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EDI AND ITS POWER TO CHANGE BUSINESS AND LIFE-CASE STUDY

Abstract: This paper is result of project of implementation electronic delivery note and monitoring of KPIs of business processes and workplace organization. Initial analysis has led to the conclusion that certain business processes can be improved through more efficient of document management. Improvement of business processes also has meant better workplace organization with more efficiency and decreased stress and NVAA. As documentation, we have considered all documents which should be registered and verified in SAP, as ERP system which company X has used. By checking links between documents, we have established that delivery note has the greatest impact on other documents and all processes, especially on P2P process (purchase to pay).

Keywords: EDI, KPI, Business Process, Provider, Supplier, AVIEXP, Logistics Portal

1. INTRODUCTION

Terms such as electronic data interchange, electronic document exchange and electronic business are used from beginning of computers history. They did not always have these names, as they are very often had various interpretations of their meaning. However, the basic idea remained the same, from the beginning until today. This would be the easiest and best to classify within the automation process, establish and improve of communication (including the exchange of material) between systems, where the term system referred on a business system, but also on information and communication system.

In the literature exists very diverse interpretation of term EDI. Regardless of such situation, we will try to bring you closer the widest possible picture through perceiving of this term from different aspects and in different contexts.

The term "EDI" (literally "electronic data exchange") refers to a structured exchange of data between organizations by electronic means. Simplified: between two computers from two different companies ([1]) But this is not e.g. e-mail (which could be included under this definition), because exchanged data are not readable for people, and also they aren't any kind of data, but the data that is exchanged e.g. in supply chain in the trade.

Traders are well aware of what it is:

orders, delivery notes, proposals delivery, level of customer stock, electronic invoices and many other documents. This data is not readable to humans, but they are legible for the information system used by partners in exchange of data. Another difference compared to e-mail: you may receive "unreadable" files, but then you need to record them somewhere, and then "imported" into your information system to be able to view the content of the message - this is already "manual" work, but we're talking about exchange without human involvement. The term "structured exchange" is very important due it says that this is the standard (format of file\documents, protocols for the exchange).

2. EDI-HOW AND WHY TO USE IT

In next parts of paper we will present all the steps and results of case studies related to the project, but before that we will consider once more the meaning of this term, as well as the necessary preconditions for the application of this standard, respectively process or technology as interpreted by some authors. Special attention will be on part how and why to use EDI.

2.1 EDI

EDI stands for Electronic Data Interchange and there are several definitions of

EDI of which are commonly used:

- EDI is the exchange of structured business data between computers of companies, done without manual intervention, electronically, through standardized messages that replace traditional paper dokumente.([2]).
- EDI is an international standard for the exchange of business documents in digital form. It is a common language with which computer-based systems, independently or semi-automatic exchange documents of various types such as orders, delivery notes, invoices, etc... As global standard EDI exists almost in the last 30 years, and the role of EDI providers is to provide interconnection of all participants in the verified system which works in whole that period.([3]).

We may notice the following four elements if we keep in mind listed, as well as other existing definitions of EDI:

- 1) Structured data-EDI transactions consist of codes, numbers and (if necessary), the short parts of the text, wherein each element has a strictly defined purpose;
- 2) Agreed standard message-EDI transactions must have a standardized format. Usually it comes standard not only agreed between trading partners, but this is the general standard,
- 3) From one to the other computer system,
- 4) Through the electronic media.

2.2 Why to use EDI (electronic data interchange between company X and suppliers):

- Saves money by providing an alternative to the information flows that require a lot of human interaction and materials, such as paper documents, phone calls, faxing documents, meetings, etc.
- Reducing the cost of manual sorting, distribution, organization and search paper documents.
- Reduction of errors, such as shipping and billing errors, eliminating the need for manually re-entering \ creating documents on destination side.
- Speed of reception and inclusion of information in the system of company X , greatly reduces the cycle time of reception,

distribution(taking from stock to the line) and usage of materials, which is great benefit for company X, especially from aspect of JIS \ JIT production.

- Feedback to the supplier about received delivery notes, registered invoices and done payments.

2.3 How to use EDI (prerequisites and way of usage):

EDI includes four main processes:

- standardization of procedures for communication,
- formatting data in structures or messages,
- transfer messages,
- converting of messages in a form suitable for processing of transferred data

EDI implies three inevitable points: ([4])

- Hardware,
- Software - significantly affect the final cost of implementation and use. Translational software converts data for shipping from inhouse application software into messages in agreed EDI format,
- Telecommunications - choice of network or service provider, which should provide an interface between otherwise incompatible systems.

For EDI is necessary:

- to know in advance who is the sender ,and who the recipient of the message,
- the message is one of the pre-agreed business documents,
- exchange of messages is performed between the computer and via telecommunication networks or providers,
- each message is pre-standardized - consists of predefined blocks (areas), and each of which has its own tag and the content that has been formed on the basis of pre-agreed code list.

Minimum requirements for WEB - EDI: ([5])

- Personal computer: (processor>=90MHz, RAM> = 32 MB, minimum Microsoft Explorer ver. 5.5 Service Pack 2).
- "User File" developed in a predefined format.
- Internet connection.
- Appropriate computer skills to execute the transfer of user files.

2.4 The third party in exchange EDI

or VAN (value added network) is a service provider in EDI exchange. This is an organization (company) which in addition to the basic service of telecommunications network also provides additional services, with the aim to reach favorable costs of total service provided to customer. We need VAN to solve problems in the use of telecommunications infrastructure:

- efficiency and speed of establishing connections with different partners that use different equipment and standards,
- protection of data during transmission (exchange),
- providing chronological data in the case of disputes between the partners,
- various types of professional assistance to potential user of EDI exchange.

3. CASE STUDY-COMPANY X

In this section we will go through the key steps in the project implementation of EDI with special attention on reached improvement of business processes.

3.1 Monitoring of business processes and consideration of improvements

Below are the key business processes that were subject to monitoring, but also most of the other processes on which they have an impact due to the connection based on flow of documents or on the level of business processes in terms preceded by \ followed.

- Entry and Registration of vendor invoices - registered manually, except one part of invoices directly transferred from SAP into SAP. In addition to the entries here are operations such as manual bonding bar code tickets and archiving of document through scanning. The possibility for an error (incorrect data entry, bonding the wrong label, an incomplete or absence of scanning) is a large bearing in mind that most part of the process is done manually.
- Verification of invoices - system during the night done the pairing of all necessary documents. A large number of invoices will appear in the backlog in case that the system is not able to do auto pairing. For all these invoices we need to start Workflow. Number of messages in the WF

was in constantly growing, and some messages weren't possible to close for a longer period. This caused bad KPI parameters for P2P process and a large number of invoices with overdue payment period.

- Verification of delivery notes - On all the problems in the process of entry and verification of invoices directly influence has the process related to the registration and verification of delivery. Delivery notes are registered manually in the Legacy system and then has been performed their migration to SAP. The system for monitoring ZEUS doing verification of delivery notes and all of them that are not in compliance with POs will be in backlog. Misalignment will occur in the event of an error during registration (wrong code of suppliers, incorrect code of material, the error in quantity, the wrong choice of delivery note, the difference in quantity between delivery notes and order, etc...). Here we had a specific situation with multiple codes of suppliers since suppliers deliver to different factories or use different codes for different purposes.

Monitoring of these processes and their impact on other business processes led to the conclusion about the status of the departments and processes:

- Logistics (problems with the documentation, as well as with efficient management of material flow due to a lack of data),
- Purchasing (multiple repetition of some activities in order to establish a connection with the delivery notes, as well as the necessity of managing a large number of WF messages),
- Finance and Accounting (a large number of invoices with necessity of multiple verification and opening of messages, activities on communication with suppliers to explain the unpaid overdue invoices),
- Treasury(impossibility of quality and timely management of cash flows),

All departments under the influence of listed problems are organized some kind of brainstorming session that was supposed to result with proposal of solutions which will improve the performance of most of the process what would lead to efficient and effective operation of all departments.

During the discussions, there have been many proposals for improving of certain processes, but EDI has been chosen as solution with most comprehensive affects on other processes.

3.2 Feasibility studies, challenges and implementation of EDI

In the previous section we have already mentioned the basic prerequisites, and below we will look at the key conditions for communication between company X and its suppliers. In addition to these conditions should be noted that for all suppliers we have done a questionnaire in order to evaluate the overall picture and the creation of the conclusions for feasibility study.

3.2.1 Feasibility study

- Company X uses provider Y to provide EDI services for suppliers.
- Supplier can start to use EDI with minimum technical requirements on their side. If they print documents from a system and have an internet connection, they can consider starting with EDI usage.
- Supplier must have an active supplier code in the company X
- Supplier should contact the provider where they can get all the information about electronic document formats and ways of connecting.
- Different levels of B2B (Business to Business) integration are possible depending on the supplier budget and their systems. Start usage of Web-EDI requires minimal effort without cost on supplier side

3.2.2 Challenges

Here are the key challenges that we faced in preparing for implementation:

- large number of suppliers with different systems, timing and extent of delivery,
- same supplier delivers to more factories within the company X and because of that it uses multiple codes,
- dislocation of suppliers,
- some vendors shipped via external warehouses or other suppliers,
- IT departments on supplier side does not exist or they do not have the appropriate level of knowledge of EDI processes

- Not precisely defined person responsible for uploading (sending) delivery note in electronic format
- Lack of technical conditions on the location of suppliers
- Provider is distant
- Supplier is not familiar with all possibilities of logistics portal and the ability to track the status of sent document

3.2.3 Implementation

Considering on all listed previously, we have defined and implemented the following steps:

- In start EDI will be used for delivery notes. Delivery notes will be automatically transferred into Legacy system, from where will migrate to SAP as before.
- Main procedure for monitoring the implementation of EDI.
- Main procedure for monitoring its use through the KPI parameters.

Based on the established procedures and several successful implementations, taken as best practice examples, we have noticed two ways for implement and use:

- Standard EDI connections supported by the provider Y. Suppliers can use this version of EDI for reception document (order issued by company X in accordance with the MRP-material resource planing) and for sending electronic delivery notes.

In this variant, vendors have had a problem with the initial setting of corresponding blocks in the structure of the message. We have analyzed all delivery notes sent by the supplier (sending has been confirmed in theirs system), but they didn't receive in our system. All detected errors (incorrect layout of blocks, data in the wrong place in the block, syntax errors as a problem for compiling ...) are solved in coordination with provider and IT department (when there wasn't IT with logistic or procurement) of suppliers.

- WEB EDI connection is an alternative solution to traditional EDI. This solution is designed to ensure that all suppliers are in a position to use EDI.

The solution is based on filling the excel file and creating a csv file for upload to the logistics portal. For this solution, suppliers do not have additional costs to establish a connection to the service provider, but it is much smaller degree of automation and is

suitable for suppliers with a smaller volume of documentation.

Excel template to be filled using data from the purchase order issued by company X, whereby this document is available for suppliers on logistic portal.

The process of creating a csv file, and check correctness of entered data is regulated by using the VB code in the template.

The process of use is significantly improved by introducing additional or improving existing opportunities in the logistics portal:

- 1) The part where the supplier may check the level of performance of EDI usage. Reports exist for two key parameters - quality (ie logical correctness) of messages and time, in terms of checking that the delivery notes arrived in our system before the truck with goods;
- 2) The part where the supplier may upload created csv file, has been further enhanced to provide 100% successful uploading,
- 3) The part where the supplier can see the status of EDI documents just a few minutes after the automatic sending from its system or upload on portal.

4. KPIs AND RESULTS

4.1 Monitoring KPI relating to the usage of EDI

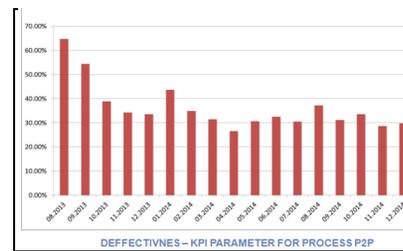
During the implementation, monitoring has been conducted at three levels:

- 1) the document arrived in our system (usage without problems),
- 2) supplier has proved usage, but document is not visible in our system (support to suppliers to fix the problem on their side),
- 3) suppliers with special status

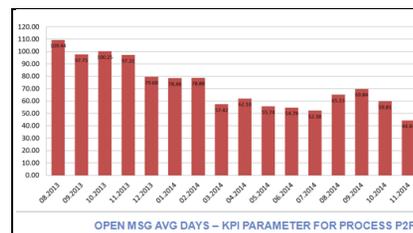
As key parameters, were monitored % of suppliers with implemented EDI and number of received electronic delivery notes. Both parameters have had continuously increasing to defined target of more than 90%.

4.2 Monitoring KPI relating to business processes

From Picture 1 we may see that, even with some oscillation during the period, one of the KPI parameters DEFFECTIVNES was stabilized at about 30% compared to the starting more then 60%.

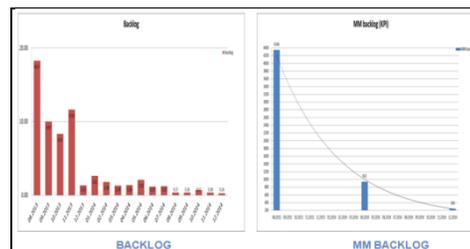


Picture 1 – Deffectivnes



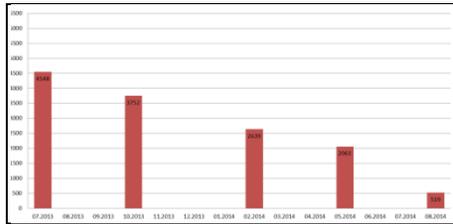
Picture 2 – Open msg avg days

From Picture 2, we may see that the average number of days for opened messages in WF has decreased on 44.44 compared to starting 109.44. This average should be further reduced by 20-25% considering that during last measurement we have had some irregularities (messages that have been closed outside the system, but the system has seen them as still open) which contributed to the result.



Picture 3 – Backlog i MM Backlog

Picture 3 shows the status of some key parameters from start of implementation until the end of monitoring. The average number of days that the invoices were unregistered is stabilized on less then one day compared to starting value over 18 days. In addition to this parameter, the number of documents that represent the MM Backlog has been decreased from more than 4000 in the beginning to 246 on the last measurements.



Picture 4 – Migrated documents in error

From Picture 4 we may see constant decrease number of delivery notes in error of during their migration from the Legacy system to SAP.

5. CONCLUSION

EDI was implemented for all suppliers of direct material with direct delivery. % of electronic documents was constantly growing up to 98% at the end of the monitoring period.

Direct and indirect impacts on business processes were:

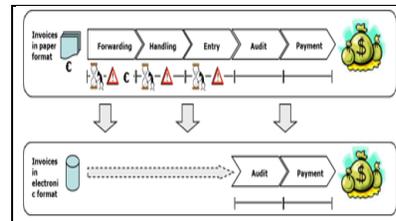
- The process of registration and verification of invoices significantly improved.
- The number of unpaid overdue invoices is considerably reduced. This allowed a much better planning and realization of cash flows.
- Parameter backlog was reduced more than 70 times. Parameter MM backlog, which indicates the number of documents in error has fallen nearly 18 times.
- Not overloading WF with number of documents in error and all departments have a significantly smaller number of messages related to WF.
- Significantly accelerated and improved the process of receiving materials.

Our next steps should be implementation EDI for invoice, taking into account the observed

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improvements and advantages of EDI, but also the understanding that it is necessary to EDI applies to all documents.



Picture 5 Paper vs Electronic invoice

Shipping, handling invoice in paper and registration is not required, a supplier is exempt from printing invoices which reduces the time, cost, and potential problems in delivery (loss of the document).

Bearing in mind that supplier will insert the number of delivery notes on the invoice, verification and linking of documents will be significantly accelerated and improved while reducing the possibility of errors and delays in payment.

We have seen how EDI has improved business processes, but we have to take in mind that in that way we also have gotten better work environment with reduced stress and NVAA.

EDI is not limited to business and commerce, but its impact is expanding into the realm of humanitarian and social efforts. The potential for EDI software to continue to transform social and humanitarian efforts and further global connection has not been capped and will hopefully continue to expand and improve. The exchanges may all be electronic, but the effects are deeply social and personal.