

# **PROJECT MANAGEMENT UPDATE FOR SMALL SIZED COMPANY**

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Mechanical and Production  
Engineering

TAMPEREEN AMMATTIKORKEAKOULU  
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## TIIVISTELMÄ

Tampereen ammattikorkeakoulu  
Kone- ja tuontatotekniikka

Jari Heinonen  
Projektinhallintaohjelmiston päivittäminen  
pienikokoiselle yritykselle

Opinnäytetyö 83 sivua, joista liitteitä 20 sivua  
Joulukuu 2013

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Nykyaikasessa yritys- ja työmaailmassa käytetään lukuisia tiekonepohjaisia ohjelmistoja, joiden ensisijainen päämäärä on kokonaisuuksien hallinnoimisessa ja tehokkuuden edistämässä. Markkinoille tulee jatkuvasti uusia ohjelmistoja mutta laadullinen ero ohjelmistojen kesken saattaa olla huomattavan suuri. Projektinhallinta pohjaisessa työskentelyssä räätälöityjen tietokoneohjelmien käyttäminen on lisääntynyt huomattavasti viime vuosikymmenen aikana. Ilmiötä voidaan pitkälti perustella teknologian kehittymisellä. Tietokonepohjaiset ohjelmistot edistävät työntehokkuutta tehden toiminnoista yksinkertaisempia samalla mahdollistaen lukuisten tehtävien suorittamisen samaan aikaan. Varsinkin projektinhallinnassa resursseja on käytettävissä huomattava määrä ja tämä luo kokonaisuudesta haastavan sekä erittäin monimuotoisen työskentely-ympäristön.

Tämän opinnäytetyön tarkoitus on tutkia ja kehittää pieni- ja keskikokoiselle yritykselle suunnatun projektinhallintaohjelman käyttämistä. Ohjelmistot kokonaisuutena ovat isoja ja monimutkaisia paketteja jotka sisältävät huomattavan määrän toimintoja ja ominaisuuksia. Tässä opinnäytetyössä kuitenkin keskitytään materiaalihallintapuolen varaosa-kirjaston käyttämiseen ja järjestelyyn sekä pieniin käytännön kehityksiin. Opinnäytetyön on tilannut DEUMARECO Marine systems GmbH, joka myy varaosia, tekee korjauksia ja suunnittelee teknisiä ratkaisuja meriliikenteelle ja -teollisuudelle ympäri maailmaa. Yrityksen toimipiste sijaitsee Hampurissa, Saksassa.

Yritys on käyttänyt opinnäytetyössä käsiteltävää ohjelmistoa vuodesta 2009. kyseinen projektinhallintaohjelma oli ensimmäinen yrityksessä, mutta käyttöönoton yhteydessä resurssien sekä ajan puutteen takia ohjelman jotkut ominaisuudet ovat jääneet osin hyödyntämättä. Lisäksi käytön aikana on syntynyt ongelmakohtia juuri materiaalihallintapuolelle. Jotkut esiintyneet ongelmat ovat esiintyneet projekteissa ohjelman käytön aikana ja hankaloittaneet osaltaan projektien hallinnoimista. Ongelmat eivät ole olleet vakavia mutta niistä on ollut selvää haittaa yritykselle.

Opinnäytetyön valmistelu ja tekeminen aloitettiin tutustumalla kehitettävään ohjelmistoon ja yrityksen työnkuvaan sekä toimintatapoihin. Opinnäytetyötä tehdessä tekijä on työskennellyt kokopäiväisesti yrityksessä ja käyttänyt ohjelmaa päivittäin. Yrityksen henkilöstö on kertonut opinnäytetyötä tutkittaessa mitä he ohjelmalta kaipaisivat ja mitkä seikat ohjelmissa eivät toimi toivotusti. Lisäksi henkilöstö on saanut antaa omat parannusehdotuksensa ohjelmasta mitkä on otettu huomioon päätelmiä tehdessä.

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Asiasanat: ohjelmistot, projektin hallinta, työkalut, päivitys

## ABSTRACT

Tampereen ammattikorkeakoulu  
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For Small Sized Company

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In modern times in business and in working life the use of computer softwares is becoming more and more common. New advanced softwares are developed into the market every day to help companies manage their operations. The Softwares aim to make daily actions more efficient and easier to conduct. Project management is an ancient concept but also a fairly common one in today`s modern working life. Numerous softwares have been developed especially for project management purposes. The more resources and concepts you have to control to achieve your goal; the more challenging it is to organize the project. Softwares are developed especially to help in that need to organize the entity and minimize the risks.

The purpose of this Thesis is to research and developed project management software intended to be used in small and medium sized companies. The project management softwares today are complex packages with numerous features and aspects. This Thesis will focus on material management section. The focus will especially be in a way to utilize the major features in article management and article creation in the system. The Thesis is ordered by DEUMARECO Marine Systems GmbH that works mainly in naval industry. The company sells spare parts, conducts repairs and designs technical solutions to shipbuilding industry and suppliers all around the world. The company is located in Hamburg, Germany.

The company has integrated project management software into operations during 2009. The software was the first one of its kind in the company. Due to lack of time and proper implementation some of the software`s features have not been utilized properly. Some minor flaws have occurred and some features have not been correctly used. These factors have created conflicts within the daily use of the software that have sometimes complicated operations in projects. The conflicts are not significant but nonetheless decreasing the desired efficiency.

The Thesis was conducted by familiarizing with the software and the company`s operations. The Thesis has been done simultaneously with regular work which has been a major factor in assessing flaws in the software. The Thesis has been conducted with close co-operation with the company`s personnel. The personnel`s opinions have guided the research and improvement suggestions.

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Key words: software, project management, tools, update

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# 1 INTRODUCTION

## 1.1 CONTENTS

The objective of this thesis is to research and enhance the software's features and methods used in project management based working by studying some basic project management principles and zeroing in on how the Lexware Premium- software's Warenwirtschaft - or as referred from now on - Materials management side completely functions. Fundamentally all these actions aim to improve the passing-through-time of projects. Especially the focus will be the article library in all of its diversity and complexity. Materials management section of the software has all the basic functions from clients, suppliers, technical, and commercial information's which are used when controlling the actions regarding offers, negotiations and agreements. The article library contains all the articles that have been used in the company transactions. The thesis is introduced by a company Deumareco Marine systems GmbH, a small sized selling- and engineering firm located in the midst of northern Germany's vivid industrialism and business area. The company work language is basically English but the software is a German version and so there will be some German terms introduced in this research.

This thesis will introduce a researched solution to use the Materials management's article library more efficiently and swiftly by considering all the technical, commercial, and basic compulsory aspects needed by the company in its daily operations. The thesis will nevertheless focus on the materials management's both mechanical and technical information and the article library that plays a significant role in the usability of the software.

First there will be an introduction of the company that ordered the thesis and the backgrounds regarding the project. After this there will be some basics of project management methods and tools. Through the introduction of the Lexware's features and functions follows a more close illustration of the goals and research questions that this thesis aims to answer. In the end the proposed solutions will be introduced for the features and questions. And lastly the future applications of the solutions portrayed in this thesis will be reasoned.

## 1.2 DEUMARECO Marine Systems GmbH

Deumareco Marine Systems is an engineering and selling company that works in Naval reselling, designing and repairs area. The company was founded in 1993 by Jussi Järvinen and Pekka Salmi, men that have worked in the business since the 70`s. Main offices were quickly opened in Hamburg, Germany and another in Tarvasjoki in Southwest Finland near the city of Turku. The company`s early main area was in new ship building subcontracting, designing and modification specialization. Today the company`s main area is spare parts selling and organizing repair projects. Over the years in the business the company has established a reputation as a reliant and flexible partner in spare parts market, quick repairs and in designing robust constructs.

Deumareco and its sister companies research and designs vessel technological solutions, developing usage of spare parts in co-operation with its clients and customers. The customers include a wide range of establishments working in naval industry all around the world and a number of companies in industry and manufacturing. Deumareco Marine Systems is a part of MARECO Group. In the chart (figure 1) you can see the MARECO Group and all of its branches. Not all companies work directly in naval industry.

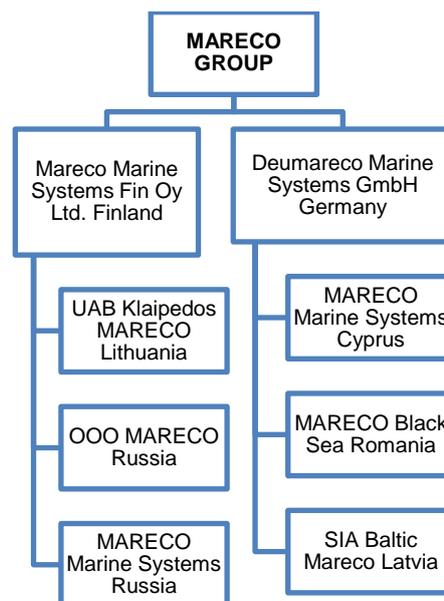


Figure 1 (MARECO Group) (Deumareco Marine Systems, 2012)

The Group employs about 70 persons specializing in naval-industry, selling, public relations and diverse manufacturing. The two main offices are in Hamburg Germany and in Tarvasjoki Finland, as mentioned. Other small offices and manufacturing sites are located strategically around Europe (See Figure 1) (Deumareco Marine Systems 2013).

Mareco Group has lots of co-operative companies around the globe. Main business relations are in Asia, mainly mainland China and South Korea. It seems to be the trend of today due to the rising industry powers in Asia. More and more of naval industry, especially building of new vessels have relocated into China, Singapore and South-Korea. Many of Europe's maritime ship building sites have been forced to close their operations during the last decade, because of the economic competition of Asia.

The Deumareco as a company is economically standing on a stabile foundation due to its strategic moves and policy's. Deumareco's turnover in the year 2012 was approximately 1,5 million euros. (Kallinen, Deumareco, 2013)

Company has a long experience specializing in all aspects of naval-industry:

- All types of hatch cover systems for different vessel types
- Vessel technical interior layouts
- Vessel short notice and standard repairs
- Standard galley cold rooms.
- Side doors and loading systems for Vessels
- Consulting on new constructing
- Damage control assessment

Deumareco works exclusively as selling agent to METOS Kitchen Intelligence Marine in Germany and some near regions of Europe. Metos produces and delivers galley system solutions, laundry equipment, furniture and other specialized products meant for larger cargo- and passenger vessels. Products are designed to fulfil all the requirements that a larger maritime kitchen equipment must have. These requirements consist of fire-proof-classifications, gadget solutions and consistency to vessel's electrical power supply.

Mareco Group is a well-established company with almost 40 years of knowledge in the maritime industry. Main market areas are still in Northern Europe and Russia. But due to the shifting of industry more and more business are also done in the Asia. Altogether Mareco is highly specialized and appreciated branch working in the heart of Europe.

### **1.3 CONTEXT BACKGROUND**

The company integrated Lexware Premium- software into its operations during 2009, and since the software has been used more and less effectively due to lack of time and resources. Early on some mistakes were made with implementation of the software. Some mistakes have been corrected but some still remain. In the normal day to day work the software plays a major role because it is the main tool via most the actions in customer to supplier relations are handled. These relations and actions are vital and they need be done swiftly and effortlessly to achieve an effective and productive working conditions. Main problem is the extensive article library, where all of the products manufactured, delivered of supplied are saved with all the article`s information. The database has been growing almost out of control and without a regular guideline. The system consists approximately 400,000 to 500,000 articles by now, and furthermore the library tends to grow steadily.

There have been plans to rearrange the article library with proper information frame for products but as said; without the right resources and proper time the job has been delayed numerous times. Main problem is that due to lack of proper product information guidelines some products are listed insufficiently into the library and in some cases the same articles are created more than twice. It makes not only the right article and all of its information harder to find but it also delays the work and thus efficiency in time-cost basis when you have to do some of the work again and again. The duplicated articles possess a major threat in complicating the cost effectiveness of some operative actions carried out during project enquiries and solutions. Also it seems that the extensive library size sometimes slows down the running time of the whole mainframe significantly when accessed simultaneously from several terminals. This has had an impact to the daily work process and of course these facts increase the project management passing through time. All of this is proving itself as a major problem decreasing cost-efficiency of operations.

## **2 PROJECT MANAGEMENT**

### **2.1 INTRODUCTION TO PROJECT MANAGEMENT**

Project management is a common work method in the modern world. Project is an establishment created to achieve a goal of predefined measure by undertaking all the resources necessary. Project management on the other hand is a way to create an environment to merge all the subjects and resources together that are needed to create the project and complete it in the boundaries of the defined measures. The measures under which the project is usually described and planned is usually one of the following three; time, budget, or quality. The construct of the project management is defined by the size of the project. Project can be a undertaking of one person or a grand design requiring hundreds or thousands of people working together towards a single goal. In a short way regardless of the type a Project is a task with a final goal and limit. And project management is a way of conduct to reach the projects goal.

Project working is certainly not a new scheme in the line of industry or business. In constructing project method working is the oldest way of establishing new buildings and constructs such as bridges, artificial lakes, or dams. Project working has widely spread as a effective method to make progress all around in the modern bureaucratic world. In the last century the development and studying regarding projects and project management has expanded massively.

Project management requires a lot of skills that are valued in the working life of today. Succesfull project management requires perception, communicating skills, organising skills, and the realization of the big picture. All these skills are effective regardless if you are a cad-engineer or a facility manager in one of the manufacturing branches.

Effective project management allows the organisation to involve the right people at the right time for the right reasons to ensure that the best quality decisions are made. (Paul Roberts, 2007, 13)

Project management creates the environment where the project's goal is achieved. The size of the management structure should be reflected into the income generated by the project. The more is the prize the more should be the investment.

The Hubble space telescope, launched into space in 1990 was a massive project that overcame huge technical challenges. A minor malfunction in manufacturing the primary mirror rendered every picture blurred. It took three years before the necessary repairs could be taken place (NASA, Hubble site, 1990). In another case when creating the new F-35 multitask fighter jet, a project undertaken by various nations in the western industrial community, has been delayed various times due to errors in the development phases. The budget has been crossed early on to the project and the delivery of the first products has been delayed because of incomplete process methods. One of the most critical defects was the cracks found in the jet engines vital turbine blades. (Reuters, 22.02.2013) (US. Department of defence, 22.02.2013)

Effective project management provides for the definition, design, implementation and control of quality, thereby reducing the risk of making a poor investment. (Paul Roberts, 2007, 13)

The risks are part of project management. Although project management aims to identify all the risks in advance and avoid them rather than correcting them when they occur. Of course with numerous variables the chance of something going wrong is considerably high. One factor in a successful project management is the number of revealed mistakes. When management is done efficiently there should be no large scale mistakes that interrupt the advance of the project. This requires a clear pattern to assign the responsibilities and communicating openly with everybody involved. Everybody working with the project should know what they are doing and in what phase of the project they are situated.

A successful project management leading to completing the project in time, budget, and quality requires a functional and coherent working society that knows the purpose of their work, they are guided onto the right path and want to achieve the best result from the first class welder to the manager of the project administrators.

## 2.2 TOOLS FOR PROJECT MANAGEMENT

Over the years project management has seen many different strategies and method models which are used when best suited for the case in hand. Especially in the last few decades the research of the methods has increased significantly (Klaus Pohl, Chris Rupp, 2011). Basically Project management is divided into schemes based on the projects nature. The scheme is built on the main focus points by which the whole project will be ruled. The focus points can change from business to technology, to marketing, or to high risk/high reward scheme (Paul Roberts, 2007). Very first thing starting a project management task is to decide what scheme will be adapted into this project. All these schemes aim to the perfect conduct of the project management towards the goal.

Tool regarding project management working helps the project team to focus on the important facts. The tools are mostly a variety of mind-sets or diagrams that help you to coordinate your time and productivity the way. A simple to-do list can be very effective in ways of coordinating your actions by your strengths.

A to-do list helps you to remember and carry out all necessary tasks, it allows you to tackle the important jobs first and not wasting time on trivial matters, it also prevents you from getting stressed about large number of unimportant jobs. (Vinod N. Patel, 2008, 258)

The tools in project management systems are tools that can be implemented in various aspects diverting from company`s operations. For example an easy model to solve problems is to make a “Drill Down” pattern that breaks down complex problems into progressively smaller parts (Vinod N. Patel, 2008, 253). The pattern just basically states the main problem and when done properly identifies itself with possible solutions. This method can be used in any problem solving scenario within company`s operations. A Finnish national aviation and defence company Patria uses a modified and diverted solution of drill-down method in its maintenance of airplanes. (Patria, 2012)

In recent times one of the support tools developed to help the project management conduct are computer based software's. When computers get better and softwares reach higher levels it is only natural to use these as tools. Softwares can save huge amount of information and are able to complete several tasks simultaneously. Computer based industrial systems are integrated everywhere in a hastening pace. It is the mainstream of modern times. Most times computer systems are integrated into companies even when they don't require such at the moment. However more and more sophisticated project management tools are brought to the market each day. These tools and softwares can add a significant boost to the efficiency when considering project management or system planning. The boost these softwares can add to companies actions must be planned throughout because the costs in implementing softwares can grow significantly, if not at first then after latent setbacks. Software implementing might demand a lot of changes in working conditions and the mind-sets. Not to mention the education of personnel to use the software to get the maximum potential out of it.

### **2.3 THE NATURE OF DEUMARECO'S NEED IN PROJECT MANAGEMENT**

Deumareco has implemented project management software into its operations in 2009. It was the first project management system in the company and the software's name is "Lexware Premium". Lexware Company has been established in 1989 and today designs its products to small and medium sized companies. The price of the software was reasonable and the annual costs were low. The software is basically easy to use and does not require huge system hardware hence to its purpose for smaller companies. These were the main reasons why Lexware was the choice of Deumareco.

Deumareco is using partially a business focused project management scheme (Paul Roberts, 2007) (Kallinen, Deumareco, 2013). The company's role in spare parts selling is guiding the business more as an customer needs - based operations where the customer sends an enquiry and the company responds to it, dealing as a middle-man between a customer and the supplier. The rule is that if the customer is reliant even the most exotic enquiry won't be turned down. The projects starts with an enquiry as mentioned. First there is the profitability assessment which is based on the customer's history and the nature of the part or service requested, this is done primarily by the sales manager and

then the sales agent. Then if the project seems suitable it is forwarded to the person fit-test to the task based on his experience and knowledge. Most of the projects are handled by a single person. The person takes full responsibility of the project and the success of it. If he can't handle it on his own or he needs assistance he will ask help from his colleagues. Some of the enquiries might be about Deumarecos standard stock items. When that is the case the person handling the project will check the availability of the article requested from the Lexware's data. If the enquiry is about a non-stock article or not in stock at the moment it will be enquired from known suppliers. This is the easy type of case that is basic routine.

Then there are some more complicated enquiries and repair requests. That is when the Lexware's full potential is needed the most. When all the operations and its actions are saved into the project files it is fairly easy to see how the situation has been handled before. Especially concerning some articles that are not standard or common anywhere. All the Articles passed from or through Deumareco are saved into Lexware's article library which includes to date about 500,000 articles. From the article library it is easy to see how the earlier project has been handled with the part. Apart from the software and Microsoft systems all projects are filed in paper form. That's a precaution and a necessity for several practical reasons. Projects are done in co-operation with customer and suppliers, naturally, and every project is closed with invoicing. Along the way Lexware is used as a tool to simplify and hasten all actions.

### **3 LEXWARE PREMIUM**

In this section the framework and main features of the software are introduced. The main features are explained roughly and focus will be on material management and the article library feature.

#### **3.1 INTRODUCTION TO SOFTWARE INTERFACE**

Lexware Premium is a multitasking and organising software that has been designed to cover all the basic needs in project management based selling functions for a small and medium sized company. Normally Project management softwares are very complex and hard-to-use type of institutions because so many functions have been squeezed into one large and rather costly package. Choosing between all of these programs to find the best solution to your company might have a big impact of the company's outcome in few years' time, so the decision should be made carefully and with some background research what the company needs. Lexware premium is the type of business tool that doesn't cost very much at first purchase; normally the cost is around 1000 EUR. The annual updating costs on the other hand accumulate quite quickly. The update cost is compulsory and starts around 700 EUR. The annual rise is about 200 to 300 EUR. For a small sized company the rise in five years make the update costs rise to around 2000 EUR, not including all the hardware and additional softwares. (Deumareco, 2013)

The software itself has been designed to apply the basic company format for all outgoing documents, with pre-defined information platforms to hasten the passing through time of projects. It makes the company's outcome to associates and customers a lot more professional and reliable. The outcome is a key factor in creating new business relationships and establishing a reputation as a serious company.

The software`s framework has been made as a simple layout. The categories are divided into sub-categories and tabs where the construct slowly opens up and guides the user to the right direction. Lexware consists of nine basic options that are opened up to sub-sections and thus making the system more accessible and easier to navigate. The Top sections are the following;

- central (Zentrale)
- Materials management (Warenwirtschaft)
- Book keeping (Buchhaltung)
- Assets management (Anlagenverwaltung)
- Wages + salaries (Lohn + Gehalt)
- travelling expenses ( Reisekosten)
- Absences (Fehlzeiten)
- Business cockpit
- Service and help

The Lexware premium can cover applications and when properly handled can be a very effective tool with all the basic operations inside a company. In Deumareco - a small sized company - the two most important categories are the Materials Management (Warenwirtschaft) and the Bookkeeping (Buchhaltung). All the basic options have sub-categories for more accurate actions and some are described later in the coming chapters.

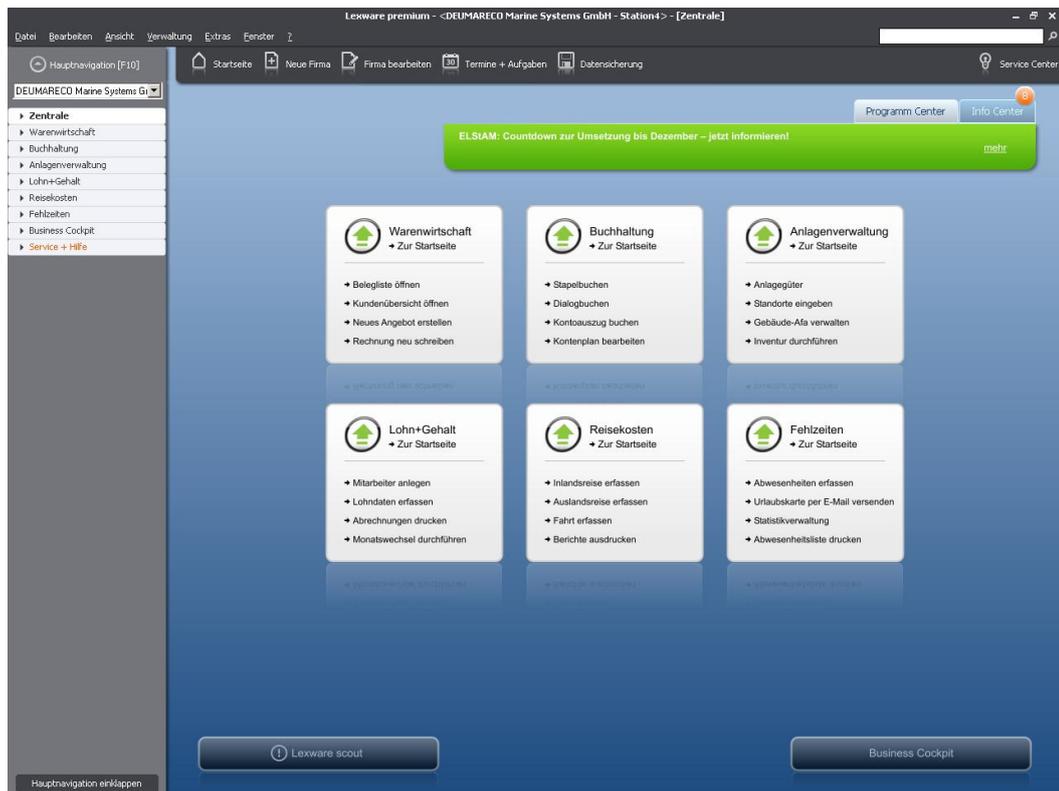


Figure 2 (Lexware start site view)

The complete knowledge of Lexware would require a course which the Lexware Company offers online. All the aspects and the complete use of all of them would require a lot of studying and familiarizing with the software. But the invest of time and effort against the actual need of software`s abilities must be carefully investigated, rather than exploiting the let`s see-kind-of-tactics which is unfortunately common in these days.

The overall use of the software is quite straightforward and easy to acquire. The basic actions are very accessible and easy to find thanks to the navigation system. But with the complexity of the program the know-how of details and settings are very useful. This is where the complexity becomes an issue. The features are heavily linked together and the linking is rather multi-layered. The actions and documents that can be created gather information from various locations. If you want to correct all of them one by one it will be a huge task. With a little introduction and guidance the work can be done correctly in the first time. This requires some knowledge of the structure and the filling the right slots the first time.

## 4 MATERIALS MANAGEMENT

From the material management all customer and supplier actions are controlled. It has several subcategories to divide different functions. Material management side has a subcategory of its most important applications. Most of these categories are linked to each other's, so if one category is not complete, the overall final form is inadequate. Concentrically it will show in the projects- subcategory when making different procedures towards the supplier or the customer.

The basic form has the company's logo and all vital information of the company that are shown to everybody who are in contact with the company. It is a good way to establish a firm picture of the company especially to new associates. After all in business and industry the first impression is a vital one.

Creating new documents in the software can be done from few different sections. But the basic creation always works the same way. You want to make a new document and you choose the type of document you wish to create. Then you fill all the necessary information. After you have created the document the software saves it and automatically asks for the following action the user desires to make. The software gives options to print the document, sent it as e-mail, or save it in some particular section separately. After these options the new document will appear in the project file and in all the other sections.

The creation of a new document will be presented in the next chapter step by step.

## 4.1 A NEW DOCUMENT

In the next pages you can see the ready document, in what form it is sent forward and the creation phases of it. The example document is an Enquiry which is probably the most common document format used in the software. The basic form of Deumareco documents first page looks like the one in the Figure 3.



# DEUMARECO Marine Systems

---

DEUMARECO Marine Systems GmbH, Ninooper Str. 184, D-21129 Hamburg  
 DEUMARECO Marine Systems GmbH  
 Heinonen Jari  
 Ninooper str. 184  
 D-21129 Hamburg  
 Neuenfelde

Page: 1  
 Supplier No.: 70644  
 Processed by: Jari Heinonen  
 Order No.: 123456789  
 Project No.: 12345  
 Vessel: EXAMPLE  
 Delivery time: Abt. xx working weeks  
 Delivery date: 31.12.2013  
 Date: 19.11.2013

**Enquiry No. 19365**

Please let us have your best

- price
- delivery time
- weight
- packing details
- packing cost
- transport cost (standard/economy)

for following items:

Item	Qty.	Unit	Description	Unit price EUR	Value EUR
1	1,00	pcs	Test Article Physic Informations Article main technical data >Materials >Drawing specifications >Part numbers		
Total value					
<b>Total value</b>					

Terms of payment & delivery:

- According to agreement
- Ex Works Finland

Term of sale: General Conditions ORGALIME S92

We are looking forward to your soonest offer.

Thank you in advance.

With best regards  
 DEUMARECO Marine Systems  
 Packing: 1 pct., AxBxC, xx kg

---

Phone: +4940-367 160  
 Fax: +4940-367 578  
 E-mail: deumareco@vonline.de  
 Web: www.deumareco.com

Bankers: Hamburger Sparkasse (HASPA)  
 BLZ: 200 505 50 • Kto-Nr.: 1267 120 093  
 BIC: HASP DE 33000  
 IBAN: DE84 2005 0550 1267 1200 93

St-Nr.: 47714/00715  
 VAT-No.: DE 811 476 598  
 Commercial Register: Hamburg HRB 52818  
 Managing Director: Jussi-Pekka Järvinen

Figure 3 (First page of a basic form)

From the picture it is easy to see the basic format and the information slots. The creating of a new document is an easy task. The program categorises the outgoing forms to the customer and to the supplier differently. There are quick buttons in the software where you can enter both creation sides and choose between the necessary forms. The framework structure is shown and explained in Table 1 (page 24).

After the original document has been made the user fills all the information along the way as the project develops. The first page where you enter when creating a document is presented in figure 4. When creating a new document, a lot of information can be searched by project number of supplier information database. These options are marked with a little magnifying glass at the other side of the text slot.

The screenshot shows the 'Auftragsassistent' software interface. On the left, there are three numbered tabs: 1. Lieferanten, 2. Positionen, and 3. Summe. The main form area is divided into several sections:

- Auftragsart:** A dropdown menu set to 'Bestellanfrage'.
- LF-Nr., Matchcode:** A text field with '70644' and a magnifying glass icon.
- DEUMARECO Mari:** A search field with a magnifying glass icon.
- Anrede:** A text field.
- Firma:** A text field with 'DEUMARECO Marine Systems GmbH'.
- Name, Vorname:** Two text fields with 'Jari' and 'Heinonen'.
- Zusatz:** A text field.
- Ansprechpartner:** A text field.
- Straße, Nr.:** A text field with 'Nincoper str.' and a number field with '184'.
- PLZ, Ort:** Two text fields with 'D-21125' and 'Hamburg'.
- Land:** A text field with 'Neuenfelde'.
- Wiedervorlage:** A checkbox.
- BA-Datum:** A date field with '19.11.2013' and a magnifying glass icon.
- BA-Nr.:** A dropdown menu with '<Auto-Nr.>'.
- Lieferdatum:** A date field with '31.12.2013' and a magnifying glass icon.
- Bearbeiter:** A dropdown menu with 'Jari Heinonen'.
- Bestellnummer:** A text field with '123456789'.
- Währung:** A dropdown menu with 'EUR'.
- Kostenstelle:** A dropdown menu with '<keine>'.
- Kostenträger:** A dropdown menu with '<keine>'.
- Projektnummer:** A text field with '12345' and a magnifying glass icon.

Below these fields is a large text area for 'Auftragsbeschreibung' (Order description) containing the following text:

```

Please let us have your best
- price
- delivery time
- weight
- packing details
- packing cost
- transport cost (standard/economy)

for following items:

```

At the bottom of the form, there are several input fields: 'Vessel' with 'EXAMPLE', 'Delivery time' with 'Abt. xx working weeks', and 'Packing' with '1 pct., AxBxC, xx kg'. There is also a 'Hilfe' button and a 'Schnellerfassung' button.

Figure 4 (Creation of new document, Basic information, page 1)

After this you choose the articles you want to include in to the document, as presented in figure 5. The software allows you to search for articles from the library. There are also other options that can be inserted. Basically you enter here all the operations, materials, or services that have a value. There is a wide range of options to include.

**Auftragsassistent**

Bestellanfrage Nr. 19365 vom 19.11.2013 - Lieferanten Nr. 70644, DELMARECO Marine Systems GmbH, D-21129 Hamburg

1 Lieferanten

2 Positionen

3 Summe

4 Info

Stammartikel

Pos. Menge Einheit kg/ME S Preis/1,00 Rabatt Warengruppe

2 1,00 0,000 0,00

Alternativ

Matchcode

Bestand Bestellt Verfügbar

0,00 0,00 0,00

Text

Pos	Artikel-Nr.	Menge	Gewicht	Preis	Rabatt	Gesamt
1	511816	1,00 pcs	0,00 M	0,00	0,00%	0,00
ST Test Article						
>type informations						
>article main technical data						
>materials						
>Drawing specifications						
>Part numbers						
NL handling, packing and transport cost						0,00

Langtext

Gesamtgewicht 0,00 kg Gesamtbetrag 0,00 €

Hilfe

Schnellerfassung

< Zurück Weiter > Speichern Abbrechen

Figure 5 (Creation of new document, contents, page 2)

After this there is only the choosing of delivery method and payment options and the words to conclude the document. For example the overall business terms that regulates the document terms in general. The conclusion can be seen from the figure below (figure 6.) and from there (figure 6.) you can also check the included taxes and the final amount.

**Auftragsassistent**

Bestellanfrage Nr. 19365 vom 19.11.2013 - Lieferanten Nr. 70644, DEUMARECO Marine Systems GmbH, D-21129 Hamburg

Zahlungsbedingungen: **Acc.to agreement** Terms of payment delivery: **- Ex Works Finland**

Lieferart: **- Ex Works Finland** - According to agreement

Gesamtbetrag Hauptleistung	0,00
abzüglich <b>0,00</b> % Rabatt	- 0,00
Nettobetrag Nebenleistung	0,00
Umsatzsteuer	0,00
Rechnungsbetrag	0,00 EUR

**Nachbemerkung**

Term of sale: General Conditions ORGALIME S92

We are looking forward to your soonest offer.

Thank you in advance.

With best regards  
DEUMARECO Marine Systems

Hilfe | Schnellerfassung | < Zurück | Weiter > | Speichern | Abbrechen

Figure 6 (Creation of new document, Terms, page 3)

The completion of the document will be by saving the document (Speichern). After this the systems recognises the saved document by its form and by the inserted project number. The document will be saved in the right locations. The system offers actions where the user can choose if he wants to send the document by e-mail or print. This phase can be seen from the figure below (Figure 7.).

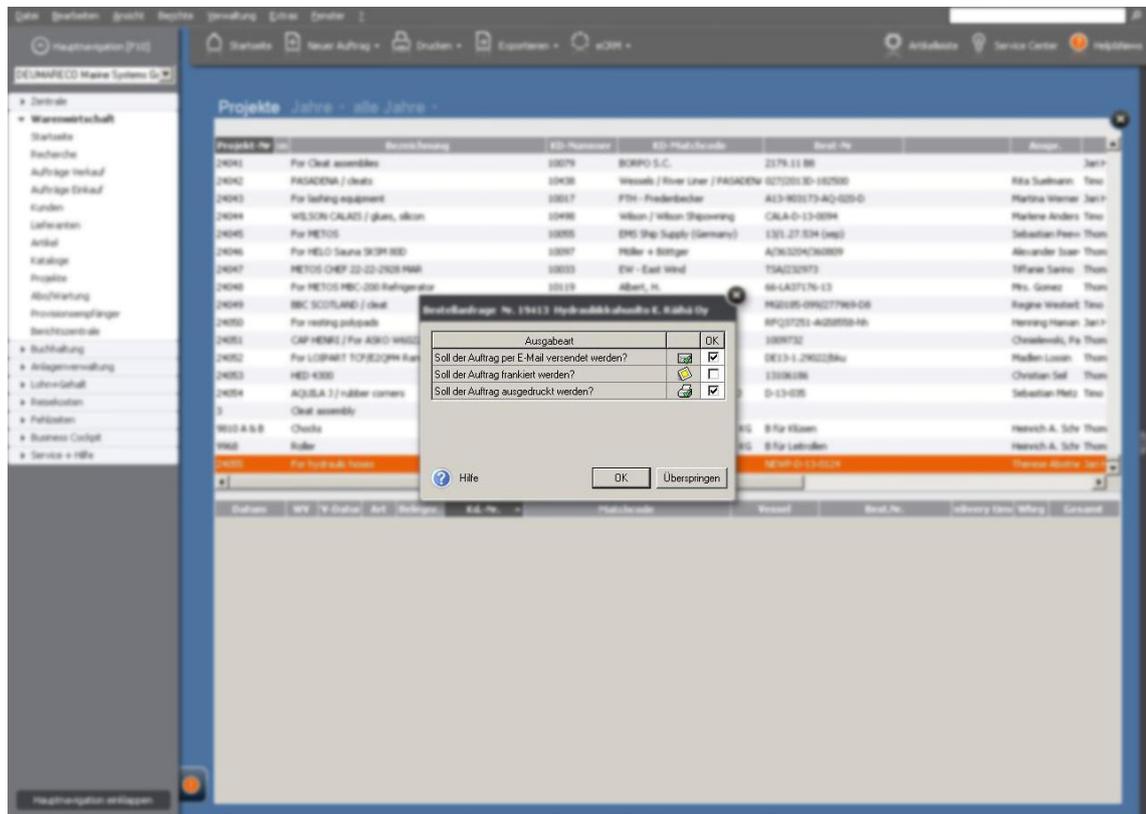


Figure 7 (Creating a new document, last phase)

The software fills out the document according to the format used. Most of the data is taken from the contact information database. When the document layout is filled correctly with the right information and articles the document can be converted forwards for the next phase. If the layout stays the same with only minor exceptions the feature saves time and effort.

Table 1 (Lexware features)

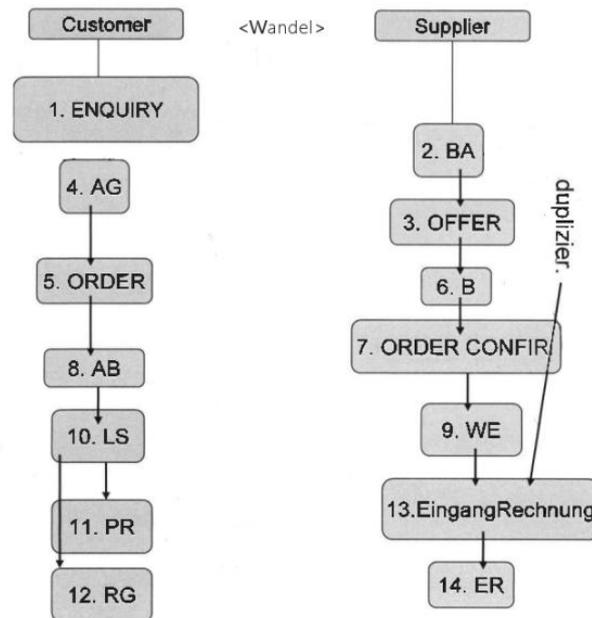


Table 1 shows how the basic feature functions and the project is driven forwards in the software. Some functions cannot be altered when the user has proceeded to the next phase. For instance after purchase has been made the enquiry cannot be altered anymore. The short terms mean the actions made in the software and the mean following; 2. BA = Enquiry, 4. AG = Offer, 6. B = Order, 8. AB = Order confirmation, 9. WE = Purchase confirmation receipt, 10. LS = Delivery note, 11. PR = Pro forma invoice, 12. RG = Invoice, 14. ER = Received invoice. The long terms mean received documents.

## 4.2 SECTIONS

The main opportunity this software gives you that you can arrange and control easily all the information you need to quickly process a quote from customer. In spare parts business processing time is one of the main factors in successful transaction. Also when the line of job is mostly based on customer service, time is an essence.

Software also gives you a standard sheet for different actions you wish to make. Enquiries, offers, orders, invoices, credit notes all have a regular form with different details. The software detects what format you wish to use and fills most of the information automatically. For example the information saved into suppliers files will automatically show in an enquiry made to this supplier.

Also the software saves all the information you want. There's various options how to insert and save data. Most that you can do in one place is the Projects sub-category, where you create new projects and make all necessary and available actions. The Materials management- subcategory sections can be seen from the main navigation window on the left side of the software screen (see figure 2, page 17).

The following are the subcategory`s main sections;

### 4.2.1 Startsite (Startseite)

Start site is only an informative displays where you can see all the available actions and where the program opens when started. Also the start site has a chart of all the most important actions and how you can toggle through them.

### 4.2.2 Investigation (Recherche)

Investigation section enables you to conduct minimal researches while exploiting all the data saved in to the software. The tool allows you to implement specified information and create a chart of diagram with the chosen information. Although the visual aspect of the outcome cannot be altered.

### **4.2.3 Selling assignments (aufträge verkauf)**

Here all of the business forms made for the customer can be found and searched with different parameters. All the documents sent to customers are gathered and they will be easy to organise and supervise.

### **4.2.4 Purchase assignments (Aufträge Einkauf)**

All the data regarding actions towards suppliers are saved here. Section works in the same way as the “selling assignments section.

### **4.2.5 Customers (Kunden)**

All the Customer information is stored here, including all the projects where the customer is in, business operations, figures, contacts, etc. The information here has a vital part in the outcome of the project because this section the correct invoice address is inserted as well as the delivery addresses. The section includes also customer contact information and both the very vital VAT-code and taxing options. The system updates all the information from here all the way directly to the invoice, which normally is the final stage of every project and an important one.

### **4.2.6 Suppliers (Lieferanten)**

All the supplier information is stored here, same kind of section as the customers listing. All the correct information here is as vital as in the customers section.

### **4.2.7 Articles (Artikel)**

All the articles sold are saved here, with all the necessary information with prices, stock numbers, suppliers and technical data. The history of every article will be gathered in here as well. In this section it is possible to link drawings or layouts. All the files regarding the article that are vital in the operations to the customer or supplier should be found through this section.

### **4.2.8 Catalogue (Katalogue)**

In this section it's possible to save or import catalogue-data if needed. Catalogues help in recognising articles. The system implements catalogue data and enables faster handling and searching if the catalogue is properly inserted.

#### **4.2.9 Projects (Projekte)**

Within this section, all the projects can be found. This is the starting point where you can create and manage a new project and all of its actions. All the other sections listed here are linked to this particular section and they support the actions that are available in the Projects- section. Through projects section it is easiest to run the whole software and it is the most used section.

#### **4.2.10 Subscription and maintenance service (Abo/Wartung)**

Here it's possible to restore data of different kind of service that company can offer, if it's necessary to separate selling products or maintenance from each other. The service side has different kind of transaction form and the system information will be linked in a bit different manner under here.

#### **4.2.11 Provision sender (Provisionemfänger)**

Section to control payments and fees for employers.

#### **4.2.12 Report central (Berichtzentrale)**

Here it is possible to create and search reports and keep an eye to the progress and efforts concerning the literal input of employee`s. It is also possible to keep a message-chain through this section and negotiate with colleagues if somebody needs assistance concerning a project issue

## 5 ARTICLE LIBRARY

Article library is the place where all of the items sold or offered via the company are saved and categorised. The Article library is one of the main focusing points in this thesis. Articles are mainly categorised differently based on company based technical or commercial status. At the moment the Deumarecos article library is categorised by technical name or as a Metos product. The intention is that a new article includes the following information for the article to be recognisable;

1. Article main technical data; Manufacturing methods, main dimensions, electrical specifications, efficiency rates, power output, fuel consumption, etc.
2. Type information; Type code, variation type markings, special information, etc.
3. Material choices; Materials, heat-treatments, material qualities, main strength qualities, length, steel ISO-grading, DIN-coding, etc.
4. Drawing specifications; Drawing numbers and item numbers
5. Part numbers; Suppliers or customers specified part numbers
6. Major manufacturers

The Software allows all information to be saved in a one big text slot. And from there all the vital information can be pasted into specific search fields of their own. Unfortunately sometimes the space to fill in the search information is fairly inadequate with space and the information should be inserted carefully. Through the slot's information the software's main search tool works. That is why all the vital information has to be recognised and correctly filled.

## 5.1 Creating a new article

Creating a new article is fairly simple. The software has introduced a process of six to ten important tabs to fill. All the slots will come in a reasonable order. The software only requires you to assist the article into a specific category but besides that the software lets you make any kind of article you want. Only the name and the article number for the system besides the category destination is enough. All the other information has to be inputted manually and often need a little searching and effort. The sections or tabs where the information is filled will be listed next the sections include the following;

### 5.1.1 Overall (Allgemein)

This is where all the main information of the part itself is saved (see Figure 7, p.29). The system automatically gives the next available article number to the first slot on the left. This top section includes slots for the article parameter which indicates the measure the item is sold. Articles could be sold in pieces, meters, litres, assemblies etc. The estimated weight can be inserted here in kilos (gewicht in kg).

There is a slot for the overall short text (Kurztext) or the short name for the item. The bigger slot named only as long text (Langtext). In the Long text slot it is possible to insert all the type numbers, drawing numbers, type codes, material options and manufacturing specifications. The long text slot can include lots of text and it will all be visible in the document's article description. Unfortunately the information in here cannot be searched with the main search tool. Next are the options to mark the item as a stock article (Lagerartikel), a part with predefined serialnumber or as a part assembled from multiple stock parts (Stückliste anlegen). Also the last named "Artikel Sperren" you can eliminate the use of this article as a duplicated item. This helps when there are many articles made from the same item, but if the article has been used in some projects so deleting it would affect projects creating conflicts to the system.

The information that can be searched with the search tool, besides the short text, are the slots below with

1. Type + tech.-info
2. part-numbers
3. Maker's info.

Here is an example of a standard item from the system, where all the main info is inserted and with what the item can be searched and tracked down amongst thousands of articles.

Artikel bearbeiten <511561 Over Center Valve>

**Allgemein**  
Erfassen Sie die Pflichtangaben des Artikels.

Artikelnummer: 511561 Einheit: pcs  
 Matchcode: 511561 Gewicht in kg: 0,000  
 Kurztext: Over Center Valve  
 Langtext: NGR-5-05/10 3 349858  
 CBEA-LHN  
 Torque 45-50 LBF FT/60-70 NM  
 Lagerartikel Lieferrückstand: 0,00  
 Serien-/Chargennummern  
 Stückliste anlegen  
 Artikel sperren  
 Type + Tech.-Info.: 45-50 LBF FT/60-70 NM  
 Part-Nbrs.: NGR-5-05/10 3349858, NGR505/10, CBEA-LHN, CBEALHN  
 Makers Info.:  
 Hilfe < Zurück Weiter > Speichern Abbrechen

Figure 8 (Creating a new article, overall)

### 5.1.2 Partlist (stückliste)

With the part list you can include all the necessary materials or parts required to build or assemble the particular article. That way the system always recognises to decrease the numbers you have in stock. It eases the administrator to follow the stock situation and make new orders if needed. With this section it is important to feed all the correct information and lengths so that the software's stock surveillance does not have a lot of changing values to throw the real stock amount out of scope. Unfortunately the system doesn't automatically notice you when your stock is low in numbers. Although there are various ways to manually follow the situation.

When the page is entered the first time the system asks you to insert the data and the amount. Then the page gathers a list of the articles to the large slot seen in figure 8. The list can be modified and changes can be made afterwards. To modify an already created list the user can enter the article list by clicking on the icon with the small magnifying glass.

The screenshot shows a software interface for creating a new part list. The window title is "Artikel bearbeiten <511561 Over Center Valve> Position einfügen". The main area is titled "Stückliste" and contains a form for adding a new part. The form includes fields for "Artikelnummer" (511561) and "Matchcode" (511561), and a "Kurztext" field with the value "Over Center Valve". Below these are input fields for "Menge" (1,00), "Verfügbar" (0,00), and "Preis" (0,00 EUR). There are buttons for "In Stückliste übernehmen", "Standardpreise", and "Gewicht". A sidebar on the left contains navigation options like "Allgemein", "Stückliste", "Strukturstückliste", etc. At the bottom, there are buttons for "< Zurück", "Weiter >", "Speichern", and "Abbrechen".

Figure 9 (Creating a new article, part list)

### 5.1.3 Building part list (Strukturstückliste)

With this section one can monitor the necessary components needed for the assembly or manufacturing the article more carefully. This is the easiest way to inspect and insert any notifications or additional information in to the article overall information. If the article has some special features or anything that requires consideration it can be seen directly from this section.

This section works in a similar fashion as the one before. Information is collected into the list. The positions will be visible in the large white slot. From there the user can inspect them and see the additional information shown in the text slot.

The screenshot shows the SAP 'Strukturstückliste' (Structure List) interface for article 511561 'Over Center Valve'. The interface is divided into a left sidebar with navigation options and a main content area. The main content area is titled 'Strukturstückliste' and includes a header with the article number and matchcode, a 'Positionen' section with a large empty slot for the structure list, and a 'Text' section with input fields for 'Artikelnummer', 'Matchcode', 'Kurztext', and 'Text'. Below the 'Text' section are input fields for 'Menge' (1,00), 'Verfügbar' (0,00), and 'Preis' (0,00 EUR). The interface also includes a 'Hilfe' button and navigation buttons at the bottom.

Figure 10 (Creating a new article, structure list)

### 5.1.4 Category / Price (Warengr./Preise)

The article category placement and customer price are defined in this tab. The article library is divided into sections to categorise all the different parts. The sections are made from the overall name of the article group with simple quick code and then defined more carefully by the purpose of use. For example with a lot of valve types the definition for over center valves has been made like this;

Valves EE-Val - Centre EE-Val-Cen - over EE-Val-Cent-Over

Then all the different Over Centre Valves are gathered in this subcategory where they can be manually found if the research tool is not up to as required assistance.

The price for customer is defined in this section as well. The tab shows the currency and VAT percentage in use. The price can be appointed per x number of pieces. Then if the article is assembled or manufactured inside the company the software will calculate the profit (Gewinn) and the gross profit (Rohertrag) compared to the overall assembly cost by the necessary parts.

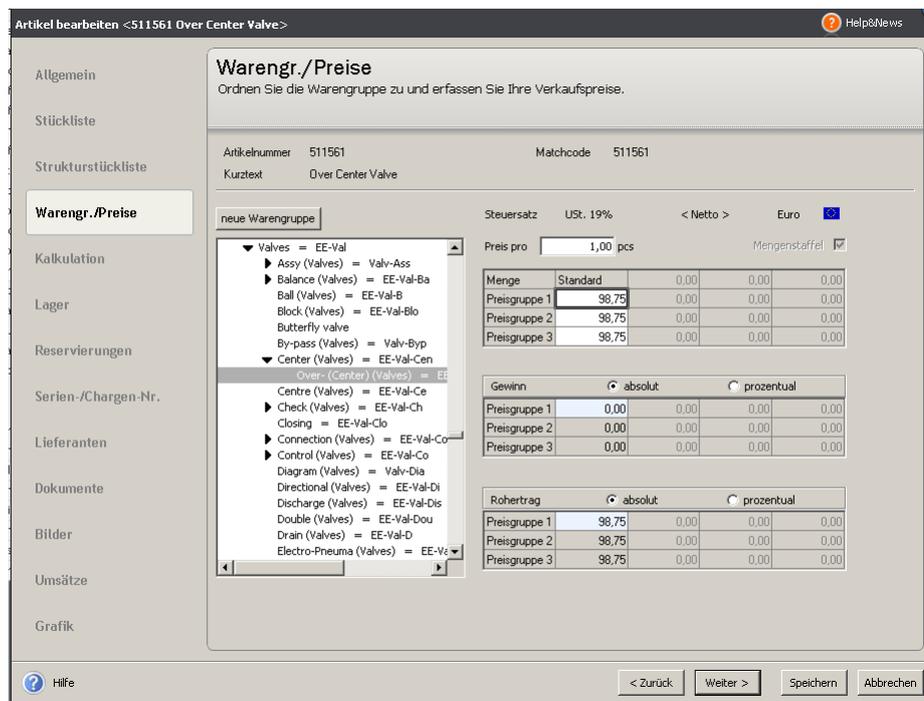


Figure 11 (Creating a new article, categorizing & pricing)

### 5.1.5 Selling price calculation (kalkulation)

With the calculation section it's possible to see what bits sums up the total selling price of an article. You can inspect and add up all the factors that you need in researching the cost-effectiveness of certain articles. You will have the ability to determine the overall input price and the output price. You can directly see the gross and net gain from the data to see if the price is according to the company's price segment.

Artikel bearbeiten <511561 Over Center Valve>

Allgemein  
Stückliste  
Strukturstückliste  
Warengr./Preise  
**Kalkulation**  
Lager  
Reservierungen  
Serien-/Chargen-Nr.  
Lieferanten  
Dokumente  
Bilder  
Umsätze  
Grafik

### Kalkulation

Kalkulieren Sie Ihre Verkaufspreise ausgehend vom Einkaufspreis.

Artikelnummer 511561 Matchcode 511561  
Kurztext Over Center Valve

Kalkulationsgrundlage		Durchschnittlicher EK-Preis aus alle		
Bezeichnung	%	EUR		
EK-Preis				
- Liefererrabatt				
- Lieferantenskonto				
+ Bezugskosten				
+ Gemeinkosten				
= <b>Selbstkosten</b>				
+ <b>Gewinn</b>				
+ Kundenrabatt				
+ Kundenskonto				
= <b>Verkaufspreis</b>				

Preisvariationen ausgehend von Standard/Preisgruppe 1 in %

Menge	Standard	Menge I	Menge II	Menge III
Preisgruppe 1	0,00	0,00	0,00	0,00
Preisgruppe 2	0,00	0,00	0,00	0,00
Preisgruppe 3	0,00	0,00	0,00	0,00

Berechnung		Gewinn	Preisvergleich
Kalkulationsgrundlage		0,00	
- Liefererrabatt		0,00	
=		0,00	
- Lieferantenskonto		0,00	
=		0,00	
+ Bezugskosten		0,00	
=		0,00	
+ Gemeinkosten		0,00	
= Selbstkosten		0,00	
+ Gewinn		0,00	
=		0,00	
+ Kundenrabatt		0,00	
=		0,00	
+ Kundenskonto		0,00	
= <b>Nettoverkaufspreis</b>		0,00	
<b>Preis pro (1,00) pcs</b>		0,00	
<b>Umsatzsteuer 19,00%</b>		0,00	
= <b>Bruttoverkaufspreis</b>		0,00	

Aktualisierung der Kalkulationsvorgaben übernehmen  
 Gewinn bei Verkaufspreisänderung aktualisieren

Kalkulierten VK-Preis übernehmen

Hilfe < Zurück Weiter > Speichern Abbrechen

Figure 12 (Creating a new article, calculating)

### 5.1.6 Stock (Lager)

If you have a lot of articles in stock it is of course important to follow the stock numbers. In a small company where there is no separate system for gathering warehouse storage data it is possible to use the Softwares own system. The system automatically adds up parts that are bought and decreases the numbers when items are sold and shipped away to the customer. The system has no back up functions. It works as a minor add to all the other features. So the system is not all reliable but it shows the approximate numbers of articles in stock and also how many have been sold already. The systems accuracy is determined by the input in part list and the correct handling of a cancelled order confirmations.

The information in this section is divided into following sections; Overall stock amount (Aktueller bestand), Reserved (Reserviert), purchased (Bestellt), and available (Verfügbar). The second section allows the user to manually correct the stock amounts for the system.

The screenshot shows the 'Artikel bearbeiten' (Article Edit) window for article 511561 'Over Center Valve'. The 'Lager' (Stock) section is active, displaying the following information:

- Artikelnummer:** 511561, **Matchcode:** 511561
- Kurztext:** Over Center Valve
- Bestandsinformationen:**
  - aktueller Bestand: 0,00
  - Reserviert: 0,00
  - Mindestbestand: 300
  - Bestellt: 0,00
  - Verfügbar: 0,00
  - Lagerort: (empty field)
- Manuelle Lagerbewegungen:**
  - Zu-/Abgang: 0,00
  - neuer Bestand: 0,00
  - neuer verfügbarer Bestand: 0,00
- Kommentar:** (empty text area)
- Lagerjournal:** Einschalten (button)

The left sidebar contains navigation options: Allgemein, Stückliste, Strukturstückliste, Warengr./Preise, Kalkulation, Lager (selected), Reservierungen, Serien-/Chargen-Nr., Lieferanten, Dokumente, Bilder, Umsätze, and Grafik. The bottom of the window features a 'Hilfe' (Help) icon and buttons for '< Zurück', 'Weiter >', 'Speichern', and 'Abbrechen'.

Figure 13 (Creating a new article, Stock status)

### 5.1.7 Reservations ( Reserviungen)

If articles have been sold the system shows all the open transactions in this section. The user can modify the information and amounts if the system somehow does not get the numbers right. This feature helps the stock updating and materials purchase actions. Normally the system determines to reduce the articles after a delivery note has been made. With this tab you can choose to reduce the numbers by order confirmation (Auftragbestätigung).

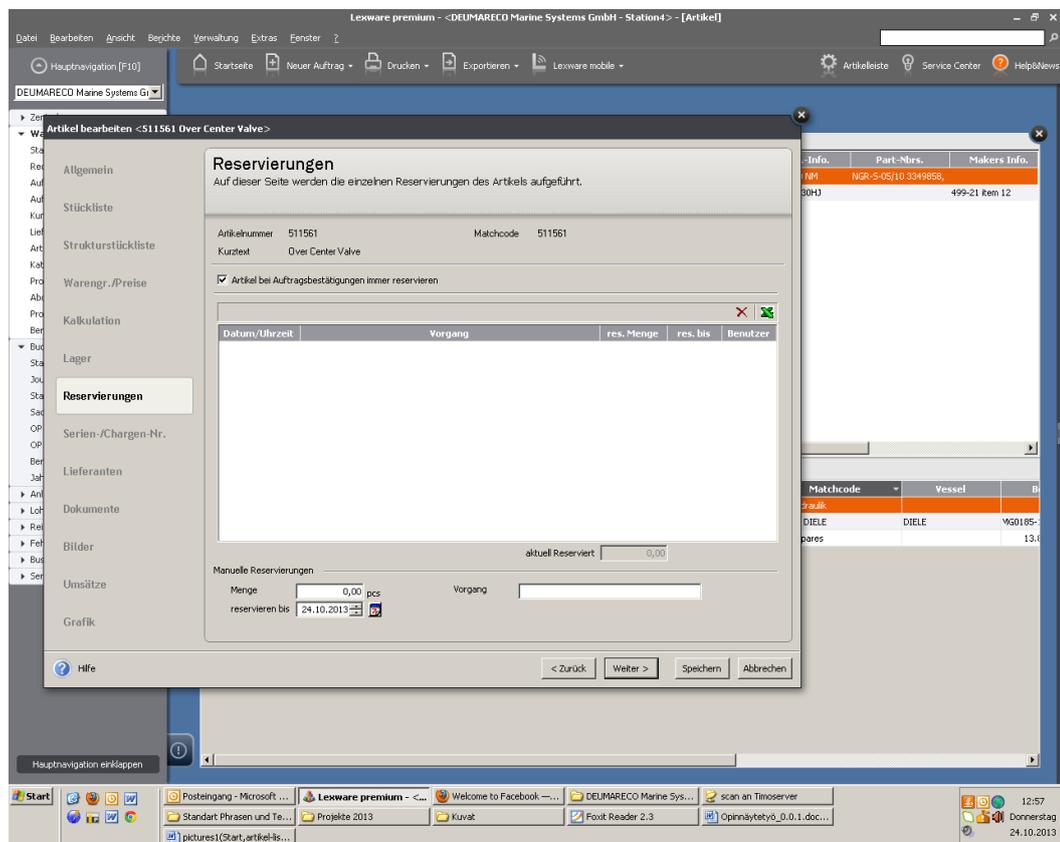


Figure 14(Creating a new article, reservations)

### 5.1.8 Serial / Batch number (Series / Charges no.)

The Serial number allows the user to apply a predefined code number into the article data so that the article can be easily traced within the system and in the production. The serial number is implied through an excel sheet customised for the purpose.

**Artikel bearbeiten <20612 3-way corner>**

**Serien-/Chargen-Nr.**  
Hier werden die verfügbaren und ausgebuchten Serien-/Chargennummern angezeigt.

Artikelnummer	20612	Matchcode	20612
Kurztext	3-way corner		

Für diesen Artikel ist die Option 'Serien-/Chargennummern' aktiviert, aber bisher keine Serien-/Chargennummer erfasst. Für jede weitere Lagerbewegung, die für diesen Artikel gebucht wird, muss die entsprechende Serien- bzw. Chargennummer angegeben werden.

Die Festlegung, ob für diesen Artikel die Serien- oder Chargennummern verwaltet werden, nehmen Sie direkt bei der ersten Eingabe der Nummern vor.

Ab dem ersten Zugang von Serien- bzw. Chargennummern für diesen Artikel werden die Nummern auf dieser Seite aufgelistet.

Verfügt der Artikel bereits über einen positiven Bestand, dann klicken Sie auf die Schaltfläche [Speichern], um die vorhandenen Serien- bzw. Chargennummern einzugeben.

Beachten Sie, dass für Serien-/Chargennummernartikel kein negativer Bestand möglich ist.

Weitere Informationen zur Lexware serien+chargennummernverwaltung finden Sie in der Programmhilfe, die Sie über die [?] - Schaltfläche aufrufen können.

Hilfe < Zurück Weiter > Speichern Abbrechen

Figure 15 (Creating a new article, serial number input)

### 5.1.9 Suppliers (Lieferanten)

In the suppliers tab are listed all the known suppliers for this article. Suppliers are searched from the softwares database. Some critical info will be needed to make the supplier's information slot complete. First the article number has to be defined. The number could be from another article as well if for instance the article belongs to an assembly or a construct. Furthermore there is the order quantity (Bestelmenge), delivery time and the supplier price for the article. The article can also be linked into a catalogue item if the system has a catalogue data inserted from the main options of the software (see chapter 4.2.8, p.26).

Artikel bearbeiten <511561 Over Center Valve>

**Lieferanten**  
Hinterlegen Sie die Bezugsquellen des Artikels.

Artikelnummer 511561 Matchcode 511561  
Kurztext Over Center Valve

zugeordnete Lieferanten Auswahl über Matchcode

Matchcode	Bestell-Nr.	Bestellmenge	Lieferzeit (Tage)	Preis pro	EK-Preis (EUR)	Katalog
Naval Spares	511561	0,00	0	1,00	0,00	N
Bolz Hydraulik	511561	0,00	0	1,00	0,00	N

Durchschnittlicher Einkaufspreis für die Rohgewinnermittlung

Rohertrag ermitteln

Zeitraum: Laufendes Wirtschaftsjahr

aus Wareneingang 0,00 EUR  
 aus EK-Preisen Lief. 0,00 EUR  
 letzter EK-Preis 0,00 EUR  
 manuell 0,00 EUR  
 aus Eingangs RG 0,00 EUR

Hilfe < Zurück Weiter > Speichern Abbrechen

Figure 16 (Creating a new article, Suppliers)

### 5.1.10 Documentation (Dokumente)

The documentation section allows documents to be linked to the article. The documentation is an important part of the article library because often the products enquired are based on technical drawings. Most of the time the drawings are based on a certain vessel class type, a series of vessels built in a certain shipyard, so the type of systems and details varies. That's why the drawings are very important.

The drawings are stored in the Microsoft folders and the linked to the software through the window you can see in the picture below.

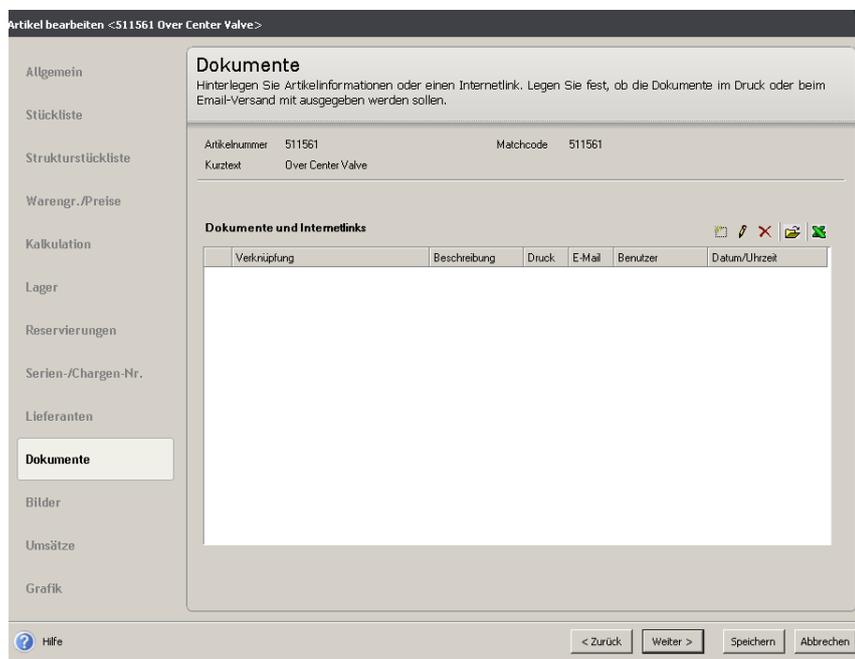


Figure 17 (Creating a new article, documentation)

### 5.1.11 Picture (Bild)

With the picture (Bild) section it is possible to link pictures to the article. Although it is merely meant for manufacturer based pictures or instruction pictures of the article. All the technical pictures and documents are easier to link to the previous section.

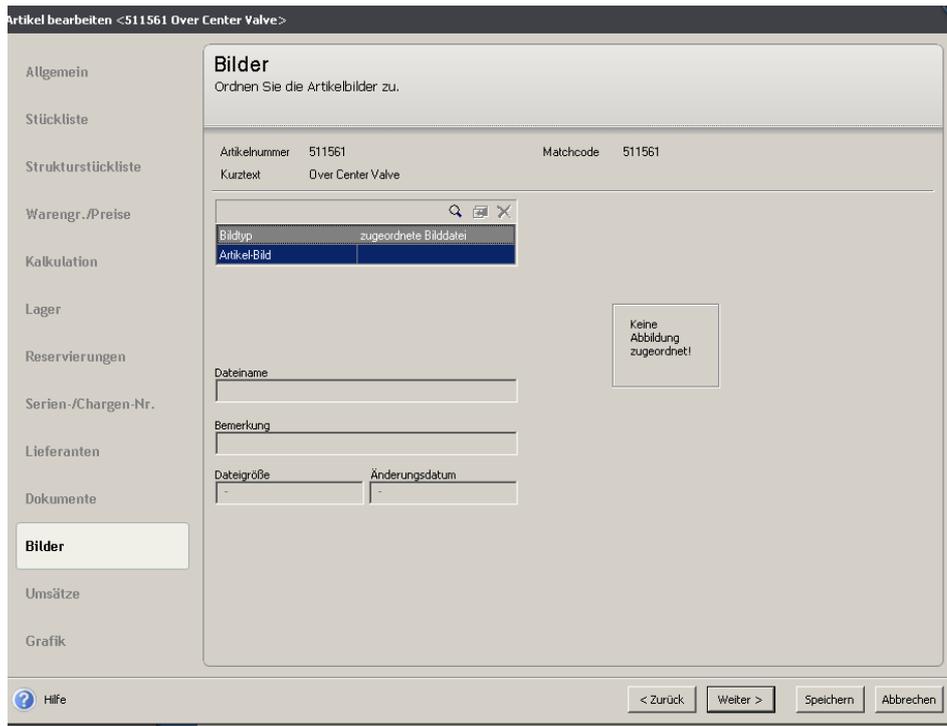


Figure 18 (Creating a new article, picture linking)

### 5.1.12 Sales (Umsätze)

This tab gathers all the transaction information regarding this article. All the selling numbers on monthly basis are shown here. Here it is easy to follow the ordered numbers and try to predict the amount of the article needed in stock. Although pretty much like the stock situation; data this is a rough estimation as well as the system gathers the data from selling confirmations.

Artikel bearbeiten <511561 Over Center Valve>

Umsätze  
Auf dieser Seite werden die Artikelumsätze ausgewertet.

Artikelnummer 511561 Matchcode 511561  
Kurztext Over Center Valve

Zeitraum	Menge	Umsatz	Zeitraum	Menge	Umsatz
Januar	0,00	0,00	Juli	0,00	0,00
Februar	0,00	0,00	August	0,00	0,00
März	0,00	0,00	September	0,00	0,00
1. Quartal	0,00	0,00	3. Quartal	0,00	0,00
April	0,00	0,00	Oktober	0,00	0,00
Mai	0,00	0,00	November	0,00	0,00
Juni	0,00	0,00	Dezember	0,00	0,00
2. Quartal	0,00	0,00	4. Quartal	0,00	0,00

Jahr 2013 Menge 0,00  Gesamtrabatt berücksichtigen Umsatz 0,00

Hilfe < Zurück Weiter > Speichern Abbrechen

Figure 19 (Creating a new article, sales)

### 5.1.13 Charts (Grafik)

In the chart section the software creates a basic pillar chart to visually demonstrate the sale and order volume of the article. The chart has the option to choose between the amount in stock and the numbers sold. It is also possible to display the selling volume to other articles and search transaction information from different quadrants.

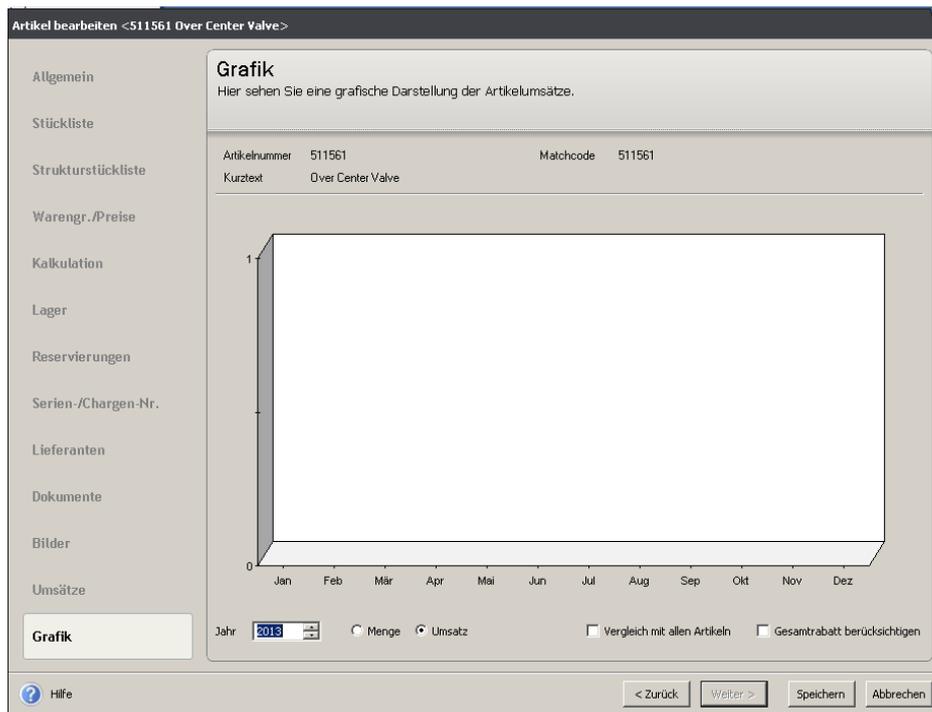


Figure 20 (Creating a new article, graphics)

## **6 STATING THE PROBLEMS**

### **6.1 WHAT ARE THE MAIN PROBLEMS**

Deumarecos problem with the software has been that the system was implemented before all the software's features were figured out. Early on especially the spare parts library was not handled the best way possible, as it has been stated earlier. Deumareco does not use all the features of the software and because of this it is vital to use all the necessary aspects of the software to the fullest. Before the software implementation all the forms were made in excel format so the software was a big step forwards in the company operations.

With the extensive growth of the article library it is important to have a specified layout creating the articles. Furthermore all of the features regarding the article library should be researched and studied to avoid the similar kind of situations in the future where the lack of ground work is affecting the whole outcome. The Article library is essential in the normal spare parts operations with its diversities. The complete article should have all of the information filled out properly to avoid the double creation of the articles. And what's more important all the information should be filled in the right format to make sure that the search tool is accurate. Also a similar layout in technical data will be more practical and easy on the eye both the user and the recipient.

When the correct article is easily found the jeopardy of double creation is possibly prevented. This all requires a basic understanding of the article and its basic technical functions. If the company selling a spare part for - let's say a hydraulic pump system for cargo ship's hatch covers – the employees should know the basic function of the system in a big picture. The knowledge of this matter does not prevent the company from selling the parts or the employees from solving problems but it will create the professional touch that the company should have when involved in a technical transaction. When the employees in the company have the proper knowledge of the system the company can conduct the customer service more efficiently and prevent any misunderstandings and misapprehensions that can cost the company in various ways. The knowledge though is mostly up to everybody in personal level, if an employee is interested and willing to

learn, then he will gather all the knowledge in a way or another. The problem with double creation has many levels.

## **6.2 WHAT SHOULD BE DONE**

First task is to research a method to create the articles in a similar fashion, probably best if there would be a chart to follow and see how all the information should be filled in. This first task also includes a way to really place and link all the necessary information into the article. This thesis will introduce a research that demonstrates a sensible and effective way to update the current article library and re-organise it in effective fashion. This includes a research in what could be the best way to emerge the older articles with the new ones to avoid the possibility of duplicated data. For example The METOS parts should be separated from the stock articles to make the categorising more practical. The Project management format that Deumareco has is working efficiently; this particular asset will be left mostly aside from the research and focus on the topics presented at the beginning.

All the drawings and technical layouts that are up-to-date in the company should be also updated into the system to aid identifying the articles and their purposes. All these measures are to be taken into consideration in co-operation with the personnel at Deumareco. If necessary the drawings will be updated and then linked to the system. Drawings are a huge help in the day-to-day operations with customers and suppliers, also they support the growth of personal knowledge.

Also all the features in the article library and their effect on the framework should be revised and seen if there is anything that will be of use when thinking to reduce the project pass-through-time. Main task behind all these improvements is to reduce the passing-through-time of projects by making the software more fluently useable.

### 6.3 MEASURES HOW THE IMPROVEMENTS WERE CONDUCTED

The thesis is conducted in close touch with the personnel of Deumareco. The research and updates are done in the company mostly during normal work hours. All the implementations and improvements are revised by the staffs that are acquainted with framework. The updating is made in a practical environment in active co-operation with the regular day-to-day users. The corrections are made primarily considering the personnel's wishes how to create a better mainframe for operations.

The personnel were surveyed for the main focusing points concerning the flowing usability. Survey was conducted as a group gathering for prompted discuss and an additional personal question sheet was given that the staff members filled in personally. There were a few questions in verbal and literal form that showed the employees' opinions how the material management side was functioning at the moment, what alterations would they want to make, and how would they like the alterations to be made eventually. The answers were saturated and the most pointed out problems were researched more carefully as the personnel's opinions weighted a lot considering the possible alterations and changes.

The material management system was researched during normal work operations and therefore searched for flaws. The flaws were analysed and improved with the available limitations. Instructions were gathered how certain features should be dealt in the future. All this aims for the improved use of the software and all of its major features. As said that some features are used more than others and some features need improving for better handling.

As said before the thesis main target is to improve the passing-through-time of project actions. With the maximum use of library's features the handling of some projects will become easier and hopefully in some cases there will be no need of multiple enquiring for parts. Ideal situation would be if the part is ready in the database as an article with all the necessary information to be offered directly to the customer. As it was also said earlier; speed is one of the important essences in selling spare parts. Other matters will also be taken under development and they will be described in the coming chapters.

## **7 IMPROVEMENTS**

This chapter will describe the most influential parts of the surveys and research that have been conducted regarding the materials management and the library sections. The results will be presented with the original situation and the possible improvements that have been considered the best option after revising the opinions of the company's personnel and other available possibilities.

The content of the survey that was gathered with Deumareco personnel is to be kept confidential due to user rights. The survey data and question sheets will not be presented in this thesis, but the results are illustrated and most of the proposed improvements are based on this particular information.

### **7.1 METHOD FOR ARTICLE CREATION**

#### **7.1.1 Starting situation**

Managing of the article library was, as has been told, a task that nobody had any specified guidelines to follow. There were some spoken rules to follow but overall in the passing time the library only got more and more complicated. Some efforts were taken to make the library work more efficiently and progress was surely made. But sometimes the progress was not completed and some remains of the old remained. Analysing the survey conducted with the personnel it became apparent that the managing needed a similar guideline for all to follow. A specific and simple guideline that is easy to adopt. Now the main purpose has been to process the incoming enquiries as fast as possible. The correct article information input has been mainly a secondary issue.

#### **7.1.2 Proposed measures**

The article should be listed in a similar fashion, no matter how much information there are on hand. If it is necessary to have more information to ease the recognition of the article then the employee should search the information. Easy way is to use the internet or with some suppliers you can order a catalogue or ask straight for more information. If some articles are very rare or have very little information they should be inserted into a category of their own in the article library.

All the information should be inserted into the long text slot after the overall short name. From the long text section the information can be pasted to the search slots. When the article is inserted into a formal document the long text section should always be modified depending on the purpose of the document so there are no impediments about this kind of procedure.

The information should be inserted in the following order, and it is important to remember that first fact that the document viewer notices about the article layout is the short overall name, after that the order should be the following;

1. type information; Any special or specifying information about the article that specifies the purpose or the type specialties of the article
2. article main technical data; Purely technical data to specify the information, capabilities, and characteristics concerning the main purpose of the article
3. materials; what are the main materials and the manufacturing method, most important material characteristics and qualities, including EU - standard ISO - and DIN - numbers
4. Drawing specifications; Drawing numbers and item numbers
5. Part numbers; Suppliers or customers specified part numbers
6. All other vital information regarding the use or features of the article can be inserted last with a hyphen

The search fields include three different options that are also located in the search tool. The search tool is the single most important tool in the library regarding the fast search for specified articles and swift creation of documents. The three search fields include the following;

1. Type + tech info
2. Part and Drawing numbers
3. Makers info

The information should be pasted directly from the short text slot to these three sections. And the necessary information should be inserted without spacing's and divided with a

comma. In the 1. section all the specific information should be inserted with a dot if needed and then divided with a comma (For example; not M42,5 but M42.5). If the part number includes a lots of special markings, like slashes, dots, and strikes, then the number should be inserted twice; the original and the simplified one. In Figure 20 (p.48) is an example of an ideal article with all the necessary information filled in.

Artikel bearbeiten <510111 Hydraulic Hose>

**Allgemein**  
Erfassen Sie die Pflichtangaben des Artikels.

Artikelnummer: 510111 Einheit: pcs  
 Matchcode: 510111 Gewicht in kg: 0,000  
 Kurztext: Hydraulic Hose  
 Langtext: DKOS16, M24x1,5  
 L=1300, WP275BAR  
 P/N: 12098-4-1300-M  
 P/N: 22-16-08/RZAT-08/22 (Raihä)  
 Lagerartikel Lieferrückstand: 0,00  
 Serien-/Chargennummern  
 Stückliste anlegen  
 Artikel sperren  
 Type + Tech.-Info.: L=1300, DKOS16, M24x1,5, WP275BAR  
 Part-Nbrs.: 12098-4-1300-M, 1209841300M, 22-16-08/RZAT-08/22  
 Makers Info.: Raihä

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Figure 21 (Information scheme in the article)

If the article needs some extra information the long text section should be filled as seen in figure 21.

Artikel bearbeiten <510978 Hydraulic hose>

**Allgemein**

Erfassen Sie die Pflichtangaben des Artikels.

Stückliste

Strukturstückliste

Warengr./Preise

Kalkulation

Lager

Reservierungen

Serien-/Chargen-Nr.

Lieferanten

Dokumente

Bilder

Umsätze

Grafik

Artikelnummer: 510978 Einheit: pcs

Matchcode: 510978 Gewicht in kg: 0,000

Kurztext: Hydraulic hose

Langtext: P/M: 522704130R2-463  
L=700  
- NP22-16-08 Hose fitting  
- NPYU-08 pro-jet tightening  
- NPR2AT-08 Hydraulic hose with steel braids

Lagerartikel Lieferrückstand: 0,00

Serien-/Chargennummern

Stückliste anlegen

Artikel sperren

Type + Tech.-Info: DKOS16, M24x1.5, L=700, WP275Bar

Part-Nbrs: DKOS16, 22-16-08/R2AT-08/22-16-08, 522704130R2-463

Makers Info: Räihä

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Figure 22 (Extra information example)

The Metos parts have a system of their own, as separate from the mechanical side. Metos parts have a functioning system inside the company for Metos parts are based primarily to the manufacturer's serial number. Metos products have only one distributing line so the serial number is reliable and all Metos information can be found from the selling catalogue due to its global distribution. For these reasons research of Metos parts are not taken into inspection.

### 7.1.3 Methods for Article creation

To unify all the created articles there should be an information sheet how to fill the data correctly in the right order and into the right slots. A simple template with guidance lines should do it if it will be followed as intended.

Here is an example of the template:

The screenshot shows the 'Artikel neu anlegen' (Create New Article) form in SAP. The 'Allgemein' (General) tab is active, and the user is prompted to enter mandatory data. The form includes the following fields and options:

- Artikelnummer:** 511816
- Matchcode:** 511816
- Einheit:** pcs
- Gewicht in kg:** 0,000
- Kurztext:** Test Article
- Langtext:** >type informations, >article main technical data, >materials, >Drawing specifications, >Part numbers
- Lagerartikel:**
- Serien-/Chargennummern:**
- Stückliste anlegen:**
- Artikel sperren:**
- Lieferrückstand:** 0,00
- Type + Tech.-Info.:** >type informations, >article technical, >materials
- Part-Nbrs.:** >Part numbers, Partnumbers, >Drawing specifications
- Makers Info.:** Example GmbH, Example Oy

Navigation buttons at the bottom: < Zurück, Weiter >, Abbrechen.

Figure 23 (Technical information input)

Also all employees shall be given instructions as a memo how to manage and create new articles. The memo is located in the attachments at the end of this thesis.

## **7.2 CATEGORISING**

### **7.2.1 Starting situation**

The feedback given from the users it quickly became apparent that the Organizing of the article library was a problem; for some of the articles were categorised only by their overall purpose. And the surveys confirmed that in some cases the categorising also misses a specific guideline as well as nothing really has been agreed how the parts should be categorised. The name had a short code also that followed the parts into sub-categories specifying the overall name and thus the purpose of the article. Some article groups were loosely named and in time some articles were categorised differently. The use of the software revealed that there actually is somewhat three kinds of categorising layers simultaneously in the system; one that follows the short name completely, one with its own group of specification determined by the user, and the last one with some old groups that are not really categorised but loosely stand in the bottom of the stack somewhat separated from the current categorising.

### **7.2.2 Proposed measures**

Proposed measures were that the parts should be divided into three different overall groups;

- I. Mechanical- and Rubber parts, including all stock articles and commonly sold articles
- II. Metos parts
- III. Rare articles and articles with very little information

All the articles would be divided into these three categories based on the status they have. This would clarify the system hugely and still the search tool would work with the same capacity. This way the Categorising would be as simple as it gets. Only that then the article groups would be mixed and separated only by the short name that has been

inserted. The manual search without the search tool would become slightly more complicated but if the library's overall load on the framework would decrease it would fasten the framework capacity and thus ease the passing-through-time of projects. And the passing-through-time decreasing was one of the main goals.

### **7.2.3 Methods for re-organising**

The reorganising of the library is a massive task that just has to be done manually with time and a lot of effort. The library should be reorganised outside of working hours so the progress won't get in the way of daily work. The reorganising has to be done by people who know the most important categories and have the knowledge of the library features.

Some complications exist though. The Lexware system has been constructed so that the article library and the groups are bind to specific taxing categories. So every group has also tax based options that can be modified. This causes that every time the categorising will be changed the system drops the article to the end of the library list. This has been the original cause of some loose articles in the system that i have pointed out earlier. This doesn't prevent anything, it just makes the work a little more complicated.

In conclusion based on the research made in this thesis it is recommended that three different groups are made for the articles. Although this is a subject that has to be revised in co-operation with an appointed work group to investigate this matter and determine what would be the best action regarding the overall effect on the company's business scheme.

## **7.3 MULTIPLE CREATION**

### **7.3.1 Starting situation**

When the research focused into the article library it was soon noticeable that there was a problem with same articles created multiple times. Apparently this occurred when an article is created with a very little amount of information. The survey revealed that the problem is acknowledged by the employees and more; the problem is quite common and easy to understand for there could be many manufacturers and suppliers producing the same part and often they also have their own codes. Also the customers might have one suppliers product with their part codes and have no clue that some other suppliers have the same article but with a different code. Same articles can be created into the system in the future as well. With a wide range of suppliers and customers it is very likely to happen. But when it is noticed that some parts are the same actions should be taken to link the lastly created article to the original one. If an article has been created into the system and likely it has been used in a project thus the article cannot be deleted as obsolete. This makes complications to the projects where the article has been used.

### **7.3.2 Proposed measures**

The proposed method includes two phases. If an article is found that has been created as a duplicate version of the original with different information, then the article should be tagged with the original articles serial number that the system has created. The article number should be inserted after the short name so it is directly visible after the search. For the second phase the system includes an additional option to notice the user that the article is actually a duplicate. The article creation phase's first page includes one option named "Article sperren" (see chapter 5.1.1, p.29) or in English "Article blockade" which works in the final stages of the project informing the user of the article duplication.

### 7.3.3 Methods to decrease Duplication

The Article`s short name should be converted to the following;

“Hydraulic hose\* -> 12345”

That way when the article is searched, the correction is directly seen and the original article can be found with the article number.

Artikel bearbeiten <25413 Directional valve -> 50346>

**Allgemein**  
Erfassen Sie die Pflichtangaben des Artikels.

Stückliste  
Strukturstückliste  
Warengr./Preise  
Kalkulation  
Lager  
Reservierungen  
Serien-/Chargen-Nr.  
Lieferanten  
Dokumente  
Bilder  
Umsätze  
Grafik

Artikelnummer: 25413 Einheit: pcs  
Matchcode: 25413 Gewicht in kg: 2,650  
Kurztext: Directional valve\* -> 50346  
Langtext: SG 3 W BE

Lagerartikel  
 Serien-/Chargennummern  
 Stückliste anlegen  
 Artikel sperren  
Lieferumfang: 0,00  
50346

Type + Tech.-Info.:  
Part-Nbrs.: SG 3 W BE  
Makers Info.:

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Figure 24(Article blockade)

The article blockade option can be found in the overall section (Allgemein, see chapter 5.1.1, p.29) when creating or modification an article as can be seen from figure 23. The correct article number should be written to the line after the checked box

## **7.4 LINKING DOCUMENTS**

### **7.4.1 Starting situation**

With the start of the research the company supervisor pointed out that the company has a lot of original paper drawings stored in binders. All the binders are named after one manufacturer and then all the documents from that specific supplier are saved there. These drawings are gathered together since the beginning of the company. The amount of the material consist about a hundred binders, from which about a dozen supplier`s binders are used more frequently. Drawings are used when needed but the search is always a tricky job that takes time and effort, one folder can easily handle few hundred of sheets, based on the sizes of A4 and A3. Sometimes drawings are scanned into digital form, but when so the scan might be used only for the one project. There is no index or categorising of the drawings inside the binders, only that mechanical go into their own section and all different kind of products go into their own. Although the information in these binders is vital for the company and is commonly used, there has not been a initiative for a project to go through all this information and restore it into the software systems.

### **7.4.2 Proposed measures**

All the documents should be investigated and the vital drawings permanently updated into the software`s library. Also the binders should be categorised and index`s should be made for every binder that are used or at least for the important ones. The index can be done by the main principle of purpose and also with the serial number, part number and drawing number. The software`s update on the other hand could be outlined to those articles that already exists in the article library. There is no need to do an article for every drawing, for some drawings are very old and might be obsolete by nowadays.

### 7.4.3 Methods for Linking documents

The documentation should proceed with saving the important drawings into the Microsoft folders in the company's network. And the drawing should be linked through the software's documentation linking section (Please see chapter 4.1.10. on page 37) into the specific article. There have been some difficulties linking documents from a terminal so that other terminals are able to see directly the information. Sometimes the only way is to look the documents from the document's folder path. To avoid this problem in general it will be recommended that a dual documentation procedure will be used; where the document is saved into a general drawings folder and the into a folder titled with the article's number. That way the drawing can be found by searching with the article number. It makes the search easier and faster. And with different article numbers the data folder is easy to manage.

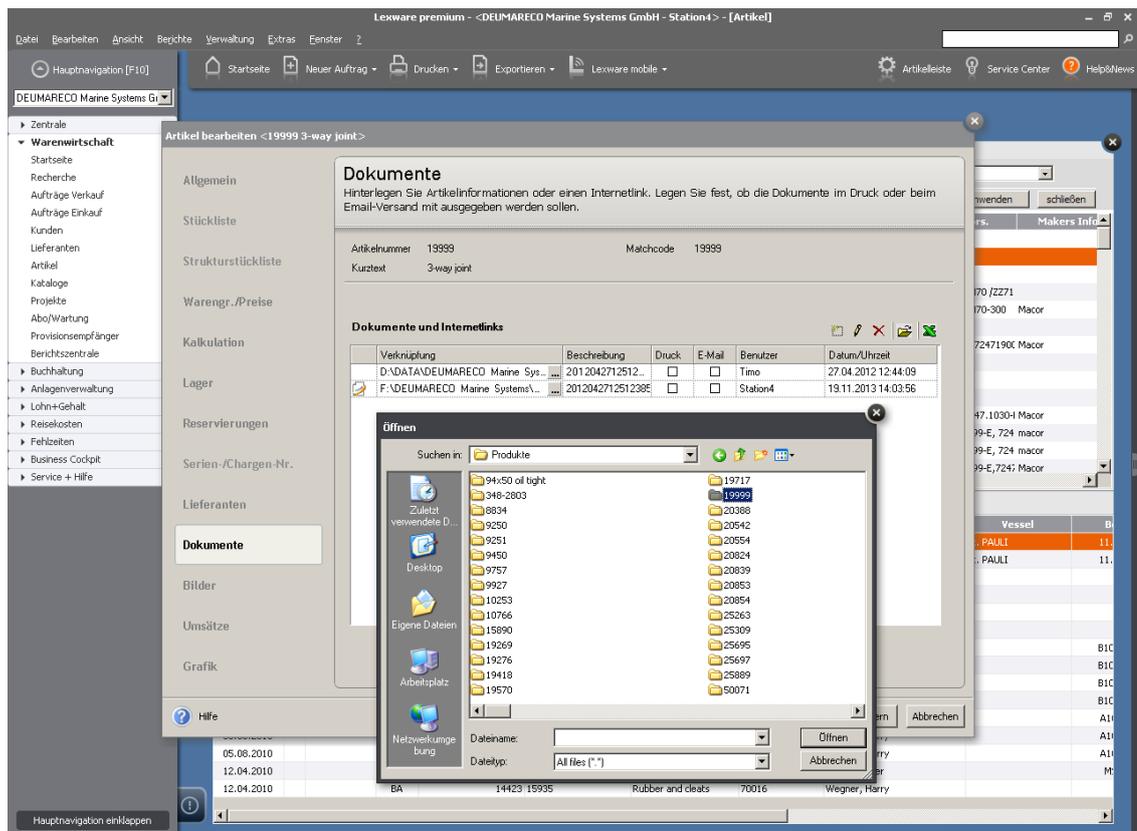


Figure 25 (Linking documents from the folder)

## 7.5 PRACTICAL IMPROVEMENTS

### 7.5.1 Project naming

When starting a new project it is standard that the project will be named after the enquired article`s or service`s short name included with a vessel`s name if the enquiry is mentioned to go for a vessel. For example standard project naming looks like this;

- 12345 For hydraulic hoses
- 12346 For Metos Marine MM 300
- 12347 SILJA EUROPA / For cleats
- 12348 EUROPA / For Rubber sealing

This is the overall name the project has and it is visible in the suppliers and customers information sections as well.

Sometime there are situation where some articles have just been sold and a new enquiry comes with the same articles. Sometimes the easiest task is to search the supplier`s information section about this information regarding the articles. But when searched the task is complicated by the overall name that suggest the sold items have been hydraulic hoses, rubber sealing, cleats, etc. When the project name has the article type visible in the project name it makes it easier to specify the item handled within the project. For example in this way;

- 12345 For hydraulic hoses (DKOS25,L=1300)
- 12346 For METOS Marine (MMC 500 Refrigerator)
- 12347 SILJA EUROPA / For Cleats (M22,L=180)
- 12348 EUROPA / For Rubber sealing (Stock + other)

When this information is visible it helps when searching through old projects looking for specific articles or services that has been provided maybe six to twelve months ago or before. This all aims again to cut the passing- through- time in projects.

### **7.5.2 Information back up saving**

In the company all data that comes in and are driven through Lexware are also printed onto paper. In modern times when electrical storage systems have become more sophisticated the company should part from the old tradition and move towards more modern procedures.

Firstly all system backups could be saved into a hard- drive or into a cloud service. Hard-drives have become very reliable and when acquiring one quality should be the main factor. Also cloud-services are the future in saving information because over the years the systems have become more and more advanced and more importantly; more secured.

With these options and added an easy-use software to manage and work incoming documents most of the paper usage could be minimized inside the company. Not only to be more nature friendly but more sophisticated and effective.

A huge amount of information could be saved into a memory-stick which every employee could have as a personal storage unit. Also Book keeping information can be saved into primary and secondary hard-drive units and once more into a secure company cloud service.

Although this would require a lot of information research and new operations scheme it is an option to be taken under serious consideration. In Europe it seems that some of the companies are not following in the top of technology improvements there is no reason why every company with capability should not seize the opportunity to use all assets it can to enhance its everyday actions.

The company should at least evaluate a plan if a digital working environment could be practical. The change can be a topical issue in the near future so at least a preliminary study could be made from the topic.

### 7.5.3 Rubber products documentation

One of the company's important specialities is manufacturing rubber sealing to cargo hold hatch covers. The rubber sealing consists of dozen different kinds of profiles and numerous types of corners and end seals. The corners pieces and end seals have to be manufactured mostly manually due to their complex construct. The company's technical documentation of these products have been terribly out dated. Company's speciality is that possesses the skill and knowledge to manufacture almost any kind of corners with a little of necessary information.

Now for the complete coherence with the Lexware and the manufacturing personnel all the manufactured rubber products should be easily found from the article library and the article should have a link to Deumareco's documented technical drawing. This requirement is important when estimating the matching of enquired articles together to those that can be manufactured by the company. Rubber products in hatch cover sealing have to match the system installed into the hatch, and with several major suppliers in the market the range of products is a grand maze itself. So this matter again provides aid to the passing-through-time of projects.

The existing documents should be updated and the ones lacking proper documentation should be created and linked. This simplifies the handling of enquiries concerning rubber products with a ready drawing to present directly to the customer and so making the process faster.

Also some request was made by the personnel that the rubber products documentation should have different versions; one for the official presentations; one specified to the manufacturing personnel; and the last one as information stripped version for some special cases.

So not only this procedure would decrease the passing-through-time it is also important for the outcome of the company that all major products that the company has an advantage over its competition have a proper and professional display, i.e. existing of proper documentation including the company's markings. At current moment this is sometimes a little but a problem.

## 8 RESULTS

### 8.1 General

Based on the Company`s pointed objective this thesis has created a guideline how to create new articles and how to apply all the necessary information correctly during the process. A simply pattern has been illustrated how the technical information should be inserted, in what order, and in what form. The guideline should serve in all cases in the company regarding the library articles.

This thesis also introduces a pattern how to link documents into the article data and how the systems own weaknesses should be avoided in this matter. The double linking method should be adapted to fix the problem. Also the results pointed out that when the article information is correctly inserted then the unnecessary article duplication could be decreased. Some article duplication will surely still exist but then again in some cases it might be an advance. If the customer only wants the specific part - for its quality over price - then the company will benefit.

If the instructions and guidelines this thesis presents are followed then the passing-through-time of projects will improve with a little effort and time. When an article is created with enough information according to the instructions (chapter 7.1.2, p.46) and with the necessary documents (Chapter 7.4.1, p.55) the passing-through-time in the future will decrease. Also the additional improvement suggestions all aim to improve the passing-through-time in project handling. The additional improvements in project naming (Chapter 7.5.1, p.57) and Rubber products documentation (Chapter 7.5.3, p.59) will benefit the company. Especially when projects are passed between employees or the user needs to quickly search for some old information. These guidelines and improvements should also simplify the structure of the article library, and furthermore decreasing the system load on the network frame.

The guidelines this thesis illustrates are to simplify the company`s everyday tasks that employees must handle in regular basis. .

## 8.2 Summary

In this thesis i have researched answers to minor issues for a section of project management software, Lexware Premium. The software as a whole is a diverse complexity. A full survey how the whole software would work in full capacity even for a small company would be a massive task. The knowledge how the whole software could work would need hundreds and again hundreds of working hours. In this thesis I have answered the questions made from the article usage in the materials management section and some questions concerning the overall usage of this particular feature.

The research was conducted on the basis of my own experiences working with the software and hearing the company`s employees about their opinions along the way. Although Lexware Premium software is in the lower price section of all the project management softwares the overall usage is in my opinion much more easier than some other project management softwares, such as for example SAP-software. The overall resource the software framework needs to run is not overwhelming and the features are generally very complete. Some flaws do exist in the system but so far in my experience they are not crucial enough to prevent any desired operations.

In my experience the management softwares are never perfect and there are always something`s that could work better, but the software is still one of the most effective tools when considering how to efficiently control the project as a whole. And the softwares are developing further every day. For a lower budget software the Lexware has worked out really well for the company this research is done to. There cannot be any underestimating the fact that integrating management software into the daily operations will be a boost in efficiency and creativity inside the company. Although no company should only rely on its software, there are the people using the software the company should be relying on.

I hope that some of the suggestions and models I have introduced in this thesis will be processed further and considered as a change into the old ways. Some other minor improvements concerning the usage of the software, especially the technical aspects of the operations are also suggested to take under consideration. The change is nevertheless a process than can be made only by modification and specification of operation procedures in a defined length of time.

### 8.3 Conclusion

The usage of softwares and frameworks will become more common in the business world as well as in the manufacturing operations everywhere. More and more hardware is being installed and softwares are programmed to carry out the tasks that are easy. Automation is running huge facilities with control softwares that require human only to be as a supervisor. The technological revolution is spreading into the tiniest aspects of our life. In work life today it is a basic requirement that you know how to operate fluently with basic softwares. And it's fairly common that you will need a computer to do your job efficiently no matter what line of job it is. Be that a software that keeps a log from a warehouse or software that operates huge manufacturing lines.

Computer softwares allow us to do our tasks faster and more accurate. The chance of mistakes is lowered when more and more of variables are controlled efficiently. Humans do mistake no doubt about it, but the softwares we create and use give us a chance to correct them when we still can. The company this thesis is made for needs to see the urge to keep developing the policies and procedures how to conduct operations. Sometimes it is good to questions some old ways and see if something else could work better - if not, then it is good to keep going as it was earlier - But if the new way creates improvement, it creates positive energy and hopefully makes some things more efficient to conduct in the future. It is healthy to see that improvement can always be made, and there always will be something that needs improvement.

The technology is spreading everywhere, especially in most developed industrial nations. Telefax was a crucial way of communicating in its time, now it is becoming out dated fast. More of business transactions are made with e-mails today than with phone calls. It is easy and saves us time.

The technology is the key in the future and with correct use and on-going development of the technology at hand the company can keep up with the on-going trend making it easier to stay competitive in modern business world; the world that is constantly and invariably chancing. It is the choice of the people with the responsibility of deciding how they want to keep up to it.

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## **Article Creation**

*Internal Memo*

**Jari Heinonen**

**09.12.2013**

## Article Creation

Please read the following instructions carefully. This memo acts as a guideline when creating new articles into the Lexware System`s Warenwirtschaft library feature. It is vital that these instructions will be followed and conducted in a professional manner and accuracy.

These guidelines are to help the daily operations that are undertaken regularly. First there is a simple template for information input and then a few examples. Few special cases are introduced in the end of this memo. Then the creation process will be instructed throughout.

This is a public version and meant for public viewing. All the confidential company information has been removed.

### 1. Creating a new article

When making a new article please take care that the information is correct and accurate. If some information is somehow not precisely accurate or you are not sure about the origin of the data, **do not insert the data** and **Do not make assumptions**. Use only the information which is verified by the manufacturer or supplier.

When inserting information to the first page in the new article; follow the next steps and inset the data in correct order.

When the user wishes to create a new article he will enter the Article library section. This section can be entered from the Warenwirtschaft main navigation menu or from the second page when creating a new document (Figure 1).

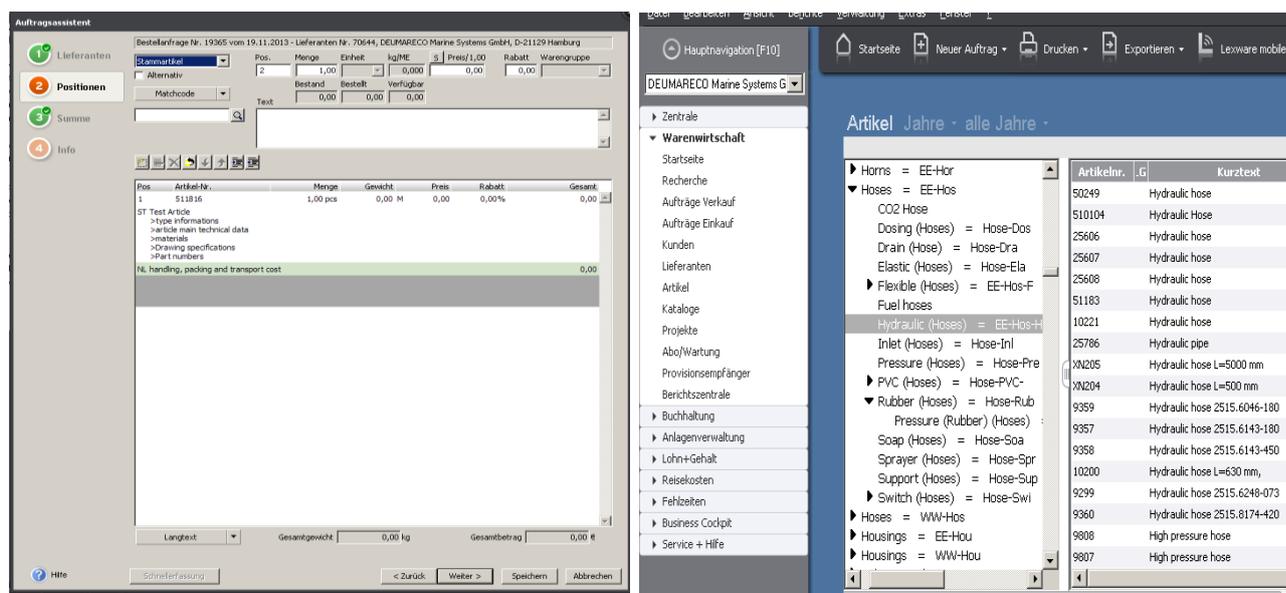


Figure 1 (Creating a new article)

## 2. Information input

When inserting information to the first page in the new article; follow the next steps and inset the data in correct order;

1. **type information** (Any special or specifying information about the article that specifies the purpose or the type specialties of the article)
2. **article main technical data** (Purely technical data to specify the information, capabilities, and characteristics concerning the main purpose of the article)
3. **materials** (what are the main materials and the manufacturing method, most important material characteristics and qualities, including EU - standard ISO - and DIN – numbers)
4. **Drawing specifications D/N: - I/N:** (Drawing numbers and item numbers)
5. **Part numbers P/N:** (Suppliers or customers specified part numbers)
6. **Additional information** (Essential information regarding the use or features of the article)

Here is an example template of a new article (Figure 2) to specify the information input in the first tab.

Allgemein	
Erfassen Sie die Pflichtangaben des Artikels.	
Artikelnummer	511816
Matchcode	511816
Kurztext	Test Article
Langtext	>type informations >article main technical data >materials >Drawing specifications >Part numbers
<input type="checkbox"/> Lagerartikel <input type="checkbox"/> Serien-/Chargennummern <input type="checkbox"/> Stückliste anlegen  <input type="checkbox"/> Artikel sperren	Einheit pcs Gewicht in kg 0,000 Lieferrückstand 0,00
Type + Tech.-Info.	>type informations, >article technical, >materials
Part-Nbrs.	>Part numbers, Partnumbers, >Drawing specifications
Makers Info.	Example GmbH, Example Oy

Figure 2 (Information input)

When article contains information that is already inserted in a different form, the information can be added to the same line. Same can be done when technical information regarding the same characteristic. Also the same action can be done when information is short and simple.

In the langtext section the information should be spaced with a comma and a space, information with desimals should be divided with a dot;

240V, 8A, 4.3kW, 1200 1/min  
L = 480 mm

But when inserted into the search slots on the bottom, information should be formatted without spacings as follows;

240V,8A,4.3kW,1200 1/min  
L=480mm

When creating a new product the user should also revise if the product is and stock article; is assembled from other stock articles; or if it is a duplicate article. The Serial number feature is not used in the company. If some of the earlier is the case then the proper mark should be made into middle section of the overall section (Allgemein) seen in figure 1. earlier. The options are Lagerartikel / Stückliste anlegen / Artikel sperren. The first two options opens a new section further on.

### 3. Example articles

Examples of first pages in some basic articles can be found in the next chapters;

#### 3.1 Hydraulic hoses

The screenshot shows the SAP 'Artikel bearbeiten' (Article Maintenance) screen for article 511411, 'Hydraulic Hose'. The interface is divided into a left sidebar with navigation options and a main 'Allgemein' (General) tab. The 'Allgemein' tab contains fields for article number, matchcode, unit, weight, short and long descriptions, and various checkboxes for inventory and article status. At the bottom, there are buttons for navigation and saving.

Field	Value
Artikelnummer	511411
Matchcode	511411
Einheit	pcs
Gewicht in kg	0,000
Kurztext	Hydraulic Hose
Langtext	K102176-6-12-1300 L = 1300 Female thread 3/4" WP 320 bar
Lieferumfang	
Lieferfrist	
Lieferrückstand	0,00
Type + Tech.-Info.	L=1300,3/4",320bar
Part-Nbrs.	K102176-6-12-1300,K1021766121300
Makers Info.	MacGregor

Buttons at the bottom: Hilfe, < Zurück, Weiter >, Speichern, Abbrechen

Figure 3 (Hydraulic hoses)

## 3.2 Rubber corners

Artikel bearbeiten <50787 Rubber corner>

**Allgemein**

Erfassen Sie die Pflichtangaben des Artikels.

Artikelnummer	<input type="text" value="50787"/>	Einheit	<input type="text" value="pcs"/>
Matchcode	<input type="text" value="50787"/>	Gewicht in kg	<input type="text" value="5,075"/>
Kurztext	<input type="text" value="Rubber corner"/>		
Langtext	<input type="text" value="Corner piece, PN70, solid&lt;br/&gt;P/N: 7247.435-0-D"/>		

Lagerartikel Lieferrückstand

Serien-/Chargennummern

Stückliste anlegen

Artikel sperren

Type + Tech.-Info.

Part-Nbrs.

Makers Info.

Hilfe

Figure 4 (Rubber corners)

### 3.3 Rubber Packing

Artikel bearbeiten <RK1 Rubber packing>

**Allgemein**

Erfassen Sie die Pflichtangaben des Artikels.

Artikelnummer: RK1 Einheit: m  
Matchcode: RK1 Gewicht in kg: 1,630  
Kurztext: Rubber packing  
Langtext: 71x32mm, sponge, 3-side-skin, 10m/roll  
P/N: 1020955  
MGN 10971

Lagerartikel Lieferrückstand: 0,00  
 Serien-/Chargennummern  
 Stückliste anlegen  
 Artikel sperren

Type + Tech.-Info.: 71x32mm,sponge,3-side-skin,10m/roll  
Part-Nbrs.: 1020955,MGN 10971,10.00.08,ZZ 71,W3271-C-35  
Makers Info.:

Hilfe < Zurück Weiter > Speichern Abbrechen

Figure 5 (Rubber Packing)

### 3.4 Metos Article

Artikel bearbeiten <XM0200 Magnetic contactor>

**Allgemein**

Erfassen Sie die Pflichtangaben des Artikels.

Artikelnummer	XM0200	Einheit	pcs
Matchcode	XM0200	Gewicht in kg	0,489
Kurztext	Magnetic contactor		
Langtext	220-230V Metos Part-No. 3240709 [Pricelist: 2013] [Delivery time: Abt. 2-3 working weeks]		
<input type="checkbox"/> Lagerartikel <input type="checkbox"/> Serien-/Chargennummern <input type="checkbox"/> Stückliste anlegen		Lieferrückstand 0,00	
<input type="checkbox"/> Artikel sperren			
Type + Tech.-Info.	220-230V, 49A		
Part-Nbrs.	3240709		
Makers Info.	Metos		

Hilfe < Zurück Weiter > Speichern Abbrechen

Figure 6 (Metos Article, Spare part)

Metos articles are divided to Spare parts and to New products. With Metos articles It is important to mark the correct part number in the form shown above. Additionally every time when making article of a spare part the Pricelist and Delivery time information should be checked. The inserted delivery time to customer should be +1 week to the delivery time Metos informs. The Metos article catalogue 2013 can be found from the supplier's folder.

If creating an article about a new Metos Product, all the product information will be inserted into the langtext field. Here is an example of the whole langtext field, and from the Lexware`s article;

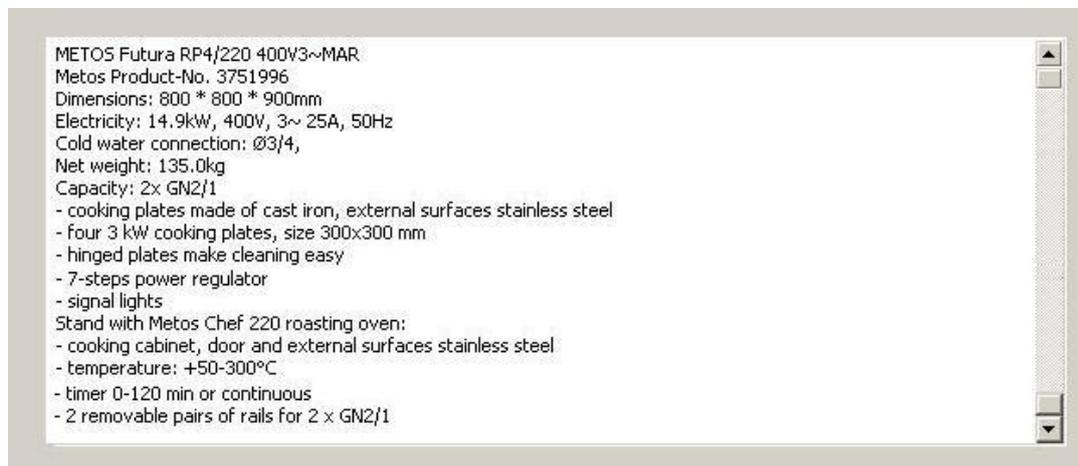


Figure 7 (Long text field of Metos Oven)

Artikel bearbeiten <19544 Range+oven>

**Allgemein**  
 Erfassen Sie die Pflichtangaben des Artikels.

Stückliste  
 Strukturstückliste  
 Warengr./Preise  
 Kalkulation  
 Lager  
 Reservierungen  
 Serien-/Chargen-Nr.  
 Lieferanten  
 Dokumente  
 Bilder  
 Umsätze  
 Grafik

Artikelnummer: 19544  
 Matchcode: 19544  
 Kurztext: Range+oven  
 Langtext: METOS Futura RP4/220 400V3~MAR  
 Metos Product-No. 3751996  
 Dimensions: 800 \* 800 \* 900mm  
 Electricity: 14.9kW, 400V, 3~ 25A, 50Hz  
 Cold water connection: Ø3/4,  
 Einheit: pcs  
 Gewicht in kg: 135,000

Lagerartikel  
 Serien-/Chargennummern  
 Stückliste anlegen  
 Artikel sperren

Lieferrückstand: 0,00

Type + Tech.-Info.: Futura RP4/220,400V3~MAR  
 Part-Nbrs.: 3751996  
 Makers Info.: Metos

Hilfe < Zurück Weiter > Speichern Abbrechen

Figure 8 (Metos Article, new product)

## 4. Special cases

### 4.1 Additional Information

Articles with lots of additional information should be marked with a hyphen, in the same way as it was done in the Metos article (see chapter 2.4, Figure 7 & Figure 8);

The screenshot shows the SAP 'Artikel bearbeiten' (Article Maintenance) interface for article S10978, 'Hydraulic hose'. The 'Allgemein' (General) tab is active, showing various fields for article data. The 'Langtext' (Long Text) field contains detailed technical specifications for the hose, including part numbers and materials. The 'Type + Tech.-Info.' field contains 'DKOS16, M24x1.5, L=700, WP275Bar'. The 'Part-Nbrs.' field contains 'DKOS16, 22-16-08/R2AT-08/22-16-08, S22704130R2-463'. The 'Makers Info.' field contains 'Rähä'. The 'Lieferrückstand' (Delivery Status) is 0,00. The interface includes a sidebar with navigation options like 'Stückliste', 'Kalkulation', and 'Lager', and a bottom bar with buttons for '< Zurück', 'Weiter >', 'Speichern', and 'Abbrechen'.

Field	Value
Artikelnummer	S10978
Matchcode	S10978
Kurztext	Hydraulic hose
Langtext	P/M: S22704130R2-463 L=700 - NPYU-08 Hose fitting - NPYU-08 pro-jet tightening - NPYU-08 Hydraulic hose with steel braids
Lieferumfang	
Lagerartikel	<input type="checkbox"/>
Serien-/Chargennummern	<input type="checkbox"/>
Stückliste anlegen	<input type="checkbox"/>
Artikel sperren	<input type="checkbox"/>
Lieferrückstand	0,00
Type + Tech.-Info.	DKOS16, M24x1.5, L=700, WP275Bar
Part-Nbrs.	DKOS16, 22-16-08/R2AT-08/22-16-08, S22704130R2-463
Makers Info.	Rähä

Figure 9 (Article with additional information)

## 4.2 Several Article numbers

Article with several supplier part numbers can be specified by marking the supplier in parenthesis`s in the end of the number;

Artikel bearbeiten <510111 Hydraulic Hose>

**Allgemein**

Erfassen Sie die Pflichtangaben des Artikels.

Stückliste

Strukturstückliste

Warengr./Preise

Kalkulation

Lager

Reservierungen

Serien-/Chargen-Nr.

Lieferanten

Dokumente

Bilder

Umsätze

Grafik

Artikelnummer: 510111 Einheit: pcs

Matchcode: 510111 Gewicht in kg: 0,000

Kurztext: Hydraulic Hose

Langtext: DKOS16 ,M24x1,5  
L=1300,  
WP275BAR  
P/N: 12098-4-1300-M  
P/N: 22-16-08/R2AT-08/22 (Räihä)

Lagerartikel Lieferrückstand: 0,00

Serien-/Chargennummern

Stückliste anlegen

Artikel sperren

Type + Tech.-Info. L=1300, DKOS16, M24x1,5, WP275BAR

Part.-Nbrs. 12098-4-1300-M, 1209841300M, 22-16-08/R2AT-08/22

Makers Info. Räihä

Hilfe < Zurück Weiter > Speichern Abbrechen

Figure 10 (Article with several part numbers)

## 5. Article input into Document

When inserting standard articles into document from the article library it is very important to view the articles information and edit the long text based on the document recipient. When receiving an enquiry from customer, the offer should be similar to information the customer has inserted. And vice versa when regarding an offer from the supplier. Suppliers usually have the latest information of articles so their provided information should be used in article library.

Auftragsbestätigung Nr. 16089/19.11.2013, Vorgang Nr. 14935 - Kunden Nr. 11432, DEUMARECO Marine Systems GmbH,

Stammartikel

Pos.	Menge	Einheit	kg/ME	S	Preis/1,00	Rabatt	Warengruppe
2	1,00		0,000		0,00	0,00	

Matchcode

Bestand Bestellt Verfügbar Rohertrag in %

0,00 0,00 0,00 0,00 0,00

Reservieren

Text

Pos	Artikel-Nr.	Menge	Gewicht	Preis	Rabatt	Gesamt
1	510111	1,00 pcs	0,00 S	29,10	0,00%	29,10

ST Hydraulic Hose  
DKOS16 ,M24x1,5  
L=1300,  
WP275BAR  
P/N: 22-16-08/R2AT-08/22

Figure 11 (Use of the Articles)

So when making a purchase from Rähä about the article seen in Figure 10, the information should be edited as it can be now seen in Figure 11.

## 6. Partlist (Stückliste)

If the Article is assembled from other products and the “Stückliste anlegen” option is marked from the overall section during the creation process. When proceeding from the first section forwards the system opens up the following view;

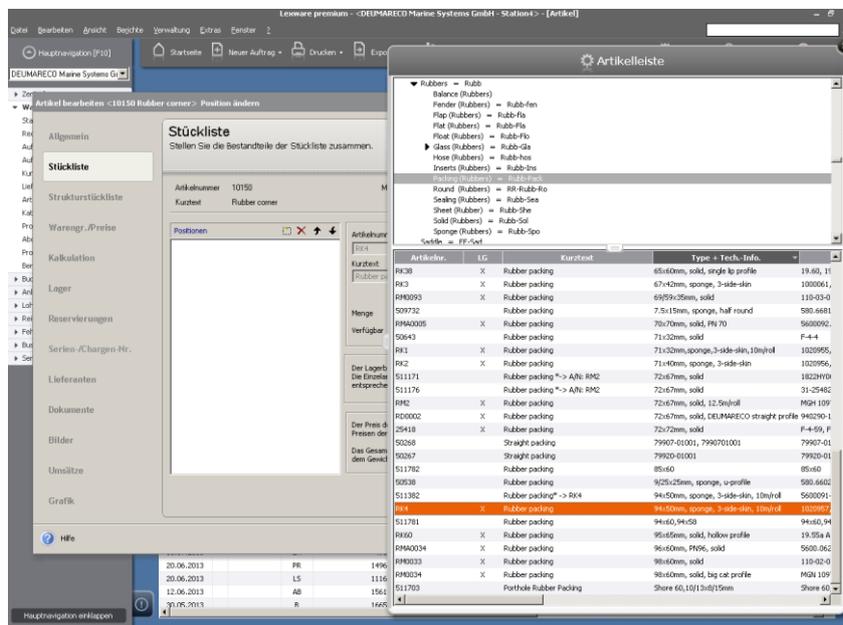


Figure 12 (Part list, opening)

Then the user will search for the correct parts and insert them to the list with the correct amount. This feature is most common regarding rubber corners. When inserting the correct amount of rubber used to make the article, the user should revise from the manufacturing personnel about the amount. The amount seen from drawings is usually not the correct one.

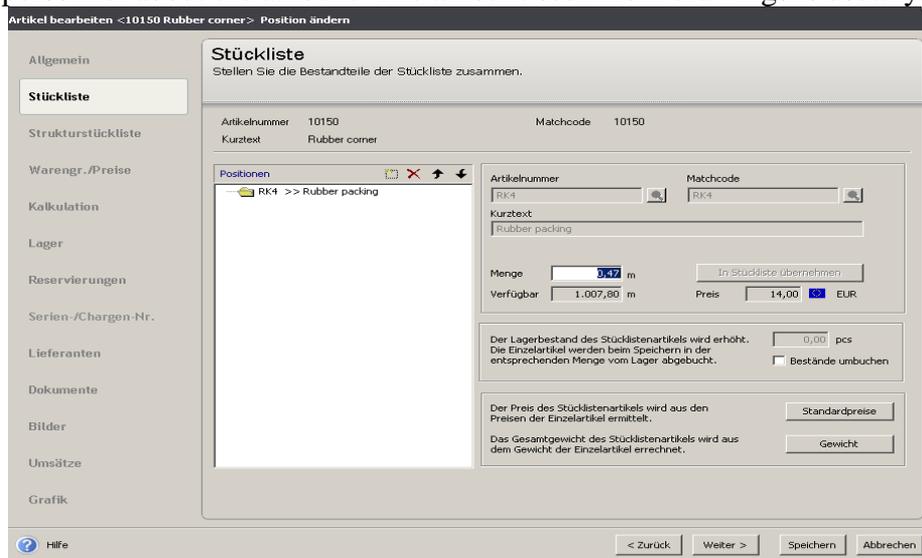


Figure 13 (Part list)

## 7. Viewing the Construct part list

The third sections sums up the informatin from the part list. The section is named as Strukturstücklist, which translates as “construct part list”. This section shows only if the part list feature is activated.

The screenshot shows the SAP 'Strukturstückliste' (Construct part list) interface. The main title is 'Strukturstückliste' with the subtitle 'Diese Seite zeigt Ihnen die Struktur der Stückliste an.' (This page shows you the structure of the part list).

At the top, the article number '10150' and 'Rubber corner' are displayed, along with the 'Matchcode' '10150'.

The 'Positionen' (Positions) section shows a tree view with 'RK4 >> Rubber packing' selected.

The details for the selected position are as follows:

Artikelnummer	Matchcode
RK4	RK4
Kurztex	
Rubber packing	
Text	
94x50mm, sponge, 3-side-skin, 10m/roll	
1020957	
10969	
10.00.11	
522700704	
1822X00002	
79983-0010	
79983-00101	
5600.010.02	
5600.017.0.E	
Menge	0,47 m
Verfügbar	1.007,80 m
Preis	14,00 EUR

At the bottom of the interface, there are buttons for '< Zurück', 'Weiter >', 'Speichern', and 'Abbrechen'. A 'Hilfe' (Help) icon is also present in the bottom left corner.

Figure 14 (Construct part list)

## 8. Categorising the article & Inserting the price

First in the fourth section the article is inserted into a specified article group. The article`s are divided into categories defined by the article`s main purpose. For every part there should be a overall category (Valves) and if the category consists several different type of articles then the category can opened up into subcategories (Center(Valves)). And so on. Every article should be defined into the correct group.

If the user cannot find a proper category it is possible to create a new one. For detailed instructions please revise Thomas Järvinen or Jari Heinonen regarding this subject.

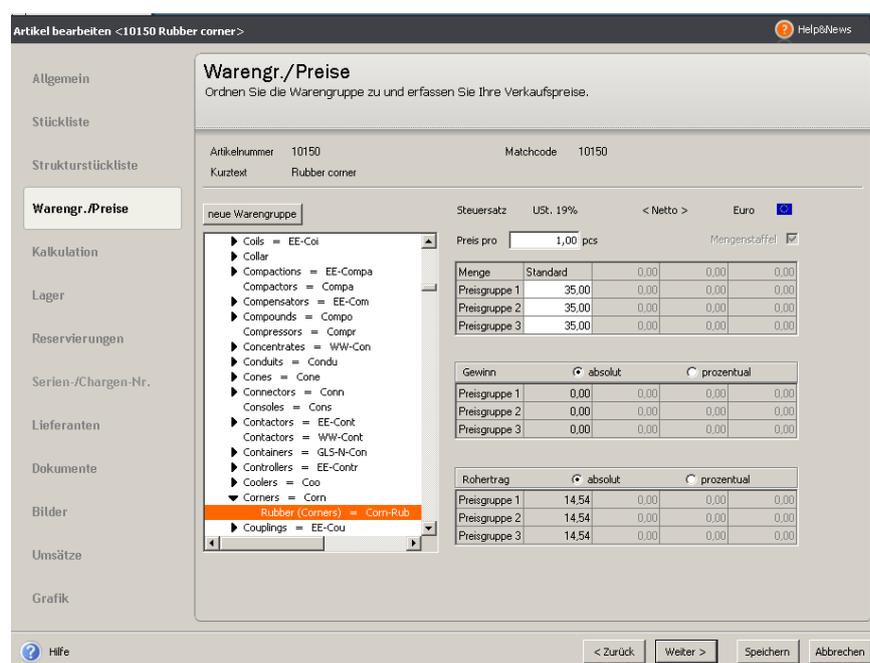


Figure 15 (Categorising & selling price)

Also in this section the user should insert the sale price of the article. Since the company`s database does not use the price group feature for customers; the same price should be inserted into all three slots. The price can also be assigned to price pro x pieces, seen above the price slots.

The fifth section – “Kalkulation” – will be left untouched, thus there is no reason to view it.

## 9. Stock amount

The sixth section is opened if the “lagerartikel” option is selected from the overall page (see chapter 1). The section shows and records the amount of the article in stock. When first time entered or there is a need to modify the amounts; the user will insert the amount into the “Zu-/Abgang” slot.

- If the user wants to increase the stock amount he will insert the amount into this slot
- If the user wants to decrease the amount in stock, he will put a minus (-) in front of the amount

Figure 16 (Stock numbers)

## 10. Reservations list

In the seventh sections the user can add any reserved order amounts for the system. This section is usually left untouched, because the system adds up the entire amount here automatically. However there is an option for manual input in the bottom section. There the user can add the amount, date, and details of the order.

The screenshot shows a software interface for managing reservations for article 10150 'Rubber corner'. The interface is divided into a left sidebar with navigation options and a main content area.

**Navigation Sidebar:**

- Allgemein
- Stückliste
- Strukturstückliste
- Warengr./Preise
- Kalkulation
- Lager
- Reservierungen** (highlighted)
- Serien-/Chargen-Nr.
- Lieferanten
- Dokumente
- Bilder
- Umsätze
- Grafik

**Main Content Area: Reservierungen**

Auf dieser Seite werden die einzelnen Reservierungen des Artikels aufgeführt.

Artikelnummer: 10150      Matchcode: 10150  
 Kurztext: Rubber corner

Artikel bei Auftragsbestätigungen immer reservieren

Datum/Uhrzeit	Vorgang	res. Menge	res. bis	Benutzer

Manuelle Reservierungen

aktuell Reserviert: 0,00

Menge: 0,00 pcs      Vorgang:

reservieren bis: 05.12.2013

Buttons: < Zurück, Weiter >, Speichern, Abbrechen

Figure 17 (Reservations)

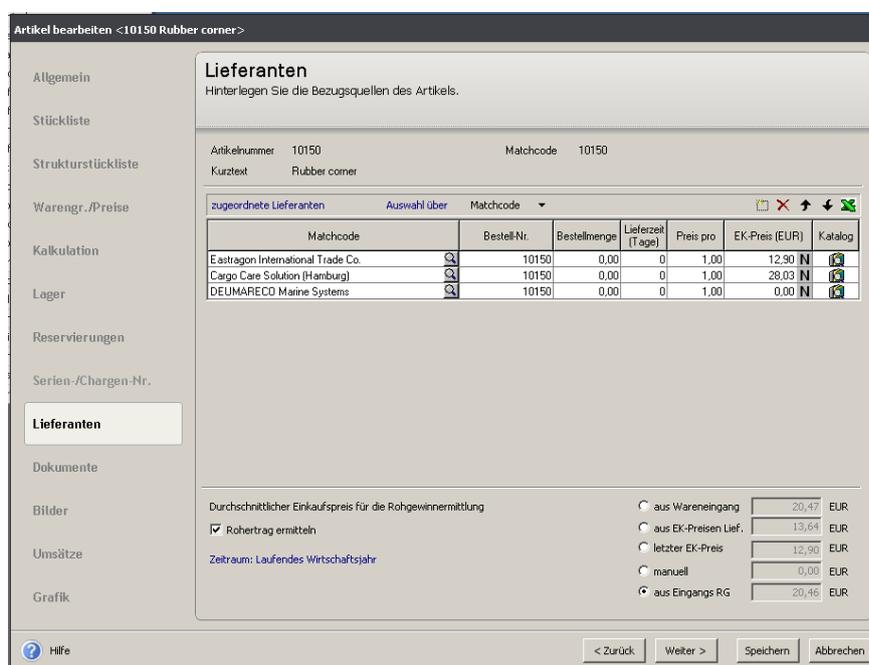
The Eight section - serial and batchnumbers - is not used in the company, thus there is no reason to view it.

## 11. The Suppliers

The suppliers section (Lieferanten) allows the user to insert all the known suppliers into the article so that when the article is used in enquiry the system automatically fills in the last saved price. A new supplier is searched from the software`s database directly.

When the user wishes to insert a new supplier he first chooses to inset a new slot into the list. This is done by clicking the new icon  in the right hand side toolbar just above the list. After this the correct supplier is searched from the database by clicking the magnifying glass in the matchcode column.

Additionally the user can and always should insert the delivery time (Lieferzeit) of the item. Next step is to insert the article`s net-price into the EK-Preis slot.



Artikel bearbeiten <10150 Rubber corner>

**Lieferanten**  
Hinterlegen Sie die Bezugsquellen des Artikels.

Artikelnummer 10150 Matchcode 10150  
Kurztext Rubber corner

zugeordnete Lieferanten Auswahl über Matchcode

Matchcode	Bestell-Nr.	Bestellmenge	Lieferzeit (Tage)	Preis pro	EK-Preis (EUR)	Katalog
Esstragon International Trade Co.	10150	0,00	0	1,00	12,90	N
Cargo Care Solution (Hamburg)	10150	0,00	0	1,00	28,03	N
DEUMARECO Marine Systems	10150	0,00	0	1,00	0,00	N

Durchschnittlicher Einkaufspreis für die Rohgewinnermittlung

Rohertag ermitteln

Zeitraum: Laufendes Wirtschaftsjahr

aus Wareneingang 20,47 EUR  
 aus EK-Preisen Lief. 13,64 EUR  
 letzter EK-Preis 12,90 EUR  
 manuell 0,00 EUR  
 aus Eingangs RG 20,46 EUR

Hilfe < Zurück Weiter > Speichern Abbrechen

Figure 18 (Suppliers)

In the end of this section is one more feature that the user must pay attention to. In the bottom part the user must mark the **“Rohertag ermitteln”** slot and the **“Aus eingangs RG”** slot, as shown in the picture above. These slots ensure that the system recognises the correct price from the eingangrechnung into the system features in later phases of operations.

## 12. Document linking

In the last section for input is the document linking. Linking documents and technical drawings into the article is **very important**. In assemblies, hydraulic cylinders and rubber corners the drawings are vital for the operations. Without the documents some enquiries cannot be processed.

Then the correct document is searched in the same fashion as the supplier list feature functioned. The user chooses to insert a new row to the list by clicking the  icon on the top right toolbar above the list. After this he presses the icon in the right side of the “Verknüpfung” column. The icon opens the standard microsoft search window.

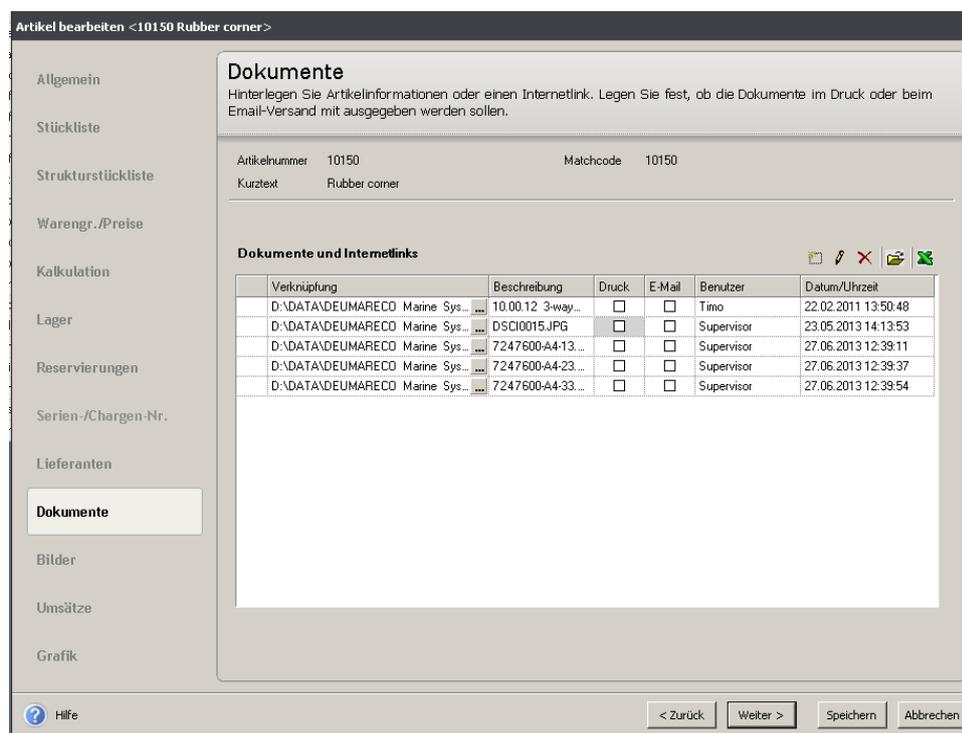


Figure 19 (Document Linking)

## 13. Double linking

The system currently holds one flaw to the document linking feature. When documents are linked in one client computer another computer in the server is not able to directly open the same document. This flaw exists and it must be bypassed. The method to do this is to create a folder into the “Produkte” folder titled with the article number. All the necessary documents will also be copied to this folder and linked in the same way as in chapter 10.

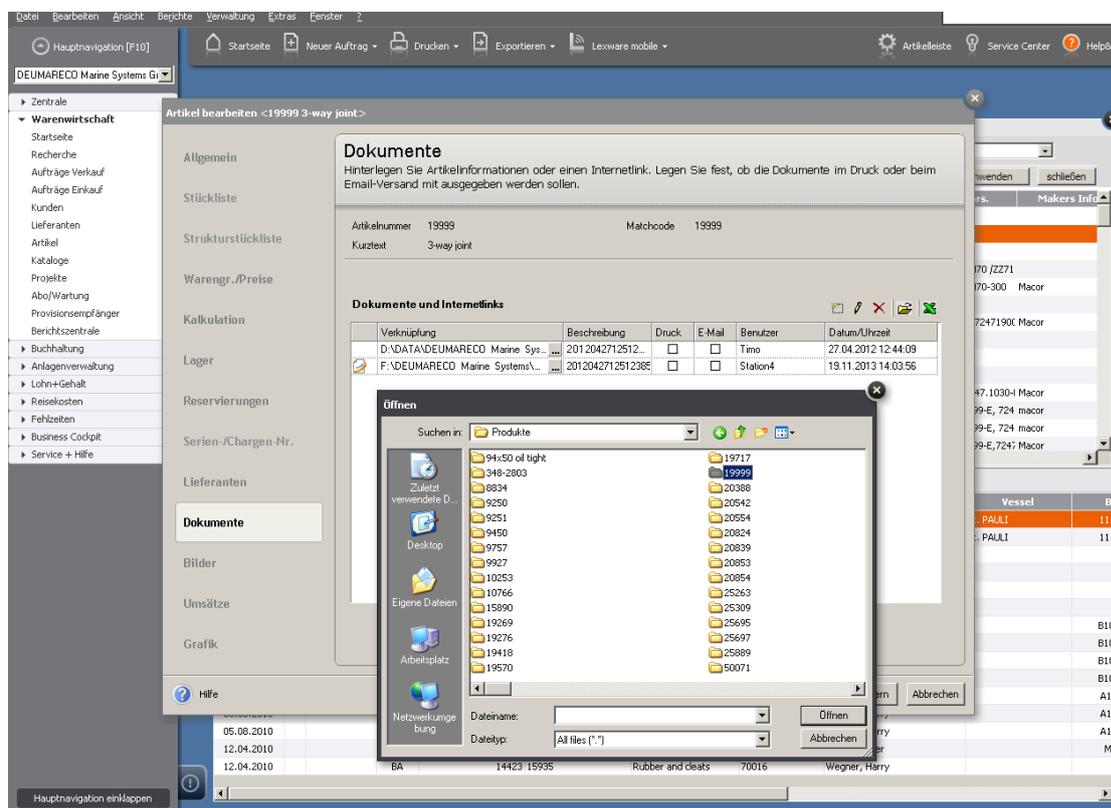


Figure 20 (Document double linking)

The remaining sections do not concern creation of new article so they won't be reviewed.

When the user saves the article from the “Speichern” button in the last phase He is personally responsible for the correct input of all necessary and available information. If the user is aware of any deficiency he is responsible to correct them as soon as possible. Any problems or misconducts should revised with the superiors.