PERFORMANCE-BASED-LOGISTICS PROCUREMENT OF INTEGRATED LOGISTICS SERVICES IN THE PUBLIC SECTOR

Andreas Glas and Michael Essig*

ABSTRACT. The contribution of the procurement function to achieve the major strategic objectives of public supply management, efficiency and security of supply, is the obtainment of control over required goods, whereas logistics is concerned with the inner and inter organisational allocation of these goods (Eßig, 1999, p.25). Public institutions require complex goods and services, like whole service solutions or product systems to perform public tasks. Examples are IT-solutions, comprehensive facility management services or material goods like rescue helicopters, fire brigade equipment as far as to military weapon systems. Due to the concentration on core tasks, public institutions have outsourced supporting services (Reichard, 2004, p.50). Public capabilities of maintenance, repair and transportation are extensively reduced as well as public institutions try to minimize stocks of inventory. This demands for a more integrated and efficient logistics support from external service providers. On the basis of a characterization and specification of public logistics the major challenges for the public procurement function are identified. As a consequence of sourcing logistics services it is necessary to deduct the requirements for public logistics from organizational strategies. These requirements then help to define the logistic demand, to execute the public procurement procedure and at least to contract and manage external logistics providers on basis of a performance measurement system.

AIM AND METHODOLOGY

In this paper we will have a closer look on public procurement of logistics services. The focus of this deductive-analytical analysis is to

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identify differences between private sector and public sector logistics requirements and their effects and consequences for public procurement of logistics services.

This paper includes three parts. In Part 1 logistics services are defined in order to give a framework for public logistics services and their specific characteristics. From the major strategic objectives of public supply management consequences for the procurement of logistics services are derived. In part 2 incomplete information and information asymmetry as very critical aspects of public procurement of logistics services are examined. In order to align the interests of public buyers and external service providers a performance based business model is presented. Part 3 presents a three step performance measurement system for the public sector. On the basis of a public balance scorecard, the logistics requirements are derived from superior organisational strategies and then translated into some manageable business ratios. Public procurement then can use these figures for the public procurement procedure and the award of contracts. In a conclusive part the key issues of this paper are summarised.

PUBLIC SUPPLY MANAGEMENT – THE PROCUREMENT OF LOGISTIC SERVICES

Logistics services

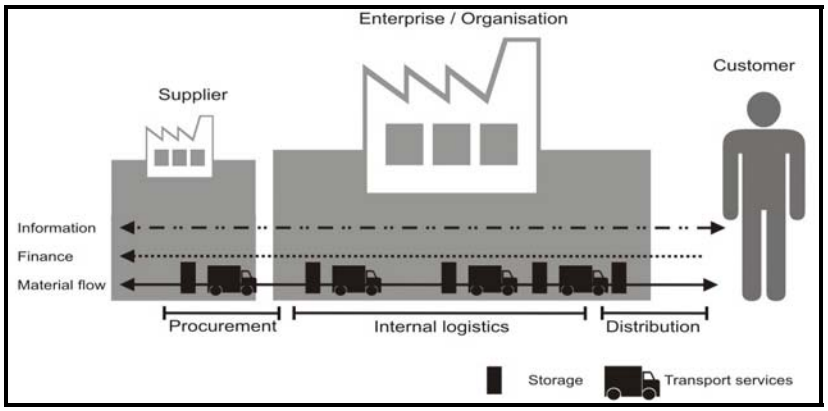
Both, the procurement and the logistics function, supply organisations with required goods. The procurement function cares for the obtainment of control over the goods and the logistics function for the inner and inter organisational allocation of these goods (Eßig, 1999, p.25). According to Pfohl (2004, p.4) logistics processes connect the production of goods with the usage and consumption of goods in distributing these goods. Logistics processes transform goods not in the quality dimension, like production or consumption processes do, but rather in dimensions of time and space via transportation and storage processes. Logistics services can be divided into processes of transportation, inventory, order picking, packaging and related information management.

Therefore logistics management is that part of supply chain management that plans, implements and controls the efficient, effective forward and reverse flow and storage of goods, services and related

information, between the point of origin and the point of consumption, in order to meet customers' requirements (Council of Logistics Management, 1998).

According to this definition, its relation to supply chain management and the development of a concentration on core competencies, respectively core tasks in the public sector (Prahalad/Hamel, 1990), a highly integrated and comprehensive logistics management is required to meet the challenge of a higher complexity of demand objects and the necessity to collaborate in networks (See Figure 1).

FIGURE 1
General understanding of logistics services



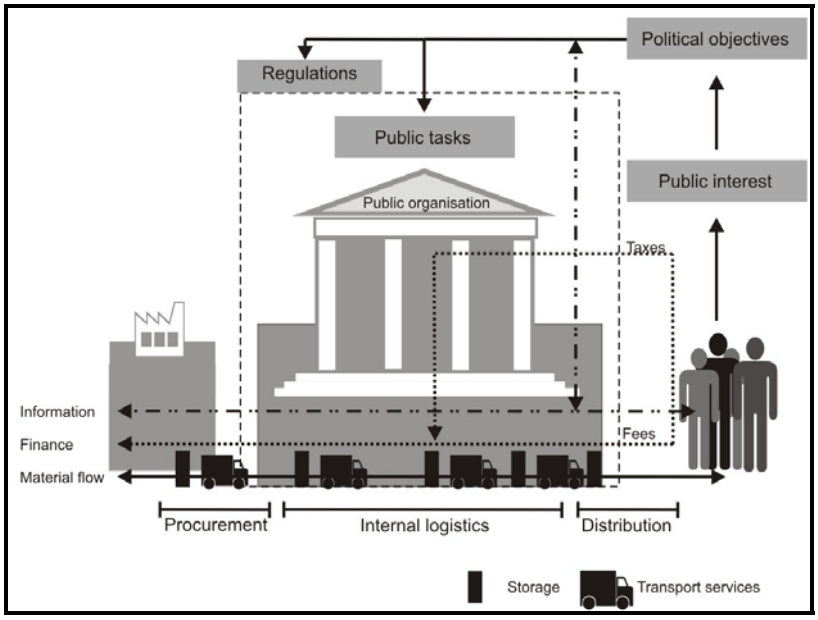
Public Supply Management - Public Procurement And Logistics

The public task, which is set to a public institution, originates from the political interpretation of the public interest and the decision-making processes depending on the political system and government (Brede, 2005, p.13). Typical public tasks are internal and external security, education, social or health care services. Oftentimes public tasks are not defined and described in detail. Due to the nebulous public interest and the vague objective of public welfare and the political economy of maximising the political benefit, public tasks set the scope of activities for public organisations without giving well-defined and task oriented objectives (Budäus, 1998, p.58). Therefore public organisations have to decide how to perform a given public task. In recent years public

institutiones reduced their performance depth and concentrated on so-called core tasks, whereas other supporting tasks have been contracted out to private enterprises. In the most extensive form private enterprises perform a public task by order (contract) of a public institution directly for the citizen (Domberger/Jensen, 1997, p.67). In any cases the flows of material, information and finance have to be coordinated and integrated. Two alternatives can be distinguished:

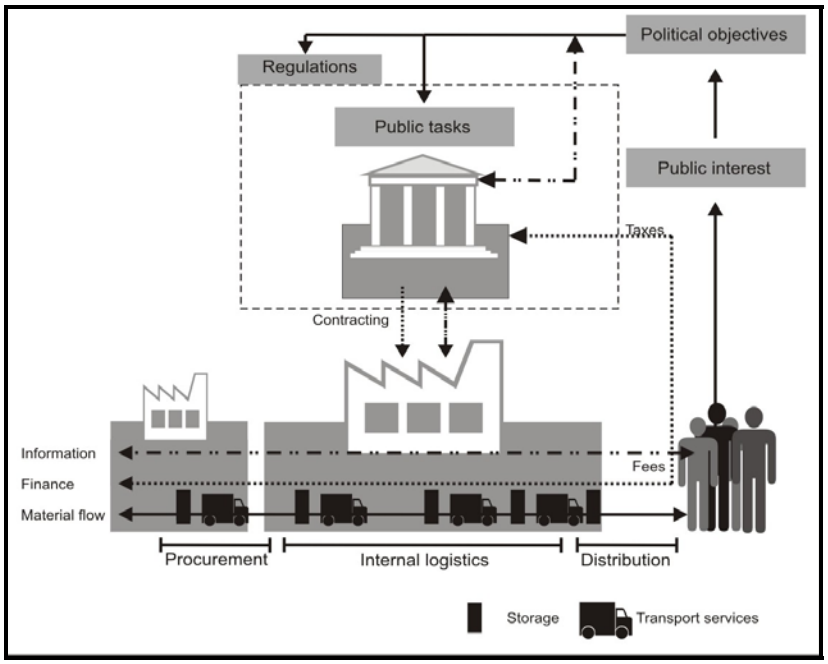
In the first case a public institution is responsible for the performance of a given public task. Then external suppliers and logistics providers have to deliver goods and services to a public demand carrier. Therefore it is important to integrate external and internal logistics services. In this case (alternative 1) the challenge for public managers exists in planning, coordinating and controlling the required supply flows in order to realize a high level of productivity of the public service providers. One example for this is the public task internal security with the public organisation "police" (See Figure 2).

FIGURE 2
Alternative 1, Framework for the public logistics system



In the other case public institutions are contracting out at least parts of a public task. This means that one or several private sector enterprises perform a public task in direct contact with the citizen. One example is a private enterprise, which is responsible for the waste disposal of a local municipality by order and of account of the local government. Indeed a contract between a public institution and the enterprise does exists, no interaction between a public demand carrier with its internal logistics processes and an external supplier or other logistics providers takes place. In this case, alternative 2, the challenge for public managers exists in planning, coordinating and controlling an external supply chain in order to create value for the citizens in form of a high and stable performance level (See Figure 3).

FIGURE 3
Alternative 2: Framework for logistics in the case of contracting out public services



In summary public supply management is embedded in a framework of social-political processes, public tasks and special regulations. Although in alternative 2 public organisations have to manage the relationship to the contract partner, it is hardly possible to influence logistics processes, aside from implementing special contract agreements. Therefore this paper concentrates on the framework for the public logistics system, alternative 1. Here public organisations really need to allocate, combine and integrate goods and services. Also public managers have the possibility to change and reconfigure logistics processes if necessary, including the option to outsource them to external service providers. Therefore alternative 1 stands for public logistics, whereas alternative 2 can be seen more in the sense of a public supply chain management.

Procurement of Logistics Services

Due to the extensive reduction of public internal logistics capabilities, apart from special logistics capabilities for e.g. the military or police, the importance of external logistics providers is rising. The question is, in which way external logistics services are procured and how public procurement can contribute to enhance logistics performance.

On the one hand logistics services are integral parts of contracts, when public organisations procure goods or services (procurement logistics). In this case the logistics service is part of the public procurement procedure of the main demand object. One example is the procurement of IT-equipment and the receipt of this good by the public organisation at the agreed time and place. In long-term contracts sophisticated procurement logistics methods, like delivery-on-demand or direct-deliveries to the demand carrier can be implemented.

On the other hand logistics services are themselves objects of public procurement procedures. When public organisations are contracting out their internal or distributional logistics services, external providers take over the operation of one or several logistics processes, e.g. the operation of storages.

Generally outsourcing of non-core tasks and sourcing of complex product-systems or service solutions has led to an extensive change of demand and supplier relations. In sourcing integrated services in form of long-term buyer-supplier cooperation, public organisations expect to enhance efficiency. Main reasons for this are the reduction of complexity

due to a decrease of the supplier base, the cost cutting integration of processes and the transfer of knowledge leading to more innovation (Hartmann, 2004, 74).

Suppliers can be classified in correspondence to their delivered product, its complexity and necessity of integration with other goods. Using the three categories units (items), package services and solutions almost every demand object is covered (Präuer 2004, p.3). In order to reduce complexity and to save transaction costs more and more long-term contracts replace internal processes and unit sourcing of single units, hoping to save coordination and process costs. Logistics services as demand objects can equally be either units, like one-term transports or package services like storage, commission and transportation or a solution like the management of all logistics processes for an organisation.

Producers of complex products and services develop to solutions providers and take over former internal processes, including logistics services for their good or service (procurement logistics).

Another kind of solutions provider emerge in outsourcing almost every logistics process to only one specified logistics provider. Bundling demand of logistics services in the public sector leads to long-term public-private cooperation (often 4-10 years) with just one or few suppliers. Such solution providers in the logistics sector, who organize and coordinate supply chain management for customers are called three or forth party logistics provider (3PL / 4PL). Even in assumed sensitive domains of public activities, like defence or police, logistics are outsourced to private solution providers (Cardinali, 2001, p.105).

Security of Supply: Specific Challenge for Public Logistics Services?

Logistics deals with the management of materials and related information flows. This suits for private enterprises as well as for public institutions. In both sectors solution providers perform complex logistics and supply management tasks. Thus, is there a difference between public and private sector logistics?

Government decide if a specific task should be regulated and treated in a special way. This is economically justified with arguments from the discussion around public goods, market failures, external effects and the existence of natural monopolies. In short public authorities try to avoid undesired effects in a specific public field and assign a public task to

public organisations. Then public performance takes the place of incomplete private-sector results (Lenk, 2004, p.27).

Public performance can be seen as a form of monopoly, because one organisation has sufficient control over one good or service to determine significantly the terms on which others have access to it. (Friedman, 2002, p.208). Therefore the ultimate customers of public services, the citizens, are dependent on the public service's price and quality. Therefore in contrast to private enterprises public institutions do not aim at profit maximisation but rather at the fulfilment of a given task with a certain level of output, respectively outcome (Kosiol, 1968, p.261). Citizens are dependent on reliable and available public service offers, e.g. in public fields like internal, external security, education or health care. Therefore capable procurement and logistics functions have to care for the supply with required goods and services for public sector organisations and ultimately the citizens. Security of supply in this context means more than the right good or service in the right quality at the right time in the right place, which is the general objective of supply management. (Grochla, 1977, p.182, Arnold, 1997, p.18). This objective is doubtless the precondition for public sector operability. Indeed security of supply in the public sector implies that public organisations are responsible for continuous and stable supply of public services to the citizens. In any circumstances a certain level of service availability and service quality has to be guaranteed for the citizens. This means availability, operativeness and also a certain level of robustness.

One concise example for insufficient security of supply is the situation of lacking capabilities for waste disposal in Naples. One other example is a rescue helicopter or a weapon system, which is not operational, due to a long delivery period for spare parts. These examples show that security of supply in the public sector is outstanding. The political, social and economic effects of an unstable supply of public services are immense.

Therefore in the past public institutions implemented robust internal logistics processes, especially high safety stocks for spare parts and redundant logistics systems with an overcapacity of personnel and equipment. Indeed a secure and robust public logistics management is cost intensive and high safety stocks or redundant logistics capacities are no guarantee for an effective logistics system. Gansler and Lucyshyn (2006, p.2) compared the logistics performance of the US-department of

defence with commercial companies. The results are very clear. The benchmark of private sector logistics is a 1-4 days order to receipt time, whereas in the US-defence sector 21 days is the average, despite higher stocks and higher logistics costs.

This could mean that there are methods of private sector supply management, which allow a better logistics performance at lower costs in comparison with the public sector. In face of limited and reduced budgets in the public sector, this could mean that public logistics manager should examine their processes carefully and implement private-sector best practices, respectively source logistics services from best-in-class providers. But how it is possible to implement and manage supplier relations with profit maximising service providers in order to create robust public logistics processes?

PERFORMANCE CONTRACTING: THE ALIGNMENT OF INTERESTS

The main question of public logistics management is how a higher level of logistics performance can be reached without loosing the objective of security of supply out of sight. Therefore not every private-sector concept of supply management is adoptable to the public sector (Budäus, 1998, p.25). However sourcing logistics services from specialized service suppliers seems advantageous. These logistics providers have sophisticated know-how and experience and can benefit from economies of scale and scope. What is then the peculiarity of sourcing logistics services in the public sector?

Quality Attributes, Principal-Agency Relations, Dependencies

Starting point have to be the logistics requirements of public organisations. Often public buyers do not anticipate specific risks and dangers and try to minimize costs relying on the logistics providers´ capabilities. Without doubt security of supply is very important, because the continuous and stable supply with public services is outstanding for the public welfare as mentioned above. Therefore the logistics requirements have to be deducted from superior organisational strategies especially for goods and services of high strategic relevance.

But generally services are mainly characterised by their intangibility, the inclusion of an external factor (here: a material good and related information) and simultaneity of production and consumption. As a

consequence it is only in parts possible to measure the performance of services. While search attributes can be recognised and measured before services are rendered, experience attributes can only be measured ex post and credence attributes not at all (Nelson 1970, Darby/Karni 1973, p.68, Weiber /Adler 1995, p.54).

These service attributes are tightening the uncertainties, which are generally the result of information asymmetries and the fear of opportunistic behaviour between buyer and service provider. The principal-agency theory is to be concerned with the problem of uncertainty in principal-agent relations (Eisenhardt, 1989).

In the public sector complex principal-agent relations on different levels do exist. For instance citizens vote politicians in elections, who assign public tasks to bureaucrats. These again award contracts to private enterprises. Additionally public and private sector managers and their employees have other interests as well.

Concerning the procurement of public logistics services there is a conflict of objectives between public buyers and private service providers, public welfare on the one hand and profit maximisation on the other. Public organisations have to initiate, coordinate and control business relationships with providers, who have to perform robust logistics processes in order to assure the supply with required goods or services also in changed circumstances.

Especially long-term contracts considered with the principal-agency theory can have serious effects for the supplier relationship due to the information asymmetry between agent and principal.

Ex ante of the conclusion of the contract, public buyers have not the ability to control specific subjects of the contract due to the experience and credence attributes of these services (hidden characteristics). Therefore it is the interest of the agent to appear as capable as possible, being fully aware that with the conclusion of the contract the public principal is in a lock in situation, due to the costly public procurement procedure and the long-term and complex contracts. In the case of IT-Outsourcing of the Armed Forces in Germany the contract was 17.000 pages thick (Bayer, 2007). The longer the contract period and the higher specific investments, the more intense is this dependency. The compensation of ex post adaptations or changes is oftentimes very expensive for the principal.

The coordination of a supply chain is largely an information processing and management task. Its performance is difficult to measure (hidden action). To what extend in the relationship with the logistics provider further prospects of improvements of efficiency do exist, is hidden for the principal (hidden information). Moreover it is in the hands of the agent, if continuous efforts for a higher performance are made and if such improvements in the relationship, beyond first (expected) positive results, are passed on to the principal (hidden intention).

As an opposite to the advantages of long-term contracting in the public sector, namely the effects of bundling demand and integrated processes, are the disadvantages in form of a lack of competition, higher coordination costs in the public sector, e.g. for the public procurement procedure or budget regulations, and the costs for the principal-agency relation. The so-called agency-costs emerge either from inefficiencies in this relation (hold-up, adverse selection, moral hazard) or from actions to overcome the information asymmetry.

The higher coordination costs in the public sector and the lack of competition in comparison to spot transactions are not regarded and can be seen as constants for this paper. Therefore the effects of the information asymmetry have to be overcome in a cost optimal way to realize a most efficient supplier relationship in the public sector.

The Alignment of Interests

One possibility to reduce the information asymmetry in this principal-agent relation is signalling of the supplier and screening of the buyer. Nevertheless the problem even of strong signals (specific investments of the supplier, public announcements etc) is, that the suppliers' intention is still different from the buyers' interest and therefore an agent can potentially take advantage of an edge of information.

Particularly in long-term contracting it is not always possible to determine opportunistic behaviour, due to experience and credence attributes of services and the situation of incomplete information for the principal. Additionally public buyers can only punish such behaviour, if corresponding contract clauses have been implemented. Therefore and by reason of the principles of public procurement law (transparency, subjective legal protection of bidders) results the tendency and the need of public buyers to make as complete contracts as possible. This implies

that measures to reduce agency costs have to be implemented in the contract and therefore considered before the conclusion of the contract (ex ante).

One method to overcome information asymmetry is the alignment of interests of the agent to the interests of the principal. In doing so, the agent then really acts in the intention of the principal. The public sector tries to align interests in using contracts, which only desired suppliers sign, due to the performance guaranties and incentives in these contracts.

In the case of simple logistics services the problem of information asymmetry and opportunistic behaviour can be treated very well using metrics. On the basis of only some metrics the service quality can be specified, managed and controlled. Examples for such metrics are delivery period, delivery reliability, supply readiness, delivery quality and delivery flexibility (Arnold et.al., 2004, p.8).

By sourcing more complex logistics solutions, the management and controlling is much more difficult. Due to the complexity of the logistics services it is not possible to control the service quality only with some metrics. It is necessary to give strong incentives. The strongest form of an incentive for a private sector enterprise refers to the objective of profit maximisation. In pay-per-performance models the payment is linked to performance metrics with or without a basic pay. Common examples are agreements of the *Performance Base Logistics* (PBL) of the US-armed forces. Here a PBL stands for an alternative logistics support that transfer traditional inventory, supply chain and technical support functions to the supplier for a guaranteed level of performance at the same or reduced costs. This business model has led to significant improvements for the US-defence logistics. Besides PBL, other more theoretical approaches treat performance-oriented long-term supplier cooperation (*Performance Contracting* (Kleikamp, 2002) or *Solution Sourcing* (Präuer, 2004)).

Due to the complexity of long-term supplier relationships and the difficulties of their implementation, management and adaptation, there is a necessity to deduce adequate metrics from strategic objectives as early as possible in the procurement process and to link these metrics with a suitable pay-per-performance system. Generally the balance scorecard as a strategic controlling instrument can serve as a frame for such a performance measurement system for the procurement function in the public sector.

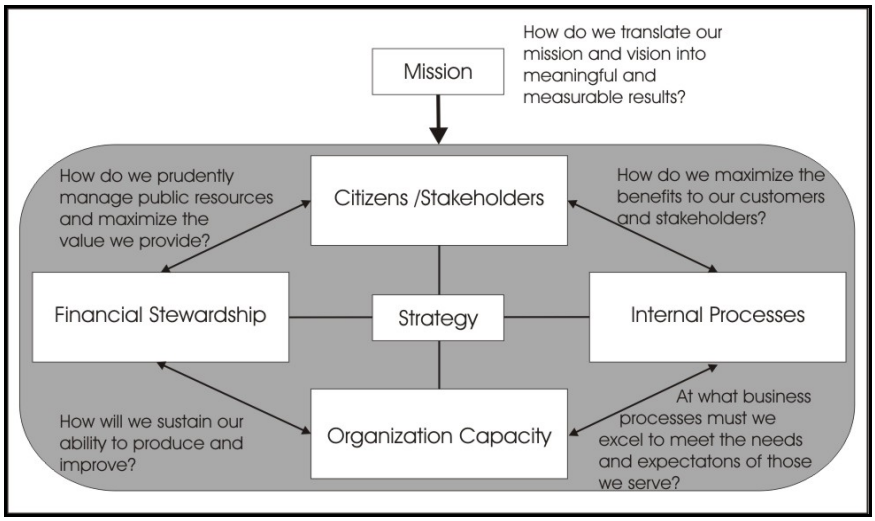
BALANCE SCORECARD AS A TOOL FOR STRATEGIC PUBLIC PROCUREMENT

In this section the balance scorecard (BSC) in one adapted form for the procurement function of the public sector is presented. Then the linkages of the BSC and deduced metrics with the public procurement process are analyzed in order to develop a more strategic, objective consistent and proactive public procurement.

Public Balance Scorecard

Originally developed in the early 1990s (Kaplan/Norton, 1992), the BSC has migrated to become a full performance management system applicable to both private and public sector organisations. The basic idea is to document strategic objectives of a considered domain (enterprise, profit centre, department) with significant metrics. A BSC uses monetary and non-monetary ratios. The measurement of input, process and output /outcome metrics allows a continuous observation of the development of defined strategic objectives. To prevent risk also early metrics are used. (Horvath/Kaufmann 1998). Figure 4 presents a corporate wide BSC for a public or non-profit organisation.

FIGURE 4
Public /Non-profit Balance Scorecard



Source: Rohm and Halbach (2005, p.4).

Balance Scorecard in the Public Procurement Process

The objectives for the procurement function are down welling derived from the corporate strategic objectives. The BSC's on different levels of an organisation can vary in content, structure and context. The context is either corporate or network /supply chain oriented (Siepermann, 2006, p.26).

For the procurement function different versions are possible (a.o. Wagner, 2003 or Engelhardt, 2002). In this paper the focus is not on the architecture of the BSC but the linkage between strategic objectives and performance oriented procurement of logistics services.

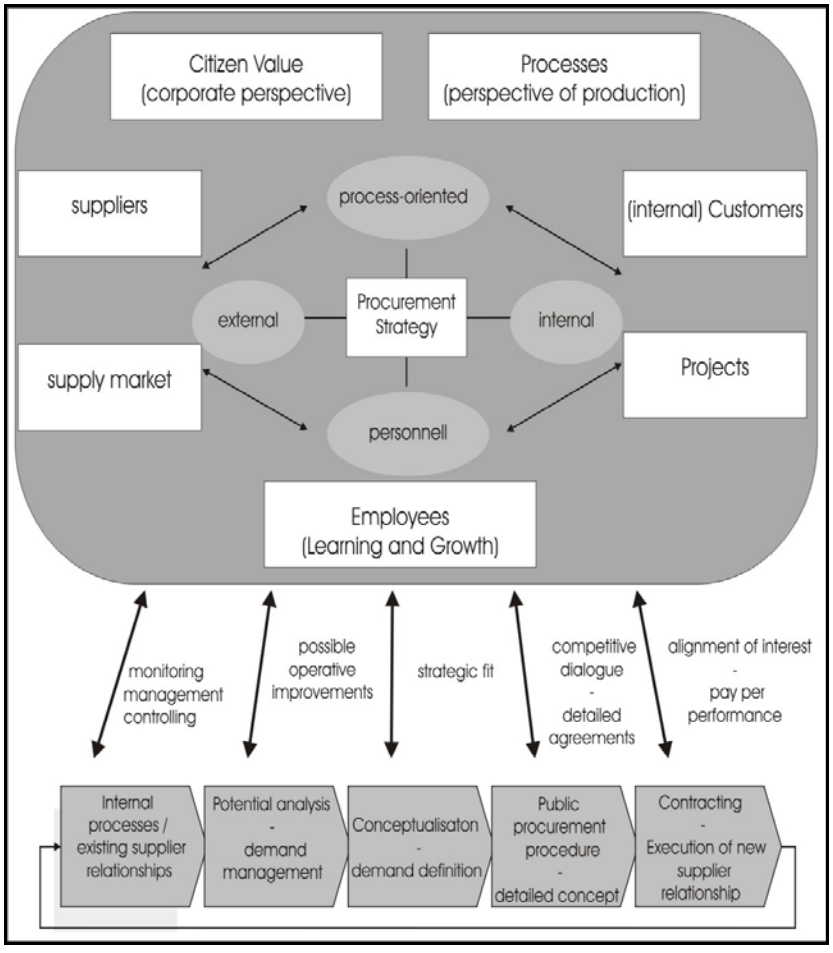
In particular for complex projects it is reasonable to link and monitor the supplier relationship in every step of the progressing procurement process with own strategic objectives. This is the case in most of the outsourcing and long-term cooperation projects of logistics services.

Strategic performance measurement systems can have a benefit right at the beginning of the procurement process. Already existing supplier relationships, e.g. in form of numerous contracts with a large supplier base or internal logistics service departments are managed using metrics and a BSC. Is there a difference between the hitherto efficiency and recognised opportunities of the supply markets, then it is necessary to make a capability analysis. Possible improvements can be expressed in a predicted change of the existing metrics. If a reorganisation (outsourcing /sole sourcing) is not possible due to other strategic objectives, then a management gap has been identified at least. Measures, e.g. qualification of the personnel or changes of internal processes can be undertaken to reduce this gap. In the evaluation of the service quality and performance and its comparison to the opportunities of the supply market the procurement function has an important early warning task.

If the implementation of a new sourcing strategy is required, then the next step is to make an internal concept of the demand to evaluate the strategic fit with superior objectives (citizen value). Therefore it is necessary to define new or change metrics. It is even possible to combine a range of metrics in a new perspective (e.g. for a specific project). This planning is continued more intense in the proper public procurement procedure. In this public procedure (e.g. the competitive dialogue, oftentimes with a precedent call for expressions of interest) the performance based agreements are planned in detail. In particular service

levels, performance metrics and the regulations regarding pay-per-performance are of importance in this step. It is very important to select the right measures, which are not always the available ones nor the easiest to measure. In long-term contracts the adaptation of the logistics quality has to be regulated as well, to gain logistics flexibility. Consequently the BSC can support management decisions on all process steps of public procurement (See Figure 5).

FIGURE 5
Connection of BSC and Public Procurement Process



Source: According to the Procurement-BSC of Buchholz (2002).

CONCLUSIONS FOR THE PROCUREMENT OF LOGISTICS SERVICES

Complex logistics services are intransparent and their quality is very difficult to measure. Indeed it is necessary to manage profit maximising enterprises in a way that the most efficient fulfilment of public tasks is realized. Sensitive domains, e.g. pharmaceuticals, ammunition for police or armed forces, maintenance support for the information and communication system of fire brigades or even logistics for employed troops, require a sophisticated management system.

With the implementation of a procurement-BSC the management of complex public procurement projects is already possible at an early stage of the procurement process. In the first considerations the demand can be specified in terms of a desired or predicted development of metrics. Then it is possible to consider if such a development would fit with superior strategies.

With the linkage of performance and payment an alignment of interests (profit vs. public task) in the supplier relationship is possible. Therefore the logistics provider has a vital interest to perform required services in the right quality most efficiently.

The requirements on logistics services have to be managed in a way to balance security of supply and economic efficiency. Therefore it is necessary to segment demand and to treat it in different ways in dependency of the situation. When situations change, the long-term contracts can be adjusted using performance metrics, e.g. to prioritise maintenance logistics support e.g. for rescue helicopters in order to augment their utilisability and availability.

At least it is again possible to evaluate the performance of processes with the best-in-class of the supply market in order to identify opportunities for further improvements. In the environment of performance-based contracts suppliers are more likely to exert themselves for improvements.

In summary the procurement of services is generally difficult to manage. Complex logistics services are no exception. The presented model of a performance based public logistics is appropriate to support the management of such procurement projects. In the next step it is necessary to identify metrics for every perspective of the BSC and for every process step of the procurement process. Their cause-effects

relationships have to be mapped in order to develop a strategic procurement performance measurement system.

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