# Improving the product search process through interface redesign

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# **UNIVERSITY OF TWENTE.**

Bachelor Thesis February 2017

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#### Abstract

It can be difficult for companies to order the right components or products, especially when it might concern thousands of products at once. Mydatafactory developed a system to helps these companies order the right parts or products. An important part of this system is called 'the matching interface'. This matching interface enables the user to check whether the system linked the correct product to an item on the companies 'grocery list'. Validating these products can be a long and tedious process, the goal of this project was to improve this process in speed and usability. First the current interface was tested through usability tests, questionnaires and interviews. Based on these results a prototype was developed. This prototype was then tested with the same procedure as the current matching interface in order to conclude if the prototype could indeed improve the matching process. The results showed that the prototype interface did improve the matching process in both speed and usability, but further improvements are still necessary.

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#### **1 INTRODUCTION**

Mydatafactory is a company that specializes in data matching and data cleansing. Founded in 2009, Mydatafactory operates in the data management domain. Mydatafactory provides services that cleanse existing product databases, meaning they remove errors and standardize notation of product data (e.g. "10 mm" or "10.0 mm" becomes "10mm"). Mydatafactory also provides a tool for product matching, meaning that the clients of Mydatafactory can search and match the products they or their clients need against their own or their supplier's database. This enables clients of Mydatafactory to order supplies more easily, by running an entire list of parts and products through the search engine in one go. Mydatafactory strives for clean, error free product data (e.g. name, size, material, manufacturer, part number, etc. of the products) and fast and easy product matching. Mydatafactory's clients include Shell (oil company) and ERIKS (supplier of industrial components and products).

Automatically matching these desired products, or *local articles*, to actual products, called *master articles*, is a difficult process. There are many different brands, having many different products and product types, with many different attributes between products and product types. Not to mention differences between the notations of product attributes and differences in units of measurement, such as foot and meter. Next to these differences there is the possibility of human error made when the master article data was entered into the database or when the local article data was written. Therefore it is necessary to manually check if the search results are indeed the required products. To accomplish this they use a so called *matching interface*.

Checking all these local articles ( $\pm 1000 - 10.000$  per client list in ERIKS' case) against matched products is a repetitive and labor intensive job. By redesigning the matching interface, it might be possible to make the matching process easier, faster and less of a burden for the user.

The goal of this research is to improve the design of the product match interface in such a way that it best suits the user. The user should be able to match the local article to the desired result as easy and as fast as possible, without getting tired too soon. At the end of the project there should be a working prototype and a list of recommendations for Mydatafactory.

#### 1.1 Overview

Each chapter of this report discusses a different aspect of this project. In chapter 2 the problem, scope and goal are explained, after which the Research Questions (RQ's) are determined (section 2.4). After the problem description, we will take a look at the interface Mydatafactory currently uses (chapter 3). Testing of the current interface will be discussed in section 3.2 and the analysis of the results of these tests in section 3.3. With the results from these tests and analysis of the current interface, combined with a literature study (chapter 4), several requirements will be established (chapter 5). These requirements will form the basis for the interface prototype. The prototype will be discussed in detail in chapter 8. Testing and analysis of this prototype will be discussed in section 8.2.

#### **2 PROBLEM DESCRIPTION**

Mydatafactory believes that the current matching interface (Figure 1) is not optimal in use and user-friendliness. If the matching-interface is not optimal, then neither is the matching process, meaning it takes more time to complete than it should. The matching-process takes up a lot of valuable time and resources and is therefore rather expensive. Mydatafactory believes that the current matching process could benefit a lot from a redesigned interface when it comes to efficiency, productivity and reduction of cognitive load. A new interface design could help the user to match local articles to master articles faster. The redesign could also reduce the strain on the eyes and mind of the user, making the repetitive process less tiring.

#### 2.1 Stakeholders

This project has multiple stakeholders, namely Mydatafactory and the clients of Mydatafactory. Mydatafactory would benefit from a better interface and faster matching process, since it would increase the attractiveness of their products and services. The clients of Mydatafactory are the companies, especially their employees, who use the system to find and order the parts and products they need. Some employees use the interface every day to do their job. Mydatafactory and its clients want to see an improved and tested user-interface, which reduces the time it takes to match an entire local article list and also reduces the cognitive load on the user.

#### 2.2 Scope

Due to time constraints the scope of this research will be limited to the matching interface and matching process only. The manual search, called *manual look-up* by Mydatafactory, for the correct product match, when the search engine fails to find the correct master article, will be outside the scope of this project. The matching process starts when the search results of the matching engine are shown to the user and will contain multiple cycles of product matching. Each cycle ends when either the product is matched with one of the results or a manual look-up is initiated. Batch processing, reordering the match results in such a way that the matches which are most likely correct appear on top and other sorting and filtering tactics will also be outside the scope of this project. The scope of this project solely focuses on matching a local article to a master article.

#### 2.3 Goals

The main goal of this project is to improve the current matching interface and deliver a working prototype of the improved interface. Along with this prototype, Mydatafactory will receive this report which explains the issues of the current matching interface and how they could be solved.

#### 2.4 Research Questions

**Main Research Question:** How can an interface redesign increase efficiency, productivity, attention span and usability of the interface during the matching process?

**Sub-Research Question 1:** What does the current interface look like and how is it used? Which strengths and weaknesses does it have and how do users deal with them?

**Sub-Research Question 2:** Which interface functions/features could increase efficiency during the matching process? This means functions/features that allow a decrease in time, effort and energy needed to match a product with a local article.

**Sub-Research Question 3:** How can interface design improve the reading and searching speed of the user? For example, which combination of front and background color, typeface, font size and weight and other factors might increase the users reading speed?

#### 2.5 Methods

Since the interface should help the user to match local articles to master articles faster, the interface will be designed with the user in mind, the so called *user centered design* method. " 'User-centered design' (UCD) is a broad term to describe design processes in which end-users influence how a design takes shape." (Abras, Maloney-Krichmar, and Preece 2004). This means that the end users are involved in the design process, one way or another. Abras, Maloney-Krichmar, and Preece (2004) suggest seven techniques to involve users in the design process. From these techniques three are used in this study, these are:

- Background Interviews and questionnaires In order to collect data related to the needs, desires and expectations of the user.
- Usability testing Generating qualitative and quantitative data about the use of the interface.
- Interviews and questionnaires Collecting user satisfaction and other qualitative data, especially important after a usability test with a prototype.

Using UCD when designing almost anything, has the advantage that the design process takes into account what the (future) users of the product want and might expect from it. It could also provide valuable insights in how users interact with your product, if they interact with it in the way it was intended.

# **3 ANALYSIS OF THE CURRENT INTERFACE**

In order to design a new interface, we first need to find out how the current interface is used and which strengths and weaknesses it has. The results of the analysis will then serve as a benchmark against the coming prototype against the current interface. This way we can measure if the prototype is an improvement on the current interface and process. Evaluating the current interface will be done through task driven usability tests, questionnaires and interviews with the users, after which a new interface will be designed based on the evaluation results and literature research. Finally a prototype will be built and bench-marked against the current interface. The prototype will be evaluated using a similar approach to compare its performance to the current interface.

#### 3.1 Interface Description

When starting the program you are asked to select the master article database of the supplier or manufacturer. After the database has been selected, the list of local articles from the client of the supplier or manufacturer can be loaded. You are then able to view this list of local articles and select the local articles and/or attributes you wish to match to the master articles. These master articles contain all the information the supplier or manufacturer needs to deliver the correct products.

| Article matching - Eriks BE Internal Test              |   |  |               |               |                |        |                       |                    |                                  |                          |       |
|--|---|--|---------------|---------------|----------------|--------|-----------------------|--------------------|----------------------------------|--------------------------|-------|
| Mode: Only matching   I Action: Match Local to Master  | ode: Only matching 🔹   Action: Match Local to Master 💌 Type: Konkura 🔹 🚯 Parameters Source scope: 💋 Select Language: 🚍 Dutch 🔹 Mapping: 💋 Select Value of the start match in the start mat |  |               |               |                |        |                       |                    |                                  |                          |       |
| Article matches  | tide matches Candidates for selected article match en   |  |               |               |                |        |                       |                    |                                  |                          |       |
| 14 4 > > Page: 1 / 5 🔂 Total: 106 In view              | v: 25   | Selected: 1 Page size: 25 🛛 🕞 🖼 👻 🛞            |               |               |                |        | ART                   | M                  | DESCRIPTION 1 NL                 | M M., M P M MANUFA       |       |
| AR DESCRIPTION 1 NL                                    |   | ART M M DESCRIPTION 1 NL                       | M M M P       | MANUFAC       | TURER CATALOG. | . 🕅 M/ | 77                    | -                  | 7                                |                          |       |
| C 🖓 Contains: 🖓  |   |  |               |               |                |        | 23562961 Z1           | Legris 0101 0      | 4 10 kopp.4mm-85P1/8             | LEGRISBANC 0101 04 10    | (8232 |
| 24493 RECHTE INSCHROEF 4X1/8"BSP 0101 04 10 LEGRIS     |   | 562961 Z1 Legris 0101 04 10 kopp.4mm-BSP1/8    | LEGRISBANC    | 0101 04 10    | B23214316      | 0101 0 | 23565986 Z1           | Legris 3311 1      | 0 13 04 blok 2x1/4+4x1/8 BSP     | LEGRIS NORM 3311 10 13 0 | (B23  |
| 231951 RECHTE INSCHROEF 4X1/8"BSP 0101 04 10 39 LEGRI: |   | 562962 Z1 Legris 0101 04 10 39 kopp.4mm-BSP1/8 | LEGRIS BANC   | 0101 04 10 39 |                | 0101 0 | 23562962 Z1           | Legris 0101 (      | 4 10 39 kopp.4mm-BSP1/8          | LEGRIS BANC 0101 04 10 3 |       |
| 231963 RECHTE INSCHROEF 4XM5 0101 04 19 LEGRIS         |   | 562963 Z1 Legris 0101 04 19 kopp.4mm-M5        | LEGRIS BANC   | 0101 04 19    | B23214323      | 0101 0 | 23566000 Z1           | Legris 3313 1      | 0 13 02 blok 2x1/4+4x1/8 BSP     | LEGRIS BANC 3313 10 13 0 | B23   |
| 231964 RECHTE INSCHROEF 4XM7 0101 04 55 LEGRIS         |   | 562964 Z1 Legris 0101 04 55 kopp.4mm-M7        | LEGRIS BANC   | 0101 04 55    |                | 0101 0 | 23562976 Z1           | Legris 0101 0      | 8 10 kopp.8mm-BSP1/8             | LEGRIS NORM 0101 08 10   | (B232 |
| 231972 RECHTE INSCHROEF 5XM10 0101 05 60 LEGRIS        |   | 562969 Z3 Legris 0101 05 60 kopp.5mm-M10x1     | LEGRIS NORM   | 0101 05 60    |                | 0101 0 | 23562985 Z1           | Legris 0101 1      | 0 13 kopp.10mm-BSP1/4            | LEGRIS BANC 0101 10 13   | B232  |
| 24495 RECHTEINSCHROEF 6X1/8"BSP 0101 06 10 LEGRIS      |   | 562970 Z1 Legris 0101 06 10 kopp.6mm-BSP1/8    | LEGRIS BANC   | 0101 06 10    | B23214329      | 0101 0 | 23562966 Z1           | Legris 0101 0      | 5 10 kopp.5mm-BSP1/8             | LEGRIS BANC 0101 05 10   | (8232 |
| 231975 RECHTE INSCHROEF 6X1/8"BSP 0101 06 10 39 LEGRI: |   | 562971 Z1 Legris 0101 06 10 39 kopp.6mm-BSP1/8 | LEGRIS BANC   | 0101 06 10 39 |                | 0101 0 | 23562970 Z1           | Legris 0101 0      | 6 10 kopp.6mm-BSP1/8             | LEGRIS BANC 0101 06 10   | (8232 |
| 24492 RECHTE INSCHROEF 6X1/4"BSP 0101 06 13 LEGRIS     |   | 562972 Z1 Legris 0101 06 13 kopp.6mm-BSP1/4    | LEGRIS NORM   | 0101 06 13    | (B23214330     | 0101 0 | 23562978 Z1           | Legris 0101 0      | 8 13 kopp.8mm-BSP1/4             | LEGRIS BANC 0101 08 13   | B232  |
| 231973 RECHTE INSCHROEF 6X1/4"BSP 0101 06 13 39 LEGRI: |   | 562973 Z1 Legris 0101 06 13 39 kopp.6mm-BSP1/4 | LEGRIS BANC   | 0101 06 13 39 |                | 0101 0 | 23562965 Z1           | Legris 0101 (      | 4 56 kopp.4mm-M8x1               | LEGRIS BANC 0101 04 56   |       |
| 231996 RECHTE INSCHROEF 6XM10 0101 06 62 LEGRIS        |   | 562975 Z1 Legris 0101 06 62 kopp.6mm-M10x1,5   | LEGRIS BANC   | 0101 06 62    |                | 0101 0 | 24103352 Z1           | 01010456 Le        | ris 0101 04 56 rechte inschx     | LEGRIS BANC 0101 04 56   |       |
| 24494 RECHTE INSCHROEF 8X1/8"BSP 0101 08 10 LEGRIS     |   | 562976 Z1 Legris 0101 08 10 kopp.8mm-BSP1/8    | LEGRIS NORM   | 0101 08 10    | (B23214333     | 0101 0 | 23566002 Z1           | Learis 3313 1      | 0 13 04 blok 2x1/4+8x1/8BSP      | LEGRIS BANC 3313 10 13 0 | 1823  |
| 231998 RECHTE INSCHROE                                 |   | 562977 Z1 Legris 0101 08 10 39 kopp.8mm-BSP1/  | EG            | 0101 08 10 39 |                | 0101 0 | 23566060 Z1           | -<br>Learis 3538 ( | 4 10 baniohuis 4                 | LEGRIS NORM 3538 04 10   | _     |
| 231992 RECHTE INSCHROEF 8X # BSP 0101 08 13 39 LEGRI   |   | 562979 Z1 Legris 0101 08 13 39 kopp.8mm-BSP1/4 | LEF SBANC     | 0101 08 13 39 |                | 0101 0 | 23566073 71           | Lenris 3539 (      | 4 10 baniobuis 4mm               | LEGRIS BANC 3539 04 10   |       |
| 24496 RECHTEINSCHROEF 8X B'BSP 0101 08 17 LEGRIS       |   | 562980 Z1 Legris 0101 08 17 kopp.8mm-BSP3/8    | FGRIS BANC    | 0101 08 17    | B23214335      | 0101 0 | 23566080 71           | Learis 3549 (      | 4 10 banjobujs 4 n/BS            | LEGRISBANC 3549 04 10    |       |
| 231994 RECHTE INSCHROEF 8X3/8"BSP 0101 08 17 39 LEGRI  |   | 562981 Z1 Legris 0101 08 17 39 kopp.8mm-BSP3/8 | LEGRIS BANC   | 0101 08 17 39 |                | 0101 0 | 22567122 71           | Logric 7200 (      | A 10 deukradus 4mm PCD1/R        | LECRIFRANC 7200 04 10    | 18126 |
| 231997 RECHTE INSCHROEF 8XM12 0101 08 65 LEGRIS        |   | 562982 Z1 Legris 0101 08 65 kopp.8mm-M12x1     | LEGRIS BANC   | 0101 08 65    |                | 0101 0 | 23567240 71           | Legris 7500 (      | 4 10 bracie data PC01/0          | LEGRISDANC 7300 04 10    | 18222 |
| 231990 RECHTE INSCHROEF 10XM14 0101 10 70 LEGRIS       |   | 562989 Z3 Legris 0101 10 70 kopp.10mm-M14x1,25 | ELEGRIS NORM  | 0101 10 70    |                | 0101 1 | 2000000 21            | Legiis of to c     | 4 To banjo 4mm-bsP1/8            | LEGRISDANC 0118 04 10    | 0202  |
| 232014 RECHTE INSCHROEF 10XM14 0101 10 71 LEGRIS       |   | 562990 Z1 Legris 0101 10 71 kopp.10mm-M14x1,5  | LEGRIS BANC   | 0101 10 71    |                | 0101 1 | 23565612 21           | Legris 3132 (      | 4 10 Inst.y-4x4mm-BSP1/8         | LEGRIS BAINC 3132 04 10  |       |
| 232024 RECHTE INSCHROEFKOPP.10XM16 0101 10 74 LEGRIS   |   | 562991 Z1 Legris 0101 10 74 kopp.10mm-M16x1,25 | ELEGRIS NORM  | 0101 10 74    |                | 0101 1 | 23564137 23           | Legns 04690        | 4 10 kogelkraan 2x BSP1/8        | LEGRIS NORM 0469 04 10   |       |
| 232026 RECHTE INSCHROEF 10XM16 0101 10 75 LEGRIS       |   | 562992 Z3 Legris 0101 10 75 kopp.10mm-M16x1,5  | LEGRIS NORM   | 0101 10 75    |                | 0101 1 | 11103140 25           | VOSS 11006         | 2 Rechte Inschroef 8L 1/8 "BSP"  | BANC                     |       |
| 232028 RECHTE INSCHROEF.10XM18 0101 10 78 LEGRIS       | 1   | 562993 Z1 Legris 0101 10 78 kopp.10mm-M18x1,5  | LEGRIS BANC   | 0101 10 78    |                | 0101 1 | 23563382 Z1           | Legris 0119 (      | 4 10 banjo 2x4mm-BSP1/8          | LEGRIS BANC 0119 04 10   |       |
| 232025 RECHTE INSCHROEF 12X1/4"BSP 0101 12 13 LEGRIS   |   | 562994 Z3 Legris 0101 12 13 kopp.12mm-BSP1/4   | LEGRIS NORM   | 0101 12 13    | B23214350      | 0101 1 | 23563383 Z1           | Legris 0119 (      | 4 10 39 banjo 2x4mm-BSP1/8       | LEGRIS BANC 0119 04 10 3 |       |
| 232023 RECHTE INSCHROEF 12X1/4"BSP 0101 12 13 39 LEG   |   | 62995 Z1 Legris 0101 12 13 39 kopp.12mm-BSP1/4 | 4 LEGRIS BANC | 0101 12 13 39 |                | 0101 1 | 23565877 Z1           | Legris 3193 (      | 4 10 ins.t-kop.2x4mm-BSP1/8      | LEGRIS BANC 3193 04 10   |       |
| 24506 RECHTE INSCHROEF 12X3/8"BSP 0101 12 17 LEGRIS    |   | 562996 Z1 Legris 0101 12 17 kopp.12mm-BSP3/8   | LEGRIS BANC   | 0101 12 17    | (B23214351     | 0101 1 | 23565894 Z1           | Legris 3198 (      | 4 10 ins.t-kop.2x4mm-BSP1/8      | LEGRIS NORM 3198 04 10   | B232  |
| 232027 RECHTEINSCHROFF 12X3/8'BSP 0101 12 17 39 LEGR   |   | 562997.71 Learis 0101 12 17 39 konp.12mm-BSP3/ | BI FGRIS BANC | 0101 12 17 39 |                | 0101.1 | 23565696 Z1           | Legris 3149 (      | 4 10 inst.banj.2x4mm-BSP1/8      | LEGRIS BANC 3149 04 10   |       |
|  |   |  |               |               |                |        | 23562977 Z1           | Legris 0101 (      | 8 10 39 kopp.8mm-BSP1/8          | LEGRIS NORM 0101 08 10 3 |       |
|  |   |  |               |               |                |        | 11022564 Z5           | 'VOSS 11012        | 2 Rechte inschroef 10L 3/8""BSP" | BANC                     |       |
|  |   |  |               |               |                |        | 4                     |                    |                                  |                          | ÷.    |
|  |   |  |               |               |                |        | AA Manual Jookun (53) |                    |                                  |                          |       |
|  | Cic Manual lockup (r2)  |  |               |               |                |        |                       |                    |                                  |                          |       |
| 4  |   |  |               |               |                | •      | Φ                     |                    | Create master and link to        | class (F4)               |       |

Fig. 1: The current matching interface used by Mydatafactory.

After the user has selected the source scope, which columns of the local articles the search engine uses to find matches, the search engine searches 30 possible matches per local article. The amount of possible matches can be set in the settings of the program. When the search engine is finished you are presented with the results. The current matching interface (Figure 1) displays these results in four main parts. The first part contains the search queries or local articles (Figure 1 Section 1) and the best match according to the search engine (Figure 1 Section 2). The second part displays

the best match and 29 other alternatives to the selected local article (Figure 1 Section 3). These alternatives can be set as best match by double clicking them. After the user has determined that the local article is matched to the correct master article, he or she can check the box of the corresponding row (Figure 1 Section 4) to confirm the match is correct.

The current interface has several features which help the user match products faster and easier. The interface uses bold highlighted text to quickly show the user the criteria on which a product was found. In Figure 1 bold red, purple and green text can be found. These different colors have different meanings within the interface. Red bold text means there is a match on a unique identification number (UID). This can either be a manufacturer part number, barcode, or some other sort of identification number. Purple bold text means the search engine found a manufacturer or brand name within the local article text. Green bold text means the search engine found some sort of measurement or dimension of an article. Section 3 of Figure 1 also contains not bold colored text, which means those articles (either colored blue or green) are preferred articles by the client of Mydatafactory. The highlighting of these products is determined by the client and therefore different for each client of Mydatafactory.

Many rows also have background colors applied to them, the most obvious being the blue background for local articles and green backgrounds for the best matches. In section 3 of Figure 1 however a red background might occur. The default conditions for the appearance of the red background means the product is matched on a UID as well as a manufacturer or brand name. This default setting can be changed by the user to meet other requirements. If a local and master article meet these set requirements, they are also automatically checked as a correct match by the system.

#### 3.2 Evaluation Experiment

Before an improved interface can be designed and built, it is necessary to know how the current users use the interface. Knowing problems, time consuming processes and other constraints users encounter within the interface, is key during the design process. The experiment consisted of three main parts: a questionnaire, a usability test and an interview.

3.2.1 The Usability test A usability test was used to observe and analyze how a users interact with the matching interface. The usability test was not only meant to determine how the current interface is used, but also to find the problem areas and to find out how users deal with these problem areas. It was a task driven usability test, meaning the participants were given a few predetermined tasks to see how they complete them. During the usability test, the participant was asked to match a list with 25 local articles. These local articles were selected to contain many different types and styles of products. This way every aspect could be examined. During the selection of the local articles, the location of the matching master article was known and it was made sure the locations varied among the 25 master article matches. The user would have to match the local article to the correct master article. During the usability test it was registered how many actions the user had to perform, before finding the correct match. With this data we can help the user by rearranging or re-sizing interface items according to the way they are used and how important they seem to be. For example, if users need to scroll to a certain column often, then it might be useful to bring

it forward. The process of matching one local article to one master article starts when the screen is loaded and stops when the match is made. The next cycle starts immediately after the match was made. To limit the amount of difference between the usability tests, as many factors as possible were kept the same. During every test, the same hardware setup, the same data source and the same search engine were used.

*Eye Tracking*: To get the most out of the usability tests, eye tracking software was used to capture everything the user looks at. This way it is possible to find view patterns, focus points as well as unconscious glances. From these patterns, focus points and glances, could be determined how the user uses the interface. Eye-tracking software by Szymon Deja (Deja 2016), called 'GazeRecorder', was used to track the eyes of the user during the matching process. GazeRecorder uses a simple webcam to track and record what part of the screen the



Fig. 2: Partial screenshot of a heatmap generated by GazeRecorder (Deja 2016) during a test.

user was looking at and then produced a heat map based on this data (Figure 2).



Fig. 3: Picture of the usability test setup when used at Mydatafactory

In order to keep the usability test sessions as constant as possible, every participant used the exact same setup. Since some of the testing took place at Mydatafactory and some at ERIKS, a client of Mydatafactory, at their location in Eindhoven, the entire setup (Figure 3) was brought to Eindhoven to keep most variables constant. The setup consists of a 27 inch monitor connected to a laptop which handled the programs needed to run the matching process and data capturing software and hardware. A web cam placed on top of the monitor recorded the participant's eyes for the eve tracker software. After the pilot test it became clear that a headrest was

needed to keep the participant's head steady in order to improve eye tracking results.

3.2.2 The Questionnaire The questionnaire was meant to give insight into the experience and knowledge the participants had with regard to the interface and the products used in the test setup. Analysis of the answers the participants gave, might provide information about how user friendly and intuitive the interface is. The questionnaire consists of two parts. The first part tries to determine the experience level of the user. The second part tries to capture the user's thoughts and preferences regarding the interface and contained all questions of the System Usability Scale (SUS) (Brooke et al. 1996), a scale which can be used to compare interface designs, combined with additional questions more specific to the interface. The complete questionnaire can be found in Appendix II. 3.2.3 **Interviews** The goal of the interviews was to get feedback directly from the user. The interview enabled the user to elaborate and address parts of the interface that they thought needed improvement or should be left as is. It is possible some of these points might not have been found by the questionnaire or usability test. The interview questions were based on the choices a participant made during the usability test and the questionnaire, therefore there was not a predetermined list of questions.

3.2.4 **Participants** In total there were six participants, all male, three from Mydatafactory and three from ERIKS. One of the participants from Mydatafactory was a novice user. With this user a pilot test was run. From this pilot it became apparent that a headrest was needed to keep the participant's head steady during the usability test, in order to produce better eye-tracking results. The pilot test was not included in the results. From the other five participants, three were very familiar with the interface. They had worked a lot with it and knew its functions very well. From these five participants, the participants from ERIKS use the interface almost on a daily basis.

3.2.5 **Procedure** Every participant did the experiment once and completed it in one go. The experiment started with the first part of the questionnaire, which included the informed consent form and a few experience related questions. When the participant finished the first part, he received information and instructions for the calibration of the eye-tracking setup and the usability test. After this the participant was asked to calibrate the eye-tracker and perform the usability test. When the usability test was completed, the participant was asked to fill out the remainder of the questionnaire, containing the questions specific to the interface design and functioning. During the usability test and the final questionnaire the participant was asked several questions related to choices he made and behavior he showed.

#### 3.3 Results

Analysis of the data should help determining the strengths and weaknesses that the current interface has. When the strengths and weaknesses are known, solutions can be made and the design process can start.

3.3.1 Usability Test In total five usability tests were conducted, with the current interface, including the pilot test. The computed results of the remaining four tests can be found in Table I. As can be seen in Table I it takes 27 seconds on average to match one local article to a master article. Considering the fact that the queries presented to the participants were chosen to contain as many styles and types as possible, meaning the local articles are relatively hard to match, 27 seconds is still a lot of time to match only one product. In those 27 seconds the participants' eyes went an average of 3 times from left to right and 2.5 times from right to left (Figure 2). This may not seem like much, but it results in a viewing distance of 123.6 cm from left to right and 101.2 cm from right to left per product.

From the table it can also be seen that the participants either use the hotkeys to change the match status or use the mouse (the right click menu).

#### Observations

From real-time observations and video reruns, it was noticed that the use of the alternatives list depends of the user and the situation. Some participants tend to

| Participant                         | 1                   | 2                  | 3        | 4                   | Average             |
|-------------------------------------|---------------------|--------------------|----------|---------------------|---------------------|
|                                     |                     |                    |          |                     |                     |
| Match statistics:                   |                     |                    |          |                     |                     |
| Rows Matched                        | 68%                 | 64%                | 68%      | 76%                 | 69%                 |
| Rows Left Open                      | 32%                 | 0%                 | 0%       | 12%                 | 11%                 |
| Rows With Other Statuses            | 0%                  | 36%                | 32%      | 2%                  | 22%                 |
| Manual look-up used                 | 8%                  | 24%                | 4%       | 12%                 | 12%                 |
|                                     |                     |                    |          |                     |                     |
| Time:                               |                     |                    |          |                     |                     |
| Duration Matching                   | 00:05:23            | 00:13:48           | 00:11:57 | 00:14:01            | 00:11:17            |
| Duration in Manual Look-up          | 00:01:31            | 00:03:12           | 00:00:08 | 00:03:06            | 00:01:59            |
| Duration in Matching Interface      | 00:03:52            | 00:10:36           | 00:11:49 | 00:10:55            | 00:09:18            |
| Average Duration/Match              | 00:00:13            | 00:00:33           | 00:00:29 | 00:00:34            | 00:00:27            |
|                                     |                     |                    |          |                     |                     |
| Eye-tracking:                       |                     |                    |          |                     |                     |
| Number of Left to Right (L-R) Gazes | 38                  | 70                 | 118      | 83                  | 77,25               |
| Number of Right to Left (R-L) Gazes | 28                  | 55                 | 101      | 69                  | 63,25               |
| Average L-R/Match                   | 1.52                | 2.8                | 4.72     | 3.32                | 3.09                |
| Average R-L/Match                   | 1.12                | 2.2                | 4.04     | 2.76                | 2.53                |
| Total Distance                      | $2640 \mathrm{cm}$  | $5000 \mathrm{cm}$ | 8760cm   | $6080 \mathrm{cm}$  | $5620 \mathrm{cm}$  |
| Distance/Match                      | $105.6 \mathrm{cm}$ | $200 \mathrm{cm}$  | 350.4cm  | $243.2 \mathrm{cm}$ | $224.8 \mathrm{cm}$ |
| Times Horizontally Scrolled         | 0                   | 14                 | 0        | 2                   | 4                   |
|                                     |                     |                    |          |                     |                     |
| How status was changed:             |                     |                    |          |                     |                     |
| Double clicking Alternative Match   | 52%                 | 24%                | 68%      | 36%                 | 45%                 |
| Manual Look-up Match Result         | 0%                  | 16%                | 0%       | 2%                  | 9%                  |
| Pre matched                         | 16%                 | 16%                | 16%      | 16%                 | 16%                 |
| Checkbox Checked                    | 0%                  | 8%                 | 0%       | 12%                 | 5%                  |
| Right Click Menu Used               | 0%                  | 36%                | 0%       | 8%                  | 11%                 |
| F-shortkey Used                     | 0%                  | 0%                 | 28%      | 12%                 | 1%                  |
| Clicked Next Row                    | 44%                 | 16%                | 4%       | 12%                 | 19%                 |

TABLE I: Statistics generated from the usability test

use the entire alternative list, when asked they said they did it because it was there already, so they might as well use it. While others simply relied on the search engine to locate the correct one within the first five results, assigning another status such as NIG (Niet In Gamma, not in product range),

There was also a very particular way the participants were looking back and forth between the local articles and the matched master articles. They start with a fixation on the local article, probably trying to remember the name and the numbers listed, then they switch to the matches trying to locate those name and numbers. When the data they are looking for is not highlighted or within the first 3 or 4 alternatives, the 'ping-ponging' starts: they focus on the alternatives and quickly go back and forth between the local article and the master articles, re-remembering the initial data. The act of going back and forth and then re-remembering the data, is likely to be a tedious and mentally demanding task.

3.3.2 **Questionnaire** The Questionnaire indicated that all the participants are users with more than half a year of experience and they all are familiar with the interface and its behavior. The questionnaire also produced a SUS score (Brooke et al. 1996), a subjective score, between 0 and 100, giving a rough indication of the usability of a system or interface. This SUS score (Table II) can later be compared to the SUS score of the prototype. Comparing the scores will conclude if the interface is actually improved.

Further analysis of the questionnaire indicated that for the current interface:

- The use of color for both background and highlighting was preferable and might even be extended to include more.
- All the participants indicated that sufficient information was present in the interface, but three participants thought they had to perform too many actions to find the relevant information.
- They had sufficient knowledge and once matches were made, all four participants were confident about their choices.
- All sections of the interface were easily identified.
- Text in all sections was neither easy nor hard to read.

The other questions of the questionnaire were related to possible new functionality. The functionalities that received positive feedback were illustrated in with more detail in the mock-ups (section 6) and some later implemented in the prototype (section 8).

3.3.3 **Interviews** The interviews were the most helpful part of the experiment. They gave the participants the opportunity to give their own suggestions about improvements. From a preliminary talk with two users from ERIKS it became very clear that the

| Participant | 1    | 2    | 3    | 4    |
|-------------|------|------|------|------|
| SUS Score   | 52,5 | 42,5 | 62,5 | 57,5 |

TABLE II: SUS score each participantgave the interface

usability problems the current matching interface has, are being worked around or optimized in ways the interface is not intended to be used. At their company they first apply filters to create small batches of queries with similar attributes. These filtered products are then matched, after which they apply different filters to create the next batch of products.

In addition to this short conversation there were individual interviews with the participants and a group session with the participants from ERIKS. Since the points mentioned in both the individual interviews and the group session are overlapping they are combined into one list. Although most of these suggestions are new and might improve the matching process, some of these suggestions could be seen as bug-fixes and consistency issues.

#### New suggestions

- One single value causes an entire column to be shown. This creates a lot of empty space, resulting in large view distances.
- Matches made while a filter was in place, might show up later in the matching process. Hiding these matches is preferable.
- A possibility to select multiple rows in order to change the status of those rows at the same time, would be useful.
- Unable to copy the data in the table cells.
- The blue text color in the alternatives section has no added value. The amount of blue makes the black text pop out, also not desired.
- Quick filter at the top of the alternatives list, allowing the user to search through the 30 alternatives for a specific word or id.
- A Google shortcut to find specifications of the product would be appreciated.
- Saving the progress made takes too much time. After save the search needs to

be rerun in order to continue matching. Not saving might result in progress loss as well, when the connection is lost or interrupted.

- The pre-matched results should not be saved in between saves, if they have not yet appeared to the user
- Rerun the search on a small selection, with adjusted parameters

#### Bugs

- Emptying a filter after it was used hides all the data and requires a new search initiation to reappear.
- The interface is lagging when a lot of check boxes are checked in a short time, probably because the alternatives list is updating.
- Color all instances of the 'matched on' data.

#### **Consistency Issues**

• Automatically going to the next line when the status of a product is changed to something other than 'Match', currently only happens when the status is set to 'Match'.

#### Other comments

These were also found during the conversation and are useful for Mydatafactory, but outside the scope of this project.

- When selecting the source scope, selecting which columns of the local article data should be used by the search engine, it is unknown how many values a certain column has. It is desired to know these values.
- The persistent search queries in the manual look-up are useful.
- Adding a preferred brand to the search parameters.

The suggestions above were raised by the participants them selves, this means that these suggestions and issues are very present during the matching process. If these would be implemented or resolved it would mean an increase in usability and possibly speed for the user.

#### 4 LITERATURE

In order to design the best prototype possible, a literature study was done into several aspects of a search and matching interface, as well as interface design in general and the effects of color and text font when reading text off a screen. This literature study was then used as a guideline during the design of the new interface. When searching for and comparing data in a digital environment, there are certain these guidelines can support the user with his/her task.

#### 4.1 **Tables**

It is shown that when it comes to tables and table searches, lines separating columns and rows can influence reading and information retrieval speed (Wu and Yuan 2003). It was found that, depending on the search direction, lines can help improving search speed. If the search goes column by column, then there should be lines between the columns, if the search goes row by row, then there should be lines between the rows. When the search can go both ways, there should not be any separating lines.

#### 4.2 Text

Since the matching interface is a text based interface, it is useful to know which typeface, typeface size and color combination is optimal to increase reading speed and comprehension of the data. Garcia and Caldera (1996) investigated the effects of typefaces and typeface sizes on reading speed. They concluded that typeface Arial at 12 characters per inch (cpi) provided the best results, although it was not always the preferred choice.

According to Wu and Yuan (2003) reading speed is higher when foreground luminance is lower than the background luminance (FL < BL), but the visual preferences of the participants was higher for higher foreground luminance with lower background luminance (FL > BL). This means that the lightness of the background color should be lighter than the color of the text for faster reading speed, but the other way around is preferred by the participants of Wu and Yuan's test.

Implementation of these guidelines into an improved interface might improve the reading and searching speed of the user. For the interface of Mydatafactory this would mean three things: The table sections which contain the data should have separating lines between the rows, since the interface of Mydatafactory uses a row by row search. The luminance of the color of the tables should be higher that of the color of the data in the table. The data within the table should be presented in Arial at 12 cpi.

#### 5 REQUIREMENTS

There are certain requirements that the new interface should fulfill. Mydatafactory would like the new interface to be more efficient and faster in use. The new interface should be easy and intuitive to use, yet still contain all the options and features of the current interface, such as sorting and color highlighting, since different users use different features. Also new features could be implemented, if they speed up the product matching process. The requirements listed here are a combination of requirements from Mydatafactory and requirements found through testing and interviews.

#### Requirement 1:

The interface should be able to display all relevant attributes in a understandable and clean way.

**Requirement 2:** The interface should allow the user to quickly see where and on which data(type) a product is matched.

**Requirement 3:** The interface should bring the number of steps and actions it takes to find and match to the local article with a product down to a minimum.

**Requirement 4:** The interface should reduce the amount of time the user needs to match a product.

**Requirement 5:** The interface should reduce the amount of effort needed from the user as much as possible.

**Requirement 6:** Behavior of the interface should be as expected by the user.

**Requirement 7:** Response times of the interface should be fast, or the interface should let you know it is busy.

#### 6 MOCK-UPS

This chapter discusses several matching interface mock-ups. Mock-ups are a visual representation, sometimes with a little functionality, of an idea or design. The mock-ups are meant to give the user a better understanding of certain ideas and functions. The mock-ups discussed in this section are based on the results of the first usability tests conducted at Mydatafactory, recommendations and requirements from Mydatafactory and own ideas. They were later shown to the participants of the last three usability tests right after they completed their tests at ERIKS. Feedback from the participants was gathered by asking them what they thought about the



Fig. 4: Partial screen shot of mock-up 1 Suggested Functionality

ideas and functionality proposed in the mock-ups. The feedback received from the three participants is also included in this section. Full images of the mock-ups can be found in appendix IV.

#### 6.1 Mock-up 1: Suggested Functionality

#### • Description

Mock-up 1 does not feature any layout changes (Figure 4). The functionality consisted of the 'Pop-up Query', which shows the local article data underneath the mouse when the mouse hovers over the master article data, individual scroll bars for the three sections and an easier way to organize and show or hide columns. What each functionality does exactly is explained in more detail in section 7.

#### • Feedback From Participants

The proposed functionality was well-received by the participants. They were very excited about the pop-up functionality, since it has the potential to significantly decrease the time and effort needed to match products. The individual scrolling sections was not something they had thought of themselves before, but when explained to them they agreed it would be a welcome improvement. The simplifying of column sort and hiding is very useful according to the participants, but the way proposed in the mock-up, via an additional menu, might not be the way to go, since it uses another menu and there are already enough menus. A better way to achieve this functionality might be a drag and drop method, dragging the column to its preferred location.

#### 6.2 Mock-up 2: Interchanging Columns

#### • Description

This mock-up explores the possibility of interchanging columns. Since the local data is mapped to the same column headers as the master data, it is possible to interchange them. Meaning the first column in the table would be the

'Description 1 NL' from the local data, with next to that the 'Description 1 NL' from the master data or best match. This continuous until all columns are displayed. See Figure 5 for a partial screen shot of the mock-up.

# • Feedback From Participants

The first reaction of the participants showed interest in the concept, but when they started to think about it a little bit more, they all agreed it probably would not work as well as the current layout. They thought it would easily confuse, since the two distinct sections, local articles and master articles, are now mixed.

| AR' | ARTNR    | DESCRIPTION 1 NL                            | DESCRIPTION 1 NL                        |
|-----|----------|---|---|
| 100 | 23586101 | OLIEKEERRING 40-65-10                       | Motip 4065 vinylspray 400ml wit         |
| 101 | 23766420 | Nokrol KR52B                                | Kurverol KR 52 B                        |
| 102 | 23446629 | FACOM SET VOOR BINNEN-BUITENBORGVEREN       | Facom u.306j1 set binnen/buitentrekkers |
| 103 | 12577674 | Oliekeerring DIN3760 A NBR d15xD32xB7       | Brochuredisplay A4 H240xB230xD32        |
| 104 | 10041043 | TRILLINGSDEMPER 30X20 B /55SH M. 8X27       | Trillingsdemper B 30x20 M8 NBR          |
| 105 | 23951740 | VIS A SIX PANS CREUX 8.*8 912* - M 12 X 80  | Legbord M. Steunconsole 1000X300 Mm Li  |
| 106 | 12728878 | V-RIEM STANDARD ULTRAFLEX SPB 3800 (B=16    | V-riem SPB3800 Red Power 3              |
| 107 | 23441699 | Lager 6207 2rs                              | Lager (hk) 6207-2rs                     |
| 108 | 11575908 | 601112118 Mini-bolkraan 2/2 (v/v), 1/8'     | mini-kogelkraan 601112118 G1/8          |
| 109 | 23604658 | LAGER 6007 ZZ                               | Lager nsk 6007zz                        |
| 110 | 23793172 | DIN916 04X16 A2                             | Ophangbeugel voor reddingsboei          |
| 111 | 11788780 | spanbus din 7343 3x20                       | DIN7343 veerstaal 3x20 /1000            |
| 112 | 12083961 | BUS MB2030DU                                | Glijlager mb 2030 DU-H                  |
| 113 | 12306841 | RL.NANO1PB 1/4" doppenset 6-kant +ratel FAI | Doppenset compact rl.nano1pb 1/4'       |
| 114 | 23827551 | din 7991 6x16 zn                            | Ds bout DIN933 zn 8.8 6x16              |
| 115 | 23374590 | DIN 315 Fluegelmutter M16 Temperg.verz      | Din315 mni vleugmoer m16 /20            |
| 116 | 23781500 | VERLENGSTUK VOOR DOPPEN 1/2'"' 250 N        | Stahlwille 12250 metalen oliekan        |
| 117 | 23574753 | O-RING 4P.*400295* 18,64 X 3,53             | Manner Ike-100 iat                      |
| 118 | 23573471 | MAKITA A-87367 RESERVELAMP TBV.ML122,123    | Makita a-87367 buislamp ml122           |
| 119 | 12612458 | SKF SCREW PLUG M10X1 406-011                | Stop m10x1 406-011                      |

Fig. 5: Close-up of mock-up 2 Interchanging Columns

| ARTNR  | DESCRIPTION 1 NL  | MANUFACTURER NAME   | MANUFACTURE   | DESCRIPTION 2 NL                        |
|--------|---|---------------------|---------------|---|
|        | ARTNR   | DESCRIPTION 1 NL    | ARTSTAT       | POSTYPE                                 |
| 100    | OLIEKEERRING 40-65-10   |                     |               |   |
| 235861 | Motip 4065 vinylspray 400ml wit                                 | Z1                  | BANC          | MOTIP                                   |
| 101    | Nokrol KR52B  | SKF                 | SKF KR 52 B   | SKF KR 52 B                             |
| 237864 | Kurverol KR 52 B  | Z1                  | BANC          | SKF                                     |
| 102    | FACOM SET VOOR BINNEN-BUITENBORGVEREN 470 / / / GAGF004400.     |                     |               |   |
| 234466 | Facom u.306j1 set binnen/buitentrekkers                         | Z1                  | BANC          | FACOM                                   |
| 103    | Oliekeerring DIN3760 A NBR d15xD32xB7                           |                     |               |   |
| 125776 | Brochuredisplay A4 H240xB230xD32                                | Z5                  | BANC          | BRADY                                   |
| 104    | TRILLINGSDEMPER 30X20 B /55SH M. 8X27                           | TRELLEBORG INDUSTRI | 4669*TDB3020M |   |
| 100410 | Trillingsdemper B 30x20 M8 NBR                                  | Z5                  | BANC          | UNSPECIFIED                             |
| 105    | VIS A SIX PANS CREUX 8.*8 912* - M 12 X 80 - ZN                 |                     |               |   |
| 239517 | Legbord M. Steunconsole 1000X300 Mm Lich                        | Z5                  | BANC          |   |
| 105    | V-RIEM STANDARD ULTRAFLEX SPB 3800 (B=16,3)CONTI                |                     |               |   |
| 127288 | V-riem SPB3800 Red Power 3                                      | 25                  | BANC          | OPTIBELT                                |
| 107    | Lager 6207 2rs  |                     |               |   |
| 234416 | Lager (hk) 6207-2rs   | Z1                  | BANC          | UNSPECIFIED                             |
| 108    | 601112118 Mini-bolkraan 2/2 (v/v), 1/8"                         | NORGREN             | 601112118     |   |
| 115759 | mini-kogetkraan 601112118 G1/8                                  | Z1                  | BANC          | NORGREN                                 |
| 109    | LAGER 6007 22   |                     |               |   |
| 236046 | Lager nsk 6007zz  | Z1                  | BANC          | NSK                                     |
| 110    | DIN916 04X16 A2   |                     |               | stelbout imbus M4x16 mm zonder kop inox |
| 237931 | Ophangbeugel voor reddingsboei                                  | Z5                  | BANC          | UNSPECIFIED                             |
| 111    | spanbus din 7343 3x20   |                     |               |   |
| 117887 | DIN7343 veerstaal 3x20 /1000                                    | Z1                  | BANC          | FAST-X                                  |
| 112    | BUS MB2030DU  |                     |               |   |
| 120839 | Glijlager mb 2030 DU-H  | 25                  | BANC          | UNSPECIFIED                             |
| 113    | RLNANO1PB 1/4" doppenset 6-kant +ratel FACOM / RL.NANO1 / / 200 |                     |               |   |
| 123068 | Doppenset compact rl.nano1pb 1/4'                               | Z1                  | NORM          | FACOM                                   |
| 114    | din 7991 6x16 zn  |                     |               |   |
| 228275 | De houe DING23 yes 0.0 Gu16                                     | 75                  | CDI A         | INSPECIEIED                             |

Fig. 6: Close-up of mock-up 3 Interchanging Rows

# 6.3 Mock-up 3: Interchanging Rows

#### • Description

This mock-up is similar to the interchanging column mock-up, with the minor difference that this mock-up interchanges the rows. Meaning it first shows the entire row of the local article, then the entire row of the best matching master article, after which a new local article row is shown (Figure 6).

# • Feedback From Participants

This mock-up was immediately shot down, none of the participants liked it, they all thought the interchanging rows would only lead to confusion and more human error since there is no clear sectioning.

# 6.4 Mock-up 4: Slow Matching

# • Description

For the harder to match products it might be useful to change the layout of the screen. With the harder to match products, the emphasis is on the local article, the alternative section and the manual look-up function. Giving these a more prominent place in the interface might speed up the process. This mock-up shows such an alternative layout, placing the alternative section underneath the local article section and best matches (Figure 7), instantly reducing the distance between the local articles and the alternative master articles. The downside is that there are fewer alternative master articles showing without the user needing to scroll. It is possible to counteract this by allowing the alternative section to be pulled up until it reaches the top row (Figure 8) leaving only the current task visible. When the status of the local article changes, it should automatically go to the next one, showing only that one at the top.

### • Feedback From Participants

The participants liked this idea a lot, especially when during the discussion it came up to make this interchangeable with (a variation on) the current layout, which is more suitable for the fast matches.



Fig. 7: Image of mock-up 4 Slow Matching, Alternatives Down



Fig. 8: Image of mock-up 4 slow Match, Alternatives Up

#### 7 Suggested Interface Improvements

From the analysis of usability tests, questionnaires, interviews and conversation with the participants from ERIKS about the mock-ups, several problems with the interface could be identified. These problems can be divided into three main categories: 'space and layout problems', 'workflow problems' and 'consistency problems'. In order to improve the matching interface and process, these problems need to be solved. In this chapter these problems and their suggested solutions will be discussed.

| FACT | MANUFACTURER   | DESCRIPTION 1 NL                                | Sta |   | DESCRIPTION 1 NL                          | ARTSTAT | POSTYPE | MANUFACTU   |
|------|----------------|---|-----|---|---|---------|---------|-------------|
|      |                | OLIEKEERRING 40-65-10                           | Ne  |   | Motip 4065 vinyispray 400ml wit           | Z1      | BANC    | MOTIP       |
| R 52 | SKF            | Nokrol KR52B                                    | Ne  | Z | Kurverol KR 52 B                          | Z1      | BANC    | SKF         |
|      |                | FACOM SET VOOR BINNEN-BUITENBORGVEREN 4         | Ne  |   | Facom u.306j1 set binner/buitentrekkers   | Z1      | BANC    | FACOM       |
|      |                | Oliekserring DIN3760 A NBR d15xD32xB7           | Ne  |   | Brochuredisplay A4 H240xB230xD32          | Z5      | BANC    | BRADY       |
| DB3( | TRELLEBORG INI | TRILLINGSDEMPER 30X20 B /55SH M. 8X27           | Ne  |   | Trillingsdemper B 30x20 M8 NBR            | Z5      | BANC    | UNSPECIFIEI |
|      |                | VIS A SIX PANS CREUX 8.*8 912* - M 12 X 80 - ZN | Ne  |   | Legbord M. Steunconsole 100000300 Mm Lich | Z5      | BANC    |             |
|      |                | V-RIEM STANDARD ULTRAFLEX SPB 3800 (B=16,3      | Ne  |   | V-riem SPB3800 Red Power 3                | Z5      | BANC    | OPTIBELT    |
|      |                | Lager 6207 2rs                                  | Ne  |   | Lager (hk) 6207-2rs                       | Z1      | BANC    | UNSPECIFIEI |
| 118  | NORGREN        | 601112118 Mini-bolkraan 2/2 (v/v), 1/8"         | Ner |   | mini-kogelkraan 601112118 G1/8            | Z1      | BANC    | NORGREN     |
|      |                | LAGER 6007 ZZ                                   | Ne  |   | Lager nsk 6007zz                          | Z1      | BANC    | NSK         |
|      |                | DIN916 04X16 A2                                 | Ne  |   | Ophangbeugel voor reddingsboei            | Z5      | BANC    | UNSPECIFIEI |
|      |                | spanbus din 7343 3x20                           | Ne  |   | DIN7343 veerstaal 3x20 /1000              | Z1      | BANC    | FAST-X      |
|      |                | BUS MB2030DU                                    | Ne  |   | Glijager mb 2030 DU-H                     | Z5      | BANC    | UNSPECIFIEI |
|      |                | RLNANO1PB 1/48quot doppenset 6-kant +ratel FACC | Ne  |   | Doppenset compect rl.nano1pb 1/4"         | Z1      | NORM    | FACOM       |
|      |                | din 7991 6x16 zn                                | Ne  |   | Ds bout DIN933 zn 8.8 6x16                | Z5      | ERLA    | UNSPECIFIEI |
|      |                | DIN 315 Fluegelmutter M16 Temperg.verz          | Ne  |   | Din315 mni vleugmoer m16 /20              | Z1      | BANC    | FAST-X      |
|      | FACOM          | VERLENGSTUK VOOR DOPPEN 1/2' 250 MM FACO        | Ne  |   | Stahlwille 12250 metalen oliekan          | Z1      | BANC    | STAHLWILLE  |
|      |                | O-RING 4P. 400295 18,64 X 3,53                  | Ne  |   | Manner Ike-100 lat                        | Z9      | BANC    | MANNER      |
| 17   | MAKITA         | MAKITA A-87367 RESERVELAMP TBV.ML122,123        | Ne  |   | Makita a-87367 buislamp ml122             | Z5      | BANC    | MAKITA      |
| 1    | SKF            | SKF SCREW PLUG M10X1 406-011                    | Ne  |   | Stop m10x1 406-011                        | Z5      | BANC    | VOGEL SKF   |
|      | LOCTITE        | PAKKINGKOORD // 55                              | Ne  |   | Loctite 55 afdichtingskoord 150meter      | 29      | BANC    | LOCTITE     |
|      |                | GOUPILLLE CONIQUE 18 - 6 X 60 BL                | Ne  |   | DIN1b staal 6x60 /50                      | Z1      | BANC    | FAST-X      |
|      |                | courrole A68 1755mm                             | Ne  |   | Courrole phg a68                          | Z5      | BANC    | SKF         |
|      | BAHCO          | SCHROEFSLEUTEL ERGO 9071 - 8' BAHCO             | Ner |   | M2,6x0,45 HSS-E JIS B-4430 (90718)        | Z1      | BANC    | VOLKEL      |
|      |                | BOOR CIL, DIN338 RN diameter 10 mm              | Ne  |   | Boor cil. din 338 hss 10,30mm             | Z1      | BANC    | GUHRING     |

#### 7.1 Space and Layout Improvements

The suggested improvements listed here either change the layout of the interface or optimize the use of screen space within the interface.

Fig. 9: Illustration of the fast layout design

#### Multiple Layouts

• Problem

Based on interviews and conversations with users of the matching interface, it became clear that there are two types of matching modes, fast matching and slow matching. First there are the easy matches. These matches can be checked very fast. Beside these there are the slow matches. These matches are either matched incorrectly by the engine, need more information or cannot be matched because there is no product for them. These matches take more time and effort to go through.

These two matching modes each require a different approach. The fast matching relies heavily on the local article section and the best matched master article section of the screen, while the slower matching relies more on the local article section, the alternative section and the manual look-up. Since the two different modes utilize different parts of the screen, it makes sense to reorganize the screen based on the type of matches being made.

#### • Fast match layout

The fast match layout is mainly focused on the local article and best match section. It will minimize all the other components on the screen to minimize distractions. To speed up the matching process as much as possible, the order of the local article columns might be reversed. By doing so the distance between the columns containing the most valuable information decreases, such as 'Description 1 NL' which is the main description of both local and master articles, allowing for less back and forth looking and faster matching (Figure 9).

#### • Slow match layout

The slow matching layout mainly focuses on the local article section and the alternative section combined with the manual look-up function. Since the best match section is not important, and most likely incorrect, in this matching stage, it would be useful to hide or minimize it, removing the distraction it might cause. A suggestion might be to move the alternative section under the first line of the local article section (Figure 7 & Figure 8). This reveals the full width of the alternative section and all the information it contains. It also reduces the distance between the description of the local article and the description of the alternatives.

# Hide empty columns based on page

# • Problem

The current interface hides empty columns, but only across all search results. The downside is that, when there is one value in the entire column, the column is shown on every page, resulting in valuable screen space being lost on almost every page.

# • Possible Solution

Checking for and hiding empty columns on a page to page basis reduces the use of space on pages where the column would be empty, while still showing the information when necessary and keeping the structure of the information intact.

# Independent scrolling of local article and master article sections

# • Problem

With the current interface the local article and the best match section vertically and horizontally scroll as one. Only vertical scroll is desired by the users, since this keeps the rows correctly aligned. Horizontal scroll however is not preferable. When you horizontally scroll the best match section to view additional attributes, the local article section should remain stationary in order to check the values against each other.

• Possible Solution

Make both the local article section and best match section independently scrollable; this way not only the local article section will remain on screen when scrolling, but also allows for better positioning of the best match section.

# Hide validated rows

• Problem

The current interface keeps showing validated products in a grayed out state when filters are applied. This also works the other way around: when products are validated with a filter in place, after removal of the filter the validated product remains visible in a grayed out state. These grayed out products use space that could also have been used to display other products. Currently these products can only be hidden by rerunning the matching process, which, depending on the number of queries, could take up a lot of time.

#### • Possible Solution

Hide validated products when a filter is changed or the user navigates to the next page.

#### Hide excessive cell content and show on mouse over

### • Problem

Most of the time the values in the cells are short and concise, however sometimes they are very long and take up a lot of space when the column stretches to fit the text, leaving a lot of unused space above and below that particular cell. It also forces the user to manually shrink the column width because of one cell value, simultaneously hiding its information (Figure 10)

# • Possible Solution

Showing the information on mouse over, will minimize the loss of space, remove the time needed to re-size the columns but still have all the data present when needed. This saves space while all information is still easily accessible when needed (Figure 10).

| <br>             |              |            |
|------------------|--------------|------------|
| <br>hidden exces | sive content |            |
| <br>Lorem ipsu   |              |            |
| Characteristics  |              |            |
| <br>Snown exces  | sive content |            |
| Lorem ipsu       | m dolor sit  | amet, cons |
|                  |              |            |

Fig. 10: Illustration of hiding and showing of the excessive cell content.

| Glijlager mb 20              |   | BANC |      |      |
|------------------------------|---|------|------|------|
| Doppenset con                | Z1  |      | NORM |      |
| Ds bout DIN93                | Z5  |      | ERLA |      |
| Din315 mni vle               |   |      |      | BANC |
| Stahlwille 1225              | From Query:<br>FACOM RL FACOM<br>RL.NANO1PB |      |      | BANC |
| Manner Ike-10                |   |      |      | BANC |
| Makita a-8736                |   |      |      | BANC |
| Stop m10x1 406-011 Z5        |   |      |      | BANC |
| Loctite 55 afdi              |   | BANC |      |      |
| DIN1b staal 6x60 /50 Z1      |   |      |      | BANC |
| Courroie phg a68 Z5          |   |      |      | BANC |
| M2,5x0,45 HSS                |   | BANC |      |      |
| Deep all die 000 has 40 00mm |   |      |      | DANO |

Fig. 11: Illustration of the pop-up function.

# 7.2 Workflow Improvements

The suggested improvements in this section are aimed at supporting the user by reducing the number of actions needed to validate a match, automating or simplifying tedious tasks and speeding up the general matching process.

# Pop-up Query

• Problem

From the eye-tracking results it was found that the user often goes back and forth between the local article section and the best match section or alternative section. The user is checking and rechecking the local article values against the matches.

• Possible Solution

Bringing the local article to the other side of the screen in the form of a pop-up (Figure 11), could reduce the viewing distance and time needed to validate a match. This pop-up would follow the mouse cursor and show the local article data with highlighting (Figure 11).

# Autosave

# • Problem

Currently the matches are only saved when the save button is pressed. When the connection to the application is lost or interrupted all matches that have been made are lost. Although internet connections are quite stable at the moment, any interruption could cause this to happen, resulting in loss of data and loss of time.

# • Possible Solution

Implementation of autosave function either after every status change, page change or every few minutes, would resolve this issue.

# Google/catalog search button

• Problem

Sometimes a user does not know what product or type of product is being matched. During an interview it was suggested a search button might help. This button would open a browser window and search the local article data either on Google, or the company catalog.

• Possible Solution

Incorporate a button which automatically launches a local article related Google or catalog search.

# Auto/fast fill manual look-up and filters

# • Problem

When users are performing a manual look-up for a local article, they manually type text in the search fields. Most of the time, the text they typed in the search fields is the same as parts of the text in the local articles. This makes the act of filling in the search fields a very tedious and unnecessary job.

# • Possible Solution

A auto or fast fill function for the manual look-up fields. If the user is able to select (parts of) the local article and then drag and drop or use a hotkey to fill the search field with those selected parts of the local article, it would speed up this process. This method could also be used to enter values into the filter areas.

# Select to filter

# • Problem

The same sequence of actions as described above can be used to initiate quick filters. Sometimes the user gets a local article with a very specific attribute. If this attribute is missed by the matching engine, the user can decide to filter the alternatives list first rather than performing a manual look-up.

# • Possible Solution

Selecting a crucial part of the local article to initiate a string search through the alternatives list could result in faster matching.

# Clear search fields button

### • Problem

When asked, the participants from ERIKS stated that it was a good thing that the search fields remained filled; this fits in their work flow of batch processing. Many of the same types of products are matched in sequence, only a detail differs, therefore the manual look-up entries more or less stay the same. However sometimes it is necessary to empty the search fields, and a button would save time in this instance.

# • Possible Solution

Add a button or hot key which does this for the user or select the entire contents of the search field when it is activated.

# Bulk value change

# • Problem

Especially with the fast matches the user can often validate a lot of rows in the same way. From the interview it became apparent that rather than checking and changing the status, the user prefers to check many rows and then change them all. With the current interface this results in a very long response time, since for every status change the interface loads the next alternative list

# • Possible Solution

Adding support for row selection and multiple status changes based on that section.

# Show number of values on source scope selection

# • Problem

The source scope selection determines which columns for the local article data are used when searching for master articles. During the interviews it was mentioned that it was impossible to know how many values a certain column contained before running the matching engine. Knowing these values might help the users when choosing which columns to use for the matching engine.

# • Possible Solution

Since the data source is chosen before the matching interface is entered, it should be possible to display the number of values per column when the user is determining the source scope.

# Be allowed/able to copy info in the cells

# • Problem

Currently it is impossible to select and/or copy data displayed in the matching interface.

# • Possible Solution

Enable copying of data. This can be used to fill search fields, perform Google or catalog searches, or other tasks if the previous mentioned functionality fails or is not desired.

#### 7.3 Consistency Improvements

Consistency improvements are improvements to already existing functionality or features. The existing functionality or features mentioned here are very useful, but incomplete.

#### Go to next row on status change

#### • Problem

This function is already partially implemented. When a match is made, either via the check box, double clicking an alternative match or manual look-up, the interface automatically goes to the next row. From the interviews it became apparent that this behavior is also desirable when the status is set to other values such as: MIN (More Information Needed) or NIS (Niet In SAP, meaning the product should be available, but it is not found). The different statuses can be set by using hotkeys and a right-click menu. In both instances it should jump to the next row

### • Possible Solution

Expand this functionality to include status changes via hotkeys or the right click menu.

#### Report button for bad data

#### • Problem

This button is specifically aimed at the master data (the data against which the queries are matched). When mistakes in this data are found, they need to be corrected. Mistakes in the master data need to be reported to Mydatafactory. A report button could be used to mark this particular piece of data and allow the user to continue matching. The mistakes can then be sent to Mydatafactory every few days to be corrected

• Possible Solution

A button at the end of every master data row which would add the necessary data to a file or data, which would then be sent to Mydatafactory.

#### Color all instances of the 'matched on' string

• Problem

Currently only one instance of a part of text the products are matched on is highlighted through color.

• Possible Solution

Color highlight all instances of the 'matched on'. This will result in faster validation of the match, since currently most of the highlighted instances are at the end of the row, probably due to reverse order highlighting, meaning the highlighting starts at the last column and only highlights one instance.

#### Empty filter shows all results

• Problem

The filters above the local articles are of great help to the user, a current bug however results in hiding all data when a filter is emptied and simultaneously removing the filter. Only a rerun of the matching engine would make them reappear.

#### • Possible Solution

Fix this bug by having all the unvalidated local articles reappear.

The suggestions given in this chapter are based on the results of the usability test, interviews and questionnaires. Although some of these suggestions are outside the scope of this project, they are still valuable for Mydatafactory and might be tested later, as part of future work. The suggestions that are inside the scope and can be tested using the current test setup, were implemented in the prototype.

#### 8 The Prototype

The prototype is meant to test if the findings from the tests, interviews, questionnaire and other sources discussed in chapter 7 actually work and improve the matching process. Since Mydatafactory has ambitions to move to a web application, it was chosen to build a web-based prototype. It also became apparent that Mydatafactory was looking into KnockoutJS as a Javascript framework for the interface. For that reason knockoutJS was used for the implementation.

#### 8.1 Prototype Description

Since not all functionalities mentioned in chapter 7 are relevant or can be tested using the usability tests conducted for this project, not all functions have been implemented into the prototype.

Functionality that has been implemented:

- Multiple Layouts
- Hide empty columns based on page (For the test the empty columns were removed manually, since it concerns a small dataset)
- Independent scrolling of local article and master article sections
- Hide excessive cell content and show on mouse over
- Pop-up Query
- Select to filter
- Be allowed/able to copy info in the cells
- Go to next row on status change
- Color all instances of the 'matched on' string
- Empty filter shows all results

The following functionalities have not been implemented in the prototype, since they do not directly influence the usability tests or can't be tested using the current setup:

- Hide validated rows. This functionality is meant to prevent the displaying of validated rows when filters are in place or removed. However filter functionality does not exist in the prototype. It is useless since there is only one page to match. Since there is no filtering there is also no need to hide validated rows.
- Autosave. This functionality is meant to prevent data loss in case of connection failure. The prototype is hosted locally, meaning there is no connection to a server. So there is no risk of data loss.
- **Google/catalog search button**. Searching for products other than the given options is out of the scope of this project.
- Auto/fast fill manual look-up and filters. Manual look-up is not present in the prototype.
- Clear search fields button. This is meant for manual look-up search fields, but manual look-up is outside the scope of this project and therefore not present in the prototype.
- Bulk value change. This is meant for pages where (almost) all rows can be validated very quickly. From the chosen test data, it is certain that this will not happen during the test. The local articles were selected because of their complexity, therefore the possibility of a user matching them quickly enough to consider bulk status change is very unlikely, as could also be seen during the usability test of the current interface.

- Show number of values on source scope selection. No scope can be selected within the prototype.
- **Report button for bad data**. Although the test data might have contained mistakes, it would not have been useful to use this function during such a small usability test

| NL       | MANUFACTURER PN    | MANFACTURER NAME        | DESCRIPTION 1 NL                    | #    | ART NR     | DESCRIPTION 1 NL                | MANFACTURER NAME | MANUFACTURER PN    | MANUFACTURER CATE | ART NR   | DESCRIPTION 1 NL                  | MANFACTURER NAME | MANUFACTURER PN M |
|----------|--------------------|-------------------------|-------------------------------------|------|------------|---------------------------------|------------------|--------------------|-------------------|----------|-----------------------------------|------------------|-------------------|
|          |                    |                         | OLIEKEERRING 40-65-10               | 1 0  | 23586101M  | Antip 4065 vinylspray 400ml wit | MOTIP            | 04065              |                   | 23586101 | Motip 4065 vinylspray 400ml wit   | MOTIP            | 04065             |
| KR 52 B  | SKF KR 52 B        | SK                      | Nokrol KR52B                        | 2    | 23766420   | Curverol KR 52 B                | SKF              | KR 52 B            |                   | 11037475 | OLIEKEERRING MET RVS VEER         | 9                |                   |
|          |                    |                         | RGVEREN 470 / / / GAGF004400        | 3    | 23446629   | acom u.306j1 set binnen/buiten  | In FACOM         | U.306J1            | 3148515241734     | 11274144 | OLIEKEERRING MET RVS VEER         |                  |                   |
|          |                    |                         | ring DIN3760 A NBR d15xD32xB7       | 4    | 127579930  | Niekeerring NBR Type A          |                  |                    |                   | 11342739 | OLIEKEERRING MET RVS VEER         | a                |                   |
|          | TDB3020M8X27*46691 | RELLEBORG INDUSTRIAL AV | DEMPER 30X20 B /55SH M. 8X27        | 5    | 100410431  | rillingsdemper B 30x20 M8 NBR   | UNSPECIFIED      |                    |                   | 11907645 | Oliekeerring R1 PTFE 65x85x10     |                  |                   |
|          |                    |                         | CREUX 8.8 912 - M 12 X 80 - ZN      | 6    | 23951740L  | egbord M. Steunconsole 1000X    | х                | 8912               |                   | 24116143 | BE405510G Oliekeerring 40 x 55 :  | ¢                |                   |
|          |                    |                         | RD ULTRAFLEX SPB 3800CONTI          | 7    | 12728878   | -riem SPB3800 Red Power 3       | OPTIBELT         | SPB3800            |                   | 24116144 | BE406810GP Oliekeerring 40x68x    | d                |                   |
|          |                    |                         | Lager 6207 2rs                      | 8 🗆  | 23441699L  | ager (hk) 6207-2rs              | UNSPECIFIED      | 6207 2RS           |                   | 11042094 | OLIEKEERRING MET RVS VEER         | 9                |                   |
|          | 601112118          | NORGRE                  | i-bolkraan 2/2 (v/v), 1/8 601112118 | 9    | 11575908 n | nini-kogelkraan 601112118 G1/8  | NORGREN          | 601112118          |                   | 11274112 | OLIEKEERRING MET RVS VEER         | 6                |                   |
|          |                    |                         | LAGER 6007 ZZ                       | 10 🗆 | 23604658L  | ager nsk 6007zz                 | NSK              | 6007ZZ             |                   | 11274183 | OLIEKEERRING MET RVS VEER         |                  |                   |
| kop inox |                    |                         | DIN916 04X16 A2                     | 11 🗆 | 237931720  | Ophangbeugel voor reddingsboei  | UNSPECIFIED      | INOX               |                   | 11037764 | OLIEKEERRING MET RVS VEER         | 6                |                   |
|          |                    |                         | spanbus din 7343 3x20               | 12 🗆 | 11788780   | 0IN7343 veerstaal 3x20 /1000    | FAST-X           | 073439600030020    |                   | 11080229 | OLIEKEERRING MET RVS VEER         | a                |                   |
|          |                    |                         | BUS MB2030DU                        | 13 🗆 | 120839610  | Slijlager mb 2030 DU-H          | UNSPECIFIED      | MB 020.030 DU-H ** |                   | 11334764 | OLIEKEERRING MET RVS VEER         |                  |                   |
|          |                    |                         | NANO1 / / 2000166427 / / FACOM      | 14 🗆 | 123068410  | Ooppenset compact rl.nano1pb 1  | /FACOM           | RL.NANO1PB         | 3148519040425     | 11031048 | OLIEKEERRING MET RVS VEER         | 9                |                   |
|          |                    |                         | din 7991 6x16 zn                    | 15 🗆 | 238275510  | os bout DIN933 zn 8.8 6x16      | UNSPECIFIED      | \$B9126            |                   | 11665749 | Oliekeerring PTFEspecial 10x17x3  | 3                | PF214810550001    |
|          |                    |                         | 5 Fluegelmutter M16 Temperg.verz    | 16 🗆 | 236899850  | 0IN315 gietijzer M16 /20        | FAST-X           | 16260160001        | 003150000160000   | 24116170 | BE65808GP Oliekeerring 65x80x8    |                  |                   |
|          |                    | FACO                    | /2" 250FACOM S.215 10.69.85.91      | 17 🗆 | 237815005  | tahlwille 12250 metalen oliekan | STAHLWILLE       | PP103189           | 77010001          | 11095099 | OLIEKEERRING MET RVS VEER         |                  |                   |
|          |                    |                         | O-RING 4P.400295 18,64 X 3,53       | 18 🗆 | 23574753N  | fanner Ike-100 lat              | MANNER           | 400295             |                   | 11095100 | OLIEKEERRING MET RVS VEER         | a                |                   |
| *A73844  | A-87367            | MAKITA                  | RESERVELAMP TBV.ML122,123           | 19 🗆 | 23573471   | Aakita a-87367 buislamp ml122   | MAKITA           | A-87367            |                   | 11131658 | Oliekeerring met rvs veer 40x55x7 |                  |                   |
|          | 406-011            | SKI                     | KF SCREW PLUG M10X1 406-011         | 20 🗆 | 126124585  | Nop m10x1 406-011               | VOGEL SKF        | 406-011            |                   | 11274110 | OLIEKEERRING MET RVS VEER         |                  |                   |
| 55 150M  | 55                 | LOCTITI                 | PAKKINGKOORD // 55                  | 21 🗆 | 11146483 L | octite 55 afdichtingskoord 150m | LOCTITE          |                    |                   | 11274148 | OLIEKEERRING MET RVS VEER         |                  |                   |
|          |                    |                         | JPILLLE CONIQUE 1B - 6 X 60 BL      | 22   | 12519258F  | Raccords conique M6X1-4mm       | VOGEL SKF        | 504-200K           |                   | 11274152 | OLIEKEERRING MET RVS VEER         | 6                |                   |
|          |                    |                         | courroie A68 1755mm                 | 23 🗆 | 239993670  | Courrole phg a68                | SKF              | PHG A68            |                   | 11551818 | OLIEKEERRING MET RVS VEER         | 9                |                   |
| SLEUTEL  |                    | BAHCO                   | LEUTEL ERGO 9071 - 8" BAHCO         | 24 🗌 | 12505704M  | 12,5x0,45 HSS-E JIS B-4430 (90  | 7VOLKEL          | 90718              |                   | 11294438 | OLIEKEERRING MET RVS VEER         |                  |                   |
| 1 TIVPRO |                    |                         | ₹ CIL. DIN338 RN diameter 10 mm     | 25 🗆 | 233814276  | loor cil. din 338 hss 10,30mm   | GUHRING          | 33810,3            |                   | 11031967 | OLIEKEERRING MET RVS VEER         |                  |                   |
|          |                    |                         |                                     |      | _          |                                 |                  |                    |                   | 11076966 | OLIEKEERRING MET RVS VEER         | a                |                   |
|          |                    |                         |                                     |      |            |                                 |                  |                    |                   | 24103494 | 12064507 oliekeerring nbr 40x62x  | 1                |                   |
|          |                    |                         |                                     |      |            |                                 |                  |                    |                   | 11041983 | OLIEKEERRING MET RVS VEER         | 1                |                   |
|          |                    |                         |                                     |      |            |                                 |                  |                    |                   | 11074662 | OLIEKEERRING MET RVS VEER         |                  |                   |
|          |                    |                         |                                     |      |            |                                 |                  |                    |                   | 11074724 | OLIEKEERRING MET RVS VEER         |                  |                   |

Fig. 12: The fast layout of the prototype interface.

Screen shots of the two different layouts can be found in Figure 12 and Figure 13. In chapter 4 it was discussed which typefaces, color and table designs would increase reading and searching speed. The elements discussed in chapter 4, such as typeface Arial at cpi 12 for optimal reading performance, are also implemented in the prototype. Furthermore it was chosen to keep the colors of the different sections the same as in the current interface, as well as the colors for the highlighting of the important pieces of text. This was chosen because the users were already very familiar with these colors and their meaning, changing the colors would probably only lead to confusion among the participants.

The slow layout of the prototype interface (Figure 13) has changed slightly since the mock-up, the section with alternative matches is permanently overlapping the local article section and best match section, instead of being 'pulled-up' when needed by the user. This permanent overlap was introduced to reduce the amount of actions, clicking to pull it up, and reduce the distance between the local articles and the alternative master articles. This did create the need, and extra action, to scroll to the next row every time a match was made or a status is changed. To eliminate this extra action a new auto-scroll functionality was introduced. This auto-scroll functionality centers the active row in the middle of the section, eliminating the need to scroll.

#### 8.2 Prototype Analysis

The evaluation of the prototype was done in the same manner as the evaluation of the current interface, with minor adjustments to the procedure. Some questions in the questionnaire sections 'Design and Readability' and 'Functionality' were

| Mode: Only Matching 😄 Action: Match    | h local to master 🗧 Type: | Konkura 😋 Parameters   | Source Scope Target Scope | Language: | Dutch 🗧 🗆     | All Pages At Once > Start   |         |                                 |                                 |                           |      |
|--|---------------------------|------------------------|---------------------------|-----------|---------------|-----------------------------|---------|---------------------------------|---------------------------------|---------------------------|------|
| IC C > > textField text                | Field excel logo 2 draat  | ende pijitjes Floppy 😨 | MatchMode:<br>Fast O Slow |           |               |                             |         |                                 |                                 |                           |      |
| # DESCRIPTION 1 NL                     | MANFACTURER NAME          | MANUFACTURER PN        | DESCRIPTION 2 NL          |           | ART NR        | DESCRIPTION 1 NL            | MANFAC  | TURER NAME MANUFACTURER PN MANU | FACTURER CATELOG PN PRODCOMP PN | SUPPLIER NAME             | COM  |
| 1 OLIEKEERRING 40-65-10                |                           |                        |                           |           | 23586101 Mot  | p 4065 vinylspray 400ml wit | MOTIP   | 04065                           | 4065                            |                           |      |
| 2 Nokrol KR52B S                       | KF                        | SKF KR 52 B            | SKF KR 52 B               | 0         | 23766420 Kun  | erol KR 52 B                | SKF     | KR 52 B                         |                                 | SKF Belgium NV (niet edi) | ZRNS |
| ART NR DESCRIPTION 1 NL                | MANFACTURER NAM           | MANUFACTURER PN MANU   | JFACTURER CATELOG PN PROD | COMP PN S | UPPLIER NAME  | COMPETITOR PN COMPETI       | OR NAME |                                 |                                 |                           |      |
| 23586101 Motip 4065 vinylspray 400ml   | wit MOTIP                 | 04065                  | 4065                      |           |               |                             |         |                                 |                                 |                           |      |
| 11037475 OLIEKEERRING MET RVS V        | /EER ·                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11274144 OLIEKEERRING MET RVS V        | /EER I                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11342739 OLIEKEERRING MET RVS V        | /EER ·                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11907645 Oliekeerring R1 PTFE 65x85:   | x10                       |                        |                           | S         | eal Maker     |                             |         |                                 |                                 |                           |      |
| 24116143 BE405510G Oliekeerring 40 :   | x 55 x                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 24116144 BE406810GP Oliekeerring 40    | )x68x1                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11042094 OLIEKEERRING MET RVS V        | /EER ·                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11274112 OLIEKEERRING MET RVS V        | /EER ·                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11274183 OLIEKEERRING MET RVS V        | /EER :                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11037764 OLIEKEERRING MET RVS V        | /EER ·                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11080229 OLIEKEERRING MET RVS V        | /EER ·                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11334764 OLIEKEERRING MET RVS V        | /EER :                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11031048 OLIEKEERRING MET RVS V        | /EER ·                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11665749 Oliekeerring PTFEspecial 10:  | x17x3                     | PF214810550001         |                           | F         | luorseals Spa |                             |         |                                 |                                 |                           |      |
| 24116170 BE65808GP Oliekeerring 65x    | 8x08                      |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11095099 OLIEKEERRING MET RVS V        | /EER :                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11095100 OLIEKEERRING MET RVS V        | /EER ·                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11131658 Oliekeerring met rvs veer 40x | (55x7)                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11274110 OLIEKEERRING MET RVS V        | /EER :                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11274148 OLIEKEERRING MET RVS V        | /EER ·                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11274152 OLIEKEERRING MET RVS V        | /EER ·                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11551818 OLIEKEERRING MET RVS V        | /EER ·                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11294436 OLIEKEERRING MET RVS V        | /EER:                     |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11031967 OLIEKEERRING MET RVS V        | /EER :                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11076966 OLIEKEERRING MET RVS V        | /EER ·                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 24103494 12064507 oliekeerring nbr 40  | 1x62x1                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11041983 OLIEKEERRING MET RVS V        | /EER !                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11074662 OLIEKEERRING MET RVS V        | /EER :                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |
| 11074724 OLIEKEERRING MET RVS V        | /EER I                    |                        |                           |           |               |                             |         |                                 |                                 |                           |      |

Fig. 13: The slow layout of the prototype interface.

slightly altered to focus more on the prototype and how the changes are perceived by the user, instead of what they want to have changed. The changed questionnaire can be found in section III. Next to these questions, the user will be asked to switch from the 'fast-layout' (Figure 12) to the 'slow-layout' (Figure 13) after row twelve. Not all participants tested both the current and the prototype interface, one participant from ERIKS only tested the current interface, and one participant from Mydatafactory only tested the prototype interface. An overview of familiarity with the interface and which participant tested which interface can be found in Table III.

| Participant                | 0 (pilot) | 1        | 2             | 3             | 4             | 5        |
|----------------------------|-----------|----------|---------------|---------------|---------------|----------|
| Familiarity                | New       | Familiar | Very Familiar | Very Familiar | Very Familiar | Familiar |
| Tested Current Interface   | Yes       | Yes      | Yes           | Yes           | Yes           | No       |
| Tested Prototype Interface | Yes       | Yes      | Yes           | Yes           | No            | Yes      |

TABLE III: Overview of familiarity with the interface and which participant tested which interface.

8.2.1 Usability test The usability tests were conducted the same way as the usability test of the current interface, with the addition of an explanatory introduction about the functionality of the prototype interface. During this introduction all new functionalities of the interface were shown and explained to the participants, to make sure they know they exist and how they work before they do the usability test. Everything else is still the same as the previous usability tests, the same equipment and product data. Keeping the data the same was not an issue, since there was more than a month between the usability tests done by the user. The results of the usability test are shown in Table IV. With participant 3 there were technical difficulties which prevented the gathering of eye-tracking results.

When comparing the statistics gathered from both usability tests (Table V), it becomes clear that the prototype interface improves the matching process. The time it takes to match the 25 products is down by 01:36, while the average time to

| Participant                         | 1                  | 2        | 3        | 5                   | Average             |
|-------------------------------------|--------------------|----------|----------|---------------------|---------------------|
| Match statistics:                   |                    |          |          |                     |                     |
| Rows Matched                        | 52%                | 56%      | 80%      | 56%                 | 61%                 |
| Rows Left Open                      | 48%                | 44%      | 20%      | 44%                 | 39%                 |
| Time:                               |                    |          |          |                     |                     |
| Duration in Matching Interface      | 00:04:46           | 00:10:40 | 00:15:40 | 00:07:58            | 00:09:41            |
| Average Duration/Match              | 00:00:12           | 00:00:26 | 00:00:38 | 00:00:19            | 00:00:24            |
|                                     |                    |          |          |                     |                     |
| Eye-tracking:                       |                    |          |          |                     |                     |
| Number of Left to Right (L-R) Gazes | 45                 | 38       | -        | 64                  | 49                  |
| Number of Right to Left (R-L) Gazes | 13                 | 30       | -        | 63                  | 35.3                |
| Average L-R/Match                   | 1.8                | 1.52     | -        | 2.56                | 1.96                |
| Average R-L/Match                   | 0.52               | 1.2      | -        | 2.52                | 1.41                |
| Total Distance                      | $2320 \mathrm{cm}$ | 2720cm   | -        | $5080 \mathrm{cm}$  | $3373 \mathrm{cm}$  |
| Distance/Match                      | $92.8 \mathrm{cm}$ | 108.8cm  | -        | $203.2 \mathrm{cm}$ | $134.9 \mathrm{cm}$ |
| Times Horizontally Scrolled         | 0                  | 1        | 0        | 0                   | 0.3                 |
|                                     |                    |          |          |                     |                     |
| How status was changed:             |                    |          |          |                     |                     |
| Double clicking Alternative Match   | 25%                | 36%      | 56%      | 4%                  | 30.25%              |
| Checkbox Checked                    | 25%                | 20%      | 24%      | 48%                 | 29.25%              |
| Clicked Next Row                    | 42%                | 40%      | 20%      | 48%                 | 37.5%               |

TABLE IV: Statistics generated from the usability test of the prototype interface

make a match is decreased by 3 seconds. Not only the duration of the matching process is down, but also the looking distance is down by 89.9cm per local article. Considering that the participants are more familiar with the current interface and how that interface is operated, it could improve even more when the users get familiar with the functionality introduced by the prototype and bugs in the prototype are resolved. The only thing that did not improve are the number of matches made. With the prototype interface, fewer local articles were matched with master articles. One reason for this might be the manual look-up. A total of eight products, during the usability test of the current interface, were matched using the manual look-up. Since the manual look-up is missing in the prototype interface, this might have resulted in fewer matches.

8.2.2 Questionnaire The questionnaire given to the participants of the prototype usability test contained many of the same questions as the first questionnaire. The only difference was that the first questionnaire was aiming at finding problems, while this one tried to determine whether or not the proposed solutions were effective. This questionnaire also produced a SUS score (Brooke et al. 1996), this SUS score (Table VI) compared to the SUS score of the current interface. The SUS-score shows that, although not every participant agrees, the prototype is an improvement compared to the current interface. The lower SUS score for participants 1 and 3 could be due to the bugs in the prototype, which lowered their scores because they might have thought it would eventually behave in the same way as the bugs do. Some of these bugs included the automatic scrolling introduced in the 'slow-layout'. This scroll functionality had the tendency to not scroll far enough and showing only half of the row being matched.

The questionnaire also showed that all added functionalities to the interface were liked by the participants, even though some are in need of improvement. Most of the improvements suggested by the participants concerned bugs in the interface. One

|                                     | Current interface  | Prototype interface |
|-------------------------------------|--------------------|---------------------|
| Match statistics:                   |                    |                     |
| Rows Matched                        | 69%                | 61%                 |
| Rows Left Open or other status      | 33%                | 39%                 |
| Time:                               |                    |                     |
| Duration Matching                   | 00:11:17           | 09:41               |
| Average Duration/Match              | 00:00:27           | 00:00:24            |
| Eye-tracking:                       |                    |                     |
| Number of Left to Right (L-R) Gazes | 77.25              | 49                  |
| Number of Right to Left (R-L) Gazes | 63.25              | 35.3                |
| Average L-R/Match                   | 3.09               | 1.96                |
| Average R-L/Match                   | 2.53               | 1.41                |
| Total Distance                      | $5620 \mathrm{cm}$ | $3373 \mathrm{cm}$  |
| Distance/Match                      | 224.8cm            | $134.9 \mathrm{cm}$ |
| Times Horizontally Scrolled         | 4                  | 0.3                 |
|                                     |                    |                     |
| How status was changed:             |                    |                     |
| Double clicking Alternative Match   | 45%                | 30.25%              |
| Checkbox Checked                    | 5%                 | 29.25%              |
| Clicked Next Row                    | 19%                | 37.5%               |

TABLE V: Comparison of the current interface and the prototype

| Participant         | 1    | 2    | 3    | 4    | 5    | average |
|---------------------|------|------|------|------|------|---------|
| Current interface   | 52.5 | 42.5 | 62.5 | 57.5 |      | 53.75   |
| Prototype interface | 45   | 65   | 60   |      | 67.5 | 59.75   |

TABLE VI: SUS score comparison

participant suggested to also include all the master data in the pop-up when hovering over that row, eliminating the need to scroll.

8.2.3 **Interviews** During the interviews the participants expressed that they liked the new functionality the prototype offers, but that it is not optimal yet. The prototype contained a number of bugs and missed some functionality the old one did have. After it was explained to them that the purpose of the prototype was to test new ideas and most of the old functionality would come back, they understood it better. Next to fixing the bugs and reintroducing old, missing features, the participants suggested some other changes:

#### Different way of highlighting

The current interface and prototype highlights the parts of the text where the matching engine has matched the local article to a master article. Highlighting of the text essentially has two purposes. The first one is to show important pieces of the local data, the second is to show where that data returns in the master data. It might be useful to change the highlighting to distinguish these two purposes. One way to achieve this might be to underline important pieces of text and highlight when paired to a certain master article.

#### Thinner top section for 'slow-layout'

Due to the top down search nature of the second layout, alternative master articles are below the local articles. Participants said it was annoying and they got confused as to which local article they were matching, since multiple were visible.

#### Ability to add commentary to matches

It was suggested to add the possibility to add commentary or notes to the matches. The reason behind this is that sometimes the local articles are looked up on the internet, because the user does not know what it means. If he finds out what the local article is, it might be useful to add a link or commentary so the next person working with that data does not have to look for it himself.

#### Text alignment to the right

In the prototype the data of the local articles was aligned to the right in the 'fast' layout. This was done to bring the data closer to the master articles. Participants indicated that this alignment was making it harder for them to read. Therefore this should be changed back to a left alignment.

#### Extend the pop-up functionality

The pop-up functionality was well liked among participants, they saw its potential. They did however suggest some changes and extensions. At the moment it shows all the cell data in the pop-up. Instead they suggested that only the important part would be shown with around 3 characters context before and after to check if the matching engine included everything relevant. All the other information would not be that important. They also suggested to display the master data of the row the mouse is hovering over, next to the local data in the pop-up. With these changes the pop-up functionality would look like Figure 14.

| -3 veerstaal 3x20 /1000 Z1 BANC      |           |      |  |  |  |  |  |  |
|--------------------------------------|-----------|------|--|--|--|--|--|--|
| r mb 2030 DU-H Z5 BANC               |           |      |  |  |  |  |  |  |
| set compact rl.nano1pb 1/4' Z1 NORM  |           |      |  |  |  |  |  |  |
| t DIN936 zn 8.8 6x16 Z5 ERLA         |           |      |  |  |  |  |  |  |
| mni vle                              |           |      |  |  |  |  |  |  |
| lle 122: From Query:   From Master:  |           |      |  |  |  |  |  |  |
| Ike-10 RL.NANO1PB                    | L.NANO1PE | 3    |  |  |  |  |  |  |
| a-8736                               |           | J    |  |  |  |  |  |  |
| 10x1 406-011                         | Z5        | BANC |  |  |  |  |  |  |
| 55 afdichtingskoord 150meter Z9 BANC |           |      |  |  |  |  |  |  |
| staal 6x60 /50 Z1 BANC               |           |      |  |  |  |  |  |  |
| staar oxou /ou                       | Z1        | BANC |  |  |  |  |  |  |

Fig. 14: Illustration of a suggested pop-up design

#### 9 Discussion

Although the results of this project are very promising somethings did not go as planned or did not deliver the amount or type of results that were expected. With the experienced gained during the course of this project, some things would be done differently if another project came along.

#### 9.1 Planning

The initial planning was to test the current interface and then make several iterative prototypes. Due to delays partially because of the eye-tracking, which will be explained later, this was reduced to one prototype. If the project would be done again The eye-tracking will probably be skipped to be able to run tests earlier in the project. Running the tests earlier in the project might result in better and more iterative prototypes.

#### 9.2 Methods

The methods used did not always provide the amount or type of results that were expected or worth the effort to get them. One of these methods was the use of eyetracking. The implementation of eye-tracking into the usability test took a lot of effort and getting the right software and hardware also delayed the project a lot. If a screen recording in combination with a web-cam image was used it would have been sufficient in the case of this interface. If the task was more complex than looking form the left to the right and back, eye-tracking would probably have been more valuable. The used to implement eye-tracking might have been useful in the prototyping stage, to create a prototype which would be less buggy and contain more functionality. A better prototype might not only have resulted in better test results, but also more tested functionality.

The most valuable information came from the interviews and group sessions, especially the ones where examples could be given by the participants or when the mock-ups were shown. This allowed the participants to better explain their problems. The group sessions also sparked a sort of brainstorm effect with regard to problem finding. This sort of group session might also have been very insightful after the usability test of the prototype. The interviews provided a large amount of data and could benefit from a little more attention next time.

Although the interviews have proven themselves to be the most valuable, they would have lost a lot of their meaning if there was no interface or prototype to test. During the testing of the prototype it became apparent that bugs and missing or not implemented features weigh heavily on the user experience. Even though this might be expected, it was hard for participants to see through the bugs and quirks of the prototype and focus on the parts that were meant to be tested. For this reason it would benefit the results a lot if more time was spend on the prototype in order to make it function better before being tested.

#### 9.3 Participants

The participants have been working with the current interface for a long time now and since humans tend to be creatures of habit, they might have been stuck in their old rituals regarding the use of the interface. Especially since the prototype has somewhat of a learning curve, the results might be negatively influenced by these habits. Due to these habits users might have become confused by the new layout or hesitant to use new functions and therefore not improving the results. The participants' social behavior could also have influenced the results by not speaking their minds about certain aspects of the interface, prototype or other things, because they are afraid of being impolite when being honest. Aside from this wrong interpretation of the actions preformed by the participants or answers given to the questions asked could also have influenced the results.

The number of participants could also have been too small and too contained, since there were only six, and all from Mydatafactory or ERIKS, while the interface is used by more clients of Mydatafactory. This could have caused the results to heavily lean towards a certain type of user, while in fact there might be more.

For a next project this would mean: Earlier testing in order to have workable results earlier in the project. This could lead to more time for prototype(s) and therefor more testing. More user input through questions and group sessions with a wider variety of participants. Generating more reliable results which are applicable to various users.

#### 10 Conclusion

The goal of this project was to increase efficiency, productivity and attention span, while decreasing cognitive load on the user during the matching process. This was done by looking at how the current interface looks and is used. Which strengths and weaknesses it has and how do users deal with them. Determining which interface functions and features could increase efficiency during the matching process. Researching how interface design can improve the reading and searching speed of the user. For example, which combination of front and background color, typeface, font size and weight and other factors might increase the users reading speed.

The current interface turned out to be very complex and unfriendly to the user, it does little to support the user in a fast and easily accessible way. That is why new functions and features or new ways to access those functions and features were introduced to support the user and simplify their tasks. These functions and features, mainly the pop-up function, also reduced the back and forth looking habit the users had developed due to the layout of the interface. This habit was especially present when the best match was not correct and the alternative list was used to find the correct match. For this reason a second layout type was introduced, reducing the effort needed to match the more difficult articles. Other functions reduced searching time such as the 'select to search' function, allowing the user to locate a certain string in the list of alternatives.

The research into reading and searching from a computer screen determined that the design of the grid, color use, typeface and font size used in the current interface were already pretty good. Only the font size was changed to for optimization.

All these functions, features and redesign choices combined increased efficiency, productivity and usability while decreasing the time and effort needed to match local articles to master articles.

#### 10.1 Future Work

For future work it would be good to test the untested improvement suggestions from chapter 7, which are not implemented in the prototype (Chapter 8), to see which ones will work and which ones will not and maybe find some new or alternative solutions. It might also be useful for Mydatafactory to (re)test the current and prototype interface with other clients they have, this might generate other insights into the interface. Further testing and exploration of the current and the prototype interface along with the suggested functions and features might improve the interface and process even more.

#### 11 Acknowledgements

I would like to express my deep gratitude to Mariët Theune and Dolf Trieschnigg, my supervisors, for their patient guidance, enthusiastic encouragement and useful critiques of this research work. I would also like to thank Arjan Herskamp and Jeroen Reinink, for giving me a place to work in Meppel. My grateful thanks are also extended to Henk Giele, Robert Linde, Michel van der Cruysen, Bas Verheij and Gert van Nuffel for participating in the tests. Finally, I wish to thank my mother, Irene Lukens for proof reading many version of this report, support and encouragement throughout my study.

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# 12 APPENDICES

#### Appendix I Test Data

Test queries used for the usability test (JSON format).

["qid", "Set Id", "Time", "Query - datasource / workpackage", "Query - MDF ID", "Query ARTNR", "Query - DESCRIPTION 1 NL", "Query - DESCRIPTION 2 NL", "Query - MANUFACTURER NAME", "Query - MANUFACTURER PN", "Query - EAN CODE", "Position correct match", "Match - class id", "Match - class name", "Match - MDF ID", "Match - ARTNR", "Match - DESCRIPTION 1 NL", "Match - DESCRIPTION 2 NL", "Match - MANUFACTURER NAME", "Match - MANUFACTURER PN", "new position", "new group"]

["100", "1478", "2014-12-03 14:30:49.530", "WP59", "1446459", "2104", "OLIEKEER-RING 40-65-10", "", "", "", "7", "1076", "Dynamische dicht./oliekeerringen NBR/OK NBR standaard", "26974", "10009373", "OK NBR E-RST 40x65x10", "", "RX", "", "", "position 6-15", "-1", "not found"]

["101", "1988", "2015-04-01 11:12:09.563", "FC-campina-Aalter-Lagers", "2959060",
"09712084", "Nokrol KR52B", "SKF KR 52 B", "SKF", "SKF KR 52 B", "", "1", "1675",
"Lagertechniek/Lagertechniek/Nokkenrollen div.", "957195", "23766420", "Kurverol KR 52 B", "open", "SKF", "KR 52 B", "7316571596105", "position 1", "1", "position1"]
["102", "1135", "2014-09-12 15:30:27.547", "WP41", "1432431", "1696", "FACOM SET VOOR BINNEN-BUITENBORGVEREN 470 / / GAGF004400 / /
", "", "", "", "", "21", "1752", "Gereedschappen/Handgereedschappen/Tangen & Pincetten", "741254", "23446750", "470 2 borgveertangen binnen/buiten", "met bekken cap.max.63mm", "FACOM", "470", "3148515415005", "position 16-30", "4", "position 2-5"]

["103", "1548", "2014-12-16 12:09:36.260", "WP64", "1448505", "22", "Oliekeerring DIN3760 A NBR d15xD32xB7", "", "", "", "", "6", "1076", "Dynamische dicht./oliekeerringen NBR/OK NBR standaard", "26484", "10008722", "OK NBR E-RST 15x32x7", "", "RX", "", "", "position 6-15", "24", "position 16-30"]

10:18:48.707", "Knauf", ["104", "10308", 2016-07-28 "5456082". "1678". 8X27", "", "TRILLINGSDEMPER "TRELLEBORG 30X20 B /55SH M. INDUSTRIAL AVS", "4669\*TDB3020M8X27", "", "8", "1276", "Dynamische dicht./trillingdempers/Tril.d. cilindrisch", "81269", "10041042", "Trillingdemper RX00c200ae B 30x20 M8x20", "", "RX", "200050/203020/F1060016092", "", "position 6-15", "9", "position 6-15"]

["105", "10178", "2016-07-12 13:15:16.710", "MDK Cargill", "5451670", "60317935",
"VIS A SIX PANS CREUX 8.8 912 - M 12 X 80 - ZN", "", "", "", "", "17", "1826",
"Bevestigingen/Mechanische bevestig/Ov. Mech. Bevestig.", "498739", "11768863",
"DIN912 8.8 ezn dr tot kop M12x80 /50", "cilinderkopschroef met binnenzeskant",
"FAST-X", "11768863", "4043952181089", "position 16-30", "17", "position 16-30"]

["106", "1006", "2014-08-01 11:24:17.110", "WP33-WP36", "1429799", "05010303", "V-RIEM STANDARD ULTRAFLEX SPB 3800 (B=16,3)CONTI", "", "", "", "", "1", "2060", "Mechanische aandrijv/V-riemen/V-riem smalprofiel", "882101", "23617432", "V-riem SPB3800", "", "OPTIBELT", "SPB 38007700", "4014486079012", "position 1", "3", "position 2-5"]

["107", "8241", "2016-01-11 16:00:24.323", "Earthminded", "3571476", "120", "Lager  $6207\breve{0}0a0\breve{0}0a0\breve{0}0a0$  2rs", "', "', "', "'', "5", "1653", "Lagertech-

niek/Lagertechniek/Kogellagers", "956173", "23758386", "Groefkogellager 6207-2RS1", "eenrijig tweezijdig afgedicht", "SKF", "6207-2RS1", "7316577067319", "position 2-5", "8", "position 6-15"]

["108", "9331", "2016-06-12 07:15:49.877", "BRAMMER BE DATABASE", "5124129", "", "601112118 Mini-bolkraan 2/2 (v/v), 1/8", "", "NORGREN", "601112118", "", "1", "302", "Pneumatiek/Ventielen/Divers gestuurd Vent", "1415538", "11575908", "mini-kogelkraan 601112118 G1/8", "", "NORGREN", "601112118", "", "position 1", "1", "position1"]

"3394", ["109", "2015-09-28 11:07:01.090", "Prayon PT", "3144916". "", "". "LAGER 6007 ZZ", "", "Lagertech-"04023146", "", "18", "1653", niek/Lagertechniek/Kogellagers", "955474", "23757683", "Groefkogellager 6007-2Z", "eenrijig tweezijdig afgedicht", "SKF", "6007-2Z", "7316577096845", "position 16-30", "-1", "not found"]

["110", "1777", "2015-03-04 14:00:04.550", "Westvlees", "2930478", "222", "DIN916 04X16 A2", "stelbout imbus M4x16 mm zonder kop inox", "", "", "", "16", "1819", "Bevestigingen/Mechanische bevestig/Binzeskantbout Inox", "929920", "23727188", "DIN916 RVS A2 M4x16 /500", "stelschroef binnenzeskant kraterpunt", "FAST-X", "23727188|51260040016", "4043377075741", "position 16-30", "2", "position 2-5"]

["111", "5418", "2015-10-27 15:45:37.887", "Valeron grijpvoorraad 2", "3323506", "129", "spanbus din 7343 3x20", "", "", "", "1", "1826", "Bevestigingen/Mechanische bevestig/Ov. Mech. Bevestig.", "900828", "23692739", "DIN7343 staal 3x20 /1000", "spiraalspanbus standaard uitvoering", "FAST-X", "23692739|39140030020", "4043952506431", "position 1", "2", "position 2-5"]

["112", "1457", "2014-12-01 15:07:16.403", "WP59", "1446087", "487", "BUS MB2030DU", "", "", "", "", "0", "1669", "Lagertechniek/Lagertechniek/Glijlagerbussen", "120872", "12440147", "Cilindrisch glijlager MB 020.030 DU", "Buitenmantel staal looplaag PTFE", "UNSPECIFIED", "MB 020.030 DU", "", "not found", "17", "position 16-30"]

["113", "1139", "2014-09-12 15:45:39.643", "WP41", "1432550", "5407", "RL.NANO1PB 1/4doppenset 6-kant +ratel FACOM / RL.NANO1 / / 2000166427 / / FACOM", "", "", "", "2", "1750", "Gereedschappen/Handgereedschappen/Sleutels", "206164", "12306841", "Doppenset compact rl.nano1pb 1/4'", "6-kant met ratel met stofdichte kop", "FACOM", "RL.NANO1PB", "3148519040425", "position 2-5", "1", "position1"]

["114", "5439", "2015-10-27 17:23:52.810", "Valeron grijpvoorraad 2", "3324031", "654", "din 7991 6x16 zn", "", "", "", "9", "1814", "Bevestigingen/Mechanische bevestig/Binnenzeskantbouten", "891285", "23688938", "ISO10642/DIN7991 8.8 ezn M6x16 /500", "bout verzonken kop binnenzeskant", "FABORY|FAST-X", "07470.060.016 - M6X16|07470060016", "4043952605899", "position 6-15", "15", "position 6-15"]

["115", "9154", "2016-05-04 13:35:06.600", "Visserie Cimalux", "5075746", "07191650", "DIN 315 Fluegelmutter M16 Temperg.verz", "", "", "", "", "11", "1815", "Bevestigingen/Mechanische bevestig/Zeskantmoeren", "898208", "23689991", "DIN315 gietijzer ezn M8 /100", "din vleugelmoer met ronde vleugels", "FABORY|FAST-X", "16270.080.001 - M8|16270080001|23689991", "4043952063804", "position 6-15", "-1", "not found"]

["116", "721", "2014-07-23 22:45:56.393", "eriks1match", "1186202", "9080970426", "VERLENGSTUK VOOR DOPPEN 1/2250 MM FACOM S.215 10.69.85.91", ", "FACOM", "", "I, "1750", "Gereedschappen/Handgereedschappen/Sleutels",

"740561", "23443821", "s.215 verlengstuk 1/2 l=250mm", "standaard", "FACOM", "S.215", "3148510579504", "position 1", "6", "position 6-15"]

["117", "1482", "2014-12-03 16:54:45.020", "WP59", "1446545", "5643", "O-RING 4P.400295 18,64 X 3,53", "", "", "", "14", "1109", "Dynamische dicht./O-ring NBR/O-ring NBR 70", "57346", "10027350", "O-ring NBR 36624 210 18,64x3,53 =500", "", "RX", "B10027350", "", "position 6-15", "27", "position 16-30"]

["118", "4023", "2015-10-06 09:46:47.353", "DAF tender Tools", "3164854", "17102122", "MAKITA A-87367 RESERVELAMP TBV.ML122,123", "A-87367 RESERVELAMP MAKITA VOOR ML122 ML123 \*A73844", "MAKITA", "A-87367", "", "1", "1795", "Gereedschappen/Elektrisch Handgeree/Ov. Elektrisch", "841842", "23573471", "Makita a-87367 buislamp ml122", "", "MAKITA", "A-87367", "88381157681", "position 1", "1", "position1"]

["119", "8517", "2016-01-28 13:25:06.380", "DAF tender lagers", "3583381", "99W33600100341", "SKF SCREW PLUG M10X1 406-011", "", "SKF", "406-011", "", "1", "1681", "Lagertechniek/Lagertechniek/Smeersystemen", "1210888", "12612458", "Stop m10x1 406-011", "", "VOGEL SKF", "406-011", "", "position 1", "1", "position1"]

["120", "7700", "2015-12-15 11:18:03.637", "ALCON artikellijst", "3333482", "A007 G00055", "PAKKINGKOORD // 55", "LOCTITE PIPE SEALING CORD 55 150M", "LOCTITE", "55", "", "15", "1831", "Bevestigingen/Chemische bevestig/Lijmen & Kitten", "1249358", "23168316", "55 AFDICHTINGSKOORD 150MTR", "", "LOCTITE", "23570553|303455|98650150", "5010266325613", "position 6-15", "10", "position 6-15"]

["121", "10226", "2016-07-14 14:15:11.503", "MDK Cargill", "5451833", "60318156", "GOUPILLLE CONIQUE 1B - 6 X 60 BL", "", "", "", "", "1", "1826", "Bevestigingen/Mechanische bevestig/Ov. Mech. Bevestig.", "891029", "23688673", "DIN1b staal 6x60 /50", "conische pen 1/50 gedraaid", "FAST-X", "23688673|39000060060", "4043952001219", "position 1", "2", "position 2-5"]

"4043952001219", "position 1", "2", "position 2-5"] ["122", "1317", "2014-10-10 18:36:53.583", "WP46", "1437349", "800202", "courroie A68 1755mm", "", "", "", "6", "2059", "Mechanische aandrijv/V-riemen/V-riem klassiek", "877924", "23609155", "V-riem 13x1725 A68", "", "OPTIBELT", "13 17257700|13 17257700", "4014486033175", "position 6-15", "-1", "not found"]

["123", "2629", "2015-06-29 11:50:14.390", "WIENERBERGER", "2983912", "112547940", "SCHROEFSLEUTEL ERGO 9071 - 8BAHCO", "SCHROEFSLEU-TEL", "BAHCO", "", "", "0", "1750", "Gereedschappen/Handgereedschappen/Sleutels", "1242428", "23069236", "MOERSLEUTEL GEFOSFATEERD 9071", "", "Bahco", "|BAHCO", "9071", "not found", "-1", "not found"]

["124", "8941", "2016-03-30 14:07:41.070", "Amcor Diversen", "5067714", "07891", "BOOR CIL. DIN338 RN diameter 10 mm", "BOOR CIL. DIN 338 HSS 1145201 10,0MM TIVPRO", "", "", "21", "1769", "Gereedschappen/Verspanende gereedsc/Boren", "1218437", "12645949", "Metaalboor cil DIN338 N 10mm HSS", "RX410", "RX", "RX410-10.00", "", "position 16-30", "21", "position 16-30"]

#### APPENDIX II Questionnaire Current interface

Questionnaire given to the participants of the current interface usability test.

1/9/2017

MDF Current Interface Testing

# MDF Current Interface Testing

\*Vereist

#### Interface testing of the current interface used by



#### **General Information**

This questionnaire, in combination with a usability test, is used to evaluate the product matching interface used by Mydatafactory.

Screen recordings and webcam images will be made and saved for research purposes.

1. Name \*

#### **Informed Consent**

The purpose of this research is to analyse the current product matching interface used by Mydatafactory.

During this research some privacy sensitive data will be collected and stored, namely webcam recordings made during the usability test. This data will be handled with care and only shared with persons involved in this research (UT supervisor, Mydatafactory supervisor). Privacy sensitive data will only be shared with third parties after explicit permission of the participant. After the research is finished (approximately mid February), the privacy sensitive information will be deleted, the screen recordings might be saved for research and reference to improve other parts of the program supplied by Mydatafactory. These screen recording will however not contain any privacy sensitive information

For questions about this research please contact: Christiaan Boersma Rodenmorsweg 3 7591 NJ Email: <u>boersmachristiaan@gmail.com</u> Tel: 0618698920

For queries, complaints or comments about the research please contact the secretary of the EC. dr. ir. H.J.A. op den Akker (Department HMI) Ethics Committee, Faculty of EEMCS, University of Twente PO Box 217 7500 AE Enschede (NL) Tel: +31(0)53.4894602 email: <u>BFD\_EWI@ewi.utwente.nl</u> Fax: +31(0)53.4893114 website: <u>http://www.utwente.nl/en/education/eemcs/</u>

# By continuing, you agree to the collection and use of this data for this specific research

https://docs.google.com/forms/d/1vGKz4OludlnzfeRvhxaWqh65-QcfYvvEmbOpxlZ2ms0/edit

https://docs.google.com/forms/d/1vGKz4OludlnzfeRvhxaWqh65-QcfYvvEmbOpxlZ2ms0/edit

1/9/2017

MDF Current Interface Testing

#### **Pre User Test Questions**

Please answer these questions before starting the usability test

2. How often have you used the product matching interface? \*

Markeer slechts één ovaal per rij.

|               | 0-100      | 101-500  | 501-1000   | More than 1000 |
|---------------|------------|----------|------------|----------------|
|               | products   | products | products   | products       |
| Amount of use | $\bigcirc$ |          | $\bigcirc$ |                |

3. How familiar are you with the product matching interface? \*

Markeer slechts één ovaal.

|                 | 1          | 2          | 3          | 4          | 5          |               |
|-----------------|------------|------------|------------|------------|------------|---------------|
| Very unfamiliar | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | very familiar |

#### 4. Since when have you been using the product matching interface? (approximately)

Voorbeeld: 15 december 2012

#### **Start Usability Test**

The usability test consists of several different components.

We start with setting up and calibrating the eye tracking software. With the eye-tracking software we get a better understanding of the way the product matching process is handled by the user.

When calibration is finished you will be asked to perform a number of product matches. During the matching everything you do is recorded, your gaze, location and clicks of your mouse, keypresses and the screen itself.

Please start the usability test now.

When you finish, you can continue with the questionnaire

#### **System Usability**

1/9/2017

#### MDF Current Interface Testing

5. System Usability Scale \* Markeer slechts één ovaal per rij.

|   | Strongly disagree | Disagree   | Neutral    | Agree      | Strongly<br>Agree |
|---|-------------------|------------|------------|------------|-------------------|
| I think that I would like to use<br>this system frequently                                      | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I found the system<br>unnecessarily complex   | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I think that I would need the<br>support of a technical person to<br>be able to use this system | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I found the various functions in<br>this system were well integrated                            | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I thought there was too much<br>inconsistency in this system                                    | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I would imagine that most<br>people would learn to use this<br>system very quickly              | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I found the system very<br>cumbersome to use  | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I felt very confident using the<br>system   | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I needed to learn a lot of things<br>before I could get going with this<br>system               | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |

User Knowledge and User Experience These questions are related to the knowledge you have about the products you just matched and the experience you just had.

#### 6. Your experience

Markeer slechts één ovaal per rij.

|  | Strongly disagree | Disagree   | Neutral    | Agree      | Strongly<br>Agree |
|--|-------------------|------------|------------|------------|-------------------|
| Too many colors were used in the interface                     | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| The relevant attributes are<br>highlighted                     | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I have to scroll too much to find the relevant attributes      | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| Too many candidate matches<br>are shown                        | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| The font size is too small                                     | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| The font is clear  | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| Too little information is shown in<br>the matches section      | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I'm very confident about my<br>matches                         | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I had sufficient knowledge about<br>the products being matched | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I knew which product attributes<br>were relevant               | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I checked every product<br>attribute visually                  | $\bigcirc$        | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |

# **Design and Readability**

1/9/2017

#### MDF Current Interface Testing

7. How clear did you think the organization of information on the interface screen was? \* Markeer slechts één ovaal.



8. How fast did you know what the different sections meant? \*

Markeer slechts één ovaal per rij.

|                       | Immediately | Quickly    | Neither fast<br>nor slow | Slow       | Had to look<br>multiple times | l still<br>don't<br>know |
|-----------------------|-------------|------------|--------------------------|------------|-------------------------------|--------------------------|
| Section 1 (Blue)      | $\bigcirc$  | $\bigcirc$ | $\bigcirc$               | $\bigcirc$ | $\bigcirc$                    | $\bigcirc$               |
| Section 2<br>(Green)  | $\bigcirc$  | $\bigcirc$ | $\bigcirc$               | $\bigcirc$ | $\bigcirc$                    | $\bigcirc$               |
| Section 3 (Red)       | $\bigcirc$  | $\bigcirc$ | $\bigcirc$               | $\bigcirc$ | $\bigcirc$                    | $\bigcirc$               |
| Section 4<br>(Yellow) | $\bigcirc$  | $\bigcirc$ | $\bigcirc$               | $\bigcirc$ | $\bigcirc$                    | $\bigcirc$               |

#### 9. What (combinations of) interface changes would you like to see or try? \*

Vink alle toepasselijke opties aan.

|  | None, | the | current | interface | has the | e optir | nal la | yout. |
|--|-------|-----|---------|-----------|---------|---------|--------|-------|
|--|-------|-----|---------|-----------|---------|---------|--------|-------|

I would like it better if the queries were shown above their best match (top to bottom matching).

I would like to have one screen per product to go through

Anders:

1/9/2017

#### MDF Current Interface Testing

10. How would you rate the readability of the text in the different sections \*

Markeer slechts één ovaal per rij.

|                                    | Very hard  | Hard       | Neither easy nor hard | Easy       | Very easy  |
|------------------------------------|------------|------------|-----------------------|------------|------------|
| Section 1 (Blue): Queries          | $\bigcirc$ | $\bigcirc$ | $\bigcirc$            | $\bigcirc$ | $\bigcirc$ |
| Section 2 (Green): Best<br>Matches | $\bigcirc$ | $\bigcirc$ | $\bigcirc$            | $\bigcirc$ | $\bigcirc$ |
| Section 3 (Red): Alternatives      | $\bigcirc$ | $\bigcirc$ |                       | $\bigcirc$ | $\bigcirc$ |

# **Functionality**

11. Do you think the interface offers enough functionality? If not, what would you like to see? (Multiple options possible) \*

Vink alle toepasselijke opties aan.

| Yes  |
|--|
| No, add switchable color schemes.                                    |
| No, add an autoscroll function to the matched attribute.             |
| No, add a hide column function.                                      |
| No, add a function which shows the matched attributes on mouse over. |
| No, add more short keys.   |
| No, add (better) row sort.   |
| Anders:  |

# **Additional Comments**

12. If you have additional comments or suggestions for the new interface, please write them here



#### APPENDIX III Questionnaire Prototype interface

Questionnaire given to the participants of the prototype usability test.

2/24/2017

MDF Current Interface Testing

# MDF Current Interface Testing

#### Interface testing of the current interface used by



#### **General Information**

This questionnaire, in combination with a usability test, is used to evaluate the product matching interface used by Mydatafactory.

Screen recordings and webcam images will be made and saved for research purposes.

1. Name \*

#### **Informed Consent**

The purpose of this research is to analyse the current product matching interface used by Mydatafactory.

During this research some privacy sensitive data will be collected and stored, namely webcam recordings made during the usability test. This data will be handled with care and only shared with persons involved in this research (UT supervisor, Mydatafactory supervisor). Privacy sensitive data will only be shared with third parties after explicit permission of the participant. After the research is finished (approximately mid February), the privacy sensitive information will be deleted, the screen recordings might be saved for research and reference to improve other parts of the program supplied by Mydatafactory. These screen recording will however not contain any privacy sensitive information

For questions about this research please contact: Christiaan Boersma Rodenmorsweg 3 7591 NJ Email: <u>boersmachristiaan@gmail.com</u> Tel: 0618698920

For queries, complaints or comments about the research please contact the secretary of the EC. dr. ir. H.J.A. op den Akker (Department HMI) Ethics Committee, Faculty of EEMCS, University of Twente PO Box 217 7500 AE Enschede (NL) Tel: +31(0)53.4894602 email: <u>BFD\_EWI@ewi.utwente.nl</u> Fax: +31(0)53.4893114 website: <u>http://www.utwente.nl/en/education/eemcs/</u>

# By continuing, you agree to the collection and use of this data for this specific research

https://docs.google.com/forms/d/1eJSyl3SKzpFJgPcPopgcsudMyu25Yk6rgFt12dp2g8U/edit

MDF Current Interface Testing

#### **Pre User Test Questions**

Please answer these questions before starting the usability test

2. Markeer slechts één ovaal per rij.

|               | 0-100      | 101-500    | 501-1000   | More than 1000 |
|---------------|------------|------------|------------|----------------|
|               | products   | products   | products   | products       |
| Amount of use | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$     |

3. How familiar are you with the product matching interface?

Markeer slechts één ovaal.



4. Since when have you been using the product matching interface? (approximately)

Voorbeeld: 15 december 2012

#### **Start Usability Test**

The usability test consists of several different components.

We start with setting up and calibrating the eye tracking software. With the eye-tracking software we get a better understanding of the way the product matching process is handled by the user.

When calibration is finished you will be asked to perform a number of product matches. During the matching everything you do is recorded, your gaze, location and clicks of your mouse, keypresses and the screen itself.

Please start the usability test now.

When you finish, you can continue with the questionnaire

#### System Usability

#### MDF Current Interface Testing

5. System Usability Scale \* Markeer slechts één ovaal per rij.

|   | Strongly<br>disagree | Disagree   | Neutral    | Agree      | Strongly<br>Agree |
|---|----------------------|------------|------------|------------|-------------------|
| I think that I would like to use<br>this system frequently                                      | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I found the system<br>unnecessarily complex   | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I thought the system was easy<br>to use   | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I think that I would need the<br>support of a technical person to<br>be able to use this system | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I found the various functions in<br>this system were well integrated                            | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I thought there was too much<br>inconsistency in this system                                    | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I would imagine that most<br>people would learn to use this<br>system very quickly              | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I found the system very<br>cumbersome to use  | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I had sufficient knowledge about<br>the products being matched                                  | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I felt very confident using the<br>system   | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I needed to learn a lot of things<br>before I could get going with this<br>system               | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |

#### **User Knowledge and User Experience**

These questions are related to the knowledge you have about the products you just matched and the experience you just had.

#### 6. Your experience

Markeer slechts één ovaal per rij.

|  | Strongly<br>disagree | Disagree   | Neutral    | Agree      | Strongly<br>Agree |
|--|----------------------|------------|------------|------------|-------------------|
| Too many colors were used in the interface                     | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| The relevant attributes are<br>highlighted                     | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I have to scroll too much to find the relevant attributes      | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| Too many candidate matches<br>are shown                        | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| The font size is too small                                     | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| The font is clear  | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| Too little information is shown in<br>the matches section      | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I'm very confident about my<br>matches                         | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I had sufficient knowledge about<br>the products being matched | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I knew which product attributes<br>were relevant               | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |
| I checked every product<br>attribute visually                  | $\bigcirc$           | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$        |

MDF Current Interface Testing

# **Design and Readability**

7. How clear did you think the organization of information on the interface screen was during the first matching mode? (Alternatives on the side) \*

| IANFACTURER NAME         | DESCRIPTION 1 NL                          | ** | ART NR DESCRIPTION 1 NL                     | EAN CODE       | MANUFACTURER CATELOG PN | MANFACTURER | ART NR   | DESCRIPTION 1 NL                    | EAN CODE      | MANUFACTURER CATELOG |
|--------------------------|---|----|---|----------------|-------------------------|-------------|----------|-------------------------------------|---------------|----------------------|
|                          | OLIEKEERRING 40-45-10                     |    | 23586101 Motip 4065 vinylspray 400ml wit    | 8711347040850  |                         | MOTIP       | 23951740 | Legbord M. Steunconsole 1000X30     | 4044917323803 |                      |
| SK                       | IF Nokrol KR528                           |    | 23766420 Kurverol KR 52 B                   | 7316571595105  |                         | SKF         | 12529531 | Handschoen Granite 5 Beta 9         |               | 8912                 |
|                          | BUITENBORGVEREN 470 / / / GAGF004400      |    | 23895957 Millieustelling voor binnen opslag |                |                         | UNSPECIFIED | 12530038 | DIN912 M1.4X4 A4 vis to six pans i  |               |                      |
|                          | Oliekeerring DIN3760 A NBR d15xD32xB7     |    | 23839554 Olekeeming nbr e-gvp               |                |                         | UNSPECIFIED | 12530039 | DIN912 M1.6X4 A2 vis to six pans of |               |                      |
| TRELLEBORG INDUSTRIAL AV | STRILLINGSDEMPER 30X20 B /555H M. 8X27    |    | 10041043 Trillingsdemper B 30x20 M8 NBR     |                |                         | UNSPECIFIED | 12530041 | DIN912 M1.4X6 A2 vis to six pans i  |               |                      |
|                          | 3 SIX PANS CREUX 8.8 912 - M 12 X 80 - ZN | 0  | 23951740Legbord M. Steunconsole 1000003     | (4044917323803 |                         |             | 12530042 | DIN912 M1.6X6 A2 vis to six pans of |               |                      |
|                          | VI STANDARD ULTRAFLEX SPB 3800CONTI       |    | 12728878V-riem SPB3800 Red Power 3          |                |                         | OPTIBELT    | 12530043 | DIN912 M2.5X16 A4 vis to six pans   |               |                      |
|                          | Lager 6207 2m                             |    | 23441699Lager (hk) 6207-2rs                 |                |                         | UNSPECIFIED | 12530045 | DIN912 M2.5X18 A4 vis to six pans   |               |                      |
| NORGRE                   | N "Mini-bolkraan 2/2 (v/v), 1/8 601112118 |    | 11575908 mini-kogelkraan 601112118 G1/8     |                |                         | NORGREN     | 23095394 | DIN912 8.8 M12x80 /50               | 4043952166550 | 009128000120080      |
|                          | LAGER 6007 ZZ                             |    | 23604658Lager nsk 6007zz                    |                |                         | NSK         | 23696752 | DIN912 8.8 ean M12x80 /50           | 4043952177747 | 009128100120080      |
|                          | DIN916 64X16 A2                           |    | 23793172 Ophangbeugel voor reddingsboei     |                |                         | UNSPECIFIED | 23096913 | DIN912 8.8 gvz M12x80 /50           | 4043952182079 | 009128600120080      |
|                          | spanbus din 7343 3x20                     |    | 11788780 DIN7343 veerstaal 3x29 /1000       | 4043952507315  |                         | FAST-X      | 11767711 | DIN912 8.8 DISP M12x80 /50          | 4043952163572 |                      |
|                          | BUS M82030DU                              |    | 12083961 Glijlager mb 2030 DU-H             |                |                         | UNSPECIFIED | 23827581 | Ds bout DIN933 zn 8.8 12x80         |               |                      |
|                          | COM / RL NANO1 / / 2000166427 / / FACOM   |    | 12306841Doppenset compact rLnano1pb 1       | 2              | 3148519040425           | FACOM       | 12316530 | Sormat plug chem.ank.inw.dr.M8(1)   | 6416031726231 | SRCH7,08 Z           |
|                          | din 7991 6x16 zn                          |    | 23827551Ds bout DINS33 zn 8.8 6x16          |                |                         | UNSPECIFIED | 11764037 | DIN561a 8.8 M12x80 /25              | 4043952102855 |                      |
|                          | DIN 315 Fluegelmutter M16 Temperg verz    |    | 23689985/DIN315 gietijzer M16 /20           | 4043952063743  | 003150000160000         | FAST-X      | 23367464 | Din912 8.8 inb.bout vold m12x80 /5  |               |                      |
| FACO                     | MDOPPEN 1/2" 250FACOM S.215 10.69.85.91   |    | 23781500Stahlwille 12250 metalen oliekan    | 4018754048498  | 77010001                | STAHLWILLE  | 11768863 | DIN912 8.8 ean dr tot kop M12x80    | 4043952181069 | 009128150120080      |
|                          | O-RING 4P.400295 18,64 X 3,53             |    | 23574753Marner like-100 iat                 |                |                         | MANNER      | 23890354 | Aml dir@12-m12x80 schroef           | 4020772153175 |                      |
| MAKIT                    | ACA A-87367 RESERVELAMP TBV.ML122.123     |    | 23573471 Makita a-87367 buislamp mi122      | 86381157681    |                         | MAKITA      | 23303412 | Bouchon male 1/8 6 pans creux 23    |               |                      |
| 58                       | F SKF SCREW PLUG M10X1 406-011            |    | 126124585top m10x1 406-011                  |                |                         | VOGEL SKF   | 23303414 | Bouchon male 3/8 6 pans creux 23    |               |                      |
| LOCTIT                   | E PAKKINGKOORD // 55                      |    | 11146483 Loctite 55 afdichSngskoord 150m    |                |                         | LOCTITE     | 12688572 | Bouchon male 3/8 6 pans creux 23    |               |                      |
|                          | GOUPILLLE CONIQUE 18 - 6 X 60 BL          |    | 12519258 Raccords conique M6X1-4mm          |                |                         | VOGEL SKF   | 23369776 | Dir976a 8.8 dor draadeind m12x80    |               |                      |
|                          | courrole A68 1755mm                       |    | 23999367 Courrole php a68                   |                |                         | SKF         | 23092344 | DIN6912 8.8 M12x80 /50              |               | 069128000120080      |
| BAHO                     | OCHROEFSLEUTEL ERGO 9071 - E' BAHCO       |    | 12505704M2.5x0.45 HSS-E JIS B-4430 (90      | 4022835907183  |                         | VOLKEL      | 23090459 | DIN479 8.8 M12x80 /25               | 4043952088948 | 004798000120080      |
|                          | BOOR CIL. DIN338 RN diameter 10 mm        |    | 23381427 Boor cil. din 338 has 10.30mm      |                |                         | GUHRING     | 23096734 | DIN031 8.8 M12x80 /50               | 4043952223420 | 009318000120060      |
|                          |   |    | -   |                |                         |             | 23097200 | DIN931 8.8 err M12v80 /50           | 4043952231845 | 009318100120080      |
|                          |   |    |   |                |                         |             | 23097423 | DIN931 8.8 thu M12x80 /50           | 4043952235638 | 009318200120080      |
|                          |   |    |   |                |                         |             | 23097894 | DIN933 8.8 M12x89 /50               | 4043952259702 | 009338000120080      |
|                          |   |    |   |                |                         |             | 23034228 | DN033 8.8 ees M12+80.50             | 4043052260410 | 0000338100120060     |
|                          |   |    |   |                |                         |             | 23056432 | DIN033 8.8 the M12+80 (50           | 4043952270219 | 009338200120080      |
|                          |   |    |   |                |                         |             |          | Construction of the second states   |               |                      |



8. Why do you think that?

#### MDF Current Interface Testing

9. How clear did you think the organization of information on the interface screen was during the second matching mode? (Alternatives underneath) \*

| DESCRIPTION 1 NL               |               | MANFACTURER NAM         | NE .             | MANUFACTURER    | R PN DE     | SCF                  | ART NR 0          | DESCRIPTION 1 NL    | EAN CODE            | MANUFACTURER CATELOG PN MANFACTURER NAM | IE MANUFACTURER P | N PRODCOMP P |
|--------------------------------|---------------|-------------------------|------------------|-----------------|-------------|----------------------|-------------------|---------------------|---------------------|---|-------------------|--------------|
| LIEKEERRING 40-65-10           |               |                         |                  |                 |             |                      | 23586101 Motip 40 | 065 vinylspray 400m | i wit 8711347040650 | MOTIP                                   | 04065             | 4065         |
| ART NR DESCRIPTION 1 NL        | EAN CODE      | MANUFACTURER CATELOG PN | MANFACTURER NAME | MANUFACTURER PN | PRODCOMP PN | SUPP                 | LIER NAME         | COMPETITOR PN       | COMPETITOR NAME     |   |                   |              |
| 3766420 Kurverol KR 52 B       | 7316571596105 |                         | SKF              | KR 52 B         |             | SKF Belgium N        | iV (niet edi)     | ZRNS000511          | Brammer BE          |   |                   |              |
| 4026756 Kurverol KR52-8        | 4012802428315 |                         | NA               | KR52-8          |             | Schaeffler BVE       | BA (INA EDI)      |                     |                     |   |                   |              |
| 1834447 Kurverol KR52-B-NMT    | 4054362446156 |                         | NA               | KR52-B-NMT      | 57501480078 | Schaeffer BVE        | IA (INA EDI)      | ZRK001093           | Brammer BE          |   |                   |              |
| 1766421 Kurverol KR 52 PPA     | 7316571696112 |                         | SKF              | KR 52 PPA       |             | SKF Belgium N        | V (niet edi)      | ZRN9000512          | Brammer BE          |   |                   |              |
| 3766422 Kurverol KR 52 PPXA    | 7316571696129 |                         | SKF              | KR 52 PPXA      |             | SKF Belgium N        | W (nush)          |                     |                     |   |                   |              |
| 4026758 Kurverol KR52-PP-A     | 4012802428414 | 0057504580000           | INA              | KR52-PP-A       |             | Schaeffer BVE        | A (INA EDI)       | 100137502           | Brammer BE          |   |                   |              |
| 3766397 Kurverol KR 22 B       | 7316571694590 |                         | SKF              | KR 22 B         |             | SKF Belgium N        | V (niet edi)      | ZRN5000484          | Brammer BE          |   |                   |              |
| 3766402 Kurverol KR 30 B       | 7316571590004 |                         | SKF              | KR 30 B         |             | SKF Belgium N        | V (nush)          | ZRN9000492          | Brammer BE          |   |                   |              |
| 3766406 Kurverol KR 32 B       | 7316571690615 |                         | SKF              | KIR 32 B        |             | SKF Belgium N        | (nush)            | ZRN9000496          | Brammer BE          |   |                   |              |
| 3766410 Kurverol KR 35 B       | 7316571588162 |                         | SKF              | KR 35 B         |             | SKF Belgium N        | V (niet edi)      | ZRN9000500          | Brammer BE          |   |                   |              |
| 3766414 Kurverol KR 40 B       | 7316571694859 |                         | SKF              | KR 40 B         |             | SKF Belgium N        | V (nush)          | ZRN9000504          | Brammer BE          |   |                   |              |
| 3766417 Kurverol KR 47 B       | 7316571694927 |                         | SKF              | KR 47 B         |             | SK/F Belgium N       | V (niet edi)      | ZRN9000508          | Brammer BE          |   |                   |              |
| 3766423 Kurverol KR 62 B       | 7316571231624 |                         | SKF              | KR 62 B         |             | <b>SKF Beigium N</b> | (nush)            |                     |                     |   |                   |              |
| 4003731 Kurverol KR 26 B       | 7316571694644 |                         | SKF              | KR 26 8         |             | SKF Belgium N        | V (niet edi)      | ZRN5000488          | Brammer BE          |   |                   |              |
| 4026720 Kurverol KR26-8        | 4012802422931 |                         | NA               | 0057483050000   |             | Schaeffer BVE        | A (INA RUSH)      |                     |                     |   |                   |              |
| 4026724 Kurverol KR30-8        | 4012802422924 |                         | NA               | 0055920030000   |             | Schaeffer BVE        | A (NA EDI)        |                     |                     |   |                   |              |
| 4026730 Kurverol KR32-8        | 4012802422955 |                         | NA               | KR32-8          |             | Schaeffer BVE        | A (INA RUSH)      | 100137497           | Brammer BE          |   |                   |              |
| 4026736 Kurverol KR35-B        | 4012802418330 |                         | NA               | 0055921350000   |             | Schaeffer BVE        | A (INA RUSH)      | 100137498           | Brammer BE          |   |                   |              |
| 4026747 Kurverol KR47-8        | 4012802428322 | 0057497270000           | NA               | KR47-8          |             | Schaeffer BVE        | A (INA EDI)       |                     |                     |   |                   |              |
| 4026762 Kurverol KR62-8        | 4012802414554 | 0069588420000           | NA               | KR62-8          |             | Schaeffer BVE        | A (NA EDI)        |                     |                     |   |                   |              |
| 2572698 Kurverol KR40-8        | 4012802422948 | 0055915540000           | NA               | KR45-8          |             | Schaeffer BVE        | A (INA RUSH)      | 100137500           | Brammer BE          |   |                   |              |
| 1834459 Kurverol KR80-8        | 4012802428582 | 0069595630000           | NA               | KR80-8          | 69595630000 | Schaeffer BVE        | A (INA RUSH)      |                     |                     |   |                   |              |
| 4026716 Kurverol KR22-8        | 4012802419207 |                         | NA               | 0057442370000   |             | Schaeffer BVI        | A (INA EDI)       | 100115541           | Brammer BE          |   |                   |              |
| 4020246 Terrington kr22b       |               |                         | TORRINGTON       | KR228           |             | Koyo Bearings        | Deutschland GmbH  |                     |                     |   |                   |              |
| 4020250 Terrinoton kr26b       |               |                         | TORRINGTON       | KRMA            |             | Koyo Bearings        | Deutschland GrebH |                     |                     |   |                   |              |
| 834448 Kurverol KR52-PP-A-NMT  | 4054362446170 |                         | NA               | KR52-PP-A-NMT   | 57504580078 | Schaeffer IIVI       | A (NA EDI)        | ZRK000680           | Brammer BE          |   |                   |              |
| 4200940 Kurverol KR52-X-PP-A   | 4012802421828 | 0057505470000           | NA               | KR52-X-PP-A     |             | Schaeffer BVE        | A (INA RUSH)      |                     |                     |   |                   |              |
| 834450 Kurverni KR52-X-PP-A-NM | 4054362446187 | 0057505470078           | NA               | KR52-X-PP-A-NMT | 57505470078 | Schaeffer BVE        | A (INA RUSH)      | ZBN(001283          | Brammer BE          |   |                   |              |
| 4026718 Kurveni KR22-X-B       | 4012002368611 |                         | NA               | KR22.X-B        |             | Schaeffer BVE        | A (INA RUSH)      |                     |                     |   |                   |              |
| 4726722 Kunwerd KR26 X.B       | 4012002428575 |                         | N.A.             | VPN V.B         |             | Schoolffor DVD       | A (INA PUPUL)     |                     |                     |   |                   |              |

Markeer slechts één ovaal.

|              | 1          | 2          | 3          | 4          | 5          |            |
|--------------|------------|------------|------------|------------|------------|------------|
| Very unclear | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | Very clear |

10. Why do you think that?

#### 11. How fast did you know what the different sections meant?

Markeer slechts één ovaal per rij.

|                       | Immediately | Quickly    | Neither fast<br>nor slow | Slow       | Had to look<br>multiple times | l still<br>don't<br>know |
|-----------------------|-------------|------------|--------------------------|------------|-------------------------------|--------------------------|
| Section 1 (Blue)      | $\bigcirc$  | $\bigcirc$ | $\bigcirc$               | $\bigcirc$ | $\bigcirc$                    | $\bigcirc$               |
| Section 2<br>(Green)  | $\bigcirc$  | $\bigcirc$ | $\bigcirc$               | $\bigcirc$ | $\bigcirc$                    | $\bigcirc$               |
| Section 3 (Red)       | $\bigcirc$  | $\bigcirc$ | $\bigcirc$               | $\bigcirc$ | $\bigcirc$                    | $\bigcirc$               |
| Section 4<br>(Yellow) | $\bigcirc$  | $\bigcirc$ | $\bigcirc$               | $\bigcirc$ | $\bigcirc$                    | $\bigcirc$               |

#### 12. How would you rate the readability of the text in the different sections \*

Markeer slechts één ovaal per rij.

|                                    | Very hard  | Hard       | Neither easy nor hard | Easy       | Very easy  |
|------------------------------------|------------|------------|-----------------------|------------|------------|
| Section 1 (Blue): Queries          | $\bigcirc$ | $\bigcirc$ |                       | $\bigcirc$ | $\bigcirc$ |
| Section 2 (Green): Best<br>Matches | $\bigcirc$ | $\bigcirc$ | $\bigcirc$            | $\bigcirc$ | $\bigcirc$ |
| Section 3 (Red): Alternatives      | $\bigcirc$ | $\bigcirc$ |                       | $\bigcirc$ | $\bigcirc$ |

5/7

https://docs.google.com/forms/d/1eJSyl3SKzpFJgPcPopgcsudMyu25Yk6rgFt12dp2g8U/edit

#### MDF Current Interface Testing

# Functionality

#### 13. Which of the added functionalities do you like? \*

Markeer slechts één ovaal per rij.

|   | Dislike the<br>functionality | The functionality needs<br>improvement | like the<br>functionality |
|---|------------------------------|--|---------------------------|
| Multiple switchable layouts                                       | $\bigcirc$                   |  | $\bigcirc$                |
| independent scrolling of<br>sections                              | $\bigcirc$                   |  | $\bigcirc$                |
| Hiding of excessive cell<br>content and showing on<br>mouse over  | $\bigcirc$                   | $\bigcirc$                             |                           |
| Pop-up at the alternatives<br>section                             | $\bigcirc$                   |  | $\bigcirc$                |
| Select to search filter   | $\bigcirc$                   |  | $\bigcirc$                |
| Extra highlighting of<br>'matched on' attributes at<br>mouse over |                              |  |                           |

14. How do some (if any) functions need to be improved?

15. Do you think the interface needs more functionality? If yes, what and why?



16. If you have additional comments or suggestions for the new interface, please write them here

Mogelijk gemaakt door

https://docs.google.com/forms/d/1eJSyl3SKzpFJgPcPopgcsudMyu25Yk6rgFt12dp2g8U/edit

# Appendix IV Mock-ups

The mock-ups and functions ideas presented during the group session at ERIKS.



|                  | $\int$                | Ę                                    | NL            | MET RVS                       | MET RVS           | TFE 65xt                        | MET RVS          | keerring                                | eerring 4                             | MET RVS                               | MET RVS   | MET RVS                                    | MET RVS             | MET RVS                                 | MET RVS          | 10/40 DN                       | 40 met 1                     | '40 (10 s)             | MET RVS                                      | eerring 6                  | 19                                     | special '                                | 01 PN10                        | V10/40 D                                 | N10/40 D                     | V10/40 D                             | PN10/40                          | V10/40TC            | 110/40 DI                           | N10/40 D                           | 10/40 DP  | 10/40 Dh  |                    | -                 |  |
|------------------|-----------------------|--------------------------------------|---------------|-------------------------------|-------------------|---------------------------------|------------------|---|---------------------------------------|---------------------------------------|---|--|---------------------|---|------------------|--------------------------------|------------------------------|------------------------|--|----------------------------|--|--|--------------------------------|--|------------------------------|--------------------------------------|----------------------------------|---------------------|-------------------------------------|------------------------------------|-----------|-----------|--------------------|-------------------|--|
|                  | ⊌<br>∏                | <ul> <li>Start Mat</li> </ul>        | SCRIPTION 1   | FKEERRING                     | EKEERRING P       | keerring R1 P                   | EKEERRING I      | 06810GP Olie                            | 05510G Oliek                          | KEERRING N                            | EKEERRING I                                     | EKEERRING N                                | EKEERRING           | EKEERRING                               | EKEERRING        | TEK SC PN                      | s hangslot 65/               | s hangslot 66/         | EKEERRING P                                  | 5808GP Oliek               | gh ECON 562                            | keerring PTFE                            | I WLP GYL 35                   | GYL 3501 PF                              | 1 GYL 3501 Pt                | GYL 3501 PF                          | FF RX PTFE                       | 1 GYL 3501 Ph       | RX PTFE PN                          | 1 GYL 3500 PF                      | GOR GR PN | GOR GR PN |                    |                   |  |
|                  |                       | t Once                               | NR DES        |                               | 4144 OLIE         | 7645 Oliel                      | 2739 OLIE        | 6144 BE4                                | 6143 BE4                              | 2094 OLIE                             | 4112 OLIE                                       | 4183 OLIE                                  | 1764 OLIE           | 0229 OLIE                               | 4764 OLIE        | 4339 PRC                       | 16766 Abu                    | 2121 Abu               | 1048 OLIE                                    | 6170 BE6                   | 1672 Veili                             | 5749 Oliel                               | 01480 Ring                     | 01507 Ring                               | 01520 Ring                   | 4141 Ring                            | 9662 Ring                        | 7908 Ring           | 4621 Ring                           | 8362 Ring                          | 5497 Ring | 8339 Ring |                    |                   |  |
|                  |                       | All Pages at                         | ATRI          | 1103                          | 0COM 1127-        | 1190                            | 1134 1134        | J1 2411                                 | 41 2411                               | 1104                                  | 1127  | 800 1127                                   | 1103                | 2118 1108                               | Z 1133           | 1143                           | a118                         | 2379                   | NO15 1103                                    | 2411                       | 1271                                   | 1166                                     | 1000                           | 67 1000                                  | 11 1000                      | 1114                                 | 1115                             | A68 1151            | ECIFI 1113                          | 1235                               | 1104      | 1111      |                    |                   |  |
|                  |                       |                                      |               |                               | PN PROD           | 4065                            | KR 52            | U.306                                   | PBMA                                  |                                       |   | SPB3                                       |                     | 60111                                   | 60072            | _                              |                              | _                      | RL.N/  |                            |  | 12250                                    | _                              | A-873                                    | 406-0                        |                                      |                                  | PHG                 | UNSP                                | 33810                              |           |           |                    |                   |  |
|                  |                       |                                      |               |                               | UFACTURER CATALOG | 55                              | 52 B             | 3515241734                              |                                       |                                       |   |  | r 2RS               | 12118                                   | 72               |                                | 139600030020                 |                        | 3519040425                                   |                            | 0160001                                | 10001                                    |                                |  |                              |                                      | 110020060060                     |                     | 18                                  |                                    |           |           | Manual Lookun (E2) | Manual Lookup (F3 |  |
|                  |                       |                                      |               |                               | N MAN             | 0406                            | KR 6             | 3146                                    |                                       |                                       |   |  | 6207                | 6011                                    | 6007             | -                              | 0734                         |                        | 3146   |                            | 4756                                   | 6 7701                                   | _                              |  |                              | _                                    | 000 0900                         | _                   | 1206                                | <u>0</u>                           |           |           |                    |                   |  |
|                  |                       |                                      |               |                               | MANUFACTURER F    | 04065                           | KR 52 B          | U.306J1                                 | PBMA41                                |                                       | 8912  | SPB3800                                    | 6207 2RS            | 601112118                               | 6007ZZ           | XONI                           | 073439600030020              | MB 020.030 DU-H *      | RL.NAN01PB                                   | \$B9126                    | 47560160001                            | 77010001 PP10318                         | 400295                         | A-87367                                  | 406-011                      |                                      | 23688673 39000060                | PHG A68             | 90718                               | 33810                              |           |           |                    |                   |  |
|                  |                       |                                      |               |                               | ANUFACTURER NAME  | (OTIP                           | KF               | ACOM                                    | RADY                                  | INSPECIFIED                           |   | DPTIBELT                                   | INSPECIFIED         | ORGREN                                  | ISK              | INSPECIFIED                    | AST-X                        | INSPECIFIED            | ACOM   | INSPECIFIED                | AST-X                                  | TAHLWILLE                                | ANNER                          | <b>AKITA</b>                             | OGEL SKF                     | OCTITE                               | AST-X                            | KF                  | OLKEL                               | SUHRING                            |           |           | ij                 |                   |  |
|                  |                       |                                      |               |                               | DSTYPE N          | ANC                             | ANC              | ANC                                     | ANC B                                 | ANC U                                 | ANC   | ANC O                                      | ANC U               | ANC                                     | ANC              | ANC                            | ANC                          | ANC                    | DRM  | RLA U                      | ANC                                    | ANC S                                    | ANC                            | ANC                                      | ANC                          | ANC                                  | ANC                              | ANC S               | ANC                                 | ANC G                              |           |           |                    |                   |  |
|                  |                       |                                      |               |                               | RTSTAT PC         | BA                              | BA               | BA                                      | BA                                    | BA                                    | BA  | BA   | BA                  | BA                                      | BA               | B                              | B                            | B                      | <u>N</u>                                     | Ш                          | BA                                     | BA                                       | BA                             | BA                                       | BA                           | BA                                   | BA                               | 8                   | BA                                  | BA                                 |           |           |                    |                   |  |
| Made Easy        |                       | C Dutch                              |               |                               | AF                | Z1                              | Z1               | s Z1                                    | <b>Z</b> 5                            | Z2                                    | n Lich Z5                                       | Z5   | Z1                  | Z1                                      | <u>z</u> 1       | <u>Z</u> 2                     | <u>z</u> 1                   | <u>Z</u> 2             | <u>z</u> 1                                   | Z5                         | <b>Z</b> 1                             | Z1                                       | <u>Z</u>                       | Z5                                       | Z5                           | 5 <u>7</u>                           | Z1                               | <u>5</u> 2          | Z1                                  | Z1                                 |           |           |                    |                   |  |
| Product Matching |                       | C Target Scope Language:             |               |                               | DESCRIPTION 1 NL  | Motip 4065 vinylspray 400ml wit | Kurverol KR 52 B | Facom u.306j1 set binnen/buitentrekken  | Brochuredisplay A4 H240xB230xD32      | Trillingsdemper B 30x20 M8 NBR        | Legbord M. Steunconsole 1000X300 Mn             | V-riem SPB3800 Red Power 3                 | Lager (hk) 6207-2rs | mini-kogelkraan 601112118 G1/8          | Lager nsk 6007zz | Ophangbeugel voor reddingsboei | DIN7343 veerstaal 3x20 /1000 | Glijlager mb 2030 DU-H | Doppenset compact rl.nano1pb 1/4*            | Ds bout DIN933 zn 8.8 6x16 | Din315 mni vleugmoer m16 /20           | Stahlwille 12250 metalen oliekan         | Manner Ike-100 lat             | Makita a-87367 buislamp ml122            | Stop m10x1 406-011           | Loctite 55 afdichtingskoord 150meter | DIN1b staal 6x60 /50             | Courrole phg a68    | M2,5x0,45 HSS-E JIS B-4430 (90718)  | Boor cll. din 338 hss 10,30mm      |           |           |                    |                   |  |
|                  |                       | cope                                 |               | ണ                             | Sta               | Ne                              | Ne <sup>s</sup>  | Ne <sup>-</sup>                         | Ne                                    | Ne <sup>r</sup>                       | Ne  | Ne   | Ne                  | Ne                                      | Ne               | Ne                             | De Ne                        | Ne                     | D<br>Ne                                      | Ne <sup>-</sup>            | Ne <sup>r</sup>                        | Ne                                       | Ne                             | Ne <sup>,</sup>                          | Ne.                          | Ne <sup>s</sup>                      | Ne.                              | D<br>Se             | Ne <sup>2</sup>                     | Ne <sup>1</sup>                    |           |           |                    |                   |  |
|                  |                       | be Konkura ← Parameters I 🗁 Source S |               | Selected: 1   Page size: 25 X | DESCRIPTION 1 NL  | OLIEKEERRING 40-65-10           | Nokrol KR52B     | FACOM SET VOOR BINNEN-BUITENBORGVEREN 4 | Oliekeerring DIN3760 A NBR d15xD32xB7 | TRILLINGSDEMPER 30X20 B /55SH M. 8X27 | VIS A SIX PANS CREUX 8.*8 912* - M 12 X 80 - ZN | V-RIEM STANDARD ULTRAFLEX SPB 3800 (B=16,3 | Lager 6207 2rs      | 601112118 Mini-boikraan 2/2 (v/v), 1/8' | LAGER 6007 ZZ    | DIN916 04X16 A2                | spanbus din 7343 3x20        | BUS MB2030DU           | RL.NANO1PB 1/4" doppenset 6-kant +ratel FACC | din 7991 6x16 zn           | DIN 315 Fluegelmutter M16 Temperg.verz | VERLENGSTUK VOOR DOPPEN 1/2' 250 MM FACO | O-RING 4P. 400295 18,64 X 3,53 | MAKITA A-87367 RESERVELAMP TBV.ML122,123 | SKF SCREW PLUG M10X1 406-011 | PAKKINGKOORD // 55                   | GOUPILLLE CONIQUE 1B - 6 X 60 BL | courrole A68 1755mm | SCHROEFSLEUTEL ERGO 9071 - 8' BAHCO | BOOR CIL. DIN338 RN diameter 10 mm |           |           |                    |                   |  |
|                  | atching               | master - Tyl                         |               | al: 20   In view: 20          | MANUFACTUREF      |                                 | SKF              |   |                                       | TRELLEBORG IN                         |   |  |                     | NORGREN                                 |                  |                                |                              |                        |  |                            |  | FACOM                                    |                                | MAKITA                                   | SKF                          | LOCTITE                              |                                  |                     | BAHCO                               |                                    |           |           |                    |                   |  |
|                  | ctory.com/m           | tch local to                         |               | /1 To                         | IANUFACT          |                                 | KF KR 52         |   |                                       | 669*TDB3(                             |   |  |                     | 01112118                                |                  |                                |                              |                        |  |                            |  |  |                                | -87367                                   | 06-011                       | 2                                    |                                  |                     |                                     |                                    |           |           |                    |                   |  |
|                  | K 认 (http://Mydatafac | Matching                             | 22            | Page: 1                       | TION 2 NL         |                                 | 2B Si            |   |                                       | 44                                    |   |  |                     | 0                                       |                  | nbus M4x16 mm zonder ko        |                              |                        |  |                            |  |  |                                | RESERVELAMP MAKITA V                     | 4                            | PIPE SEALING CORD 55                 |                                  |                     | SLEUTEL                             | DIN 338 HSS 114520                 |           |           |                    |                   |  |
| {<br>{           | ር<br>ጉ                | Mode: Only                           | Article match | ▲<br>▼<br>▼                   | ARTDESCRIP        | 100                             | 101 SKF KR 5     | 102                                     | 103                                   | 104                                   | 105   | 106  | 107                 | 108                                     | 109              | 110 stelbout in                | 11                           | 112                    | 113  | 114                        | 115                                    | 116                                      | 117                            | 118 A-87367 F                            | 119                          | 120 LOCTITE                          | 121                              | 122                 | 123 SCHROE                          | 124 BOOR CIL                       |           |           |                    |                   |  |

| l an l    | a 🗸 Parameters  | 🔁 Source Scop      | ()<br>() | Target Scope Language: 🖂 Dutch 🔸             |            |         |                   |                     |                         | ages at Once | <ul> <li>Start Match</li> </ul> |
|-----------|-----------------|--------------------|----------|--|------------|---------|-------------------|---------------------|-------------------------|--------------|---------------------------------|
| ge sizı   | a: 25           | 1<br> <br>         |          | un View                                      |            |         |                   |                     |                         |              |                                 |
| ACT DE    | ESCRIPTION 2 NL | Sti                | ARTN     | R DESCRIPTION 1 NL                           | ARTSTAT    | POSTYPE | MANUFACTURER NAME | MANUFACTURER PN     | MANUFACTURER CATALOG PN | PRODCOMP PN  | SUPPLIER NAME                   |
| -         |                 | Ne                 | 2358     | 101 Motip 4065 vinylspray 400ml wit          | Z1         | BANC    | MOTIP             | 04065               | 04065                   | 1065         |                                 |
| 52 SKF    | : KR 52 B       | Ne                 | 23766    | 420 Kurverol KR 52 B                         | z          | BANC    | SKF               | KR 52 B             | KR 52 B                 | KR 52 B      | SKF Belgium NV (niet            |
|           |                 | Ne                 | 23446    | 629 Facom u.306j1 set binnen/buitentrekkers  | Z1         | BANC    | FACOM             | U.306J1             | 3148515241734           | 1.306.1      |                                 |
|           |                 | Ne                 | 1257     | 674 Brochuredisplay A4 H240xB230xD32         | Z5         | BANC    | BRADY             | PBMA41              |                         | BMA41        | Brady WH NV                     |
| 083(      |                 | Ne                 | 10041    | 043 Trillingsdemper B 30x20 M8 NBR           | Z5         | BANC    | UNSPECIFIED       |                     |                         |              |                                 |
|           |                 | Ne                 | 23951    | 740 Legbord M. Steunconsole 1000X300 Mm Lich | Z5         | BANC    |                   | 8912                |                         | -            | Kerkmann GmbH &an               |
|           |                 | Ne                 | 12726    | 878 V-riem SPB3800 Red Power 3               | Z5         | BANC    | OPTIBELT          | SPB3800             |                         | SPB3800      | Optibelt GmbH                   |
|           |                 | Ne                 | 2344     | 699 Lager (hk) 6207-2rs                      | Z1         | BANC    | UNSPECIFIED       | 6207 2RS            | 3207 2RS                |              |                                 |
| 18        |                 | Ne                 | 11575    | 908 mini-kogelkraan 601112118 G1/8           | Z1         | BANC    | NORGREN           | 601112118           | 501112118               | 501112118    |                                 |
|           |                 | NG                 | 23604    | 658 Lager nsk 6007zz                         | Z1         | BANC    | NSK               | 6007ZZ              | 2007ZZ                  | 3007ZZ       |                                 |
| stelbou   | t imbus M4x1    | 6 mm zonder koj Ne | 23793    | 172 Ophangbeugel voor reddingsboei           | Z5         | BANC    | UNSPECIFIED       | NOX                 |                         | _            | andtmeters Naval Stu            |
|           |                 | NG                 | 11786    | 780 DIN7343 veerstaal 3x20 /1000             | Z1         | BANC    | FAST-X            | 073439600030020     | 073439600030020         |              |                                 |
|           |                 | Ne                 | 12083    | 961 Glijlager mb 2030 DU-H                   | Z5         | BANC    | UNSPECIFIED       | MB 020.030 DU-H **  |                         |              | fechn Handelsond Ne             |
|           |                 | Ne                 | 12306    | 841 Doppenset compact rl.nano1pb 1/4'        | Z1         | NORM    | FACOM             | RL.NAN01PB          | 3148519040425           | RL.NAN01PB   |                                 |
|           |                 | Ne                 | 23827    | 551 Ds bout DIN933 zn 8.8 6x16               | Z5         | ERLA    | UNSPECIFIED       | \$B9126             |                         |              | Eriks                           |
|           |                 | Ne                 | 23374    | 590 Din315 mni vleugmoer m16 /20             | Z1         | BANC    | FAST-X            | 47560160001         | 47560160001             |              |                                 |
|           |                 | NG                 | 2378     | 500 Stahlwille 12250 metalen oliekan         | Z1         | BANC    | STAHLWILLE        | 77010001 PP103189   | 77010001                | 12250        | Stahlwille byba                 |
|           |                 | Ne                 | 23574    | 753 Manner Ike-100 iat                       | 6Z         | BANC    | MANNER            | 400295              |                         |              | <b>Dy Mannerin Konepaj</b>      |
| r A-87361 | RESERVEL        | AMP MAKITA V N6    | 23573    | 471 Makita a-87367 buislamp ml122            | Z5         | BANC    | MAKITA            | A-87367             |                         | A-87367      | Vakita NV                       |
|           |                 | Ne                 | 12612    | 458 Stop m10x1 406-011                       | Z5         | BANC    | VOGEL SKF         | 406-011             |                         | 106-011      | SKF Lubrication Syst I          |
| гостт     | E PIPE SEA      | LING CORD 55 - Ne  | 11146    | 183 Loctite 55 afdichtingskoord 150meter     | Z9         | BANC    | LOCTITE           |                     |                         |              |                                 |
|           |                 | Ne                 | 23686    | 673 DIN1b staal 6x60 /50                     | Z1         | BANC    | FAST-X            | 23688673 3900060060 | 000010020060060         |              |                                 |
|           |                 | Ne                 | 23996    | 367 Courrole phg a68                         | Z5         | BANC    | SKF               | PHG A68             |                         | PHG A68      | SKF Belgium NV (niet            |
| SCH       | ROEFSLEUTEL     | Ne                 | 12505    | 704 M2,5x0,45 HSS-E JIS B-4430 (90718)       | Z1         | BANC    | VOLKEL            | 90718               | 90718                   | JNSPECIFIED  |                                 |
| BOO       | R CIL. DIN 338  | HSS 114520 Ne      | 2338     | 427 Boor cil. din 338 hss 10,30mm            | Z1         | BANC    | GUHRING           | 33810               | 3                       | 33810        |                                 |
|           | OSTTYPE N       | AANUFACTURER N     | MME MV   | INUFACTURER PN MANUFACT                      | URER CATAL | OG PN   | PRODCOMP PN SUF   | PLIER NAME          |                         |              | EAN CODE                        |
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|           | ERLA            |                    |          |  |            |         |                   |                     |                         |              |                                 |
| ш         | RLA             |                    |          |  |            |         |                   |                     |                         |              |                                 |
| 20        | NC              |                    |          |  |            |         | Sea               | Maker               |                         |              | {color}                         |
| Ξ         | RLA             |                    |          |  |            |         |                   |                     |                         |              |                                 |
| 2         | ORM             |                    |          |  |            |         |                   |                     |                         |              |                                 |
| <u> </u>  | BANC            |                    |          |  |            |         |                   |                     |                         |              |                                 |
|           | ERLA            |                    |          |  |            |         |                   |                     |                         |              |                                 |
|           | ERLA            |                    |          |  |            |         |                   |                     |                         |              |                                 |
|           | ERLA            |                    |          |  |            |         |                   |                     |                         |              | _                               |
|           | RLA             |                    |          |  |            |         |                   |                     |                         |              |                                 |
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|  | Pages at Once Start Match  |                          | PRODCOMP PN SUPPLIER NAME            | 4065                            | EAN CODE              | 8711347040650                   |                                      |                                      | {color}                         |  |                                       |   |  |                                      |  |  |  |  |   |                                     |                                     |                                       |                                   |                     |                                    |                                  |                               |                                     | ressoren  |                                |                                  |                               |                              |                              |                              |  |   |
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|  | IN                         |                          | UFACTURER PN MANUFACTURER CATALOG PN | 5 04065                         | ER NAME               |                                 |                                      |                                      | (er                             |  |                                       |   |  |                                      |  |  |  |  | sicherheitstechnik GmbH Festec Trade BV | 3. Bremicker Sohne KG               | t Raoul NV                          |                                       |                                   |                     | Is Spa                             |                                  | (voorraad)                    | voorraad)(Garlock Gmbh-Kompressoren | (niet voorraad) AW Schultze GmbH Garlock GmbH-Kom | (niet voorraad)                |                                  |                               | 3mbh-Kompressoren            |                              | (niet voorraad)              |  |   |
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| Easy                                   | <b>-</b> 4                 |                          | ARTSTAT POSTYPE                      | Z1 BANC                         | NUFACTURER CATALOG PN | 065                             |                                      |                                      |                                 |  |                                       |   |  |                                      |  |  |  |  |   |                                     |                                     |                                       |                                   | 2005620040ADCL0-WP  |                                    |                                  |                               |                                     |   |                                |                                  |                               |                              |                              |                              |  |   |
| Product Matching Made                  | t Scope Language: IC3 Duto |                          | DESCRIPTION 1 NL                     | Motip 4065 vinylspray 400ml wit | ACTURER PN            | 94                              |                                      |                                      |                                 |  |                                       |   |  |                                      |  |  |  |  | 20                                      |                                     | ET 10 SLEUTELS TOTAAL               |                                       |                                   | H                   | 10550001                           |                                  |                               | 106-20                              | 087 M9-35106-32                                   |                                |                                  |                               | 0599                         |                              |                              |  | - |
|  | C Source Scope             |                          | Sta ARTNR L                          | Nei 23586101                    | UFACTURER NAME MANUF  | IP 04065                        |                                      |                                      |                                 |  | _                                     |   |  |                                      |  |  |  |  | TEK 2-0185-{                            | S 02337                             | S 65/40 M                           |                                       |                                   | C                   | PF2148:                            | NO                               | C GYLON                       | ON VM9-351                          | ON 4177.00.                                       | PECIEFIED                      | NO                               |                               | FAB07-1                      | ų                            |                              |  |   |
|  | Parameters                 | 25                       | CRIPTION 2 NL                        |                                 | OSTTYPE MAN           | ANC MOT                         | RLA                                  | RLA                                  | ANC                             | RLA                                    | ORM                                   | ANC                                     | RLA                                    | RLA                                  | RLA                                    | RLA                                    | RLA                                      | RLA                                    | ANC PRO                                 | ANC ABUS                            | ANC ABUS                            | RLA                                   | ANC                               | 1 BANC              | ANC                                | ANC GYLC                         | 1 BANC                        | ANC GYLC                            | ORM GYLC  | ANC UNSI                       | 001 GYLC                         | ANC RX                        | ANC                          | 001 GOR                      | 001 Gore                     |  |   |
|  | ype Konkura 🔸 🖡            | telected: 1   Page size: | URER MANUFACT DESC                   |                                 | ARTSTAT P             | Z1 B                            | Z5                                   | Z5 E                                 | Z5                              | Z5 E                                   | 20                                    | 8<br>62                                 | Z5                                     | Z5                                   | Z5                                     | Z5 E                                   | Z5                                       | Z5                                     | Z5                                      | Z5 B                                | Z5 B                                | Z5 E                                  | 20 EZ                             | 21-10barg DN40/65 Z | Z1 B                               | <b>Z5</b>                        | 6                             | Z1 B                                | Z1  | Z5                             | Z1 Z1                            | Z1 B                          | Z1                           | Z5 Z5                        | Z1 Z                         |  | • |
| 🗙 🔬 (http://Aydatafactory.com/matching | y Matching                 | hes                      | PTION 1 NL MANUFACTU                 | RRING 40-65-10                  | DESCRIPTION 1 NL      | Motip 4065 vinylspray 400ml wit | OLIEKEERRING MET RVS VEER 40X65X12 R | OLIEKEERRING MET RVS VEER 50x65x10 R | Oliekeerring R1 PTFE 65x85x10 Z | OLIEKEERRING MET RVS VEER 48x65x10 R 2 | BE406810GP Oliekeerring 40x68x10 gp 2 | BE405510G Oliekeerring 40 x 55 x 10 r 2 | OLIEKEERRING MET RVS VEER 40X62X10 R 2 | OLIEKEERRING MET RVS VEER 40x52x10 R | OLIEKEERRING MET RVS VEER 30x40x10 R 2 | OLIEKEERRING MET RVS VEER 40X60X10 R 2 | OLIEKEERRING MET RVS VEER 40X80X10 RST Z | OLIEKEERRING MET RVS VEER 20X40X10 R 2 | PROTEK SC PN10/40 DN65 Z                | Abus hangslot 65/40 met 10 sleutels | Abus hangslot 65/40 (10 sleutels) Z | OLIEKEERRING MET RVS VEER 45X65X8 R 2 | BE65808GP Oliekeerring 65x80x8 gp | Veiligh ECON 562 6\ | Oliekeerring PTFEspecial 10x17x3 2 | Ring WLP GYL 3501 PN10/40 DN65 2 | Ring GYL 3501 PN10/40 DN65 1\ | Ring GYL 3501 PN10/40 DN65 2        | Ring GYL 3501 PN10/40 DN65 3,2                    | Ring FF RX PTFE PN10/40 DN65 2 | Ring GYL 3501 PN10/40TG DN65 2 2 | Ring RX PTFE PN10/40 DN65 2 2 | Ring GYL 3500 PN10/40 DN65 2 | Ring GOR GR PN10/40 DN65 2 2 | Ring GOR GR PN10/40 DN65 3 2 |  |   |
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| Article matches   |                     |                |   |                              |                 |                        |             |  |                  |          |
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| RTUR DESCRIPTION 1 NL   | MANUFACTURER NAME   | MANUFACTURE!   | DESCRIPTION 2 NL                        | Status<br>MANI IEACTI IDED N |                 | AANI IEACTI IBEB CATAL | ATRNR D     | Less Ription 1 NL                        | RTSTAT           | POSTTYPE |
|   |                     |                |   | Nonor Act One N              |                 |                        | 11037476    | NIEKEEDDING MET DAS VEED ADV65Y12 D      | - 0              |          |
| 00 October 10 October | 21                  | ANC            | VOTIP                                   | 04065                        | 04065           | 065                    | 11274144    | ALENCE ANNO MET RVS VEER 50x65x10 R 2    |                  | FRIA     |
| 01 Nokrol KR52B   | SKF                 | SKF KR 52 B    | SKF KR 52 B                             | New                          | True            |                        | 11907645    | Niekeerring R1 PTFE 65x85x10 Z           |                  | BANC     |
| 37664 Kurverol KR 52 B  | Z1                  | BANC S         | SKF                                     | KR 52 B                      | KR 52 B K       | CR 52 B                | 11342739 C  | LIEKEERRING MET RVS VEER 48x65x10 R Z    | 0                | ERLA     |
| 02 FACOM SET VOOR BINNEN-BUITENBORGVEREN 470 / / GAGF004400   |                     |                |   | New                          | False           |                        | 24116144 B  | E406810GP Oliekeerring 40x68x10 gp 2     | 0                | NORM     |
| 034466 Facom u.306j1 set binnen/bultentrekkers  | Z1                  | BANC 1         | FACOM                                   | U.306J1                      | 3148515241734 U | 1.306J1                | 24116143 B  | E405510G Oliekeerring 40 x 55 x 10 r Z   |                  | BANC     |
| 03 Oliekeerring DIN3760 A NBR d15xD32xB7  |                     |                |   | New                          | False           |                        | 11042094 C  | 0LIEKEERRING MET RVS VEER 40X62X10 R     | 0                | ERLA     |
| 25776 Brochuredisplay A4 H240xB230xD32  | Z5                  | BANC E         | BRADY                                   | PBMA41                       | a               | BMA41                  | 11274112 C  | 0LIEKEERRING MET RVS VEER 40x52x10 R Z   | 5                | ERLA     |
| 04 TRILLINGSDEMPER 30X20 B /55SH M. 8X27  | TRELLEBORG INDUSTRI | 1669*TDB3020Mi |   | New                          | False           |                        | 11274183 C  | 0LIEKEERRING MET RVS VEER 30x40x10 R Z   | 2                | ERLA     |
| 00410 Trillingsdemper B 30x20 M8 NBR  | Z5                  | BANC I         | UNSPECIFIED                             |                              |                 |                        | 11037764 C  | 0LIEKEERRING MET RVS VEER 40X60X10 R Z   | 2                | ERLA     |
| 05 VIS A SIX PANS CREUX 8.*8 912* - M 12 X 80 - ZN  |                     |                |   | New                          | False           |                        | 11080229 C  | 0LIEKEERRING MET RVS VEER 40X80X10 RST Z | 2                | ERLA     |
| 39517 Legbord M. Steunconsole 1000X300 Mm Lich  | Z5                  | BANC           |   | 8912                         |                 |                        | 11334764 C  | DLIEKEERRING MET RVS VEER 20X40X10 R Z   | 2                | ERLA     |
| 06 V-RIEM STANDARD ULTRAFLEX SPB 3800 (B=16,3)CONTI   |                     |                |   | New                          | False           |                        | 11434339 P  | ROTEK SC PN10/40 DN65 Z                  | 5                | BANC     |
| 27288 V-riem SPB3800 Red Power 3  | Z5                  | BANC 0         | OPTIBELT                                | SPB3800                      | <u></u>         | SPB3800                | a11816766 A | bus hangslot 65/40 met 10 sleutels Z     | 0                | BANC     |
| 07 Lager 6207 2rs   |                     |                |   | New                          | False           |                        | 23792121 A  | bus hangslot 65/40 (10 sleutels) Z       | 0                | BANC     |
| :34416 Lager (hk) 6207-2rs  | Z1                  | BANC I         | UNSPECIFIED                             | 6207 2RS                     | 6207 2RS        |                        | 11031048 C  | ULIEKEERRING MET RVS VEER 45X65X8 R Z    | 0                | ERLA     |
| 08 601112118 Mini-bolkraan 2/2 (v/v), 1/8'  | NORGREN             | 501112118      |   | New                          | True            |                        | 24116170 B  | E65808GP Oliekeerring 65x80x8 gp Z       | 0                | BANC     |
| 15759 mini-kogelkraan 601112118 G1/8  | Z1                  | BANC 1         | VORGREN                                 | 601112118                    | 601112118 6     | 01112118               | 12711672 V  | 'eiligh ECON 562 6\                      | 1-10barg DN40/65 | z        |
| 09 LAGER 6007 ZZ  |                     |                |   | New                          | False           |                        | 11665749 C  | Niekeerring PTFEspecial 10x17x3 Z        | -                | BANC     |
| 36046 Lager nsk 6007zz  | Z1 Z1               | BANC I         | VSK                                     | 6007ZZ                       | 6007ZZ 6        | ZZ200                  | 10001480 F  | ting WLP GYL 3501 PN10/40 DN65 2 Z       | 6                | BANC     |
| 10 DIN916 04X16 A2  |                     |                | stelbout imbus M4x16 mm zonder kop inox | New                          | False           |                        | 10001507 F  | ting GYL 3501 PN10/40 DN65 1\            |                  | ZI       |
| 37931 Ophangbeugel voor reddingsboei  | Z5                  | BANC I         | UNSPECIFIED                             | NOX                          |                 |                        | 10001520 F  | ting GYL 3501 PN10/40 DN65 2 Z           | -                | BANC     |
| 11 spanbus din 7343 3x20  |                     |                |   | New                          | False           |                        | 11144141 F  | ting GYL 3501 PN10/40 DN65 3,2           | -                | NORM     |
| 17887 DIN7343 veerstaal 3x20 /1000  | Z1                  | BANC F         | FAST-X                                  | 073439600030020              | 07343960003002  |                        | 11159662 F  | ting FF RX PTFE PN10/40 DN65 2 Z         | 0                | BANC     |
| 12 BUS MB2030DU   |                     |                |   | New                          | False           |                        | 11517908 F  | ting GYL 3501 PN10/40TG DN65 2 Z         | -                | Z001     |
| 20839 Glijlager mb 2030 DU-H  | Z5                  | BANC I         | UNSPECIFIED                             | MB 020.030 DU-H **           |                 |                        | 11134621 F  | ting RX PTFE PN10/40 DN65 2 Z            | -                | BANC     |
| 13 RL.NANO1PB 1/4" doppenset 6-kant +ratel FACOM / RL.NANO1 / / 200   |                     |                |   | New                          | True            |                        | 12358362 F  | ting GYL 3500 PN10/40 DN65 2             | -                | BANC     |
| 23068 Doppenset compact 1.nano1pb 1/4"  | Z1 II               | NORM           | FACOM                                   | RL.NAN01PB                   | 3148519040425 F | KL.NANO1PB             | 11045497 F  | ting GOR GR PN10/40 DN65 2 Z             | 2                | Z001     |
| 14 din 7991 6x16 zn   |                     |                |   | New                          | False           |                        | 11118339 F  | ting GOR GR PN10/40 DN65 3 Z             | -                | Z001     |
| :38275 Ds bout DIN933 zn 8.8 6x16   | Z5                  | ERLA           | UNSPECIFIED                             | \$B9126                      |                 |                        |             |  |                  |          |
| 15 DIN 315 Fluegelmutter M16 Temperg.verz   |                     |                |   | New                          | False           |                        |             |  |                  |          |
| 33745 Din315 mni vleugmoer m16 /20  | Z1                  | BANC F         | FAST-X                                  | 47560160001                  | 47560160001     |                        |             |  |                  |          |
| 16 VERLENGSTUK VOOR DOPPEN 1/28quot 250 MM FACOM S.215 10:69.81   | FACOM               |                |   | New                          | False           |                        |             |  |                  |          |
| 37815 Stahlwille 12250 metalen oliekan  | Z1                  | BANC S         | STAHLWILLE                              | 77010001 PP10318             | 77010001 1      | 2250                   |             |  |                  |          |
| 17 O-RING 4P.*400295* 18,64 X 3,53  |                     |                |   | New                          | False           |                        |             |  |                  |          |
| (35747) Manner Ike-100 lat  | 62                  | BANC I         | VANNER                                  | 400295                       |                 |                        |             |  |                  |          |
|   |                     |                |   |                              |                 |                        |             |  |                  |          |

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| Status    | AR' ARTNR       | DESCRIPTION 1 NL                                   | DESCRIPTION 1 NL                        | MANUFACTURER NAME         | MANUFACTURER NAME      | MANUFACTURER PN    | MANUFACTURER PN     | DESCRIPTION 2 NI                                    | ARTSTAT    | POSTVPF                        | AANUF   |
| New       | 100 235861      | 01 OLIEKEERRING 40-65-10                           | Motip 4065 vinylspray 400ml wit         |                           | MOTIP                  |                    | MOTIP               |   | Z1         | BANC                           | 14065   |
| New       | 101 237664      | 20 Nokrol KR52B                                    | Kurverol KR 52 B                        | SKF                       | SKF                    | SKF KR 52          | KR 52 B             | SKF KR 52 B   | <b>Z</b> 1 | BANC                           | (R 52 E |
| New       | 102 234466      | 29 FACOM SET VOOR BINNEN-BUITENBORGVEREN           | Facom u.306j1 set binnen/buitentrekkers |                           | FACOM                  |                    | U.306J1             |   | z۱         | BANC                           | 14851   |
| New       | 103 125776      | 74 Oliekeerring DIN3760 A NBR d15xD32xB7           | Brochuredisplay A4 H240xB230xD32        |                           | BRADY                  |                    | PBMA41              |   | Z5         | BANC                           |         |
| New       | 104 100410      | 43 TRILLINGSDEMPER 30X20 B /55SH M. 8X27           | Trillingsdemper B 30x20 M8 NBR          | TRELLEBORG INDUSTRIAL AVS | UNSPECIFIED            | 4669*TDB3020M8X27  |                     |   | Z5         | BANC                           |         |
| New       | 105 2395174     | 40 VIS A SIX PANS CREUX 8.*8 912* - M 12 X 80 -:   | Legbord M. Steunconsole 1000X300 Mm Li  |                           |                        |                    | 8912                |   | Z5         | BANC                           |         |
| New       | 106 127288      | 78 V-RIEM STANDARD ULTRAFLEX SPB 3800 (B=16        | V-riem SPB3800 Red Power 3              |                           | OPTIBELT               |                    | SPB3800             |   | Z5         | BANC                           |         |
| Dew       | 107 234416      | 99 Lager 6207 2rs                                  | Lager (hk) 6207-2rs                     |                           | UNSPECIFIED            |                    | 6207 2RS            |   | Z1         | BANC                           | 207 2F  |
| New       | 108 1157590     | 08 601112118 Mini-bolkraan 2/2 (v/v), 1/8          | mini-kogelkraan 601112118 G1/8          | NORGREN                   | NORGREN                |                    | 601112118           |   | <b>Z</b> 1 | BANC                           | 011121  |
| Dew       | 109 236046      | 58 LAGER 6007 ZZ                                   | Lager nsk 6007zz                        |                           | NSK                    |                    | 6007ZZ              |   | Z1         | BANC                           | ZZ100   |
| New       | 110 237931      | 72 DIN916 04X16 A2                                 | Ophangbeugel voor reddingsboei          |                           | UNSPECIFIED            |                    | XONI                | stelbout imbus M4x16 mm zonder kop inox             | Z5         | BANC                           |         |
| New       | 111 1178876     | 80 spanbus din 7343 3x20                           | DIN7343 veerstaal 3x20 /1000            |                           | FAST-X                 |                    | 073439600030020     |   | Z1         | BANC                           | 1734391 |
| New       | 112 120839      | 61 BUS MB2030DU                                    | Glijlager mb 2030 DU-H                  |                           | UNSPECIFIED            |                    | MB 020.030 DU-H **  |   | Z5         | BANC                           |         |
| New       | 113 123068      | 41 RL.NANO1PB 1/4" doppenset 6-kant +ratel FAI     | Doppenset compact rl.nano1pb 1/4'       |                           | FACOM                  |                    | <b>RL.NANO1PB</b>   |   | Z1         | NORM                           | 14851   |
| New       | 114 238275      | 61 din 7991 6x16 zn                                | Ds bout DIN933 zn 8.8 6x16              |                           | UNSPECIFIED            |                    | \$B9126             |   | Z5         | ERLA                           |         |
| New       | 115 233745.     | 90 DIN 315 Fluegelmutter M16 Temperg.verz          | Din315 mni vleugmoer m16 /20            |                           | FAST-X                 |                    | 47560160001         |   | Z1         | BANC                           | 75601   |
| new       | 116 237815      | 00 VERLENGSTUK VOOR DOPPEN 1/2'"' 250 N            | Stahlwille 12250 metalen oliekan        | FACOM                     | STAHLWILLE             |                    | 77010001 PP103189   |   | Z1         | BANC                           | 70100   |
| New       | 117 235747.     | 53 O-RING 4P.*400295* 18,64 X 3,53                 | Manner Ike-100 lat                      |                           | MANNER                 |                    | 400295              | FACOM   | 6Z         | BANC                           |         |
| New       | 118 235734      | 71 MAKITA A-87367 RESERVELAMP TBV.ML122,123        | Makita a-87367 buislamp ml122           | MAKITA                    | MAKITA                 | A-87367            | A-87367             |   | Z5         | BANC                           |         |
| New       | 119 126124      | 58 SKF SCREW PLUG M10X1 406-011                    | Stop m10x1 406-011                      | SKF                       | VOGEL SKF              | 406-011            | 406-011             | A-87367 RESERVELAMP MAKITA VOOR ML122 ML123 *A73844 | 4 Z5       | BANC                           |         |
| New       | 120 1114648     | 83 PAKKINGKOORD // 55                              | Loctite 55 afdichtingskoord 150meter    | LOCTITE                   | LOCTITE                | 55                 |                     |   | 6Z         | BANC                           |         |
| New       | 121 236886.     | 73 GOUPILLLE CONIQUE 18 - 6 X 60 BL                | DIN1b staal 6x60 /50                    |                           | FAST-X                 |                    | 23688673 3900060060 | LOCTITE PIPE SEALING CORD 55 150M                   | Z1         | BANC                           | 100010  |
| New       | 122 239993      | 67 courrole A68 1755mm                             | Courrole phg a68                        |                           | SKF                    |                    | PHG A68             |   | Z5         | BANC                           |         |
| New       | 123 125057      | 04 SCHROEFSLEUTEL ERGO 9071 - 8' BAHCO             | M2,5x0\                                 | BAHCO                     | NOLKEL                 |                    | 90718               |   | Z1         | BANC                           | 0718    |
| New       | 124 233814      | 27 BOOR CIL. DIN338 RN diameter 10 mm              | Boor cll. din 338 hss 10,30mm           |                           | GUHRING                |                    | 33810               | SCHROEFSLEUTEL                                      | Z1         | BANC                           |         |
| ATRNR     | DESCRIPTIO      | N 1 NL ARTSTAT                                     | POSTTYPE MANUFACTURER                   | NAME MANUFACTURER PN      | MANUFACT               | URER CATALOG PN PR | DDCOMP PN SUPPL     | JER NAME  |            | AN CODE                        | F       |
| 23586101  | Motip 4065 vir. | nylspray 400ml wit Z1                              | BANC MOTIP                              | 04065                     | 04065                  | 406                | 9                   |   | <u></u>    | 7113470406                     |         |
| 11037475  | OLIEKEERRI      | NG MET RVS VEER 40X65X12 R Z5                      | ERLA                                    |                           |                        |                    |                     |   |            |                                |         |
| 11274144  | OLIEKEERRIP     | NG MET RVS VEER 50x65x10 R Z5                      | ERLA                                    |                           |                        |                    |                     |   |            |                                | _       |
| 11907645  | Oliekeerring R  | R1 PTFE 65x85x10 Z5                                | BANC                                    |                           |                        |                    | Seal M.             | aker  | ÷          | color}                         |         |
| 11342739  | OLIEKEERRIN     | NG MET RVS VEER 48x65x10 R Z5                      | ERLA                                    |                           |                        |                    |                     |   |            |                                |         |
| 24116144  | BE406810GP      | Oliekeerring 40x68x10 gp Z9                        | NORM                                    |                           |                        |                    |                     |   |            |                                |         |
| 24116143  | BE405510G C     | Dliekeerring 40 x 55 x 10 r Z9                     | BANC                                    |                           |                        |                    |                     |   |            |                                | _       |
| 11042094  | OLIEKEERII      | NG MET RVS VEER 40X62X10 R Z5                      | ERLA                                    |                           |                        |                    |                     |   |            |                                |         |
| 11274112  | OLIEKEERRIP     | NG MET RVS VEER 40x52x10 R Z5                      | ERLA                                    |                           |                        |                    |                     |   |            |                                |         |
| 11274183  | OLIEKEERRIP     | NG MET RVS VEER 30x40x10 R Z5                      | ERLA                                    |                           |                        |                    |                     |   |            |                                | -       |
| 11037764  | OLIEKEERRIP     | NG MET RVS VEER 40X60X10 R Z5                      | ERLA                                    |                           |                        |                    |                     |   |            |                                | _       |
|           |                 |  |   |                           |                        |                    |                     |   |            |                                | ĥ       |
|           |                 |  |   |                           |                        |                    |                     |   |            |                                | :       |