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THE ORGANISATIONAL AND INFORMATION ASPECTS OF THE FINANCIAL LOGISTICAL MANAGEMENT CONCEPT IN THEORY AND PRACTICE

Dirk Swagerman and Arjan Wassenaar

Abstract: This paper presents current research in progress about inter-organisational information systems. It presents an overview of current developments illustrated by two cases in the area of inter-organisational information systems. Especially the combination of functional flows, such as logistical and financial, towards an integrated flow will be stressed. This combination of different information flows is called Financial Logistical Management. The latest developments are the combination of the different information flows with the marketing and commercial information as Electronic Consumer Response. This can lead to a situation, in which an integrated information structure within and between organisations will occur.

This paper will define the FLM concept and explain the underlying assumptions. There will be an elaboration of the basic FLM techniques and instruments illustrated in case studies relating FLM with other concepts like ERP, electronic commerce ECR Conclusions and some recommendations for further research will be presented.

Keywords: accounting information systems, inter-organisational information systems, ERP, ECR and FLM.

1. Introduction

The purpose of this paper is the introduction of the Financial Logistical Management ('FLM') concept in theory and practice. The FLM concept has the objective of introducing logistical concepts in the financial function. Furthermore the extension of the FLM concept towards Electronic Consumer Response ('ECR') will be addressed.

1. background

The current situation in most organisations is that the commercial department initiates the ordering of goods or services. The physical logistics of organisations is related to the primary process of organisations. The exchange process of logistical information between organisations can be based on the EDIFACT standard. The EDI messages make it possible to communicate directly through computers by means of the EDIFACT standard. This development has created an important change in the whole physical logistics. Just in Time ('JIT'), lean production and supply chain management can be realised in an efficient way due to the information exchange based on EDI. Also EDI is a stimulatory factor for the integration between organisations in the commercial exchange process. It is clear that EDI, as an important ICT development, has a broad impact on the behaviour of...
organisations. EDI is only possible when there is an ICT infrastructure within and between organisations. The boundaries of organisations shift and the number of hierarchical layers within organisations can decrease, due to reduced co-ordination needs.

When the goods are delivered in the warehouse, a bookkeeping action will take place in the financial administration. The financial process is the 'mirror' of the physical process which is initiated by the ordering of the goods or services. After the particular organisation receives money for the delivery of the goods or services at the bank, the financial information from the bank must be reconciled by means of electronic banking directly in the financial administration. This could be done by means of using FEDI messages.

For the settlement of the transfer there are two different clearing systems in the Netherlands: the system of the banks (Interpay former BGC) and the system of the Postgiro. The National Payment Circuit project organises the integration between the two different circuits. In an international setting for the transfer of money the banks use the Swift system. Currently the Target system from the Central Banks is being developed for the transfer of large payments between commercial banks in the EMU countries.

Currently new developments in the field of information processing and combinations of flows of information, including financial information enable the link towards marketing and commercial information, such as ECR.

2. bottlenecks in the current situation

The financial administration has the obligation to pay the debtor. Only limited commercial information, restricted to a few lines can be added to the financial information for the money transfer. This problem can be seen as an information barrier in the transaction of commercial information. The clearing process between the debtor and creditor banks is done with relatively high transaction costs and the whole clearing process will take time. The banks use float of two days for this transfer. This situation is not acceptable anymore. Due to the subsequent steps in the whole transfer process, which are not integrated, there is a risk of losing data integrity. A high degree of data integrity is seen as a quality attribute, which is considered to be important in the information flow.

The whole money and information transfer process is not integrated and can be seen as a time consuming and costly operation ('time value of money'). This means the information of the primary process, such as the logistical information is not brought in connection with the information about the financial process.

Based on the current developments in the ICT there is no reason for delay and can be overcome easily.
The FLM concept is originally developed with the purpose to integrate the financial and the logistical information flows: currently these flows are barely integrated yet. The reason for the lack of integration in the past was that in an organisation there are two different functional disciplines: the logistical function which is oriented towards the transfer of physical goods or services and the financial function, which includes the payments and the debtor administration.

3. challenges for the future

The current developments within organisations and their environment must be placed against external developments. This is the adaptation process of organisations to their environment. The consequences of the changing circumstances are that organisations must have sufficient adaptation capabilities. Adaptations will result in changes in the organisational structure, the internal processes and the required management style. The consequences are that the traditional organisational boundaries and structure will change towards a hybrid form with no clear organisational boundaries. The organisation structure of these hybrid organisations is sometimes based on small self containing organisational units, which operate in a network in interaction with other organisations. In other situations organisations operate as extended enterprises and virtual organisations.

After the developments in electronic payment services driven by banks to transfer funds against lowest costs, now the information transfer aspect between organisations is also becoming important. Within an organisation there will be a development towards the use of Electronic Resource Planning applications (‘ERP’) such as SAP and Baan software. These applications will have a tendency to integrate different functional disciplines. There are also some interesting developments in the area of electronic commerce. It is already possible to order goods directly by means of Internet, while the payment is done by means of creditcards. There are also already pilots for direct Internet payments. These developments have been enabled by the current technological developments, especially in the ICT and make an integration of the logistical and financial processes possible. In the proposed combination of the two flows of information, there will also be the spin-off for management information and commercial information.

A current trend is the globalisation of markets, which will stress the need for co-ordination of the activities of organisations by means of an information system spread out over the world. There are two important events, which make the need for an organisational answer apparent. The world wide Year 2000 problem and the change to a common currency situation (EURO) in Europe in the EMU countries. This will lead towards global logistics and global financial markets.

Another changing aspect is the management attitude. The management in general is, due to a higher professional level and permanent management education more strategically oriented than in the past. Management is more interested in developing a new way of doing business. This behaviour stimulates the development and use of FLM in organisations.
4. The enabling role of the ICT developments

The impact of the ICT on organisations and on their strategies will be more apparent in the near future, because of the growing importance of co-ordination capability between different functions in organisations. This capability of ICT is relevant for combining parts of the financial function and physical logistics. Furthermore ICT can enable inter-organisational information exchange. In general the use of ICT will result in lower transaction and co-ordination costs, with the consequence that is makes hierarchical styles structures comparatively less attractive than more market oriented structures.

The developments in the ICT have caused a shift from centralised data processing to end-use data-processing. Through an infrastructure the local information capabilities are connected. This situation has first of all occurred within the organisation itself and now due to the progress of technological development ('technological push') the internal information systems will expand towards external integration. This external integration is also caused by economic factors, market pull such as the co-ordination need in the increasingly global environment of the organisation. The linking mechanism between organisations for exchange of information is on one side the anarchistic Internet infrastructure and on the other side the corporate Intranet or the VAN infrastructure. The ICT results in the economic circumstances described in the range and reach concept (Keen 1991). This concept consists of the combination of intra- and inter-organisational systems for the exchange of information between functional systems and the core-business process which is not tied to a geographical defined place anymore.

2. Introduction of FLM concept

Financial logistics is the use of ICT and physical logistic concepts in the cash-management and the financial transaction-process with the objective of reaching effective and efficient use of liquidity. The management of financial logistics in an intra and inter-organisational way is Financial Logistic Management ('FLM').

1. need for an integral approach

The financial transaction process can be seen in the same way as the physical logistics process. There is a flow of money through the system, and there is a minimum stock of money on the accounts. Most important is the fact that there is an exchange of information based on the underlying nature of the physical (chartale) money. The parallel between physical logistics and similar process in the financial function lead to the development of concepts derived from the physical logistics in the financial function. The different financial logistic techniques which can be applied in cash-management are for example netting and cash-pooling and techniques which can be used in the financial transaction-process are for example electronic banking, FEDI, automatic reconciliation.
There are several basic fundaments on basis of which an integrated approach between the financial function and the physical logistic function can be reached. The starting point is the distinction between real transaction system and symbolic information systems, this is the so called 'place versus space' paradigm:
- real transaction system: the material exchange of goods or services in the real world;
- symbolic information system: exchange of data within the communication space.

The following step is a further explanation of the transaction phenomena. Transactions are rooted in our capitalistic economy which consists of a network of economic actors specialised in dedicated tasks. In this system property rights and resources are exchanged in transactions governed by contracts which specify the terms of delivery and compensation. Information exchange is needed to specify, control and modify contracts which govern the transactions. The transaction flows can be seen in the following way:
- the financial flow process has to be examined in relation with the underlying physical logistic flows, the interaction between the two flows is an important starting point for innovations;
- structuring of the two flows has to be examined in relation with the new capabilities of ICT;
- the pattern of the flows has to be studied in an inter-organisational frame (e.g. network theory).

The next step is to make the link from transactions to organisations. Organisations will organise their activities in such a way that commercial transactions will be executed in the most effective way. The ICT, as an enabling factor, makes it possible by means of Business Process Redesign ('BPR') to establish new patterns to govern transactions between organisations, in a better way than in the previous situation.

In general the management has the following possibilities to reach their objectives:
- reorganisation of the current financial function through the process of organisation;
- redesign of the financial process ('process-innovation') through further introduction of ICT.

For above is one of the opportunities for the management using the FLM concept in practice.

2. **the FLM concept defined**
The concepts of financial logistics must be adequately managed to become worthwhile for a particular organisation. Organisations will try to lower the costs of the use of the banking payment system as much as possible, by means of using different cash-management techniques (for instance: lock box, pooling).

The required management action related to the use of financial logistics is FLM. This concept can be described as follows: the management of financial logistics in an intra and inter-organisational way (Swagerman 1997).
Based on the above description it is clear that the FLM concept is not only a concept for a particular organisation. The power of the concept is strongly related to inter-organisational concepts and flows of information across the organisational boundaries. FLM will assist in the process of integration of the intra- and inter-organisational processes. The intra-organisational integration between different information systems can be reached by using the common EDIFACT standards. The inter-organisation integration can be reached through automatic reconciliation. A shared services application in the financial function, such as accounting house is an example of the use of FLM in organisations.

4. Cases as examples of current developments

Some examples of the concept FLM have already been put into practice. The current developments will be described by means of two case positions. In the first case of an airline company the application of the FLM concept is still in progress. The particular organisation uses these concepts to achieve a situation of shared services in an accounting house. This is the first description of this case in literature. The second case is about the flower auction in the Netherlands and has previously been published.

1. an airline company

The airline industry has for many years been one of the most exciting examples of competitive use of ICT. This very information intensive industry has a long tradition in automation. In the early 70's the industry already started to invest in intra- and inter-organisational systems like accounting and computer based reservation systems. In Europe the competition between airlines has increased for different reasons (f.e. deregulation) among which deregulation. In the 90's most of the European airline companies started new automation projects for (internal) cost reduction. In our case the company started a cost cutting programme aimed at reducing the purchasing costs. Purchasing concerns all goods and services for which an invoice is received. The objective of this programme was reduction of purchasing costs by 5-10% within a few years. At the moment this company has a divisional organisational structure. In this decentrally oriented structure, every division has its own purchasing, financial and information management department.

In 1990 the general ledger and accounts payable and receivable applications of the accounting systems were deconcentrated in divisional computer centre. This distributed hard and software made it difficult to get, reliable, company wide information about (purchasing) cost and their drivers on time. During the last years the purchasing bargaining power has weakened because of a lack of combined information about spending area's, product categories and groups of suppliers. Furthermore, evidence was found that the accounting costs of invoices were too high and could be lowered by concentrating all accounting activities as much as possible in a specialised accounting house.
In 1997 an automation project was started aimed at lowering administrative transaction costs and improving information in order to make better procurement decisions. To achieve this all decentralised accounting systems will be concentrated in three accounting units. Every “service” unit has to support divisions in executing their accounting activities like account payable and receivable. Every unit is responsible for efficient and effective service delivery to their “customers” within company-wide constraints to assure high quality of management information to improve for example purchasing decisions.

This overall project, which has to be realised in two years, is divided in different sub-projects like the formulation of company wide accounting guidelines, acquisition of software packages for accounts payable and receivable, introduction of electronic payment and establishment of organisational service units. A steering group is charged with overall project management. The corporate controller is chairman of the steering group. Members of the steering group are the controllers of all divisions and managers of each concern purchasing group.

2. case flower action

The second case is about the Dutch flower auction (Van Heck and Ribbers 1997). One of the auction systems is the Tele flower Auction. The buyers can bid via their PC. The PC is connected to a fully computerised auction clock. The physical logistics and the price discovery are uncoupled. The information about the physical process is delivered by means of EDI messages and shared between the participants. The information brokerage function especially in the auction process is apparent. Electronic markets in general will be an important phenomena in electronic commerce. After the auction the two different flows: the information flow of the goods and the auction flow are uncoupled. This separation results in improved logistical performance and service level for the buyers and sellers. The separation of the two flows is similar with the back- and front-office concept in stock brokerage at financial institutions. Centrally at the auction house the financial transactions will be processed for the different clients. This particular department can be seen as a service function in case of an internally outsourced activity to a specialised department. For the commercial position of the flower auction the quality of the secondary processes has become important, because it can increase customer service.

5. Observations and lessons learned

In practice we have observed two developments. First an extension towards the integration of different functions and secondly, an uncoupling of the different information flows. The integration of the primary process/logistical function with parts of the financial function and the marketing/manufacturing function may be seen as the next development.
The observations from two illustrative cases in connection to the subject of FLM is that the ICT is the dominant factor in realising the goals. This is not surprising. The question however is whether use of the FLM concept in organisations can result in a competitive advantage in their primary process. The strategic use of FLM is oriented towards business supporting and required BPR. The implementation of this concept starts by supporting the different flows of information. These flows can be handled in their own way in different places in the organisation. ICT can be used in this whole process as a strategically factor, resulting in an increase in service level. It is clear that the next step is that the commercial information will be tapped from the physical logistical and financial information for marketing purposes.

So, inter-organisational FLM solutions have to be considered in relation with the existing inter-organisational physical logistic information systems and inter-organisational market information systems between many independent companies.

In the flower auction case, re-engineering of financial logistic management was part of a total re-engineering project to improve physical distribution and information brokerage services. It underlines that introduction of new financial logistic management concepts are strongly related to the implementation of new physical distribution and information brokerage concepts. In contrast with the airline case re-engineering in the flower auction case is primarily based on restructuring inter-organisational logistic services. It is interesting to see that both cases are based on the idea of improving internal or external market transparency.

2. essential role of ICT

The eminent role of quasi market mechanism such as outsourcing and shared services can realised by means of the use of ICT. Due to the impact of ICT on organisations there will be a tendency to produce goods and services through the market instead of the hierarchy. The co-ordination of production will be done through the market. For organisations this results in the outsourcing of non-core business activities. This outsourcing can be done across organisational boundaries or within organisational barriers by concentrating activities at holding level in order to reach economies of scale and know-how. Within organisations quasi market structures will be developed by means of transfer pricing, organisational unit forming ed. The outsourcing in an intra-organisation way is meant to share competence in a shared services concept such as an accounting house. An accounting house can be established to process bulk transactions in an efficient way against the lowest costs by achieving economies of scale.

This information about consumer behaviour and the commercial transaction is the so called ECR information system. This information exchange facilitates intra-organisational marketing objectives. In the same way the financial information from an economic transaction can be used for other purposes than purely for intra-organisational matters. In an inter-organisational context it can be used
for the exchange of information with other parties, for instance financial clearing houses. The marketing information can be used for both inter and intra-organisational manufacturing purposes together. This consideration is the basis for JIT applications. Due to the progress of inter-organisational developments (Internet/electronic commerce/EDI) organisations will now also be pressed to integrate their intra-organisational processes.

3. FLM as an integrated approach

This paper presents the current research on the observation of real life situations. In an inductive way the theoretical components are explained in a more general way. Based on the current 'state-of-the-art' of the theory of organisational behaviour the following conclusions can be made.

In general, the extension of the FLM applications which are already used asks for redesign of relations with other intra- and inter-organisational applications, because:

- first, from an intra-organisational point of view, the structure and flow of financial transactions is narrowly related to the structure of the good flows in the manufacturing and logistic departments initiated and governed by agreed contracts between involved trading partners. Mostly, these contracts are the outcome of a contracting process under responsibility of marketing and sales departments. So, re-engineering of intra-organizational financial logistic management has to be considered in relation with the existing manufacturing and logistic management information systems and marketing and sales support information systems within a company.

In our airline case, re-engineering of the electronic payment system (accounting house) has to result in a more effective purchasing function. The new financial logistic management application has to deliver better company-wide information about purchased goods and their vendors. The purchasing department expects to augment their bargaining power and to lower costs based on company wide vendor information.

- secondly, from an inter-organisational point of view, the structure and flow of financial transactions is strongly related to the inter-organisational infrastructure and services offered by financial, physical distribution and commercial market intermediators. Intermediators are actors who support the contracting process between trading partners by providing information and financial, physical distribution and logistic support. The (inter)national banking sector consists of financial intermediators offering financial (logistic) services for financial settlement of contracts between trading partners. The (inter)national transport and warehouse sector consists of physical distribution intermediators providing physical distribution (logistic) services for executing contracts between trading partners. The commercial intermediators are specialised in information (logistic) and brokerage services to support the creation of contracts between identified trading partners.
However, new financial logistic management information systems have to fit in the overall organisational context. IS strategy planning is often useful for selecting an appropriate financial logistic management concept within the specific organisational context (Wassenaar, 1997). In the figure this intra- and inter-organisational context is visualised and this can be used as a reference model in the process of IS strategy planning.

The figure is illustrates our view on FLM as a part of electronic commerce defined as "any form of economic exchange between (economic) actors conducted via electronic connections and governed by organisational and (inter)national institutional arrangements". This definition is based on Wigand, Picot and Reichwald (1997).

Electronic commerce creates a totally new phenomenon for organisations. The basic function of electronic commerce is to facilitate the exchange of goods and services. However as an additional advantage strategic and marketing information will become available for management purposes. The scope of electronic commerce spans from inter-organisational information systems like electronic trading to intra-organisational applications like shared services applications.

- electronic commerce applications like electronic selling and electronic purchasing on Internet are focused on information logistics and brokerage for fixing up contracts between trading partners;
- extended enterprise resource planning ('EERP') applications like material and manufacturing resource planning and operating resource management systems are focused on execution of fixed contracts by supporting manufacturing and physical distribution of goods;
- FLM applications like electronic payment systems and accounting houses support the financial settlement of contracts between involved trading partners.

6. Final remarks
In the near future more attention will be paid to all kind of electronic information exchange. However, the different forms of electronic business, therefore between electronic commerce, FLM and extended enterprise resource planning applications will become even more difficult as:

- industry and organisational boundaries change or disappear;
- supply chains change and value added activities are distributed in new ways;
- customers are becoming part of the value added chain.

Our presented cases are a good illustration that a more integrated re-engineering approach of electronic commerce is important. Undoubtedly, a more integrated approach will affect the traditional boundaries between academic disciplines like information management, marketing, financial management, accounting and production and logistic management. New and more integrated interdisciplinary research like FLM will be needed.
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Enschede, January 1998
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