

# Management control of ICT-services A case study within the Defense organization

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## Abstract

*This contribution discusses an empirical investigation into the management control system (MCS) of the Defense Telematics Organization (DTO), by means of a model originating from the profit sector (Van der Meer-Kooistra and Vosselman, 2000). The model describes how contractual relations can be brought about between an outsourcing party and a supplier and how these two parties can cooperate and control the risks that come with the outsourcing of activities. The application of the model to the relation between DTO and the defense organization indicates that a bureaucracy-based management control pattern is the most suitable at the moment. Actual practice is in line with this. Furthermore, the research shows that the present organization of the MCS may cause high transaction costs. Finally, it appears that the developments in the DTO market, combined with the vision that the regular and operational information provision are becoming more and more intertwined, have an impact on the considerations with regard to positioning DTO within the Defense organization, the government organization, or as an external partner. Subsequently, this positioning problem has consequences for the "fit" of a specific type of MCS.*

## Introduction

Failing management control systems (MCS) and processes in organizations can have serious consequences, as the notorious Enron and Ahold cases have all too clearly shown. That is why management control has been the object of several research projects (see, for instance, Bisbe and Otley, 2004:1). Van der Meer-Kooistra and Vosselman (2000) have carried out an empirical research into the manner in which management control relations between for-profit organizations have been realized and can be controlled. This relation is known as *interfirm* relation and it comes into existence the moment a for-profit organization decides to outsource tasks, services or products (Van der Meer-Kooistra and Vosselman, 2000: 1-2).

The Van der Meer-Kooistra and Vosselman model is based on contracting theories,

such as transaction cost theory (Williamson, 1985), in which specific attention is given to the role of trust (Van der Meer-Kooistra and Vosselman, 2000:1). One of the outcomes of the research is that trust plays an important role in outsourcing and that drawing up large contracts, one of today's paradigms, is not always an optimal choice. Following Van der Meer-Kooistra and Vosselman's research, Langfield-Smith and Smith (2003) carry out a case study in a power plant that has outsourced its ICT services. This research, too, confirms the importance of trust in outsourcing. It can be said that the importance of trust in *interfirm* relations between for-profit organizations has been established and it is interesting to investigate whether these insights can also be detected in the management control of internal outsourcing (*intrafirm*) in not-for-profit organizations.

The aim of this investigation is to gain an insight in the applicability of the Van der Meer-Kooistra and Vosselman model by analyzing the process that gave rise to the establishment of an agency for ICT services and the contracts and agreements drawn up in the Ministry of Defense. The central question of the research is: *To what extent can the Van der Meer-Kooistra and Vosselman model be applied to the internal outsourcing of ICT services within the Ministry of Defense and in how far does this model provide a better insight into internal outsourcing within the national government?*

To this end, the paper is structured as follows. The following section will go into the research design. Section three describes the organizational model of the defense organization focusing on the position of DTO, information provision and information and communication technology. Then, the Van der Meer-Kooistra and Vosselman research model will be presented and the sub-question relating to the extent to which it is applicable to the Ministry of Defense will be dealt with. In the fifth section the results of the research will be discussed with regard to the variables of the model. Next, on the basis of these results, the hypothesis of the model will be described and compared to the actual MCS. Finally, the results of this research will be analyzed further and a number of conclusions will be drawn and some recommendations given.

## **Research design**

The research is directed at the analysis of the internal outsourcing of ICT services within the Ministry of Defense to DTO. Other (internally) outsourced services and products in the Ministry of Defense will be left out of consideration. This research is carried out in the form of a case study with the Ministry of Defense and DTO and their relation for its objects of research. Apart from the assessment of documents, directives, guidelines and reports, six functionaries were interviewed by means of semi-structured interviews.

- Defense Audit Board (ADD) - 2 functionaries; one on management level and one on executive level.
- Directorate of Information Management and Organization (DIO) - 2 functionaries; both are policymakers.
- Defense ICT Implementation Organization (DICTU) - 1 functionary; works as a senior staff member with the Smart Buyer Organization.
- DTO – 1 functionary; works at management level within the Economy and Finances (control) organization.

### **Defense Telematics Organization: managing ICT services**

The Defense Telematics Organization (DTO) came into existence in 1998 through an amalgamation of the telematics units of the Services (the present-day Operational Commands -OPCOs) and the Duyverman Computer Center agency. Its purpose was efficiency (market conformity in prices) and a qualitative impulse through scaling up. DTO is organized as an agency – an internal independent service unit of a Ministry (national government), based on a result-oriented management model (Kraak and Oosteroom, 2002: 9). The DTO agency carries out and keeps accounts of its activities with the help of an accrual accounting system as opposed to the cash system of the Ministry. DTO uses tenders, contracts and gives account by means of an annual report. It provides ICT services, including advice, integration, development and control of information systems and ICT infrastructures, primarily to the defense organization. DTO employs well over 2,000 employees and has an annual turnover of €250M. Its objective is to provide integral market-conform ICT services to its customer in conformity with the market, with exclusivity, reliability and availability for key concepts.

Vital ICT tasks for the Defense organization, such as the control of information systems and networks, have been exclusively placed with DTO. This also goes for services with special security requirements. Thus, DTO controls about 40,000 work stations and the underlying ICT infrastructural components and hundreds of (defense) applications. For the other types of services DTO has right of tender.

The individual defense units draw up contracts with DTO, specifying which products and services are purchased at what price. In order to prevent having to establish preconditions and conditions of delivery each time a product or service is delivered, a framework agreement was drawn up between DTO and Directorate-General of Finance and Control (on behalf of the other defense units). This framework agreement describes the general and specific conditions the supplier and the customer have to meet. Examples of such general conditions are price indexation, acceptance, secrecy and settling of dis-

puts. Specific conditions concern annulment, maintenance, error reporting, security and times of control.

Increasingly, DTO services are also provided to other Ministries, in particular in the field of Public Order and Safety. Thus, DTO provides, amongst others, ICT control to the Ministry of General Affairs, Internet services and all carrier services for the C2000 communication network of the Ministry of Internal Affairs, ICT control for the Immigration and Naturalization Service of the Ministry of Justice, and the control of the organ donor system of the Ministry of Welfare, Health and Sports. Furthermore, DTO was recently chosen to provide the communication network between all Ministries, the so-called Hague-circle.

Up to this moment DTO has remained a part of the Ministry of Defense. In 2001 an investigation was carried out into the advisability of an independent DTO, which in November 2002 resulted in the decision not to make it independent (outsourcing) but to impose a concrete efficiency target for the next three years on DTO. After this period, at the end of 2005, the decision not to outsource the ICT services was to be reconsidered, with the extent to which the efficiency target was attained as an important factor. In 2006 this efficiency operation was to lead to a structural lowering of prices, amounting to €64M. The reasons in 2002 for deciding not to outsource DTO for the time being had mainly to do with uncertainty regarding the security aspects of the control of the Defense communication network (Netherlands Armed Forces Integrated Network - NAFIN). Moreover, it was expected that DTO would be able to work more efficiently. On 22 November 2005 the Defense Secretary-General informed the Second Chamber about the reconsideration regarding the outsourcing of DTO. In his letter he writes the following (Second Chamber, 22-II-2005):

*'I come to the conclusion that the developments since 2002, within the Defense organization and the entire national government, have shed a new light on the reasons at the time for considering outsourcing. Therefore, for the coming years outsourcing is not an option. DTO remains a Defense unit. As for services rendered to other Ministries, the present policy is to be continued, with the main focus on the field of public order and safety. This level of ambition befits a limited capacity, as rendering services for other Ministries cannot be at the expense of the quality of service for the Defense organization.'*

This clearly shows that DTO will not be outsourced the coming years and that it is going to broaden its market. This means a gradual increase of external clients, which will make DTO less dependent on the Ministry of Defense.

### *IP and ICT*

The defense organization is strongly dependent on information provision (IP) and information and communication technology (ICT) which enables it. IP is one of the most important foundations for Defense operations as well as management and control. An MOD analysis over the period 1996-1998 shows that information provision has developed into a major production factor. The operational decision making process as well as the political process is strongly dependent on correct and timely information. In fact the decision making process is not merely supported by IP but entirely dependent on it.

Adequate information provision generates “competitive potential in winning the war”, whereby a distinction between information provision for operational and managerial and support purposes is increasingly hard to make. Currently, the defense organization is introducing Enterprise Resource Planning (ERP) to support logistic and financial processes. This ERP support must also be used during missions abroad, which only underlines the integration of managerial and operational IP. The development of concepts/visions like “Network Centric Warfare” allows an information flow from the soldier/sensor to the highest possible level. Stimulated by this sort of developments, procedures and organizations will adapt to the new possibilities. Partly due to the possibilities that future technology is going to offer (and up to an extent is already offering), the role of IP is changing from supporter to “enabler”. In order to meet the defense organization’s demand for IP, a sourcing strategy has been set up. In this context sourcing means the making of a choice for and entering into a relation with a number of internal/external suppliers, who deliver certain products and services against payment. The sourcing strategy of the defense organization concerns the choice for in-or outsourcing of the supply of IP services and products and was mapped out in 2002. Its objective is to make IP and ICT services as efficient as possible on the basis of two important principles:

- DTO supplies all vital IP products and services;
- For non-vital IP products and services the market will be approached, while DTO has the right of tender, just like the other parties in the market.

Specific requirements have been set for vital products and services with regard to reliability and exclusiveness. In view of its tasks the defense organization provides a large number of vital products and services from a societal perspective, and as a consequence the proportion of vital tasks and products will be high and so will DTO’s share of the IP supplied.

### *ICT control*

Information, Communication and Technological (ICT) infrastructure (all ICT tools combined) are necessary to realize IP. The control of non-operational ICT infrastructure is carried out by DTO and that of operational ICT infrastructure by the OPCOs. It was intended (and realized in the second half of 2006) to place the separate ICT control within the OPCOs in a so-called Joint CIS Group (JCG) for efficiency purposes. The distinction between operational and non-operational IP is a different cross-section of the IP area than vital and non-vital. For instance, vital IP can be supported by operational ICT and in that case it will not be controlled by DTO but one of the OPCOs. Eventually, this distinction cannot be made very sharply because, for instance, the infrastructure of the glass fiber network (Netherlands Armed Forces Integrated Network) is controlled by DTO and NAFIN can be an element in OIP. In short, operational ICT is ICT that is actually used in operations.

### *Management control of DTO*

In practice, the MCS of DTO is mainly realized by the Central Staff and the defense ICT implementation organization. Four elements of the Central staff, viz. the Directorate of Information Management and Organization (DIO), the Directorate of Financial and Economic Affairs (DFEZ), the Security Authority (BA) and the Defense Audit Service (ADD) are particularly relevant for the MCS of DTO. It is DIO's task to carry out the preparation, implementation and control with regard to IP policy, corporate architecture and IP plans. DFEZ is responsible for financial control of IP and ICT. One of the tasks of BA is the policy with regard to information security for the entire Ministry and in that capacity it lays down requirements for IP and ICT with regard to reliability, continuity and exclusiveness. Finally, ADD controls DTO's financial management, the financial annual report and the reliability requirements.

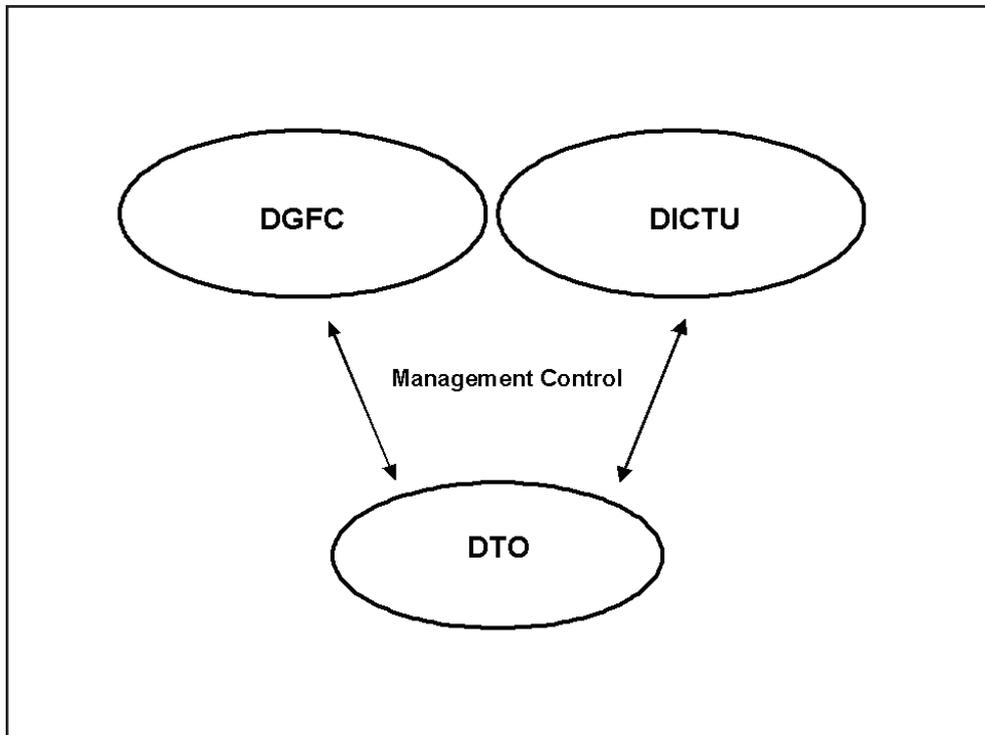


Figure 1: DTO Management control

Apart from these central staff elements the Defense ICT Implementation Organization (DICTU) is the point of contact for the Defense units (for instance, the OPCOs) and suppliers for IP and ICT matters. This implementation organization has taken over the functional control from the defense units and represents the functional clients with respect to the ICT organization. In this way DICTU can be seen as a form of shared service center (Strikwerda, 2003). The immediate occasion for establishing DICTU lies in the developments for outsourcing DTO in 2001-2002. To enable this outsourcing, it was decided to design an interface between defense clients and market parties. DTO MCS can be presented schematically as in figure 1.

In brief, the present research concentrates on what is represented below the two arrows in figure 1. They represent the relation between the Ministry of Defense and the DTO agency.

### Research model

In this section Van der Meer-Kooistra and Vosselman's model for outsourcing rela-

tions is presented and discussed. It describes how contractual relations can be brought about between an outsourcing party and the supplier and how these two can cooperate and control the risks that ensue from the outsourcing of activities (Van der Meer-Kooistra and Vosselman, 2000: 53). In essence, the model consists of three tables, which will be discussed below.

The model defines three management control patterns that are relevant for outsourcing relations (hybrid governance structures): a market-based, a bureaucracy-based, and, finally a trust-based pattern. The three patterns are characterized in table 1.

<b>Pattern Phase</b>	<b>Market based</b>	<b>Bureaucracy</b>	<b>Trust-based</b>
<b>Contact</b>	- Competitive tendering	- Pre-selection of potential suppliers; - Tender procedures; - Detailed selection criteria	- Trust, originating from friendship, previous contractual relations or reputation
<b>Contract</b>	- No detailed contracts - Payments based on standardized activities or output	- Detailed and elaborate contracts; - Payments based on real activities or output	- International contracting; framework contracts; contractual trust; - Loose relations between activities and output
<b>Execution</b>	- Periodically, ex post competitive tendering	- Supervision; - Performance measurement and evaluation, detailed ex post information processing; - Direct intervention	- Personal consultation and coordination; - Development of competence trust and goodwill trust; - Process-oriented and culture-based control mechanisms

Table 1: Management control patterns

Van der Meer-Kooistra and Vosselman argue that an outsourcing relation consists of three phases and that it is relevant to distinguish them as a management control pattern can differ per phase. The three distinctive phases are the contact phase, contract phase and implementation phase and they are called an extended make-or-buy decision, for short. Table 1, in which the characteristics of the predicted types of management control patterns are worked out, forms the core of the model. It brings together the characteristics of the various distinctive management control patterns in the separate phases of the extended make-or-buy decision. When, for instance, there is competitive tendering in the contact phase, the management control pattern is market-based. When there is much mutual contact in the implementation phase and the parties have confidence in

each other's abilities to realize the task, the management control pattern is more trust-based. The descriptions in the table are an abstraction of reality and the contact phase, for instance, will not actually be described in a single phase. It is, however, possible to establish with the help of the descriptions in the cells what the management control pattern will resemble most in reality.

The appropriateness of either of these patterns is determined by three contingency factors, viz. transaction, transaction environment and transaction party characteristics. Table 2 presents the variables that determine these characteristics and thus influence the appropriateness of the distinctive management control patterns.

<b>Transaction</b>	<b>Transaction environment</b>	<b>Transaction parties</b>
- Extent and type of asset specificity; - Frequency and reputation; - Duration of transactional period; - Measurability of activities and output	- Uncertainty of future contingencies; - Extent of market risk; - Institutional environment (legislation, systems and organizations)	- Information asymmetry; - Reputation; - Familiarity with cooperation in networks or specific parties - Risk attitude; - Negotiating power

*Table 2: characteristics of the contingency factors*

Finally, in the third table the three distinctive management control patterns (see table 1) are related to the contingency factors identified in table 2. With the help of this third table it becomes possible to predict which pattern is most appropriate with certain characteristics of contingency factors. Subsequently, with this prediction it is possible to determine from table 1 what the characteristics of the predicted management control pattern will be and vice versa.

When, for instance, there is low asset specificity and high repetition of transactions, the model predicts a market-based management control pattern. Subsequently, table 1 shows that in the contact phase competitive tendering is characteristic of a market-based management control pattern. The descriptions in this table, too, are an abstraction of reality and the party characteristics, for instance, are not usually covered by a single cell. By analyzing and comparing reality with theoretical descriptions of characteristics it is possible to determine a structure, which leads to the prediction of the appropriateness of a specific management control pattern.

#### *Applicability of the model*

The Van der Meer-Kooistra and Vosselman model was developed for outsourcing to an external organization. This brings along a specific risk element between the partners with respect to the transactions they have agreed on. Each of the parties involved in

the outsourcing bears its own share of the risk when one or other of the parties does not live up to the contract or when the circumstances surrounding the transaction change.

As was said above, the Ministry of Defense has placed an important part of the supply of ICT with DTO. This agency is a shared service center within the ministry and there is a clear client/supplier relation. This relation between an agency and the ministry which incorporates it, the so-called mother ministry, cannot be fully compared to the relation in an outsourcing with an external partner. The most relevant difference is the above-mentioned risk element. The agency, after all, belongs to the organization, so in the final instance all risk is borne by the Minister, and there is no risk-sharing between the organizations. In view of this difference it is necessary to investigate the applicability of the model for this particular case study.

	<b>Market-based</b>	<b>Bureaucracy-based</b>	<b>Trust-based</b>
Transaction characteristics	<ul style="list-style-type: none"> <li>- Low asset specificity;</li> <li>- High repetition;</li> <li>- Measurability of activities and output;</li> <li>- Short and medium-term contracts.</li> </ul>	<ul style="list-style-type: none"> <li>- Medium to high asset specificity which can be protected by contractual rules;</li> <li>- Low to medium repetition;</li> <li>- Measurability of activities or output based on contractual rules;</li> <li>-Medium to long-term contracts</li> </ul>	<ul style="list-style-type: none"> <li>-High asset specificity;</li> <li>-Low repetition;</li> <li>- Activities or output difficult to measure;</li> <li>- Long-term contracts</li> </ul>
Transaction environment characteristics	<ul style="list-style-type: none"> <li>- Many potential transaction parties;</li> <li>- The market price contains all market information;</li> <li>- Social and institutional factors are irrelevant</li> </ul>	<ul style="list-style-type: none"> <li>-Future contingencies are known to a certain extent;</li> <li>- Medium to high market risk;</li> <li>- Institutional factors influence contractual rules</li> </ul>	<ul style="list-style-type: none"> <li>- Future contingencies are unknown;</li> <li>- High market risk;</li> <li>- Social embeddedness;</li> <li>- Institutional factors influence relation</li> </ul>
Party characteristics	<ul style="list-style-type: none"> <li>- Not important, for there are various parties with the same characteristics, which makes changeover costs low</li> </ul>	<ul style="list-style-type: none"> <li>-Competence reputation;</li> <li>- Medium risk-sharing attitude;</li> <li>- Asymmetry in negotiating power</li> </ul>	<ul style="list-style-type: none"> <li>- Competence trust;</li> <li>- Experience with networks;</li> <li>- Experience with contracting of parties;</li> <li>- Risk-sharing attitude;</li> <li>- No asymmetry in negotiating power</li> </ul>

*Table 3: Contingency factors and management control patterns*

In order to assess the relevance of the model for the relation between DTO and the Ministry of Defense, first the applicability of table 1 must be looked into - a necessary step, since for the applicability of this part of the model the various phases in the outsourcing relation must be recognizable and investigable. The relevance of table 1 and 3 need not be tested for applicability as it concerns transactions between DTO and the MOD. In the execution of the case study itself the characteristics of this transaction, and the circumstances surrounding it, are investigated.

Table 1 shows the characteristics of the various distinctive management control patterns in the different phases of the extended make-or-buy decision. The test of this table focuses on the question whether it is possible to distinguish the various phases in the extended make-or-buy decision. The different management control patterns do not have to be tested for relevance beforehand. They are based on the theory described and during the execution of the case study it is investigated which pattern can be recognized in reality.

In 2001 there was the possibility that DTO was going to be outsourced and standardized contracts were drawn up in anticipation, to be subsequently presented to a market party. As described above, it did not come that far. DTO was not outsourced, but the contracts have been used for an agreement between the Ministry and DTO.

Looking at the different phases of an extended make-or-buy decision, it can be concluded that some sort of contact phase can be recognized in this preliminary phase leading up to the drawn-up contracts. Secondly, it is possible to distinguish a contract phase as contracts between the mother ministry and the agency were drawn up. Finally, the execution phase can also be investigated separately because of the presence of a contract phase and the services and products delivered by DTO following that phase. The conclusion is that Van der Meer-Kooistra and Vosselman's model does not need any adjustments for the present research.

## Results

This section discusses the results of the survey with regard to the variables from the above model. The data from documentation and interviews are structured and specified on the basis of contents and structure of the model. To this end, first, the three contingency factors, viz. characteristics of transactions, environment and parties, will be dealt with. These three contingency factors are composed on the basis of the variables that eventually predict the suitability of each of the three management control patterns. All variables are presented in a graph and subsequently discussed. Next, the role of trust in the relation between the defense organization and DTO is dealt with, after which these data are used to fill in the model and to analyze the ensuing results.

*Contingency factors*

*Characteristics of the transactions*

The characteristics of the contingency factors were discussed in the previous section. With the help of document analysis and interviews the several variables were analyzed and assessed on a scale ranging from low, to medium, to high. Figure 2 presents them in a simple survey.

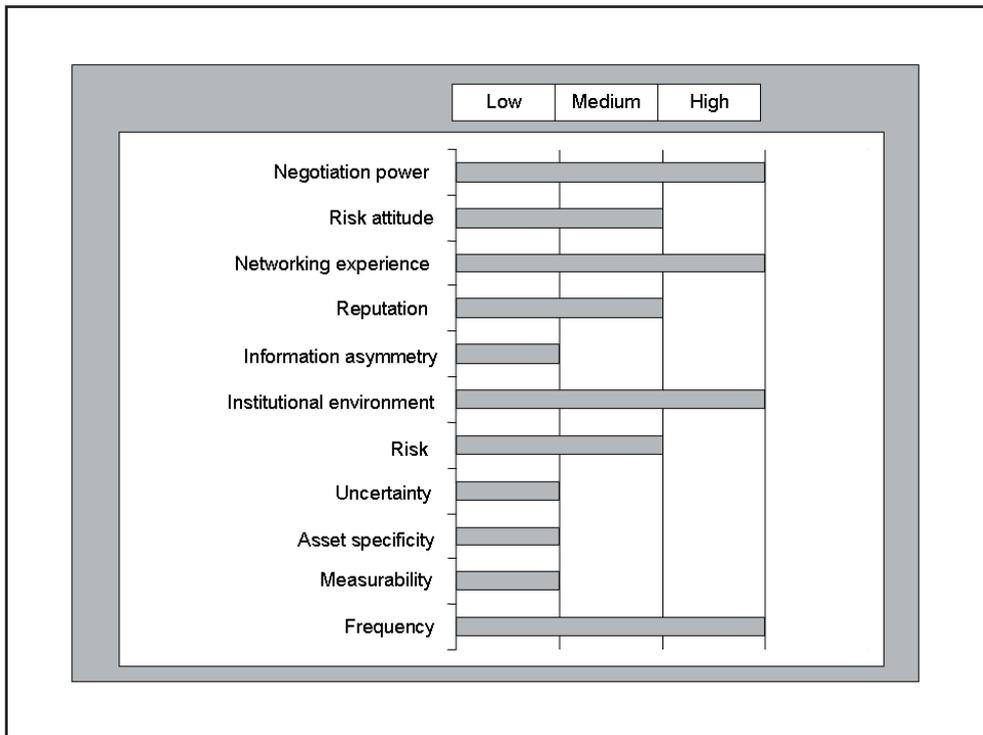


Figure 2: Survey of scoring variables

*Transactions: type and frequency*

DTO supplies services and products that are used in the day-to-day Defense management. The most telling example of this is the provision of work stations. The framework agreement distinguishes eight DTO services and products, ranging from development and implementation of software to control, detachment and supply of goods. According to the interviewees the frequency of these transactions can be ranked as high. The volume of transactions is likely to increase in the future due to the increased extent of automation, in general, and developments which may give DTO a larger role in operational operation provision, in particular.

*Transactions: measurability*

The answers the interviewees gave show that the measurability of DTO services and products is felt to be difficult. On the one hand, there is the shared insight that the measurability for component or environment level is relatively simple. On the other, the measurability of the actual services or products appears to be problematical as these are usually realized by different components and environments, such as a firewall or main-frame and a UNIX environment. Eventually, it is all about the measurability of actual services and products, as this is particularly relevant for the client.

An instrument in the framework of measurability is the General Notification of the ADD, which is specifically directed at exclusiveness, availability and reliability of components and environments. Another instrument to be used is the benchmark, which makes it possible to set up so-called reference groups, although they will have to be adjusted for the bureaucratic environment, for instance, of which DTO constitutes a part. Thirdly, DICTU has been mentioned as an instrument to further professionalize the demand, Defense, side. A professional demand side has a positive influence on the measurability of the products as it is known what to measure in the first place. Furthermore, the SLAs that are agreed upon contain a section on the reporting with a view to making the service or product more transparent for the client. The measurability of the services or products that are eventually provided are experienced as low to middle at best at the moment.

*Transactions: asset specificity*

The DTO services and products might be used in other organizations without extremely high switching costs. The banking world, where also high requirements are set for reliability, availability and exclusiveness of IP and ICT, could serve as an example. What is interesting here is that the physical switching costs of the applications, environments, et cetera, are exceptionally low when compared to companies that employ heavy machinery and specific productions halls, for instance. This is underlined by a regular testing of alternative locations. Conversely, it can be said that where security and effectiveness are priorities for the defense organization, efficiency is less important. There are few market parties that are prepared to give guarantees with regard to security and effectiveness, whereas it is demanded by the defense organization.

Furthermore, the volume of services and products supplied to the defense organization cannot easily be delivered by a market party. In other words, there is not an extensive pool of ICT companies that can produce the volume required by the defense organization at the moment. A comparison of DTO and market prices is also seen as difficult, due to the specific defense requirements for the services and products. A much-heard remark in this context is that one is not comparing likes to likes. However, benchmarking does take place and its existence has, for instance, led to the conviction that DTO's control of work stations must be cheaper.

Several interviewees have indicated that DTO's personnel have a lot of DTO and Defense oriented knowledge and that the agency is highly dependent on them. When someone leaves, it regularly emerges that essential elements of his or her job have not been described and that there is no one in the market who possesses that know-how.

Finally, two trends emerge, each with its own impact on the development of future asset specificity. First of all, there is the defense policy to use as much as possible Commercial Off the Shelf (COTS) products; so, not designing its own application for personnel management, but applying PeopleSoft, for instance. If this development continues, asset specificity will decrease (further), as the acquired know-how and products can (more) easily be used in other organizations. What goes against this development is the Defense vision that operational IP (OIP) and non-operational IP are increasingly becoming intertwined. OIP comes with specific requirements and characteristics (like deployment in mission areas, et cetera). If this intertwining is really increasing, asset specificity will grow, in spite of the application of COTS. This is due to a personnel specificity and asset specificity, such as special mobile networks, computers that can operate between - 20 degrees centigrade up to + 50 degrees centigrade, et cetera.

In conclusion, site, physical and dedicated asset specificity are at this moment ranked as low to medium. Personnel specificity, in particular, is assessed as medium to high.

*Transactions: (sub) conclusion*

Frequency of transactions is high, due to the services and products DTO delivers to the defense organization. Measurability is low to medium, with the proviso that measurability increases in parallel with a growing experience in measuring ICT. Asset specificity is low to middle, caused largely by an increased use of COTS products instead of designing solutions by the defense organization itself. One element of asset specificity, asset specificity for personnel, is experienced as medium to high.

*Characteristics of the environment: uncertainty*

After a brief period of uncertainty in 2001 and 2002 the relation with DTO with regard to the vital provision of services has become extremely stable at the moment. It has even been said that it is a relation to last forever. However, the letter of the Secretary General (SG) to the Second Chamber in November 2005 shows that outsourcing is not quite off the agenda. This is also underlined by the establishment of the Joint Service Group (JSG), at which occasion it was indicated that it would be more efficient to join DTO and JSG, but that this strategy was not pursued, due to the possible outsourcing of DTO. In such a case, after an amalgamation, the control of OIP would have to be disentangled again. With respect to the non-vital service provision, uncertainty is low, as DTO's role is clear – it is one of the parties that can submit tenders. New technologies

or developments, such as the introduction of ERP, will not lead to much uncertainty in the relation.

*Characteristics of the environment: risk*

The risk of DTO providing insufficient products and services is assessed as medium. For the continuity of management the risk is felt to be higher, but possible damage does not usually go beyond the level of being a nuisance for the client. However, due to the dependence on IP and ICT the risk of the service provision does increase.

A relevant example of the increase of risk is the development of DIV online, a project directed at replacing archives and paper flows by digital archives and workflow applications. The more archives and paper flows are replaced by digital archives and workflow applications, the greater the damage in case of problems with availability or loss of data. At the same time risk will also increase when DTO is more involved in operational information production. The chance of anything going wrong rises proportionally to the level of automation or automation support. But with operational information production the damage is usually considerably greater than with non-operational information production. In the current service provision the NAFIN network, C2000 and ODYSIS are seen as risky, in particular with regard to the potential damage.

*Characteristics of the environment: influence of institutional environment*

DTO is embedded in the governmental agency model as well as in the governmental organization. Specific influences are the rules and regulations with regard to agencies, for instance, the value of net assets, the obligation to use the Ministry of Finance's loan facility and the prohibition to offer commercial services outside the government (the so-called third market). Furthermore, DTO has to comply with the rules and regulations for governmental organizations, such as the obligation to report, legislation with regard to state secrets and the position of DTO personnel.

*Characteristics of the environment: (sub) conclusions*

The uncertainty in the environment that influences DTO and the relation with DTO ranks low. This is underlined by the fact that the position and the role of DTO within the defense organization is felt to be clear. The risk of DTO's services and products is medium, although it must be noted that an increasing dependence on automation and a growing intertwining of OIP and non-OIP will push it up. The influence of the institutional environment is high as a result of the rules and regulations pertaining to agencies and governmental organizations.

*Characteristics of the parties: information asymmetry*

DTO is consulted or plays a role in the development and formulation of new policies. Benchmarking ensures a decrease of information asymmetry with regard to management and the cost of a service or product. The establishment of DICTU as an intermediary between client and DTO also contributes to the reduction of information asymmetry.

There is a two-weekly consultation between DTO and DICTU in which new developments are discussed. Furthermore, DTO is prepared to voluntarily allow inspection of its management. It did so in the past, for instance, for the cost model of its network services, and, apart from the obligatory reports, it also sends its quarterly internal management report to CDC.

Finally, DTO also employs military personnel that return to other defense units in due course. They take with them a lot of know-how about the ins and outs of DTO and they often stay active within the IP field. In conclusion, the information asymmetry between the defense organization and DTO is mostly assessed as low.

*Characteristics of the parties: DTO's reputation*

DTO's reputation is seen as an important variable influencing the relation with the defense organization. Broadly speaking, DTO has a low reputation among workers in the IP field and its image is influenced negatively by the truck system for vital IP. Because of this, clients, the defense units, do not often have objective means of comparison. Another negative influence on DTO's reputation is the recently renovated organization in the IP field. The result is that it is not clear for everyone what the role of DIO or DICTU is. When certain aspects of IP are not properly taken care of, eyes are immediately turned to DTO, undeservedly so.

Furthermore, DTO is known as a company with a high level of expertise. The comment that is sometimes made with regard to its expertise is that it states too easily that it has a certain expertise; while during the execution of a project this is proven wrong. DTO also has the reputation of quickly grasping what a client wants, which, amongst others, is due to the long-standing duration of the relation. Apart from that application control in particular enjoys a good reputation, whereas the timeliness of delivery is felt to be low, and contrary to what is expected of DTO, its reputation for availability is falling.

*Characteristics of the parties: experience with networks*

Experience in working with a variety of companies and institutions is high for both DTO and the defense organization. For example, the defense organization uses several partners in the implementation of ERP, while there is also cooperation with market parties in the field of IP or services and products are purchased from these companies. DTO

itself regularly uses sub-contractors for specific products and services, the most important of which is KPN, which supplies a large part of the infrastructure for networks.

*Characteristics of the parties: risk attitude*

The risk attitude of both DTO and the defense organization is influenced by the importance they attach to reliability, availability and exclusiveness of IP and ICT. In the past few years, the controlled introduction of new technologies and services needed has become more important. This is underlined, for instance, by the establishment of DICTU, which has created a considerable extent of pull (through the professionalizing of demand). The push role of DTO is decreasing as a consequence.

Research by Gartner, IBM and Microsoft underlines that there is a considerable level of control within the defense organization and DTO. However, this does not mean that in all cases there is a reactive attitude towards anything new or different. Both parties acknowledge a certain measure of risk taking. In connection with this, it is interesting enough that DTO takes risks with regard to determining its own targets (for improvement), as they are often high, and sometimes too high. Taken together, the risk attitude of DTO and the defense organization is ranked as medium.

*Characteristics of the parties: difference in negotiating power*

As was expected, the interviewees ranked the difference in negotiating power as high; after all, in the end the defense organization is plainly the boss. This is also clear from DTO's Products and Services catalog (PDC), which is approved and published by the defense organization. That this does not go just like that is made clear by the example of the Blackberry (an integrated telephone and personal digital assistant – PDA). DTO wants to offer a Blackberry, and its clients would very much want to have it. The defense management, however, thinks it is too expensive and superfluous, so up to now it simply has not happened.

The defense organization has also imposed a tasking on DTO to offer cheaper services and products and by doing so makes clear who has the most power in the end. This tasking was imposed after it had been decided not to outsource DTO. Often, however, the power of defense is not played out so tough and in practice the parties approach each other on an equal footing.

*Characteristics of the parties: (sub)conclusion*

Taken together, the characteristics of the parties can be described as follows. There is little, if any, information asymmetry between the parties. The reputation of the service provider is low to medium at best. Both the defense organization and DTO have relatively much experience in working in networks. Their risk attitude is low to medium,

with a preponderance for control. The difference in negotiating power is high; in the end the Minister of Defense is in charge and this also holds for DTO, in spite of its special position as an agency.

#### *Trust*

Trust in this research has been divided into three elements: competence trust, contractual trust and goodwill trust. The findings of the research will be discussed per separate item.

#### *The role of trust: competence trust*

DTO is seen as a company which can boast a lot of expertise. In this context it can be said that there is a certain form of competence trust. What decreases this trust is DTO's tendency to say too easily that something can be done or that it has the required know-how, which in practice is not always the case. In this respect it has been indicated that there is a healthy distrust. Furthermore, DTO is also faced with a shortage of ICT personnel. As a result, it was indicated, sometimes lowly qualified or incompetent personnel are hired, especially at middle management level, which is felt to be a problem. Finally, it was indicated that a trend is becoming visible that DTO's reliability and security of its service provision are deteriorating. If this is indeed the case, this will create a tension with regard to trust in DTO in general and to competence in particular.

#### *The role of trust: contractual trust*

The relation with DTO has existed since 1998, and because of this there have been long-lasting business contacts influencing contractual trust. Several interviewees indicated that DTO is not known for its timely delivery and agreements about this are not always honored. In any case, there is no broadly shared confidence that DTO is always as good as its word. It was also indicated that the client has to ask the right questions, and that DTO will not point at the right direction on its own initiative. On the other hand, the defense organization sometimes does not honor its agreements with DTO, in particular with regard to payment of services and products. More than once there is disagreement about who has to pay what after the work has already been carried out by DTO. Nevertheless, there is a certain extent of trust with both parties that the money in the end will be paid. Of course, this is because in the last instance it is one and the same company, which more than once prompted the term Mickey Mouse money during the interviews.

#### *The role of trust: goodwill trust*

The duration of the relation between DTO and the defense organization has a positive

influence on the extent of mutual openness. After the period 2000-2002, during which possible outsourcing was an issue, the level of goodwill trust has found the way up again. A sure sign of this is that DTO is involved in new developments and that it has played a clear role in defining the sourcing strategy. DTO's role at the moment is clear and that creates a basis for more mutual openness.

DTO is not always good at communicating and maintaining the minimal requirements necessary for supplying a service or product. A good example of this was the taking over of the work stations of the OPCOs, where control was insufficient. Once they had been taken over, what was required was a good invoicing, which is difficult when a good idea about quantity and quality of these work stations is lacking. In all fairness, though, it must be said that the OPCOs were not immediately ready to recognize that the transfer was not quite up to the mark on their end.

#### *The role of trust: (sub)conclusions*

In general, there is trust in DTO, in spite of its low-ranking reputation. However, several interviewees indicated that the extent of trust is strongly person-directed – it depends with whom you do business and it is not directed at the entire organization. Divided into its constituent elements, it can be said that the extent of competence trust is reasonably high, contractual trust is relatively low and goodwill trust is medium to high.

### **Predicted and actual MCS**

On the basis of the results of the different variables and the forms of trust in the relation between DTO and the defense organization it is possible from the model to determine with the help of the third table which management control pattern is most suitable to manage and control that relation. Besides, this section will describe the actual MCS, which will subsequently be compared to the predicted one.

#### *Predicted MCS*

Below, the third table from the model, which contains the characteristics of the variables per type of management, is presented. The variables that correspond to the results are in bold type.

When the results of the transaction characteristics are compared to the three management control patterns, it is clear that they partially correspond with the description of a market-based pattern and partially with a bureaucracy-based pattern. The transaction environment characteristics seem to fall mainly within the bureaucracy pattern. Conversely, the party characteristics show features of a bureaucracy-based as well as a trust-based pattern. Looking at all three contingency factors, it is clear that the column

with the variables that predict a bureaucracy-based pattern is clearly predominant. As was indicated in the explanation of the model, in practice a pattern will never completely match the reduction of reality in this model. In the present research it can be concluded that the results of the variables and the prediction of the variables for a bureaucracy-based pattern match best.

	<b>Market-based</b>	<b>Bureaucracy-based</b>	<b>Trust-based</b>
Transaction characteristics	<ul style="list-style-type: none"> <li>- <b>Low asset specificity;</b></li> <li>- <b>High repetition;</b></li> <li>- Measurability of activities and output;</li> <li>- Short and medium-term contracts.</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Medium to high asset specificity which can be protected by contractual rules;</b></li> <li>- Low to medium repetition;</li> <li>- <b>Measurability of activities or output based on contractual rules;</b></li> <li>- <b>Medium to long-term contracts</b></li> </ul>	<ul style="list-style-type: none"> <li>- High asset specificity;</li> <li>- Low repetition;</li> <li>- Activities or output difficult to measure;</li> <li>- Long-term contracts</li> </ul>
Transaction environment characteristics	<ul style="list-style-type: none"> <li>- Many potential transaction parties;</li> <li>- The market price contains all market information;</li> <li>- Social and institutional factors are irrelevant</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Future contingencies are known to a certain extent;</b></li> <li>- <b>Medium to high market risk;</b></li> <li>- <b>Institutional factors influence contractual rules</b></li> </ul>	<ul style="list-style-type: none"> <li>- Future contingencies are unknown;</li> <li>- High market risk;</li> <li>- Social embeddedness;</li> <li>- Institutional factors influence relation</li> </ul>
Party characteristics	<ul style="list-style-type: none"> <li>- Not important for there are various parties with the same characteristics, which makes changeover costs low</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Competence reputation;</b></li> <li>- <b>Medium risk-sharing attitude;</b></li> <li>- <b>Asymmetry in negotiating power</b></li> </ul>	<ul style="list-style-type: none"> <li>- <b>Competence trust;</b></li> <li>- <b>Experience with networks;</b></li> <li>- <b>Experience with contracting of parties;</b></li> <li>- Risk-sharing attitude;</li> <li>- No asymmetry in negotiating power</li> </ul>

Table 4: Predicted Management Control Pattern

*Actual management control system*

*Actual management control system: Contact*

The contact phase started at the moment when the intention to outsource DTO was made public, between 2000 and 2002. One of the things the defense organization did

back then was to carry out a marketing research to investigate whether there are enough potential suppliers to deliver the service. Apart from that, DTO's level of service supply was mapped with the help of an external company and all contracts that had still been running up to that moment were gathered. On the basis of an insight into DTO's level of service supply at the time and the contracts, a framework agreement was drawn up (ROK) that could be concluded with an external supplier. When it was decided not to outsource DTO, it was used as a framework agreement between the defense organization and DTO.

*Actual management control system: Contract*

The individual defense units draw up contracts with DTO, specifying what products and services will be purchased and at what price. In order to avoid having to establish general and delivery conditions between DTO and DGFC (on behalf of the other defense units) each time a product or service is delivered, a framework agreement was drawn up, describing the general and specific conditions that the client and DTO have to meet. The actual order for the delivery of services or products is given by the conclusion of a Further Agreement between the client, the defense units, and DTO. The Further Agreement forms part of the complex of mutual rights and obligations that are agreed upon by the client and DTO.

The Further Agreements are standardized for the eight categories of services and products specified in the Framework Agreement, so that an individual defense unit does not have to draw up design and organization of the NOK with DTO, but that there is an across-the board standardization. The categories are: advice, training and incidental services, development and implementation of systems and software, software maintenance, control and operation of ICT infrastructure, network services, detachments, work station services and commodities. Together, ROK and NOK constitute the contract instrument that has to ensure uniformity and standardization of contracting with DTO.

The Further Agreement specifies, amongst others, conditions on prices, invoicing, agreements on quality of the services or products to be delivered and the program of requirements in which the client lays down the requirements for the result to be achieved. Appendixed to the Further Agreement, there is a Service Level Agreement (SLA), in which agreements about the operation of the service are described. They relate to form, mode and frequency of contact by the parties and reporting by DTO. Unless otherwise agreed, all contracts for control and/or maintenance are concluded for a period of three years, with a three-month term of notice.

In conclusion, contracting takes the structure of a Framework Agreement and in case of actual purchasing of services or products, a Further Agreement is drawn up, and if required, an SLA is added to the NOK. Agreements about services and products are

detailed; from pricing and invoicing to quality guarantee, reporting and consultation. In general, the contracts are relatively long-term to a minimum of three years.

*Actual Management Control System: Control*

The defense organization's MCS for DTO is given shape through different organization elements. DGFC, in particular DFEZ and DIO, is responsible for an important part of the MCS. It encompasses, for instance, the instructions for budget accountability and cash management. These are examples of result and action controls. DIO draws up the policy with regard to the defense organization's IP. DTO has to follow and make concrete this policy insofar as the implementation of the policy is DTO's responsibility. Furthermore, BA on the Central Staff level plays an important role by laying down rules and regulations for DTO with regard to the requirements for reliability, availability and exclusiveness. This relates in particular to common reliability requirements and the regulation that DTO has to draw up a security plan for its information systems. There is also personnel control, related to requirements for personnel, for instance, in the form of a mandatory periodic screening. Finally, ADD is an organizational part which is particularly directed at control of DTO, in financial as well as operational respect. This operational control is reported to the Secretary General through the DTO General Notification and it covers processes, as diverse as configuration control, changes control and, at component level, a firewall.

As for its management, DTO receives directives and report duties from CDC with regard to, for instance, the obligation to meet baseline material operations and financial control. On top of that DTO is obliged to send quarterly reports to CDC according to top report guidelines. On receipt of these reports, CDC sends them along with similar reports of other organizations within CDC to the control staff. The procedure for reporting was changed as of 2006 with the adjustment of the structure of the top reports by means of the 2006 management control instruction. DTO will follow this new approach. For the present research the changes to the contents are not relevant.

Within CDC, DICTU plays a prominent role with regard to the MCS. It does not only lay down the requirements for the applications in its role as functional controller, but it also receives various operational reports. Incidentally, the defense units (such as the OPCOs) also receive reports and draw up requirements for applications and environments. Seen from the perspective of the MCS, the defense units play a minor role as the purchasers of products and services.

*Actual Management Control System: characterization*

The next step is to compare the actual management pattern with the descriptions of the management control patterns from the model. Below, the table containing the char-

acteristics of the three distinguished management control patterns is presented. In case there are matches with the actual management control pattern bold type is used.

Pattern Phase	Market based	Bureaucracy	Trust-based
<b>Contact</b>	- <b>Competitive tendering</b>	- <b>Pre-selection of potential suppliers;</b> - <b>Tender procedures;</b> - <b>Detailed selection criteria</b>	-Trust, originating from friendship, previous contractual relations or reputation
<b>Contract</b>	- No detailed contracts - Payments based on standardized activities or output	- <b>Detailed and elaborate contracts;</b> - <b>Payments based on real activities or output</b>	- International contracting; - <b>Framework contracts;</b> - Contractual trust; - Loose relations between activities and output
<b>Execution</b>	- Periodically, ex post competitive tendering	- <b>Supervision;</b> - <b>Performance measurement and evaluation, detailed ex post information processing;</b> - <b>Direct intervention</b>	- <b>Personal consultation and coordination;</b> - <b>Development of competence trust and goodwill trust;</b> - Process-oriented and culture-based control mechanisms

Table 5: Results DTO management control pattern

The results point at a bureaucracy-based pattern. It should be remarked here that after the decision not to outsource DTO the relation between DTO and the defense organization takes place within a single organization - in terms of transaction cost theory -, one hierarchy. It goes without saying that in such a case a pattern similar to bureaucracy will develop. Furthermore, the present MCS is much more elaborate than an MCS for an outsourcing relation with an external organization, where direct intervention with an efficiency tasking, extensive “unpaid” operational IT audits by own auditors and inspection of management, financial control and material control are to a large extent superfluous.

## Discussion and conclusions

The Van der Meer-Kooistra and Vosselman model brings together insights from transaction cost theory and trust, being specifically developed for hybrid organizational forms according to the definition of the transaction cost model. In this research the model

was used to investigate whether it can be applied to relations within a single hierarchy, specifically the relation with an agency, and whether this application helps to understand how this relation came into being and how it is managed and controlled.

First of all, the model in this case study yields unambiguous results with regard to the predicted and actual management control pattern – a bureaucracy-based pattern in both cases. Second, at the time it was considered to outsource DTO, it was decided to establish DICTU in order to set up an univocal professional interface between the defense organization and a future market party. At the same time a contract structure was designed in the form of a framework contract, with underlying detailed agreements, to relate the market party with the defense organization. Had DTO been outsourced, the chosen structure would, according to the model and on the basis of unchanged results for the studied variables, have been suitable to control an outsourcing relation with a market party. This means, conversely, that the present structure and organization of the MCS is suitable for DTO with regard to various elements and need not be adjusted in case DTO is outsourced after all. In this case study the model yields the insight that the present management control structure can be explained on the basis of the contingency characteristics. This explanation, however, is only possible with an insight into the historical situational factors, in this case the background of the development of the relation between DTO and the defense organization. Thirdly, the application of the model and the established fit prompts the question whether the transaction costs of the chosen DTO organization are nor relatively high. When asset specificity, the uncertainty concerning the transactions and their frequency are considered, the transaction cost theory predicts that outsourcing to another organization, with the ensuing long-term relation, is the most efficient (Williamson, 1985: 79). In particular due to uncertainties with regard to security and the control of its own glass fiber network, the defense organization decided not to outsource DTO. At the same time an MCS was established to control the relation with another party with a clear risk problem. In spite of the focus on a greater efficiency of DTO (the imposed efficiency target), there is now an MCS that may be superfluous to a certain extent for a situation in which the transaction take place within one and the same organization. This makes it probable that the organization of the MCS itself causes the transaction costs to be relatively high. There is, as it were, a hybrid structure within an organization. It is interesting that interviewees indicated that the present MCS sometimes lacks logic and is not always properly understood; why draw up a contract elaborate penalty bonds within one organization? Fourthly, the application of the model has yielded insights which explain the development of a market for Public Order and Safety, and with it a shift from DTO to a government shared service center. In this way the relation acquires more characteristics of an actual outsourcing relation between two market parties, for which the present management control structure is broadly suited.

As was said above, the present control structure is expensive within a single hierarchy. It is expected that the establishment of the Shared Service Center will bring lower prices due to a higher filling of the fixed capacity and by economics of scope (lowering of production costs). Conversely, there may be extra transaction costs for a hybrid control structure. Seen from this perspective, it would be an understandable move to try to earn back the transaction costs that are already being incurred at the moment.

In conclusion, the case study shows that the defense organization has the policy to apply as many COTS products as possible. When this development continues asset specificity will decrease further. According to transaction cost theory, this specificity is the most important variable influencing the choice between market, hybrid and hierarchy. The lower the specificity the more the market becomes an option as a suitable governance structure, even making long-term contracts unnecessary (no need for hybrid organizational forms) in case of an extremely low specificity. After all, there will be enough market parties then and in case of any dissatisfaction with the service supply or products it is easy to switch. What goes against this development is the vision of the defense organization that operational information production and IP will become increasingly intertwined. Operational information production brings along specific demands and characteristics (such as employment in mission areas). If this intertwining keeps indeed growing, asset specificity, (in spite of the application of COTS, and in particular due to specific personnel and asset specificity) will not decrease. In that case the choice for a market-based governance becomes unlikely, and even a hybrid governance structure may prove to be unsuitable. In short, if the intertwining between OIP and IP increases, an organization element that is incorporated within the hierarchy is the obvious choice. As was concluded, the defense organization's present MCS for DTO may be an expensive construct.

### *Conclusions*

The study shows that the Van der Meer-Kooistra and Vosselman model can be applied to the situation in the Ministry of Defense. In particular the predictive variables are relevant for understanding why and how the present defense management control structure for DTO is designed as it is. Besides, the study underpins the recommendations in the research by Van der Meer-Kooistra and Vosselman and Langfield-Smith and Smith to expand the model with the variables of culture and historical situational factors. The application of the model to the relation between DTO and the defense organization indicates that a bureaucracy-based management control pattern is the most suitable in the present conditions. The actual pattern is in line with this. The results with regard to the predictive variables largely correspond to the results of earlier studies in the world of business. All three studies show the model to be relevant for the prediction and explanation of the management control relation of choice.

With the MCS the Ministry of Defense has established a pattern that is suitable for an actual outsourcing relation. On the basis of this it can be concluded that the MCS causes high transaction costs for a relation within a single company. The reason for this is the choice for placing the services and products in an agency. This brings along certain borders between the organization that have to be managed and controlled by the MCS, which has become so extensive due to the possible outsourcing of DTO. So, a part of the present organization lies at the root of this situational factor, causing high transaction costs. The level of transaction costs may be offset by efficiency gains and quality improvements by DTO, which can be attributed to the present structure of management and organizational design.

Taken together, the developments in the delivery of products and services by DTO in the internal government market of Public Order and Security, the realization that IP and operational information production are getting more and more intertwined and the application of COTS exert a strong influence on the suitability of the management control system. These variables conflict with regard to the suitability of a management control system and the consideration to position DTO within the defense organization as a government shared service center or external partner.

The present research can be categorized as a theory testing study within the category of theory oriented research. The research was carried out by means of a single case study. Because of the application of the model in a case study and the first application of the model to an intrafirm relation, its generalization force is limited. Any comments on the relation must be viewed with these limitations in mind. The extent of generalization force of comments with regard to the consistency of the model, however, has been compared to two other studies, lending the insights in the model more generalization force.

#### *Recommendations*

The research emphasizes the need for further research into the variables culture and historical situational factors as predictive variables for the suitability of a management control system. In order to validate the model further and to expand it, it is advisable to investigate these two variables explicitly in outsourcing relations. The model could also be used to assess whether an existing management control pattern is suitable for an agency when a decision to outsource must be made. It may yield insights that can be employed in the re-design of the MCS in case of an actual outsourcing. In the period of 2000-2005 DTO was given a tasking to make its prices more in conformity with the market. On the basis of the research it is to be expected that the MCS brings along high transaction costs for DTO. It would be interesting to investigate in how far these expectations can be given more substance and how the possible extra costs for management and control

can be made transparent. This would create a better insight into the effectiveness of the establishment of an agency for ICT service provision. Finally, the research has shown that the developments in the delivery of products and services by DTO in the internal government market of Public Order and Security, the realization that IP and operational information production are getting more and more intertwined and the application of COTS combined have a strong and probably conflicting influence on a management control system. In this context it is advisable to study these developments further and to assess how they influence the future of DTO and the organization and structuring of IP and operational information production within the defense organization.

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