Das Fehlen von zufriedenstellenden Gewinnraten und Verkaufs-/Einkommensumsätzen ist das Problem.

Unternehmen müssen Mehrausgaben bewältigen, die ungünstig für geschaffene Werte und damit für geringere Effizienz des Kapitals und des Betriebsvermögens sind.

In der Veröffentlichung werden die Ergebnisse der Studie zur Effizienzsteuerung als ein Werkzeug gezeigt, das es ermöglicht, eine verbesserte Unternehmensproduktivität und den Produktwert für den Zielmarkt zu integrieren. Das Unternehmen muss seine Prozesse und Ressourcen integrieren, um eine hohe Produktivität für einen bestimmten Produktwert zu erlangen. Die Ermittlung von Schlüsselkennzahlen der Unternehmen und das Zuweisen ihrer bestimmten Produktwerte ist nicht ausreichend in einer großen Anzahl von Unternehmensbeispielen. Dort ist eine aktive Unterstützung des Prozessmanagements in Logistikketten notwendig. In vielen Unternehmen wird die Steuerung der Produktivität durch die

Buchhaltung oder Finanzabteilungen geleitet, die jedoch nicht die Methoden und Werkzeuge nutzen, um wirksam die Prozesse und das Kapital einzusetzen.

Codewörter: Steuerung, Effizienz, Logistikkettenmanagement, Integration, Planung, Prozessmanagement, Leistungskennzahlen, Wertschöpfung, Wertmanagement.

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