

One Corridor – One Strategy
Joint Regional Development for the North-South Corridor



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Presentation of the final software prototype for an online freight exchange

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Abstract

Currently, a vast range of online truck freight exchanges exist on the market. But for the rail freight traffic there are only very few such online freight exchanges and they are used rather rudimentarily in operational practice. A requirement analysis for an online rail freight exchange has already been ascertained and is illustrated in the project report no. 2 (Klippert/Kowalski/Bruns (2010)). Based on this requirement analysis, a first version of the software prototype has been developed which is documented in the project report no. 3 (Föhring/Bruns (2011)). This software prototype has been further developed in cooperation with the associates of the EU-project CODE24. In the present project report the final software prototype of an online freight exchange will be introduced.

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1 Installation of the software prototype

1.1 Preliminary remarks

This instruction describes how to install RVM¹, Ruby², RubyGems³, SQLite3⁴ and Bundler⁵ as well as Rails⁶ on a system with the Linux operating system Ubuntu⁷ in the version 12.04 so that the software prototype can be installed and started.

The shown steps can be performed analogously on a series of other operating systems as well as younger and older versions of the operating system Ubuntu. In this instruction, only Ubuntu 12.04 will be discussed exemplarily.

If the software prototype will be used only for demonstration purposes and if there is no computer with Ubuntu (or another Linux operating system) available, it is recommended to install the software prototype in a virtual machine. To that end, the freely available virtualization software Oracle VM VirtualBox lends itself.⁸

It should be noted that the configuration discussed hereafter is applicable for the use of a development and demonstration server. For the productive application it is advisable to further install a sophisticated webserver system like Apache⁹ or nginx¹⁰ as well as the use of MySQL¹¹ instead of SQLite3. However, the configuration discussed below is absolutely sufficient for the application field of the present software prototype.

-
- 1) RVM is a release manager for the deployment of several strictly separated Ruby installations. Further information can be found at <https://rvm.io/>.
 - 2) Ruby is the underlying coding language of the software prototype. Further information can be found at <http://www.ruby-lang.org/de/>.
 - 3) RubyGems is a package manager for Ruby. Further information can be found at <http://rubygems.org/>.
 - 4) SQLite is a SQL-compatible database system which is especially suited for small and integrated databases. Further information can be found at <http://www.sqlite.org/>.
 - 5) Bundler is a system for the management of Gem-dependencies. Further information can be found at <http://gem-bundler.com/>.
 - 6) Rails is the web framework underlying the prototype. Further information can be found at <http://rubyonrails.org/>.
 - 7) Ubuntu is a Linux operating system. Further information can be found at <http://www.ubuntu.com/>.
 - 8) With the aid of virtualization software, virtual machines can be simulated on one's own computer. On such virtual machines, Linux operating systems like Ubuntu can be installed. Further information can be found at <https://www.virtualbox.org/>.
 - 9) Apache (actually Apache HTTP Server Project) is a popular web server. Further information can be found at <http://httpd.apache.org/>.
 - 10) nginx is a web server. Further information can be found at <http://nginx.org/>.
 - 11) MySQL is popular SQL-compatible database system. Further information can be found at <http://www.mysql.com/>.

First, the installation of RVM (Ruby Version Manager) will be covered below and after that the installation of Ruby (in the version 1.8.7) and also of Bundler. Among others, Git¹, Subversion², OpenSSL³ plus SQLite3 will be installed implicitly.

In what follows, it will be always assumed that the user has internet access from the local computer and that the user can access the system through the Linux command *sudo*⁴. Furthermore, basic comprehension of computer systems is presumed. The present instruction does not provide a basic course in the administration of Linux operating systems, but is yet to ensure an access as easy as possible to the use of the software prototype for interested users, even if they are not or are only to a minor degree well versed in the used technologies of the software prototype.

In the course of this instruction, various operations will be described that are necessary for the installation of the software prototype on a newly installed Ubuntu operating system and that require an input into a shell. The commands to be executed in this shell by the user will be displayed indented in this instruction.

Example for a command to be executed

These commands have to be entered and confirmed with the Enter key. Following these commands noted indented a screenshot will be featured regularly showing the successful execution of the command.⁵

A final, technical remark: One should never install Ruby, RubyGems or any other Ruby relevant packages via the package manager *apt*⁶. The system is not up to date and can therefore lead to major problems in the long run. With the help of the application of the Ruby Version Manager demonstrated here, such problems can be avoided from the outset.

-
- 1) Git is a distributed version control system. Further information can be found at <http://git-scm.com/>.
 - 2) Subversion is a centralized version control system. Further information can be found at <http://subversion.tigris.org/>.
 - 3) OpenSSL is a free software for Transport Layer Security. Further information can be found at <http://www.openssl.org/>.
 - 4) “sudo” stands for „substitute user do” and is a unix command that serves the execution of processes with the rights of another user. In the case at hand, “sudo” is used for the execution of the specified commands with the rights of the super user “root”.
 - 5) It should be noted that the depicted screenshots are exemplary for the Linux operating system Ubuntu 12.04. An output that differs from the screenshots shown here does not necessarily mean the failure of a command.
 - 6) Apt is a package manager for Linux. Further information can be found at <http://www.debian.org/doc/manuals/apthow-to/index.de.html>.

1.2 System preparation

First of all, it should be ensured that the most recent sources for the package manager *apt* are available. For this purpose, a shell has to be launched (as to that, hit the “Windows key” on the keyboard or click on the Ubuntu symbol on the sidebar under Ubuntu 12.04, then enter “shell” and confirm with ENTER).

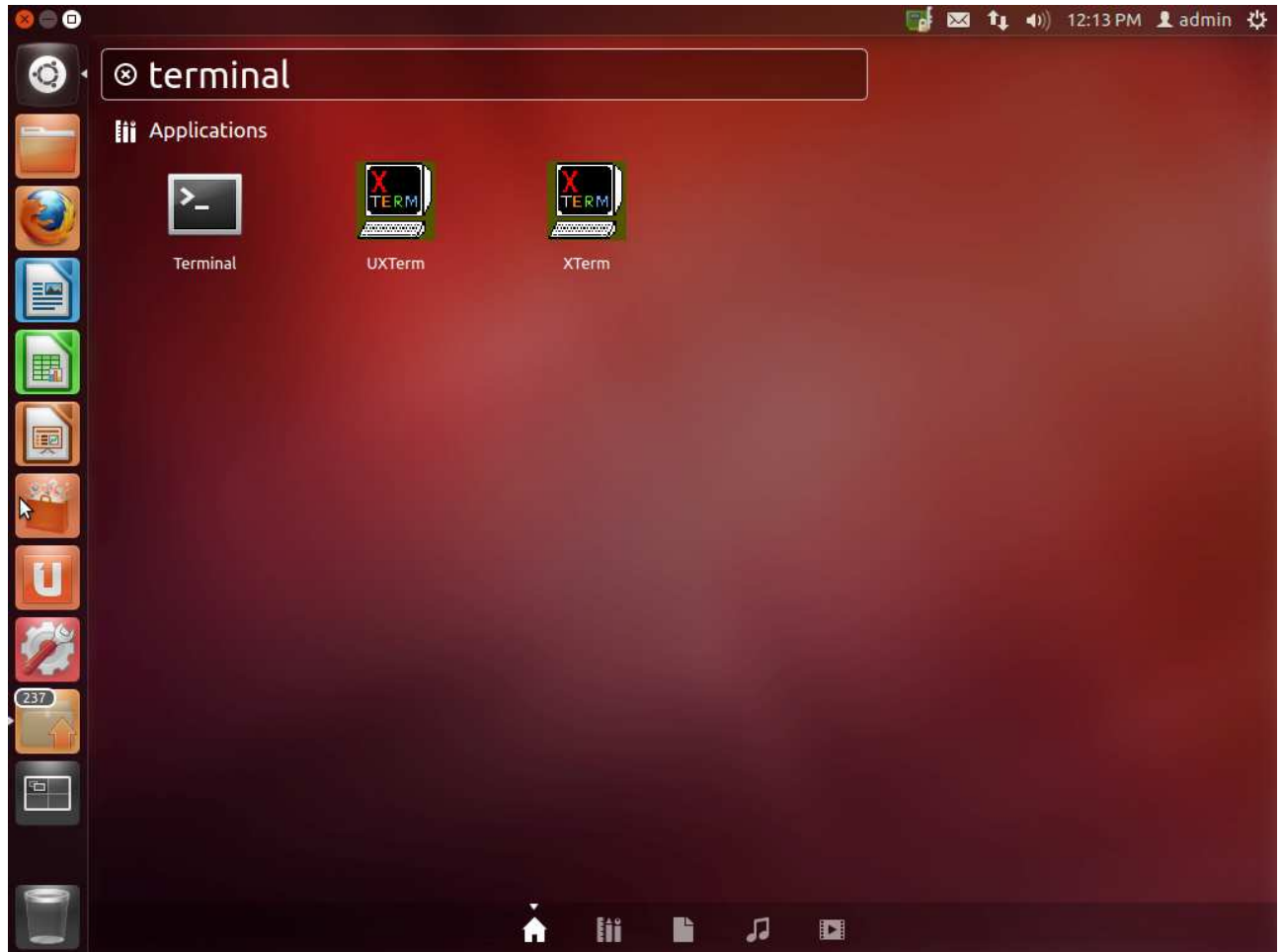


Figure 1: Launching the shell

From now on, commands will be entered into this shell to install the components necessary for launching the software prototype. Figure 2 shows the launched shell.

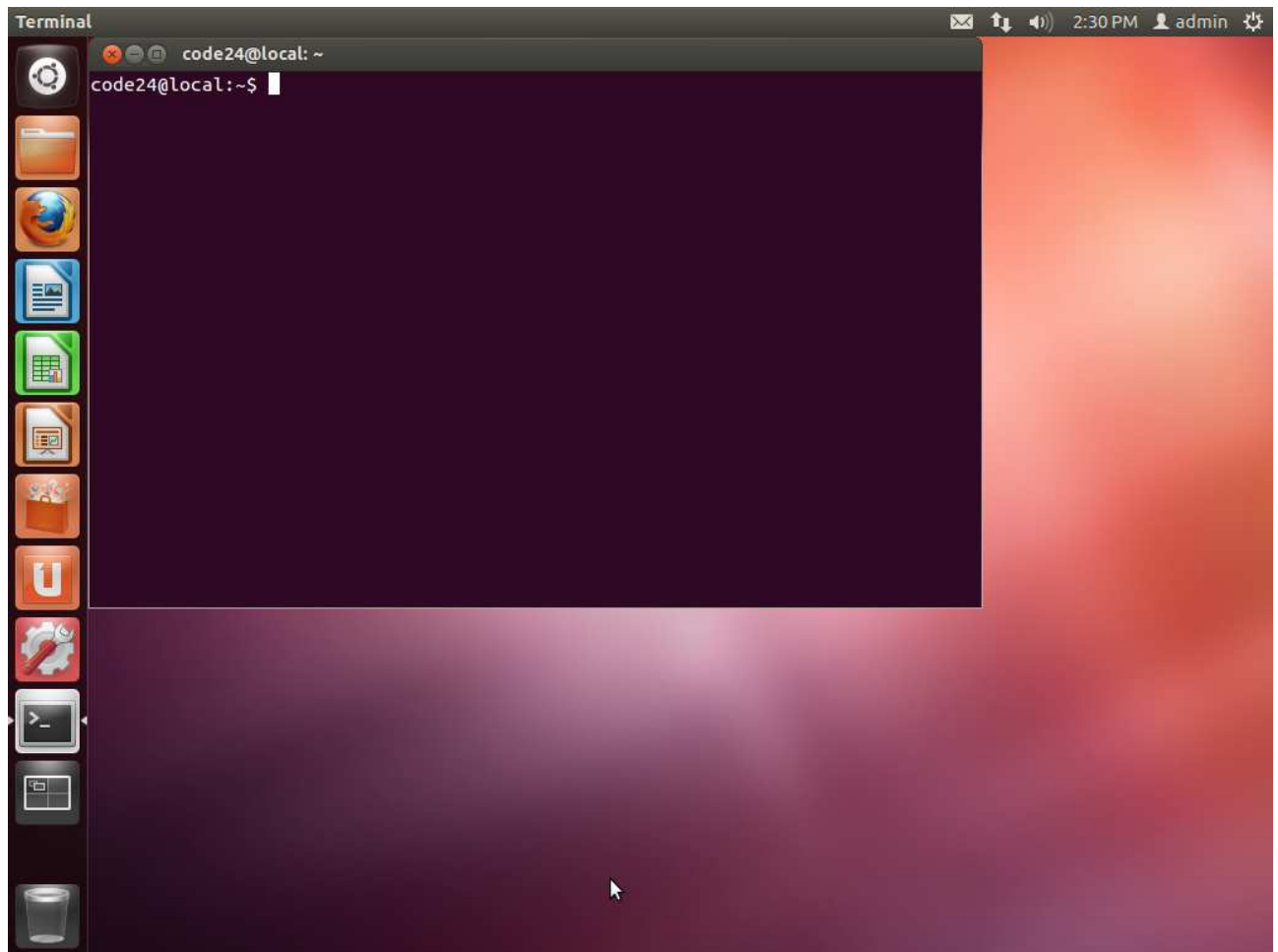


Figure 2: Launched shell

First, the prompt is displayed in the newly launched shell.¹ The following command has to be executed in order to update the sources of the package manager:

sudo apt-get update

Figure 3 shows the input of the command into the shell; Figure 4 shows the output after its execution. Hereafter, the entry of a command will not be accompanied by an additional figure, because of reasons of redundancy. From now on, only the output of the command will be displayed.

1) The prompt is “code24@local:~\$” in the shown figures. However, this indication is to be regarded as an example only, as the prompt of a shell indicates which user (“code24”) operates in the current shell on which computer (“local”) in which directory (“~”) and mode (“\$”). Thus, the prompt will vary on a different computer if one of the before mentioned factors deviate even if the same Linux operating system is used.

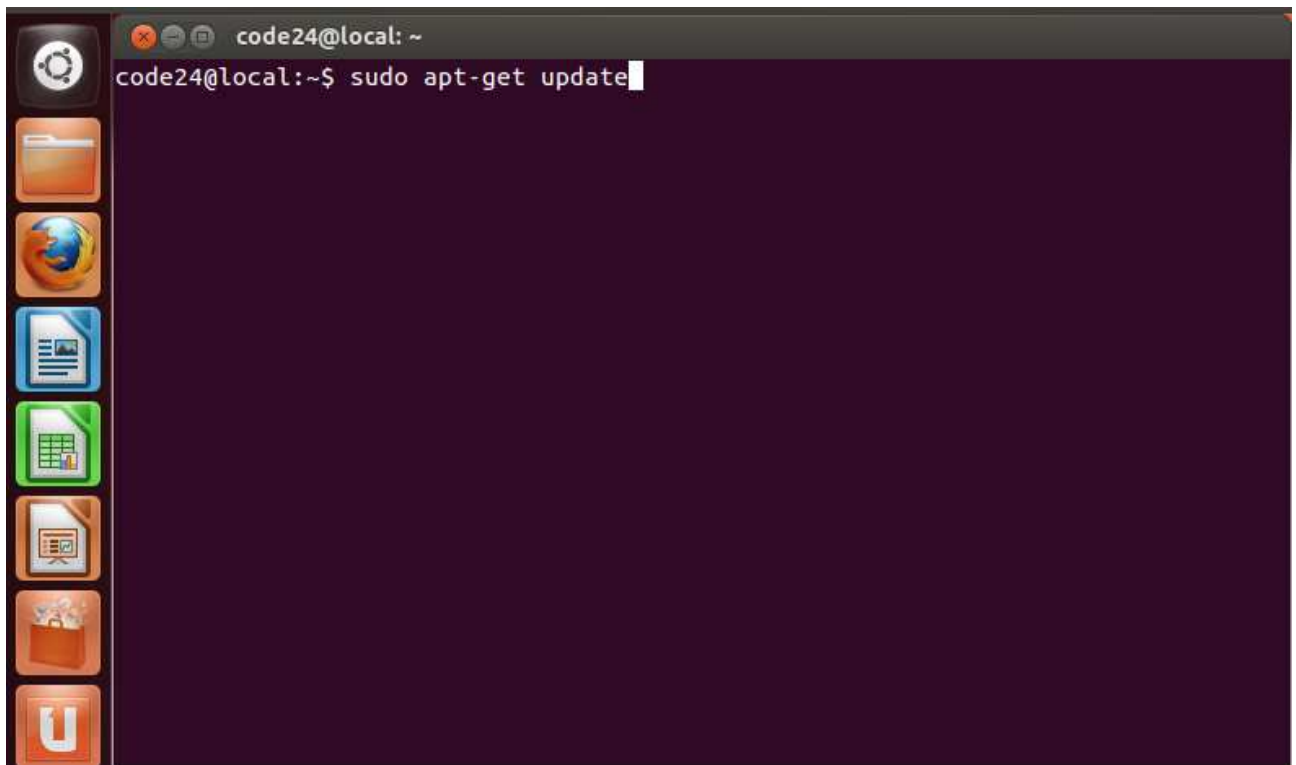


Figure 3: Entry of the first command

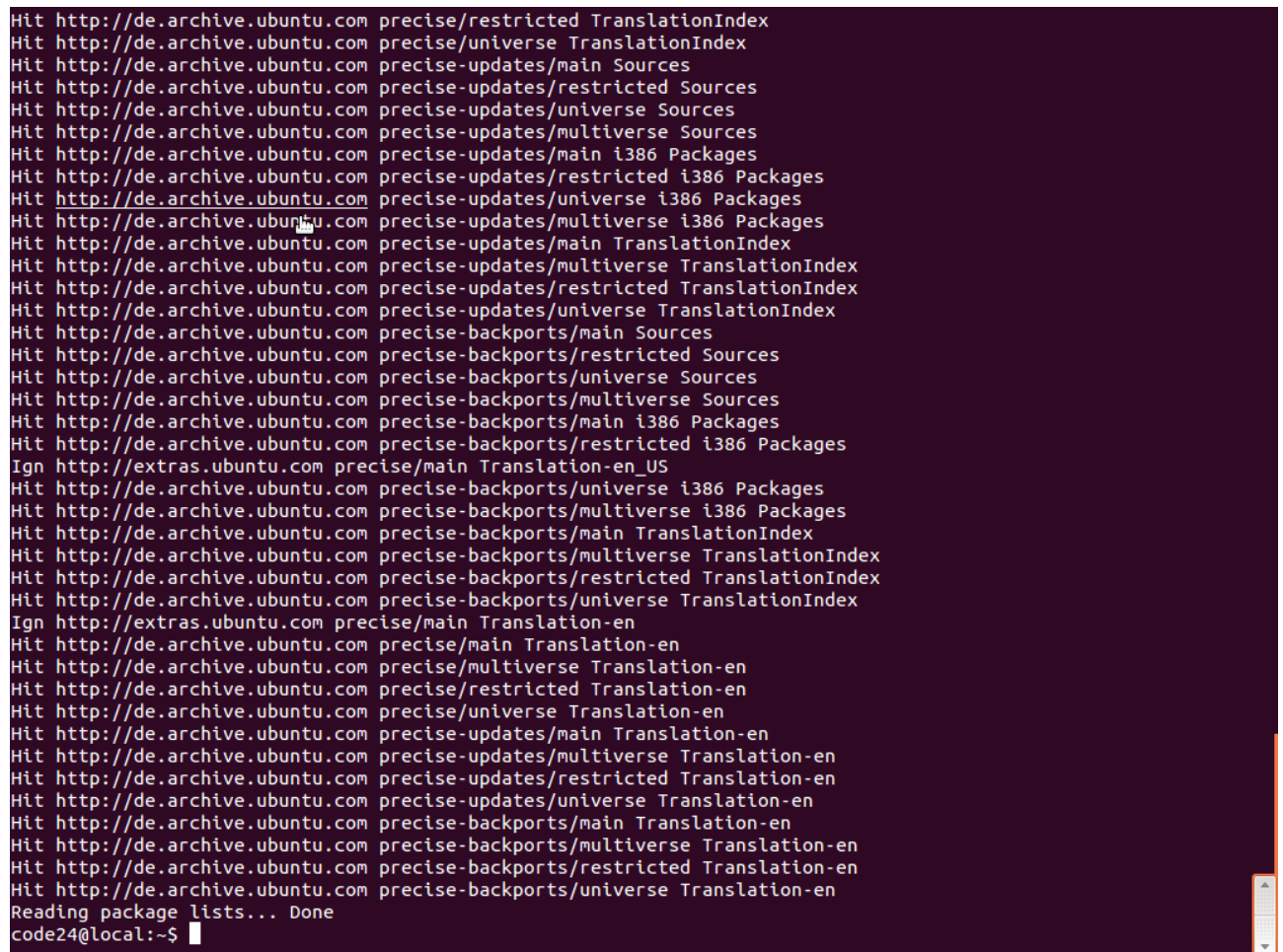


Figure 4: Update of the package manager

Next, the version control system *git-core* as well as *curl* and a package named *build-essential* will be installed, which is necessary for the compiling of Ruby.

```
sudo apt-get install build-essential git-core curl
```

The question, if the software should be actually installed, must be confirmed with “Y”.

```
Unpacking dpkg-dev (from ../dpkg-dev_1.16.1.2ubuntu7_all.deb) ...
Selecting previously unselected package build-essential.
Unpacking build-essential (from ../build-essential_11.5ubuntu2_i386.deb) ...
Selecting previously unselected package curl.
Unpacking curl (from ../curl_7.22.0-3ubuntu4_i386.deb) ...
Selecting previously unselected package fakeroot.
Unpacking fakeroot (from ../fakeroot_1.18.2-1_i386.deb) ...
Selecting previously unselected package liberror-perl.
Unpacking liberror-perl (from ../liberror-perl_0.17-1_all.deb) ...
Selecting previously unselected package git-man.
Unpacking git-man (from ../git-man_1%3a1.7.9.5-1_all.deb) ...
Selecting previously unselected package git.
Unpacking git (from ../git_1%3a1.7.9.5-1_i386.deb) ...
Selecting previously unselected package git-core.
Unpacking git-core (from ../git-core_1%3a1.7.9.5-1_all.deb) ...
Selecting previously unselected package libalgorithm-diff-perl.
Unpacking libalgorithm-diff-perl (from ../libalgorithm-diff-perl_1.19.02-2_all.deb) ...
Selecting previously unselected package libalgorithm-diff-xs-perl.
Unpacking libalgorithm-diff-xs-perl (from ../libalgorithm-diff-xs-perl_0.04-2build2_i386.deb) ...
Selecting previously unselected package libalgorithm-merge-perl.
Unpacking libalgorithm-merge-perl (from ../libalgorithm-merge-perl_0.08-2_all.deb) ...
Processing triggers for man-db ...
Setting up libtimedate-perl (1.2000-1) ...
Setting up libdpkg-perl (1.16.1.2ubuntu7) ...
Setting up patch (2.6.1-3) ...
Setting up dpkg-dev (1.16.1.2ubuntu7) ...
Setting up curl (7.22.0-3ubuntu4) ...
Setting up fakeroot (1.18.2-1) ...
update-alternatives: using /usr/bin/fakeroot-sysv to provide /usr/bin/fakeroot (fakeroot) in auto mode.
Setting up liberror-perl (0.17-1) ...
Setting up git-man (1:1.7.9.5-1) ...
Setting up git (1:1.7.9.5-1) ...
Setting up git-core (1:1.7.9.5-1) ...
Setting up libalgorithm-diff-perl (1.19.02-2) ...
Setting up libalgorithm-diff-xs-perl (0.04-2build2) ...
Setting up libalgorithm-merge-perl (0.08-2) ...
Setting up libstdc++6-4.6-dev (4.6.3-1ubuntu5) ...
Setting up g++-4.6 (4.6.3-1ubuntu5) ...
Setting up g++ (4:4.6.3-1ubuntu5) ...
update-alternatives: using /usr/bin/g++ to provide /usr/bin/c++ (c++) in auto mode.
Setting up build-essential (11.5ubuntu2) ...
code24@local:~$
```

Figure 5: Installation of required packages

After the successful installation of *git-core* and *curl*, Ruby Version Manager can be installed with the following command:

```
curl -L get.rvm.io | bash -s stable
```

```
update-alternatives: using /usr/bin/g++ to provide /usr/bin/c++ (c++) in auto mode.
Setting up build-essential (11.5ubuntu2) ...
code24@local:~$ curl -L get.rvm.io | bash -s stable
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           %                               Dload  Upload  Total   Spent    Left   Speed
100  185    100  185    0    0    224    0  --:--:--  --:--:--  --:--:--   934
100 9241    100 9241    0    0   5543    0  0:00:01  0:00:01  --:--:-- 1289k
Downloading RVM from wayneeseguin branch stable
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           %                               Dload  Upload  Total   Spent    Left   Speed
100  125    100  125    0    0    204    0  --:--:--  --:--:--  --:--:--   299
100 1045k    100 1045k    0    0   345k    0  0:00:03  0:00:03  --:--:-- 604k

Installing RVM to /home/code24/.rvm/
  Adding rvm PATH line to /home/code24/.bashrc /home/code24/.zshrc.
  Adding rvm loading line to /home/code24/.bash_login /home/code24/.zlogin.

# RVM: Shell scripts enabling management of multiple ruby environments.
# RTFM: https://rvm.io/
# HELP: http://webchat.freenode.net/?channels=rvm (#rvm on irc.freenode.net)
# Cheatsheet: http://cheat.errtheblog.com/s/rvm/
# Screencast: http://screencasts.org/episodes/how-to-use-rvm

# In case of any issues read output of 'rvm requirements' and/or 'rvm notes'

Installation of RVM in /home/code24/.rvm/ is almost complete:

[ * To start using RVM you need to run `source /home/code24/.rvm/scripts/rvm`
  in all your open shell windows, in rare cases you need to reopen all shell windows.

# code24,
#
# Thank you for using RVM!
# I sincerely hope that RVM helps to make your life easier and more enjoyable!!!
#
# ~Wayne

rvm 1.14.1 (stable) by Wayne E. Seguin <wayneeseguin@gmail.com>, Michal Papis <mpapis@gmail.com> [https://rvm.io/
]
code24@local:~$
```

Figure 6: Installation of Ruby Version Manager

The advantage of this method is that it installs Ruby on the *home* directory and thus provides a *sandbox* environment for the software prototype.

Up next, a line has to be added to the file `~/.bashrc`. This can be achieved with the following command:

```
echo '[[ -s "$HOME/.rvm/scripts/rvm" ]] && source "$HOME/.rvm/scripts/rvm"' >> ~/.bashrc
```

Following this, the file `~/.bashrc` has to be reloaded:

```
. ~/.bashrc
```

Both commands do not produce an output as one can see in figure 7.

```
code24@local:~$ curl -L get.rvm.io | bash -s stable
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           %         0         0             0          0 --:--:-- --:--:-- --:--:--    0
100   185   100   185     0     0    224       0 --:--:-- --:--:-- --:--:--    934
100  9241   100  9241     0     0   5543       0 0:00:01 0:00:01 --:--:-- 1289k
Downloading RVM from wayneeseguin branch stable
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           %         0         0             0          0 --:--:-- --:--:-- --:--:--    0
100   125   100   125     0     0    204       0 --:--:-- --:--:-- --:--:--   299
100 1045k   100 1045k     0     0   345k       0 0:00:03 0:00:03 --:--:-- 604k

Installing RVM to /home/code24/.rvm/
Adding rvm PATH line to /home/code24/.bashrc /home/code24/.zshrc.
Adding rvm loading line to /home/code24/.bash_login /home/code24/.zlogin.

# RVM: Shell scripts enabling management of multiple ruby environments.
# RTFM: https://rvm.io/
# HELP: http://webchat.freenode.net/?channels=rvm (#rvm on irc.freenode.net)
# Cheatsheet: http://cheat.errtheblog.com/s/rvm/
# Screencast: http://screencasts.org/episodes/how-to-use-rvm

# In case of any issues read output of 'rvm requirements' and/or 'rvm notes'

Installation of RVM in /home/code24/.rvm/ is almost complete:

* To start using RVM you need to run `source /home/code24/.rvm/scripts/rvm`
  in all your open shell windows, in rare cases you need to reopen all shell windows.

# code24,
#|
# Thank you for using RVM!
# I sincerely hope that RVM helps to make your life easier and more enjoyable!!!
#
# ~Wayne

rvm 1.14.1 (stable) by Wayne E. Seguin <wayneeseguin@gmail.com>, Michal Papis <mpapis@gmail.com> [https://rvm.io/]
code24@local:~$ echo '[[ -s "$HOME/.rvm/scripts/rvm" ]] && source "$HOME/.rvm/scripts/rvm"' >> ~/.bashrc
code24@local:~$ . ~/.bashrc
code24@local:~$
```

Figure 7: Configuration of the RVM script

After that, several packages have to be installed with the help of the package manager *apt*:

```
sudo apt-get install build-essential openssl libreadline6 libreadline6-dev \  
curl git-core zlib1g zlib1g-dev libssl-dev libyaml-dev libsqlite3-dev sqlite3 \  
libxml2-dev libxslt-dev autoconf libc6-dev ncurses-dev automake libtool bison \  
subversion libmysqlclient-dev
```

Here, too, the installation of the packages has to be confirmed by the additional input of “Y”.

```
Unpacking subversion (from ../subversion_1.6.17dfsg-3ubuntu3_i386.deb) ...  
Selecting previously unselected package libyaml-dev.  
Unpacking libyaml-dev (from ../libyaml-dev_0.1.4-2_i386.deb) ...  
Processing triggers for install-info ...  
Processing triggers for man-db ...  
Processing triggers for doc-base ...  
Processing 29 changed doc-base files, 2 added doc-base files...  
Setting up libxml2 (2.7.8.dfsg-5.1ubuntu4.1) ...  
Setting up libdb4.8 (4.8.30-11ubuntu1) ...  
Setting up mysql-common (5.5.24-0ubuntu0.12.04.1) ...  
Setting up libmysqlclient18 (5.5.24-0ubuntu0.12.04.1) ...  
Setting up libapr1 (1.4.6-1) ...  
Setting up libaprutil1 (1.3.12+dfsg-3) ...  
Setting up libsvn1 (1.6.17dfsg-3ubuntu3) ...  
Setting up libyaml-0-2 (0.1.4-2) ...  
Setting up m4 (1.4.16-2ubuntu1) ...  
Setting up autoconf (2.68-1ubuntu2) ...  
Setting up autotools-dev (20120210.1ubuntu1) ...  
Setting up automake (1:1.11.3-1ubuntu2) ...  
update-alternatives: using /usr/bin/automake-1.11 to provide /usr/bin/automake (automake) in auto mode.  
Setting up libbison-dev (1:2.5.dfsg-2.1) ...  
Setting up bison (1:2.5.dfsg-2.1) ...  
update-alternatives: using /usr/bin/bison.yacc to provide /usr/bin/yacc (yacc) in auto mode.  
Setting up libltdl-dev (2.4.2-1ubuntu1) ...  
Setting up zlib1g-dev (1:1.2.3.4.dfsg-3ubuntu4) ...  
Setting up libmysqlclient-dev (5.5.24-0ubuntu0.12.04.1) ...  
Setting up libtinfo-dev (5.9-4) ...  
Setting up libncurses5-dev (5.9-4) ...  
Setting up libreadline6-dev (6.2-8) ...  
Setting up libsqlite3-dev (3.7.9-2ubuntu1) ...  
Setting up libssl-dev (1.0.1-4ubuntu5.2) ...  
Setting up libssl-doc (1.0.1-4ubuntu5.2) ...  
Setting up libtool (2.4.2-1ubuntu1) ...  
Setting up libxml2-dev (2.7.8.dfsg-5.1ubuntu4.1) ...  
Setting up libxslt1-dev (1.1.26-8ubuntu1) ...  
Setting up openssl (1.0.1-4ubuntu5.2) ...  
Setting up sqlite3 (3.7.9-2ubuntu1) ...  
Setting up subversion (1.6.17dfsg-3ubuntu3) ...  
Setting up libyaml-dev (0.1.4-2) ...  
Processing triggers for libc-bin ...  
ldconfig deferred processing now taking place  
code24@local:~$
```

Figure 8: Installation of other required packages

1.3 Ruby

Since the Ruby Version Manager has been installed and loaded by now, the software Ruby can be installed in the next step in the required version 1.8.7 with the following command:

```
rvm install 1.8.7
```

An information page is displayed that must be closed with “q” before the installation of Ruby through compiling begins.

```
Ruby (and needed base gems) for your selection will be installed shortly.
Before it happens, please read and execute the instructions below.
Please use a separate terminal to execute any additional commands.

Requirements for Linux ( DISTRIB_ID=Ubuntu
DISTRIB_RELEASE=12.04
DISTRIB_CODENAME=precise
DISTRIB_DESCRIPTION="Ubuntu 12.04 LTS" )

NOTE: 'ruby' represents Matz's Ruby Interpreter (MRI) (1.8.X, 1.9.X)
      This is the *original* / standard Ruby Language Interpreter
      'ree' represents Ruby Enterprise Edition
      'rbx' represents Rubinius

bash >= 4.1 required
curl is required
git is required (>= 1.7 for ruby-head)
patch is required (for 1.8 rubies and some ruby-head's).

To install rbx and/or Ruby 1.9 head (MRI) (eg. 1.9.2-head),
then you must install and use rvm 1.8.7 first.

Additional Dependencies:
# For Ruby / Ruby HEAD (MRI, Rubinius, & REE), install the following:
  ruby: /usr/bin/apt-get install build-essential openssl libreadline6 libreadline6-dev curl git-core zlib1g zlib1
g-dev libssl-dev libyaml-dev libsqlite3-dev sqlite3 libxml2-dev libxslt-dev autoconf libc6-dev ncurses-dev automa
ke libtool bison subversion

# For JRuby, install the following:
  jruby: /usr/bin/apt-get install curl g++ openjdk-6-jre-headless
  jruby-head: /usr/bin/apt-get install ant openjdk-6-jdk

# For IronRuby, install the following:
  ironruby: /usr/bin/apt-get install curl mono-2.0-devel

Press 'q' to continue.
(END)
I
```

Figure 9: Information on compiling of Ruby

The execution of this command takes several minutes, as a version of Ruby 1.8.7 and RubyGems are now being downloaded, compiled and made available as a sandbox for the local computer.

```

Setting up libssl-doc (1.0.1-4ubuntu5.2) ...
Setting up libtool (2.4.2-1ubuntu1) ...
Setting up libxml2-dev (2.7.8.dfsg-5.1ubuntu4.1) ...
Setting up libxslt1-dev (1.1.26-8ubuntu1) ...
Setting up openssl (1.0.1-4ubuntu5.2) ...
Setting up sqlite3 (3.7.9-2ubuntu1) ...
Setting up subversion (1.6.17dfsg-3ubuntu3) ...
Setting up libyaml-dev (0.1.4-2) ...
Processing triggers for libc-bin ...
ldconfig deferred processing now taking place
code24@local:~$ rvm install 1.8.7
Installing Ruby from source to: /home/code24/.rvm/rubies/ruby-1.8.7-p358, this may take a while depending on your
cpu(s)...

ruby-1.8.7-p358 - #fetching
ruby-1.8.7-p358 - #downloading ruby-1.8.7-p358, this may take a while depending on your connection...
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left   Speed
100 4111k  100 4111k    0     0   345k      0  0:00:11  0:00:11 --:--:--  710k
ruby-1.8.7-p358 - #extracting ruby-1.8.7-p358 to /home/code24/.rvm/src/ruby-1.8.7-p358
ruby-1.8.7-p358 - #extracted to /home/code24/.rvm/src/ruby-1.8.7-p358
Applying patch 'stdout-rouge-fix' (located at /home/code24/.rvm/patches/ruby/1.8.7/stdout-rouge-fix.patch)
Applying patch 'no_sslv2' (located at /home/code24/.rvm/patches/ruby/1.8.7/no_sslv2.diff)
ruby-1.8.7-p358 - #configuring
ruby-1.8.7-p358 - #compiling
ruby-1.8.7-p358 - #installing
Retrieving rubygems-1.8.24
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left   Speed
100  371k  100  371k    0     0   541k      0  0:00:00  0:00:00 --:--:-- 1209k
Extracting rubygems-1.8.24 ...
Removing old Rubygems files...
Installing rubygems-1.8.24 for ruby-1.8.7-p358 ...
Installation of rubygems completed successfully.
ruby-1.8.7-p358 - adjusting #shebangs for (gem irb erb ri rdoc testrb rake).
ruby-1.8.7-p358 - #importing default gemsets (/home/code24/.rvm/gemsets/)
Install of ruby-1.8.7-p358 - #complete
Please be aware that you just installed a ruby that requires 2 patches just to be compiled on up to date linux sy
stem.
This may have known and unaccounted for security vulnerabilities.
Please consider upgrading to Ruby 1.9.3-194 which will have all of the latest security patches.
code24@local:~$

```

Figure 10: Compiling of Ruby

Once the process is completed, Ruby 1.8.7 can be activated with the following command:

```
rvm use 1.8.7
```

An output informs about the fact that Ruby is now being used in the version 1.8.7.

```
Setting up libxml2-dev (2.7.8.dfsg-5.1ubuntu4.1) ...
Setting up libxslt1-dev (1.1.26-8ubuntu1) ...
Setting up openssl (1.0.1-4ubuntu5.2) ...
Setting up sqlite3 (3.7.9-2ubuntu1) ...
Setting up subversion (1.6.17dfsg-3ubuntu3) ...
Setting up libyaml-dev (0.1.4-2) ...
Processing triggers for libc-bin ...
ldconfig deferred processing now taking place
code24@local:~$ rvm install 1.8.7
Installing Ruby from source to: /home/code24/.rvm/rubies/ruby-1.8.7-p358, this may take a while depending on your
cpu(s)...
```

% Total	% Received	% Xferd	Average Speed	Time	Time	Time	Current
			Dload Upload	Total	Spent	Left	Speed
100	4111k	100	4111k	0	0	345k	0
				0:00:11	0:00:11	--:--:--	710k

```
ruby-1.8.7-p358 - #fetching
ruby-1.8.7-p358 - #downloading ruby-1.8.7-p358, this may take a while depending on your connection...
ruby-1.8.7-p358 - #extracting ruby-1.8.7-p358 to /home/code24/.rvm/src/ruby-1.8.7-p358
ruby-1.8.7-p358 - #extracted to /home/code24/.rvm/src/ruby-1.8.7-p358
Applying patch 'stdout-rouge-fix' (located at /home/code24/.rvm/patches/ruby/1.8.7/stdout-rouge-fix.patch)
Applying patch 'no_sslv2' (located at /home/code24/.rvm/patches/ruby/1.8.7/no_sslv2.diff)
ruby-1.8.7-p358 - #configuring
ruby-1.8.7-p358 - #compiling
ruby-1.8.7-p358 - #installing
Retrieving rubygems-1.8.24


| % Total | % Received | % Xferd | Average Speed | Time     | Time     | Time     | Current |
|---------|------------|---------|---------------|----------|----------|----------|---------|
|         |            |         | Dload Upload  | Total    | Spent    | Left     | Speed   |
| 100     | 371k       | 100     | 371k          | 0        | 0        | 541k     | 0       |
|         |            |         |               | --:--:-- | --:--:-- | --:--:-- | 1209k   |



```
Extracting rubygems-1.8.24 ...
Removing old Rubygems files...
Installing rubygems-1.8.24 for ruby-1.8.7-p358 ...
Installation of rubygems completed successfully.
ruby-1.8.7-p358 - adjusting #shebangs for (gem irb erb ri rdoc testrb rake).
ruby-1.8.7-p358 - #importing default gemsets (/home/code24/.rvm/gemsets/)
Install of ruby-1.8.7-p358 - #complete
Please be aware that you just installed a ruby that requires 2 patches just to be compiled on up to date linux sy
stem.
This may have known and unaccounted for security vulnerabilities.
Please consider upgrading to Ruby 1.9.3-194 which will have all of the latest security patches.
code24@local:~$ rvm use 1.8.7
Using /home/code24/.rvm/gems/ruby-1.8.7-p358
code24@local:~$
```


```

Figure 11: Configuration of the RVM environment

1.4 Execution of the installation

Henceforth, it will be assumed that the software prototype has been extracted into a directory named `~/freight-exchange` (if another path has been chosen, the following explanations apply analogously for this path).

```
cd ~/freight-exchange
```

The question whether it should be trusted the local file `.rvmrc` is to be confirmed with “Y”.

```

ruby-1.8.7-p358 - #fetching
ruby-1.8.7-p358 - #downloading ruby-1.8.7-p358, this may take a while depending on your connection...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total     Spent    Left  Speed
100|4111k  100 4111k    0     0   345k      0  0:00:11  0:00:11 --:--:--  710k
ruby-1.8.7-p358 - #extracting ruby-1.8.7-p358 to /home/code24/.rvm/src/ruby-1.8.7-p358
ruby-1.8.7-p358 - #extracted to /home/code24/.rvm/src/ruby-1.8.7-p358
Applying patch 'stdout-rouge-fix' (located at /home/code24/.rvm/patches/ruby/1.8.7/stdout-rouge-fix.patch)
Applying patch 'no_sslv2' (located at /home/code24/.rvm/patches/ruby/1.8.7/no_sslv2.diff)
ruby-1.8.7-p358 - #configuring
ruby-1.8.7-p358 - #compiling
ruby-1.8.7-p358 - #installing
Retrieving rubygems-1.8.24
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total     Spent    Left  Speed
100 371k  100 371k    0     0   541k      0  --:--:--  --:--:--  --:--:-- 1209k
Extracting rubygems-1.8.24 ...
Removing old Rubygems files...
Installing rubygems-1.8.24 for ruby-1.8.7-p358 ...
Installation of rubygems completed successfully.
ruby-1.8.7-p358 - adjusting #shebangs for (gem irb erb ri rdoc testrb rake).
ruby-1.8.7-p358 - #importing default gemsets (/home/code24/.rvm/gemsets/)
Install of ruby-1.8.7-p358 - #complete
Please be aware that you just installed a ruby that requires 2 patches just to be compiled on up to date linux sy
stem.
This may have known and unaccounted for security vulnerabilities.
Please consider upgrading to Ruby 1.9.3-194 which will have all of the latest security patches.
code24@local:~$ rvm use 1.8.7
Using /home/code24/.rvm/gems/ruby-1.8.7-p358
code24@local:~$ cd ~/freight-exchange
=====
= NOTICE
=====
= RVM has encountered a new or modified .rvmrc file in the current directory
= This is a shell script and therefore may contain any shell commands.
=
= Examine the contents of this file carefully to be sure the contents are
= safe before trusting it! ( Choose v[iew] below to view the contents )
=====
Do you wish to trust this .rvmrc file? (/home/code24/freight-exchange/.rvmrc)
y[es], n[o], v[iew], c[ancel]> █

```

Figure 12: Confirmation of the confidentiality of RVM

Next, the software Bundler has to be installed.

gem install bundler

```

ruby-1.8.7-p358 - #extracted to /home/code24/.rvm/src/ruby-1.8.7-p358
Applying patch 'stdout-rouge-fix' (located at /home/code24/.rvm/patches/ruby/1.8.7/stdout-rouge-fix.patch)
Applying patch 'no_sslv2' (located at /home/code24/.rvm/patches/ruby/1.8.7/no_sslv2.diff)
ruby-1.8.7-p358 - #configuring
ruby-1.8.7-p358 - #compiling
ruby-1.8.7-p358 - #installing
Retrieving rubygems-1.8.24
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left   Speed
100 371k  100 371k    0     0   541k      0  --:--:--  --:--:--  --:--:-- 1209k
Extracting rubygems-1.8.24 ...
Removing old Rubygems files...
Installing rubygems-1.8.24 for ruby-1.8.7-p358 ...
Installation of rubygems completed successfully.
ruby-1.8.7-p358 - adjusting #shebangs for (gem irb erb ri rdoc testrb rake).
ruby-1.8.7-p358 - #importing default gemsets (/home/code24/.rvm/gemsets/)
Install of ruby-1.8.7-p358 - #complete
Please be aware that you just installed a ruby that requires 2 patches just to be compiled on up to date linux sy
stem.
This may have known and unaccounted for security vulnerabilities.
Please consider upgrading to Ruby 1.9.3-194 which will have all of the latest security patches.
code24@local:~$ rvm use 1.8.7
Using /home/code24/.rvm/gems/ruby-1.8.7-p358
code24@local:~$ cd ~/freight-exchange
=====
= NOTICE
=====
= RVM has encountered a new or modified .rvmrc file in the current directory
= This is a shell script and therefore may contain any shell commands.
=
= Examine the contents of this file carefully to be sure the contents are
= safe before trusting it! ( Choose v[iew] below to view the contents )
=====
Do you wish to trust this .rvmrc file? (/home/code24/freight-exchange/.rvmrc)
y[es], n[o], v[iew], c[ancel]> y
code24@local:~/freight-exchange$ gem install bundler
Fetching: bundler-1.1.4.gem (100%)
Successfully installed bundler-1.1.4
1 gem installed
Installing ri documentation for bundler-1.1.4...
Installing RDoc documentation for bundler-1.1.4...
code24@local:~/freight-exchange$

```

Figure 13: Installation of Bundler

Afterwards, Bundler resolves any other dependencies:

bundle

The software Bundler now installs all RubyGems required for running the software prototype.

```
Post-install message from sqlite3-ruby:
#####
Hello! The sqlite3-ruby gem has changed it's name to just sqlite3. Rather than
installing `sqlite3-ruby`, you should install `sqlite3`. Please update your
dependencies accordingly.

Thanks from the Ruby sqlite3 team!

<3 <3 <3 <3

#####

Post-install message from rdoc:
Depending on your version of ruby, you may need to install ruby rdoc/ri data:

<= 1.8.6 : unsupported
= 1.8.7 : gem install rdoc-data; rdoc-data --install
= 1.9.1 : gem install rdoc-data; rdoc-data --install
>= 1.9.2 : nothing to do! Yay!

Post-install message from formtastic:

=====
Thanks for installing Formtastic!
-----
You can now (optionally) run the generator to copy some stylesheets and
a config initializer into your application:
rails generate formtastic:install # Rails 3
./script/generate formtastic     # Rails 2

To generate some semantic form markup for your existing models, just run:
rails generate formtastic:form MODEL_NAME # Rails 3
./script/generate form MODEL_NAME      # Rails 2

Find out more and get involved:
http://github.com/justinfrench/formtastic
http://groups.google.com.au/group/formtastic
=====
code24@local:~/freight-exchange$
```

Figure 14: Execution of Bundler

Before the database can be initialized, the database configuration has to be set up. The software prototype contains two configuration examples (one for SQLite3 and one for MySQL). Thus, for example, the SQLite3 template can be activated with the following command:

```
cp config/database.yml.sqlite3 config/database.yml
```

```
#####
Hello! The sqlite3-ruby gem has changed it's name to just sqlite3. Rather than
installing `sqlite3-ruby`, you should install `sqlite3`. Please update your
dependencies accordingly.

Thanks from the Ruby sqlite3 team!

<3 <3 <3 <3

#####

Post-install message from rdoc:
Depending on your version of ruby, you may need to install ruby rdoc/ri data:

<= 1.8.6 : unsupported
= 1.8.7 : gem install rdoc-data; rdoc-data --install
= 1.9.1 : gem install rdoc-data; rdoc-data --install
>= 1.9.2 : nothing to do! Yay!

Post-install message from formtastic:

=====
Thanks for installing Formtastic!
-----
I You can now (optionally) run the generator to copy some stylesheets and
a config initializer into your application:
rails generate formtastic:install # Rails 3
./script/generate formtastic # Rails 2

To generate some semantic form markup for your existing models, just run:
rails generate formtastic:form MODEL_NAME # Rails 3
./script/generate form MODEL_NAME # Rails 2

Find out more and get involved:
http://github.com/justinfrench/formtastic
http://groups.google.com.au/group/formtastic
=====
code24@local:~/freight-exchange$ cp config/database.yml.sqlite3 config/database.yml
code24@local:~/freight-exchange$
```

Figure 15: Adopting of an exemplary database configuration

At this point, the example of the SQLite3 template is used for the database configuration, as this configuration is less elaborate and is considered as being sufficient for the purpose of running a test and demonstration installation.

Alternatively, at this point, a template for the configuration of a MySQL database does also exist, in which, however, the data concerning the database name, the user name and the password have to be adapted in case of doubt.

Subsequently, the database is being generated:

```
rake db:setup
```

```
-- create_table("notification_items", {:force=>true})
-> 0.1334s
-- create_table("notifications", {:force=>true})
-> 0.1321s
-- create_table("people", {:force=>true})
-> 0.1336s
-- create_table("reviews", {:force=>true})
-> 0.1410s
-- create_table("search_recordings", {:force=>true})
-> 0.1324s
-- create_table("simple_searches", {:force=>true})
-> 0.1329s
-- create_table("site_infos", {:force=>true})
-> 0.1413s
-- create_table("stations", {:force=>true})
-> 0.1335s
-- create_table("talk_locales", {:force=>true})
-> 0.1329s
-- add_index("talk_locales", ["name"], {:unique=>true, :name=>"index_talk_locales_on_name"})
-> 0.1330s
-- create_table("talk_phrases", {:force=>true})
-> 0.1326s
-- create_table("talk_translations", {:force=>true})
-> 0.2817s
-- add_index("talk_translations", ["phrase_id", "locale_id"], {:unique=>true, :name=>"index_talk_translations_on_phrase_id_and_locale_id"})
-> 0.3677s
-- create_table("user_roles", {:force=>true})
-> 0.2081s
-- create_table("user_roles_users", {:force=>true, :id=>false})
-> 0.1325s
-- create_table("users", {:force=>true})
-> 0.1342s
-- create_table("white_listed_items", {:force=>true})
-> 0.1574s
-- initialize_schema_migrations_table()
-> 0.2698s
-- assume_migrated_upto_version(20120502124731, "db/migrate")
-> 7.0944s
Opening: deutschland_nr.csv
headers: ["numeric_id", "name"]
```

Figure 16: Initialization of the database

The initialization of the database can take some time depending on the server hardware and the used database system, as in doing so, a great number (approx. 35.000) of stations are being loaded and validated into the database of the software prototype:

The system assistant can be found now under the URL of the server.



Figure 19: URL of the server

With the help of the system assistant, the administration account for the online freight exchange (the so called “admin user”) can be created, a demo company can be managed and the settings of the prototype installation can be conveniently adjusted within a graphical interface.

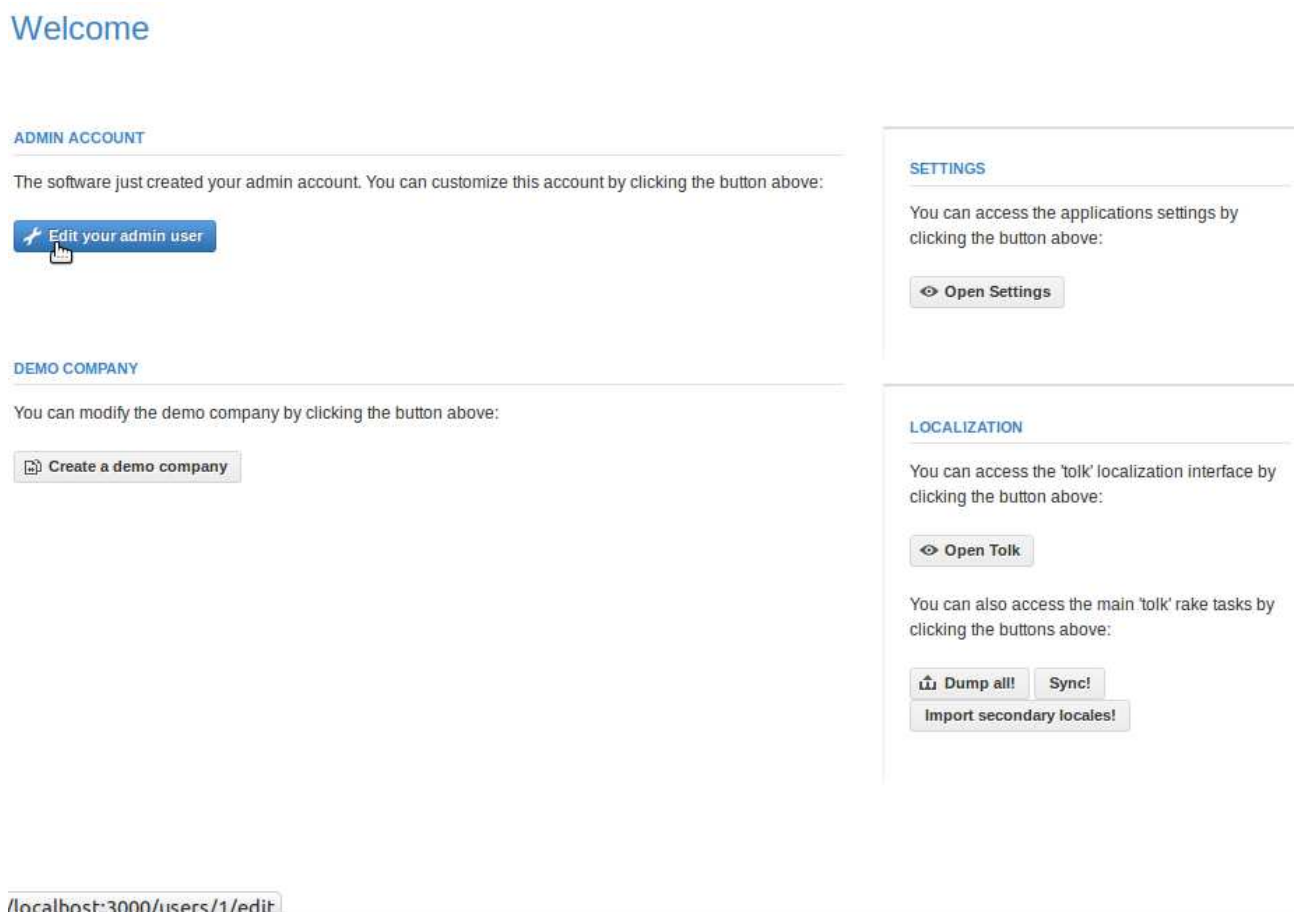


Figure 20: System assistant

As a first measure in every new installation of the software prototype, the automatically created user (“admin user”) provided with administrator rights should be edited and the login data should be changed. A click on “Editing your admin user” opens up a view in which the default user/password combination (admin/admin) as well as the default e-mail address can be edited.

Edit User

EDIT USER

Required Field Hint

Login credentials

Username

Choose a username to log in to the service

E-Mail

Enter your e-mail address here

Change password (optional)

Password Hint

Password

Choose your password carefully

Password (again)

Please repeat your password

Notifications (optional)

Notify by email

Figure 21: Input screen of the admin user

Because of safety reasons it is advisable to choose a safe username/password combination at this point.¹ Also, an existing e-mail address should be entered so that the password can be reset in case of doubt.

After the admin user has been edited, one gets back to the administrator interface through the link “Administration” on the navigation bar. With this, the basic configuration of the software prototype is completed.

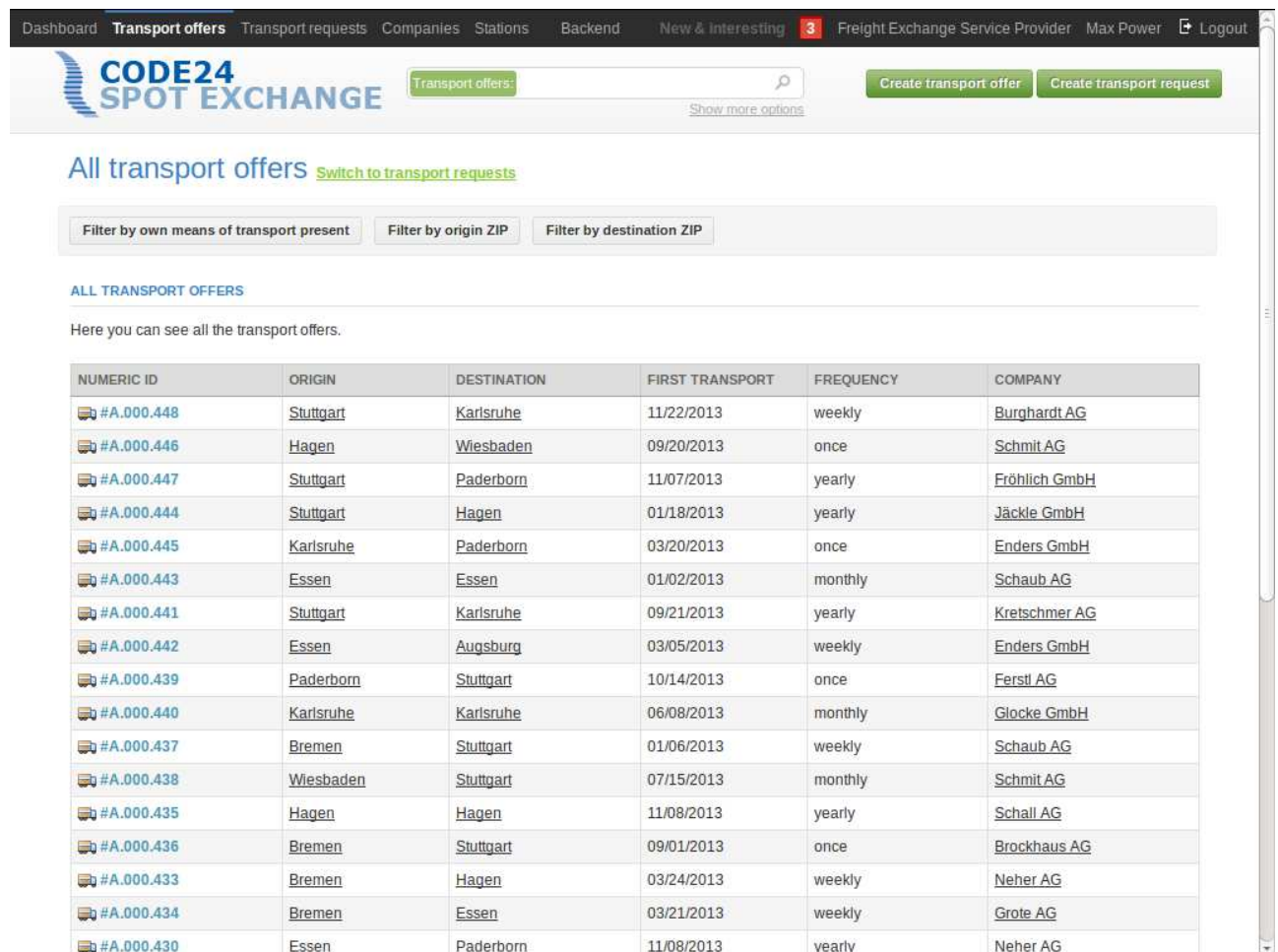
1) Longer user names and passwords are generally safer than shorter ones. An application of numbers and special characters alongside normal characters further increases the safety.

2 Features for end-users of the software prototype

2.1 Preliminary remarks

All following views of the software prototype depicted with the help of screenshots, have been created with the aid of the demo company which can be established with the system assistant (see installation of the software prototype).

The figures have been added to the project report as exemplary depictions and reflect the state of the software prototype at the time of drafting the project report. In some cases, the figures do not reflect the whole website (see for example Figure 22), but only an enlarged section of the respective view (see for example Figure 226).



The screenshot shows the 'All transport offers' page on the CODE24 SPOT EXCHANGE website. The page includes a navigation bar with 'Transport offers' selected, a search bar, and buttons for 'Create transport offer' and 'Create transport request'. Below the navigation, there are filter buttons for 'Filter by own means of transport present', 'Filter by origin ZIP', and 'Filter by destination ZIP'. The main content area displays a table of transport offers with the following data:

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#A.000.448	Stuttgart	Karlsruhe	11/22/2013	weekly	Burghardt AG
#A.000.446	Hagen	Wiesbaden	09/20/2013	once	Schmit AG
#A.000.447	Stuttgart	Paderborn	11/07/2013	yearly	Fröhlich GmbH
#A.000.444	Stuttgart	Hagen	01/18/2013	yearly	Jäckle GmbH
#A.000.445	Karlsruhe	Paderborn	03/20/2013	once	Enders GmbH
#A.000.443	Essen	Essen	01/02/2013	monthly	Schaub AG
#A.000.441	Stuttgart	Karlsruhe	09/21/2013	yearly	Kretschmer AG
#A.000.442	Essen	Augsburg	03/05/2013	weekly	Enders GmbH
#A.000.439	Paderborn	Stuttgart	10/14/2013	once	Ferstl AG
#A.000.440	Karlsruhe	Karlsruhe	06/08/2013	monthly	Glocke GmbH
#A.000.437	Bremen	Stuttgart	01/06/2013	weekly	Schaub AG
#A.000.438	Wiesbaden	Stuttgart	07/15/2013	monthly	Schmit AG
#A.000.435	Hagen	Hagen	11/08/2013	yearly	Schall AG
#A.000.436	Bremen	Stuttgart	09/01/2013	once	Brockhaus AG
#A.000.433	Bremen	Hagen	03/24/2013	weekly	Neher AG
#A.000.434	Bremen	Essen	03/21/2013	weekly	Grote AG
#A.000.430	Essen	Paderborn	11/08/2013	yearly	Neher AG

Figure 22: Full side view

Due to the redundancy of the navigation and search bar at the top of the screen, they will be removed in most cases on behalf of better legibility of the content in the figures of the software prototype (see for example Figure 25).

2.2 Access to the online freight exchange

2.2.1 Registration of a new company

Before an initial business contact can take place via the online freight exchange all future participating actors have to register at first with the online freight exchange. To that end, the potential user selects the corresponding input mask and follows the steps depicted in Figure 23.

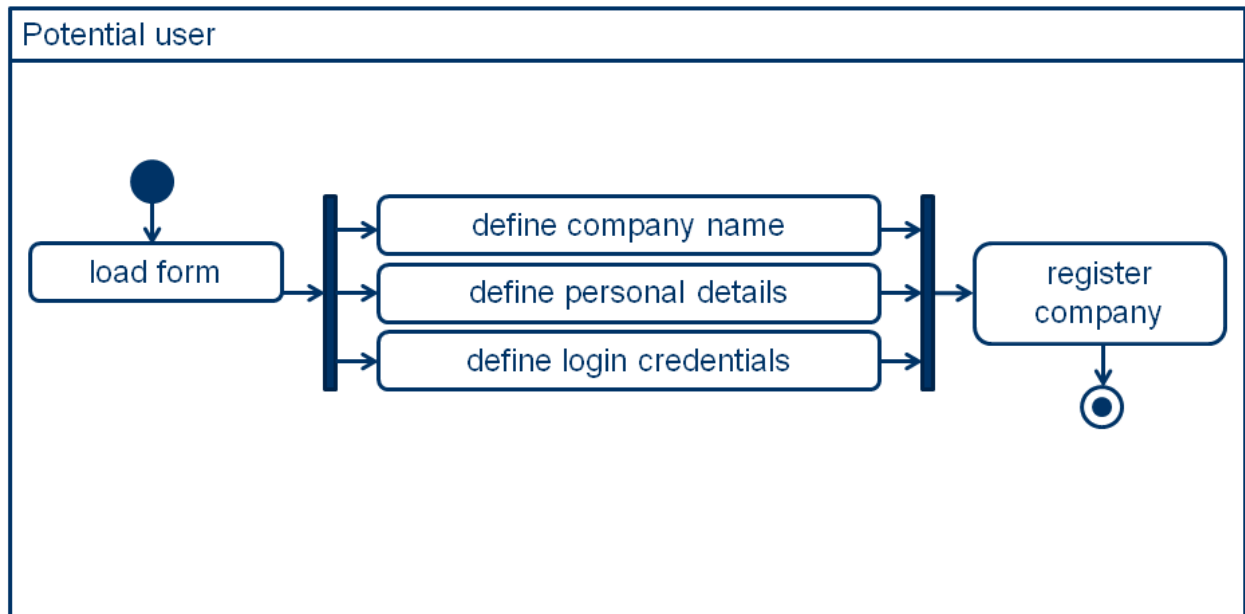


Figure 23: Registration of a new company

Is the data entered by the user valid, his company will be registered with the system and the potential user will be an active end-user. In the context of this report, “end-users” are the users of the online freight exchange and differ from “operators” in that the latter has advanced administration rights within the system of the online freight exchange.

Below, it will be demonstrated with the help of screenshots how an end-user can register with the system of the online freight exchange. If a potential end-user calls up the website of the online freight exchange, he sees a welcome screen.

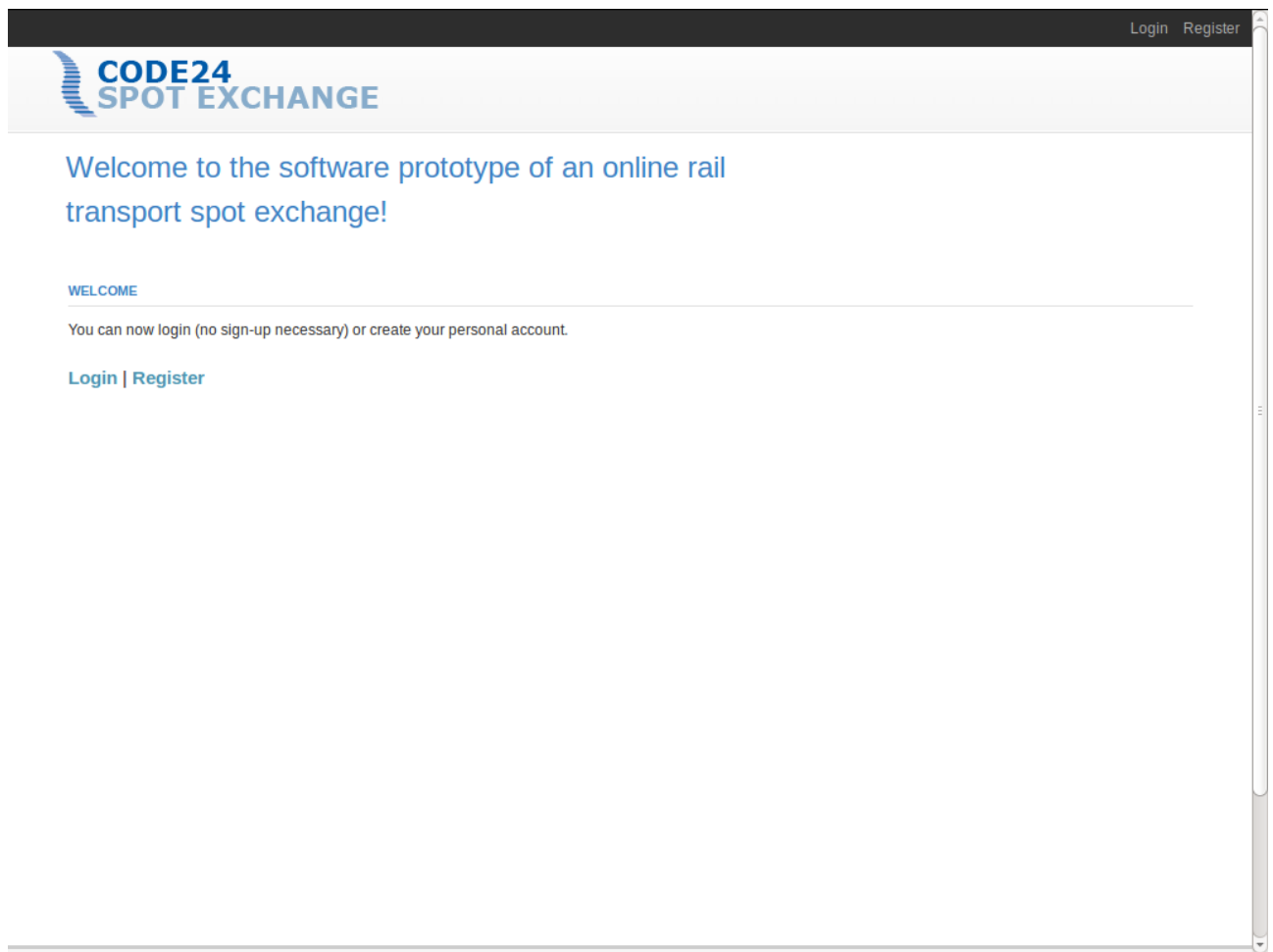


Figure 24: Welcome screen

At this point, the end-user can choose if he already has a user account at the online freight exchange at his disposal and wants to login or if he – for want of a user account – wants to register his company with the system of the online freight exchange.

If the end-user wants to set up a new user account for his company, he clicks on “register” and is being directed to the input mask for the registration of a new company.

Create company account

CREATE YOUR COMPANY ACCOUNT

You are just 60 seconds away from your own account!

Company information

Name

Personal information

Gender* ▾

Forename*

Surname*

Login credentials

Username
Choose a username to log in to the service

E-Mail
Enter your e-mail address here

Password
Choose your password carefully

Password (again)
Please repeat your password

Notifications (optional)

Notify by email

Figure 25: Registration form

In the displayed form, information concerning the company as well as personal details of the primary user of this company is being recorded. Moreover, the end-user chooses a user name, a password and enters an e-mail address. He can decide optionally whether he wants to receive notifications about new advertisements within the online freight exchange only in the system of the online freight exchange or if he wants to be informed via e-mail as well.

The primary user of a company is automatically being endowed with the necessary rights in order to be able to create other users later on.

2.2.2 Login as an existing company

If the end-user already has a user account, he clicks on “Login” and is directed to the input mask for the login procedure. Here, he can login with his username/password combination or he can get a new password with a click on “password forgotten”.

Login



The screenshot shows a login form with the following elements:

- A header section with the word "LOGIN" in blue.
- A "Username" label above a text input field.
- A "Password" label above a text input field.
- A link labeled "Forgot your password?" to the right of the password input field.
- A "Login" button below the input fields.

Figure 26: Input mask for the login procedure

Alternatively, the user can login as a user of the demo company by clicking on one of the buttons on the right side if the relevant instance of the software prototype is run in demo mode.

Login



The screenshot shows the same login form as in Figure 26, but with an additional panel on the right side:

- The "QUICK LOGIN (DEMO-ACCOUNT)" section is titled "DEMONTAGE SPRENKLER AG".
- Below this title is a list of ten demo users, each with a small icon and a button:

Username	Account ID
Martin Sprenkler	demo_user_admin
Bettina Sprenkler	demo_user02
Peter Krause	demo_user03
Martin Kowalla	demo_user04
Anette Baumann	demo_user05
Bernhard Baumann	demo_user06
Jan Etterich	demo_user07
Marius Müller	demo_user08
Caroline Ampel	demo_user09
Kerstin Fischer	demo_user10

Figure 27: Input mask for the login procedure with demo users

The option to login as a member of the demo company is only given if the demo company exists.

2.3 Advertisements for transport offers

2.3.1 Overview

Subsequent to the registration or login procedure the end-user is presented with the user interface of the online freight exchange with a view of all advertisements for transport offers.

All transport offers [Switch to transport requests](#)

Filter by own means of transport present Filter by origin ZIP Filter by destination ZIP

ALL TRANSPORT OFFERS

Here you can see all the transport offers.

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#A.000.448	Stuttgart	Karlsruhe	11/22/2013	weekly	Burghardt AG
#A.000.446	Hagen	Wiesbaden	09/20/2013	once	Schmit AG
#A.000.447	Stuttgart	Paderborn	11/07/2013	yearly	Fröhlich GmbH
#A.000.444	Stuttgart	Hagen	01/18/2013	yearly	Jäckle GmbH
#A.000.445	Karlsruhe	Paderborn	03/20/2013	once	Enders GmbH
#A.000.441	Stuttgart	Karlsruhe	09/21/2013	yearly	Kretschmer AG
#A.000.442	Essen	Augsburg	03/05/2013	weekly	Enders GmbH
#A.000.439	Paderborn	Stuttgart	10/14/2013	once	Ferstl AG
#A.000.440	Karlsruhe	Karlsruhe	06/08/2013	monthly	Glocke GmbH
#A.000.438	Wiesbaden	Stuttgart	07/15/2013	monthly	Schmit AG
#A.000.435	Hagen	Hagen	11/08/2013	yearly	Schall AG
#A.000.433	Bremen	Hagen	03/24/2013	weekly	Neher AG
#A.000.434	Bremen	Essen	03/21/2013	weekly	Grote AG
#A.000.430	Essen	Paderborn	11/08/2013	yearly	Neher AG
#A.000.431	Karlsruhe	Wiesbaden	06/08/2013	weekly	Hinz GmbH
#A.000.432	Karlsruhe	Essen	03/02/2013	monthly	Lüke GmbH

Figure 28: Overview of all advertisements for transport offers

2.3.2 Creating a new advertisement for a transport offer

If a user wants to create an advertisement, he thereby wants to send a signal that he is ready for an initial business contact. He is ready to offer a service (the transport of freight) and, concerning this, has to describe the service exactly.

Figure 29 depicts schematically the necessary steps concerning this.

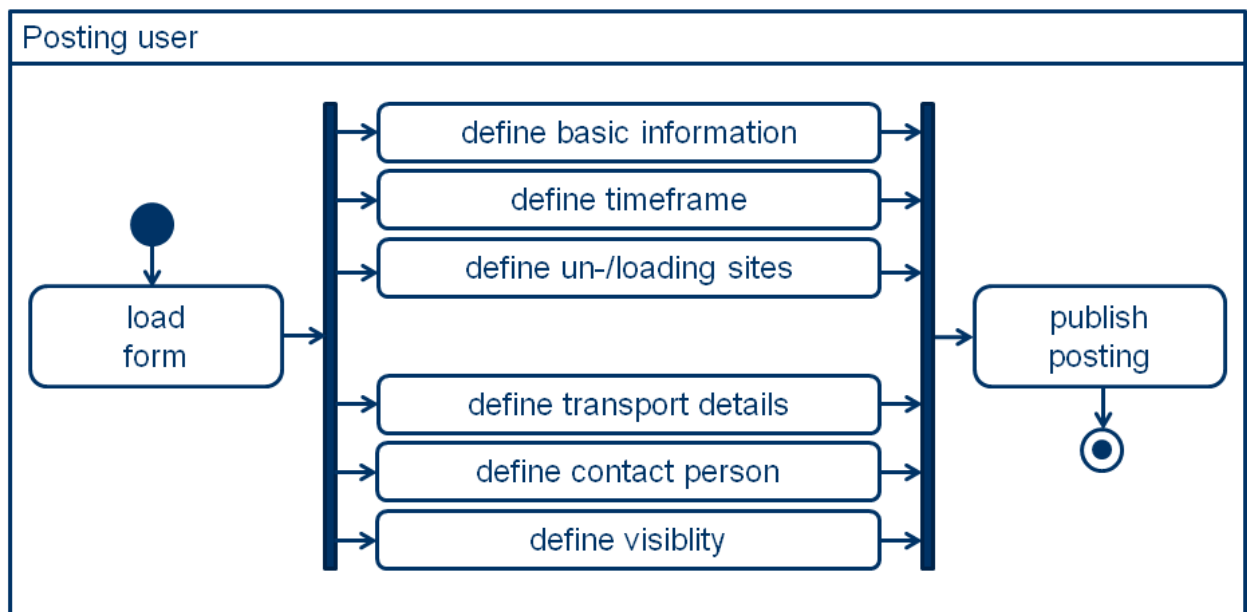


Figure 29: Creating a new advertisement for a transport offer

If all mandatory data are valid, the advertisement is stored within the system and released from the date of its validity.

If the end-user wants to create a new advertisement for a transport offer within the software prototype, he clicks on the button “New transport offer” at the top right.



Figure 30: Buttons for creating a transport offer

Afterwards he gets to the input mask for creating a new advertisement for a transport offer.

New transport offer

NEW TRANSPORT OFFER

The fields with an asterix (*) are mandatory:

Contractor

Contractor*

Posting valid from*
(Format: MM/DD/YYYY)

Posting valid until*
(Format: MM/DD/YYYY)

Time frame:

Frequency*

Loading site:

Sidetrack available? Yes No

Loading station

Search by number or name

Contractor

Street

(continued)

ZIP

Origin city

Country

Unloading site:

Sidetrack available? Yes No

Unloading station

Search by number or name

Contractor

Street

(continued)

ZIP

Destination city

Country

Transports

Own means of transport present?* No Yes

Additional information:

Contact Person

Company categories:

- Railway undertakings
 Forwarding agents
 Operators of combined cargo
 Loading agents

Figure 31: Form for creating new advertisements for transport offers

In the section “basic data” the name of the offering company as well as the start and end point of the validity of the advertisements are being entered.

Contractor
Contractor*

Posting valid from*
(Format: MM/DD/YYYY)

Posting valid until*
(Format: MM/DD/YYYY)

Figure 32: Basic data

The field “company name” is already pre-filled with the name of the company. The advertisement will not be visible for other end-users of the online freight exchange before the date entered in “advertisement valid from”. After that, the advertisement is visible for the companies specified in the subsequent course of creating it until the date entered in “advertisement valid until”.

In the section “Timeframe” it can be decided on the frequency of the offered transports. At this, the end-user can select from a number of intervals.

Time frame:
Frequency*

Loading site:
Sidetrack available? Yes No
Loading station
Search by number or name

Unloading site:
Sidetrack available? Yes No
Unloading station
Search by number or name

Contractor

Figure 33: Selection of the frequency of the transport offer to be created

If he selects, for example, “weekly” the input mask expands.

Time frame:
Frequency*

First transport at
(Format: MM/DD/YYYY)

Available until:
(Format: MM/DD/YYYY)

Frequency for repeated transports
(within the provided timeframe, e.g. per week)

Figure 34: An exemplary selection of a weekly frequency

Now, the end-user can enter in what time frame the offered transports will be available and how often the transports will take place within the entered interval.

In the sections “loading site of the freight” (and “unloading site of the freight”) the track and address data of the loading site (and unloading site) are entered.

Loading site:		Unloading site:	
Sidetrack available?	<input checked="" type="radio"/> Yes <input type="radio"/> No	Sidetrack available?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Loading station	<input type="text"/>	Unloading station	<input type="text"/>
	Search by number or name		Search by number or name
Contractor	<input type="text"/>	Contractor	<input type="text"/>
Street	<input type="text"/>	Street	<input type="text"/>
(continued)	<input type="text"/>	(continued)	<input type="text"/>
ZIP	<input type="text"/>	ZIP	<input type="text"/>
Origin city	<input type="text"/>	Destination city	<input type="text"/>
Country	Germany <input type="text"/>	Country	Germany <input type="text"/>

Figure 35: Loading and unloading site

If a railway siding is available, stations with a railway siding from a wide range of Europe can be chosen through the station search. Once the beginning of the name of one or more stations is entered into the field loading station (or unloading station), the software prototype shows a selection of stations containing the entered part of the name in their description.

Unloading site:		Unloading site:	
Sidetrack available?	<input checked="" type="radio"/> Yes <input type="radio"/> No	Sidetrack available?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Unloading station	<input type="text"/>	Unloading station	<input type="text" value="Essen"/>
	Search by number or name		Search by number or name
Contractor	<input type="text"/>		<ul style="list-style-type: none"> <input type="radio"/> 8000098 - Essen Hbf <input type="radio"/> 8001896 - Essen Stadtwald <input type="radio"/> 8001897 - Essen Süd <input type="radio"/> 8001898 - Essen West <input type="radio"/> 8001900 - Essen-Altenessen <input type="radio"/> 8001901 - Essen-Bergeborbeck <input type="radio"/> 8001902 - Essen-Borbeck <input type="radio"/> 8005031 - Essen-Borbeck Süd <input type="radio"/> 8001903 - Essen-Dellwig <input type="radio"/> 8001904 - Essen-Dellwig Ost <input type="radio"/> 8001905 - Essen-Eiberg <input type="radio"/> 8001906 - Essen-Frohnhausen <input type="radio"/> 8001907 - Essen-Gerschede <input type="radio"/> 8006514 - Essen-Holthausen <input type="radio"/> 8006194 - Essen-Horst <input type="radio"/> 8001908 - Essen-Hügel <input type="radio"/> 8001910 - Essen-Kray Nord <input type="radio"/> 8001911 - Essen-Kray Süd <input type="radio"/> 8001912 - Essen-Kupferdreh <input type="radio"/> 8000099 - Essen-Steele
Street	<input type="text"/>	Contractor	<input type="text"/>
(continued)	<input type="text"/>		
ZIP	<input type="text"/>		
Destination city	<input type="text"/>		
Country	Germany <input type="text"/>		

Figure 36: Station search using the example of the loading station

Alternative to the search by name, the station number can be entered as well. Here, too, do suggestions for possible stations appear from the database of the online freight exchange after entering the first positions.

In the section “transport data” the end-user selects whether his transport offer contains only traction or if freight cars are offered too.

Transports

Own means of transport present?* No Yes

Additional information:

Contact Person

Company categories:

Railway undertakings

Forwarding agents

Figure 37: Selection of “mere traction“

If the transport offer also contains freight cars, they can be chosen from a list.

Transports

Own means of transport present?* No Yes

Type of wagon

- Offene Wagen
- Gedekte Wagen
- Wagen mit Temperaturbeeinflussung
- Flachwagen mit 2 Radsätzen
- Flachwagen mit unabhängigen Radsätzen
- Gemischte Offen-Flachwagen
- Drehgestell-Flachwagen
- Wagen mit öffnungsfähigem Dach
- Sonderwagen
- Kesselwagen
- other

Additional information:

Contact Person

Figure 38: Selection of “traction and freight car” as well as the available type of wagon

If the concerning type of wagon cannot be found in the list, the end-user can chose the option „other” and enter specifications of his wagon type as a free text.

Transports

Own means of transport present?* No Yes

Type of wagon

Additional information:

Contact Person

Figure 39: Input of an individual wagon type

In the section “other information” the end-user can select a contact person for the advertisement from the registered users of the company. Later on, the contact details of this person will be displayed clearly visible beside the advertisement, so that potentially interested parties can quickly see who will answer further questions regarding the advertisement.

Additional information:

Contact Person

Company categories:

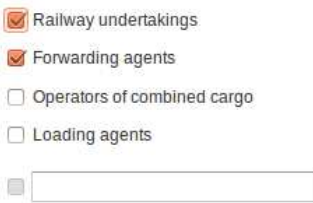


The screenshot shows a web form with two main sections. The first section is titled 'Additional information:' and contains a label 'Contact Person' next to a dropdown menu. The dropdown menu is open, displaying a list of names: Martin Sprenkler, Bettina Sprenkler (highlighted in orange), Peter Krause, Martin Kowalla, Anette Baumann, Bernhard Baumann, Jan Etterich, Marius Müller, Caroline Ampel, and Kerstin Fischer. Below the dropdown menu is a text input field with a small square icon to its left. The second section is labeled 'Company categories:' and contains a text input field with a small square icon to its left. The text 'ed cargo' is visible to the right of the dropdown menu.

Figure 40: Selection of the contact person

Finally, the end-user chooses in which company categories the advertisement should be displayed. If he does not make a choice, the advertisement will be visible for all companies registered with the online freight exchange. Otherwise, it is only visible for those belonging to the specified company categories. Additionally, there is the possibility of specifying an individual company category by using a free text field.

Company categories:



The screenshot shows a web form with a section titled 'Company categories:'. It contains four checkboxes: 'Railway undertakings' (checked), 'Forwarding agents' (checked), 'Operators of combined cargo' (unchecked), and 'Loading agents' (unchecked). Below the checkboxes is a text input field with a small square icon to its left. At the bottom of the form is a button labeled 'Create posting'.

Figure 41: Selection of the company categories

With a click on “create advertisement for a transport offer” the end-user finalizes the creation of the advertisement.

2.3.3 Viewing advertisements

After an advertisement has been created, it is given a unique advertisement number and will be published for the time of its validity.

In the detail view of the transport offer all details entered previously into the input mask are displayed.

Transport offer

Figure 42: Detail view of a transport offer

On the right side, the contact details of the advertising company as well as optionally the contact details of the individually selected contact person are listed.

Transport offer

Figure 43: e-mail to the provider

The navigation below the unique advertisement number gives the user the opportunity to write a direct e-mail to the advertising user. With a click on “e-mail to the provider”, the e-mail software of the user opens up with a pre-filled e-mail that refers to the advertisement within the software prototype.

2.3.4 Answering advertisements

Advertisements for transport requests can be answered with a corresponding advertisement for a transport offer. Thus, it is possible to advertise a transport offer semantically linked to the initial request.

Transport offer

Figure 44: Answering advertisements

When the user views an advertisement for a transport request and clicks on “answer with an offer”, an input mask for creating a new transport offer opens up.

New transport offer

NEW TRANSPORT OFFER

The fields with an asterisk (*) are mandatory:

Contractor

Contractor*

Posting valid from*

(Format: MM/DD/YYYY)

Posting valid until*

(Format: MM/DD/YYYY)

This transport offer has been created as a reply to [#N.000.502](#) (only the creator of the original transport request can see this reply).

Time frame:

Frequency*

First transport at

(Format: MM/DD/YYYY)

Loading site:

Unloading site:

Figure 45: Input mask for an advertisement as a reply to a transport request

Unlike normal input masks, a note highlighted in green points out the fact that the advertisement to be created is semantically linked to the answered advertisement for a transport request and that only employees of the advertising company can view the new advertisement.

Transport offer

This transport offer is a reply to the transport request [#N.000.502](#)

CONTRACTOR: SCHREIER GMBH

Posting valid until 12/06/2012

LOADING SITE	UNLOADING SITE
Laufer GmbH Angelstr. 35 88427 Augsburg Germany	Schreier GmbH Unter Kahlenhausen 149 91605 Bremen Germany
<i>No sidetrack available.</i>	<i>No sidetrack available.</i>

Frequency: once
First transport at: 08/11/2012

TRANSPORT DESCRIPTION

Own means of transport present? No

COMPANY INFORMATION [View profile](#)

Demontage Sprenkler AG

Address Wallstr. 56-58
ZIP 44567
City Bochum
Country Deutschland
Phone +49 (0) 234 569986-0
Fax +49 (0) 234 569986-55
E-Mail demontage@example.org
Web <http://example.org>
Commercial register entry
 -
VAT-No.
 -

[View all postings](#)

Figure 46: Detail view of a transport offer as a reply to a transport request

When the new advertisement is published, a note highlighted in green in the detail view also points out the connection to the original advertisement for a transport request.

2.3.5 Negotiating advertisements

Another option in the detail view of an advertisement is the negotiation.

Transport offer

[Negotiate](#) [Reply with transport request](#) [Contact company](#)

Figure 47: Negotiating an advertisement

With a click on “negotiating advertisement” an input mask for creating a new transport offer opens up.

New transport offer

NEW TRANSPORT OFFER

The fields with an asterisk (*) are mandatory:

Contractor	
Contractor*	<input type="text" value="Gomadingen"/>
Posting valid from*	<input type="text" value="2011-05-02"/> <small>(Format: MM/DD/YYYY)</small>
Posting valid until*	<input type="text" value="2012-11-17"/> <small>(Format: MM/DD/YYYY)</small>
Time frame:	
Frequency*	<input type="text" value="weekly"/>
First transport at	<input type="text" value="2012-12-05"/> <small>(Format: MM/DD/YYYY)</small>
Available until:	<input type="text"/> <small>(Format: MM/DD/YYYY)</small>
Frequency for repeated transports	<input type="text" value="1"/> <small>(within the provided timeframe, e.g. per week)</small>

Figure 48: Input mask of the advertisement to be negotiated

The input mask is – as can be seen in figure 48 – pre-filled with the specifications of the advertisement to be negotiated. The user has now the possibility to change individual attributes of the advertisement and thus submit a proposal in the negotiation.

Time frame:	
Frequency*	<input type="text" value="weekly"/>
First transport at	<input type="text" value="2013-01-01"/> <small>(Format: MM/DD/YYYY)</small>

Figure 49: Change of the transport period

For example, the user can change the transport period to signalize that the offer would come into question if the start point of the transports could be at a later date. Afterwards, he saves his step in the negotiation.

Transport offer

← Use as template
Edit this posting
Delete this posting

This transport offer is in negotiation. The different steps are shown in distinct colors.

CONTRACTOR: GOMADINGEN

Posting valid until 11/17/2012

<p>Aydin GmbH LOADING SITE</p>	<p>Abel GmbH UNLOADING SITE</p>
<p>Telemannstr. 176 72532 Baden-Baden Germany</p>	<p>Guntherstr. 25 25709 Paderborn Germany</p>
<p><i>No sidetrack available.</i></p>	<p><i>No sidetrack available.</i></p>
<p>Frequency</p>	<p>weekly</p>
<p>First transport at</p>	<p>12/05/2012 Mon, 05 Nov 2012 13:29:37 +0000 Max Power: 01/01/2013</p>
<p>Frequency for repeated transports</p>	<p>1</p>

TRANSPORT DESCRIPTION

Free capacities space

Own means of transport present? No

COMPANY INFORMATION View profile

Freight Exchange Service Provider

Country Deutschland

Commercial register entry

-

VAT-No.

-

View all postings

Please add more information to your company's profile.

Edit info

Figure 50: Detail view of the negotiated advertisement

The step in the negotiation is now saved in the system of the online freight exchange. Both, the user and the originally advertising user see the advertisement as displayed in the view of Figure 50. Other users cannot track the steps in the negotiation.

New & interesting

Overview
Transport requests
Transport offers
Reviews

Notification settings

NOTIFICATIONS

Here you can see postings and reviews that might be of interest for you.

Mark all as 'read'

#A.000.455 New negotiation step
#A.000.381 Gomadingen - Marne
#N.000.502 Gallmersgarten - Bad Schussenried
#A.000.379 Seevetal - Neuenweg
#A.000.375 Geretsried - Grevesmühlen
#N.000.507 Volkenschwand - Schäflarn
#A.000.374 Frauenberg - Jagsthausen

Figure 51: Notification about a negotiation in progress

The initially advertising user receives a notification about the negotiation in progress from the system of the online freight exchange. With a click on the notification, the user is directed to the nego-

tiation view of the advertisement. Contrary to the view depicted in figure 50, the initially advertising user has now the option to answer for his part with a negotiating offer.

Transport offer

This transport offer is in negotiation. The different steps are shown in distinct colors.

CONTRACTOR: GOMADINGEN

Posting valid until 11/17/2012

LOADING SITE	UNLOADING SITE
Aydin GmbH Telemannstr. 176 72532 Baden-Baden Germany	Abel GmbH Guntherstr. 25 25709 Paderborn Germany
No sidetrack available.	No sidetrack available.

Frequency: weekly

First transport at	12/05/2012
	Mon, 05 Nov 2012 13:29:37 +0000 Max Power: 01/01/2013
Frequency for repeated transports	1

TRANSPORT DESCRIPTION

Free capacities	space
-----------------	-------

[/pim-code24.wiwinf.uni-due....loading_spaces/new?parent_id=455](#)

COMPANY INFORMATION [View profile](#)

Freight Exchange Service Provider

Country: Deutschland

Commercial register entry

VAT-No.

[View all postings](#)

Figure 52: Detail view of the negotiated advertisement for the initially advertising user

With a click on “negotiating advertisement”, an input mask opens up for him, too, to negotiate the transport offer.

Time frame:

Frequency*

First transport at
(Format: MM/DD/YYYY)

Figure 53: Repeated change of the transport period

Here, the initially advertising user could change the transport period again to signalize that he cannot offer the suggested time point, but that the offer would be realizable if the transports would start at a little earlier start point. Afterwards, he saves his steps in the negotiation.

Transport offer

↩ Negotiate
↩ Reply with transport request
➔ Contact company

This transport offer is in negotiation. The different steps are shown in distinct colors.

CONTRACTOR: GOMADINGEN

Posting valid until 11/17/2012

Aydin GmbH LOADING SITE	Abel GmbH UNLOADING SITE
Telemannstr. 176 72532 Stuttgart Germany	Guntherstr. 25 25709 Augsburg Germany
<i>No sidetrack available.</i>	<i>No sidetrack available.</i>

Frequency: weekly

First transport at	12/05/2012
	Tue, 31 Jul 2012 10:27:09 +0000 Max Power: 01/01/2013
	Tue, 31 Jul 2012 10:27:09 +0000 Martin Sprenkler: 12/15/2012

Frequency for repeated transports: 1

TRANSPORT DESCRIPTION

COMPANY INFORMATION View profile

Demontage Sprenkler AG

Address Wallstr. 56-58

ZIP 44567

City Bochum

Country Deutschland

Phone +49 (0) 234 569986-0

Fax +49 (0) 234 569986-55

E-Mail demontage@example.org

Web http://example.org

Commercial register entry

-

VAT-No.

-

View all postings

Figure 54: Detail view of the negotiated advertisement after two steps in the negotiation

Now, the next step in the negotiation is depicted in the detail view of the negotiated advertisement. The negotiations between the parties can be continued for any length of time and every single step in the negotiation is highlighted in clearly distinguishable colors. As with other advertisements, the establishing of the final contact and the transaction processing take place outside of the system of the online freight exchange.

2.3.6 Browsing through advertisements

The simple locating of advertisements belongs to the main tasks of an online freight exchange. To achieve this goal, the software prototype provides the possibility of filtering the overview of all advertisements concerning transport offers according to different criteria.

The (combinable) filters for advertisements regarding transport offers are:

1. advertising company
2. zip code area of the loading and unloading site
3. location of the loading and unloading site
4. station of the loading and unloading site
5. full-text search
6. offer includes “mere traction” or “traction and freight car”

The listed filter options make a simple connection of criteria possible so that all advertisements, that qualify, for example, for the requirement “all transport offers that include only traction and that are to be loaded in the zip code area 44”, can be displayed with just a few clicks.

Demontage Sprenkler AG

Transport offers
Transport requests
Profile
Reviews
People
Invalid postings

ALL TRANSPORT OFFERS

Here you can see all the transport offers.

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#A.000.454	Augsburg	Bremen	08/11/2012	once	Demontage Sprenkler AG
#A.000.381	Baden-Baden	Paderborn	12/05/2012	weekly	Demontage Sprenkler AG
#A.000.382	Hagen	Essen	04/18/2013	once	Demontage Sprenkler AG
#A.000.379	Bremen	Wiesbaden	12/25/2012	yearly	Demontage Sprenkler AG

Figure 55: Filtering according to the advertising companies

Filtering according to advertising companies provides a simple possibility for the end-users to obtain an overview of all advertisements of a company registered with a system of the online freight exchange.

All transport offers [Switch to transport requests](#)

Filter by own means of transport present
Filter by origin ZIP
Filter by destination ZIP

ALL TRANSPORT OFFERS

Here you can see all the transport offers.

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#A.000.445	Karlsruhe	Paderborn	03/20/2013	once	Enders GmbH
#A.000.441	Stuttgart	Karlsruhe	09/21/2013	yearly	Kretschmer AG
#A.000.433	Bremen	Hagen	03/24/2013	weekly	Neher AG
#A.000.429	Hagen	Augsburg	07/21/2013	once	Burghardt AG
#A.000.419	Karlsruhe	Paderborn	07/21/2013	monthly	Burghardt AG
#A.000.417	Wiesbaden	Hagen	01/24/2013	yearly	Ulbrich GmbH
#A.000.403	Augsburg	Stuttgart	12/06/2013	once	Grote AG
#A.000.404	Paderborn	Paderborn	10/30/2013	weekly	Lüke GmbH
#A.000.397	Paderborn	Karlsruhe	04/07/2013	once	Kretschmer AG

Figure 56: Filtering according to the zip code area

Filtering according to the zip code area enables the end-users to view all advertisements that, for example, are to be loaded in the zip code area “38”. The more digits of the zip code are entered by the end-user, the more precise will be his search.

All transport offers [Switch to transport requests](#)

Filter by own means of transport present Filter by origin ZIP Filter by destination ZIP

ALL TRANSPORT OFFERS

Here you can see all the transport offers.

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#A.000.448	Stuttgart	Karlsruhe	11/22/2013	weekly	Burghardt AG
#A.000.447	Stuttgart	Paderborn	11/07/2013	yearly	Fröhlich GmbH
#A.000.444	Stuttgart	Hagen	01/18/2013	yearly	Jäckle GmbH
#A.000.441	Stuttgart	Karlsruhe	09/21/2013	yearly	Kretschmer AG
#A.000.428	Stuttgart	Hagen	05/25/2013	monthly	Petersen AG
#A.000.427	Stuttgart	Paderborn	04/23/2013	weekly	Berger GmbH
#A.000.424	Stuttgart	Karlsruhe	11/10/2013	monthly	Schmit AG
#A.000.421	Stuttgart	Essen	12/24/2013	once	Schall AG
#A.000.418	Stuttgart	Paderborn	04/28/2013	once	Grote AG
#A.000.415	Stuttgart	Bremen	11/29/2013	monthly	Lorenz GmbH
#A.000.412	Stuttgart	Augsburg	08/02/2013	monthly	Schütte GmbH
#A.000.401	Stuttgart	Stuttgart	09/03/2013	once	Petersen AG
#A.000.394	Stuttgart	Bremen	07/13/2013	weekly	Gibbs GmbH
#A.000.374	Stuttgart	Stuttgart	02/12/2013	yearly	Berger GmbH

Figure 57: Filtering according to loading sites

Filtering according to loading sites enables the end-users to list all advertisements that are to be loaded in a certain place.

All transport offers [Switch to transport requests](#)

Filter by own means of transport present Filter by origin ZIP Filter by destination ZIP

ALL TRANSPORT OFFERS

Here you can see all the transport offers.

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#A.000.447	Stuttgart	Paderborn	11/07/2013	yearly	Fröhlich GmbH
#A.000.445	Karlsruhe	Paderborn	03/20/2013	once	Enders GmbH
#A.000.430	Essen	Paderborn	11/08/2013	yearly	Neher AG
#A.000.426	Hagen	Paderborn	12/28/2013	monthly	Neher AG
#A.000.427	Stuttgart	Paderborn	04/23/2013	weekly	Berger GmbH
#A.000.418	Stuttgart	Paderborn	04/28/2013	once	Grote AG
#A.000.419	Karlsruhe	Paderborn	07/21/2013	monthly	Burghardt AG
#A.000.413	Paderborn	Paderborn	01/12/2013	weekly	Enders GmbH
#A.000.411	Bremen	Paderborn	05/11/2013	weekly	Jäckle GmbH
#A.000.408	Hagen	Paderborn	03/08/2013	weekly	Barnett GmbH
#A.000.404	Paderborn	Paderborn	10/30/2013	weekly	Lüke GmbH
#A.000.393	Paderborn	Paderborn	06/18/2013	monthly	Jäckle GmbH
#A.000.390	Hagen	Paderborn	06/02/2013	weekly	Vogler AG
#A.000.391	Hagen	Paderborn	01/11/2013	weekly	Schall AG
#A.000.381	Baden-Baden	Paderborn	12/05/2012	weekly	Demontage Sprengler AG

Figure 58: Filtering according to unloading sites

Filtering according to unloading sites enables the end-users analogously to list all advertisements that are to be unloaded in a certain location.

All transport offers [Switch to transport requests](#)

Filter by own means of transport present Filter by origin ZIP Filter by destination ZIP

ALL TRANSPORT OFFERS

Here you can see all the transport offers.

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#A.000.447	Stuttgart	Paderborn	11/07/2013	yearly	Fröhlich GmbH
#A.000.427	Stuttgart	Paderborn	04/23/2013	weekly	Berger GmbH
#A.000.418	Stuttgart	Paderborn	04/28/2013	once	Grote AG

Figure 59: Filtering according to loading and unloading sites

Like mentioned at the beginning, the filtering can be also combined, as shown in Figure 59.

Filtering according to loading and unloading stations runs analogously to the filtering according to loading and unloading sites.

Transport offers: Case sensitive Whole words

All transport offers [Switch to transport requests](#)

Filter by own means of transport present Filter by origin ZIP Filter by destination ZIP Only show transport offers originating from 'Baden-Baden'

ALL TRANSPORT OFFERS FOR 'BADEN'

Here you can see all the transport offers.

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#A.000.446	Hagen	Wiesbaden	09/20/2013	once	Schmit AG
#A.000.438	Wiesbaden	Stuttgart	07/15/2013	monthly	Schmit AG
#A.000.431	Karlsruhe	Wiesbaden	06/08/2013	weekly	Hinz GmbH
#A.000.425	Hagen	Wiesbaden	06/26/2013	monthly	Lorenz GmbH
#A.000.422	Wiesbaden	Hagen	03/28/2013	once	Glocke GmbH
#A.000.417	Wiesbaden	Hagen	01/24/2013	yearly	Ulbrich GmbH
#A.000.409	Wiesbaden	Essen	05/30/2013	yearly	Kretschmer AG
#A.000.381	Baden-Baden	Paderborn	12/05/2012	weekly	Demontage Sprenkler AG
#A.000.379	Bremen	Wiesbaden	12/25/2012	yearly	Demontage Sprenkler AG
#A.000.375	Wiesbaden	Karlsruhe	01/04/2013	yearly	Ulbrich GmbH
#A.000.369	Augsburg	Wiesbaden	09/18/2012	monthly	Fröhlich GmbH

Figure 60: Filtering according to search items

The full-text search provides the possibility of browsing through all advertisements within the system of the online freight exchange according to certain keywords. Furthermore, it provides the options “upper- and lower case” as well as “whole word” in order to further filter the resulting search results.

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#A.000.381	Baden-Baden	Paderborn	12/05/2012	weekly	Demontage Sprenkler AG

Figure 61: Filtering with compliance to the upper- and lower case of the search item

The option “upper- and lower case” demands of the search results an exact match with the search keyword so that, for example, no advertisements from “Wiesbaden” are listed for the search item “Baden”.

The option “whole word” requires of the search results that the keyword searched for occurs as a whole word in the advertisement. At this, search items like “Essen” would admittedly list advertisements for “Essen Hbf.”, but not ones for “Essen-West”.

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#A.000.454	Augsburg	Bremen	08/11/2012	once	Demontage Sprenkler AG
#A.000.448	Stuttgart	Karlsruhe	11/22/2013	weekly	Burghardt AG
#A.000.446	Hagen	Wiesbaden	09/20/2013	once	Schmit AG
#A.000.447	Stuttgart	Paderborn	11/07/2013	yearly	Fröhlich GmbH
#A.000.444	Stuttgart	Hagen	01/18/2013	yearly	Jäckle GmbH
#A.000.445	Karlsruhe	Paderborn	03/20/2013	once	Enders GmbH
#A.000.441	Stuttgart	Karlsruhe	09/21/2013	yearly	Kretschmer AG
#A.000.442	Essen	Augsburg	03/05/2013	weekly	Enders GmbH
#A.000.439	Paderborn	Stuttgart	10/14/2013	once	Ferstl AG
#A.000.440	Karlsruhe	Karlsruhe	06/08/2013	monthly	Glocke GmbH
#A.000.438	Wiesbaden	Stuttgart	07/15/2013	monthly	Schmit AG
#A.000.435	Hagen	Hagen	11/08/2013	yearly	Schall AG
#A.000.433	Bremen	Hagen	03/24/2013	weekly	Neher AG
#A.000.434	Bremen	Essen	03/21/2013	weekly	Grote AG
#A.000.430	Essen	Paderborn	11/08/2013	yearly	Neher AG

Figure 62: Options for filtering according to the desired means of transportation

Filtering according to “mere traction” as well as “traction and freight car” enables the end-users to list specifically only those advertisements which offer contain the chosen services.

All transport offers [Switch to transport requests](#)

Filter by own means of transport present > Filter by origin ZIP Filter by destination ZIP

ALL TRANSPORT OFFERS

Here you can see all the transport offers.

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#A.000.454	Augsburg	Bremen	08/11/2012	once	Demontage Sprenkler AG
#A.000.446	Hagen	Wiesbaden	09/20/2013	once	Schmit AG
#A.000.445	Karlsruhe	Paderborn	03/20/2013	once	Enders GmbH
#A.000.442	Essen	Augsburg	03/05/2013	weekly	Enders GmbH
#A.000.440	Karlsruhe	Karlsruhe	06/08/2013	monthly	Glocke GmbH
#A.000.435	Hagen	Hagen	11/08/2013	yearly	Schall AG
#A.000.433	Bremen	Hagen	03/24/2013	weekly	Neher AG
#A.000.430	Essen	Paderborn	11/08/2013	yearly	Neher AG
#A.000.431	Karlsruhe	Wiesbaden	06/08/2013	weekly	Hinz GmbH
#A.000.428	Stuttgart	Hagen	05/25/2013	monthly	Petersen AG
#A.000.429	Hagen	Augsburg	07/21/2013	once	Burghardt AG
#A.000.426	Hagen	Paderborn	12/28/2013	monthly	Neher AG
#A.000.427	Stuttgart	Paderborn	04/23/2013	weekly	Berger GmbH
#A.000.425	Hagen	Wiesbaden	06/26/2013	monthly	Lorenz GmbH
#A.000.421	Stuttgart	Essen	12/24/2013	once	Schall AG

Figure 63: Filtering according to “mere traction”

All transport offers [Switch to transport requests](#)

Filter by own means of transport present > Filter by origin ZIP Filter by destination ZIP

ALL TRANSPORT OFFERS

Here you can see all the transport offers.

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#A.000.448	Stuttgart	Karlsruhe	11/22/2013	weekly	Burghardt AG
#A.000.447	Stuttgart	Paderborn	11/07/2013	yearly	Fröhlich GmbH
#A.000.444	Stuttgart	Hagen	01/18/2013	yearly	Jäckle GmbH
#A.000.441	Stuttgart	Karlsruhe	09/21/2013	yearly	Kretschmer AG
#A.000.439	Paderborn	Stuttgart	10/14/2013	once	Ferstl AG
#A.000.438	Wiesbaden	Stuttgart	07/15/2013	monthly	Schmit AG
#A.000.434	Bremen	Essen	03/21/2013	weekly	Grote AG
#A.000.432	Karlsruhe	Essen	03/02/2013	monthly	Lüke GmbH
#A.000.424	Stuttgart	Karlsruhe	11/10/2013	monthly	Schmit AG
#A.000.422	Wiesbaden	Hagen	03/28/2013	once	Glocke GmbH
#A.000.419	Karlsruhe	Paderborn	07/21/2013	monthly	Burghardt AG
#A.000.415	Stuttgart	Bremen	11/29/2013	monthly	Lorenz GmbH
#A.000.412	Stuttgart	Augsburg	08/02/2013	monthly	Schütte GmbH
#A.000.406	Hagen	Essen	04/18/2013	once	Kretschmer AG
#A.000.407	Augsburg	Essen	12/26/2013	once	Zink GmbH

Figure 64: Filtering according to “traction and freight car”

2.4 Advertisements for transport requests

2.4.1 Overview

Apart from advertisements for transport offers, advertisements for transport requests can also be created.

[All transport requests](#) [Switch to transport offers](#)

Filter by origin ZIP
Filter by destination ZIP

ALL TRANSPORT REQUESTS

Here you can see all the transport requests.

















NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
 #N.000.573	Wiesbaden	Hagen	09/28/2013	monthly	Hinz GmbH
 #N.000.574	Essen	Bremen	03/21/2013	weekly	Lüke GmbH
 #N.000.571	Stuttgart	Essen	04/11/2013	yearly	Gibbs GmbH
 #N.000.572	Paderborn	Karlsruhe	08/31/2013	yearly	Enders GmbH
 #N.000.569	Augsburg	Bremen	11/11/2013	yearly	Neuber AG
 #N.000.570	Hagen	Essen	02/05/2013	yearly	Neher AG
 #N.000.568	Essen	Augsburg	12/13/2013	yearly	Schmit AG
 #N.000.564	Stuttgart	Bremen	04/14/2013	yearly	Breit GmbH
 #N.000.565	Paderborn	Wiesbaden	08/28/2013	monthly	Ulbrich GmbH
 #N.000.562	Augsburg	Essen	05/02/2013	weekly	Glocke GmbH
 #N.000.563	Paderborn	Karlsruhe	07/01/2013	weekly	Neuber AG
 #N.000.559	Karlsruhe	Stuttgart	05/04/2013	yearly	Lüke GmbH
 #N.000.560	Stuttgart	Bremen	09/19/2013	weekly	Barnett GmbH
 #N.000.561	Karlsruhe	Wiesbaden	04/02/2013	monthly	Burghardt AG
 #N.000.557	Hagen	Essen	10/22/2013	monthly	Zink GmbH
 #N.000.558	Karlsruhe	Essen	07/04/2013	weekly	Burghardt AG

Figure 65: Overview of all advertisements for transport requests

2.4.2 New advertisement for a transport request

If a user wants to create an advertisement for a transport request, he wants to send a signal thereby that he is ready for an initial business contact. He is ready to buy a service (the transport of freight) and, to that end, has to describe exactly the freight to be transported.

Figure 66 depicts schematically the necessary steps for this.

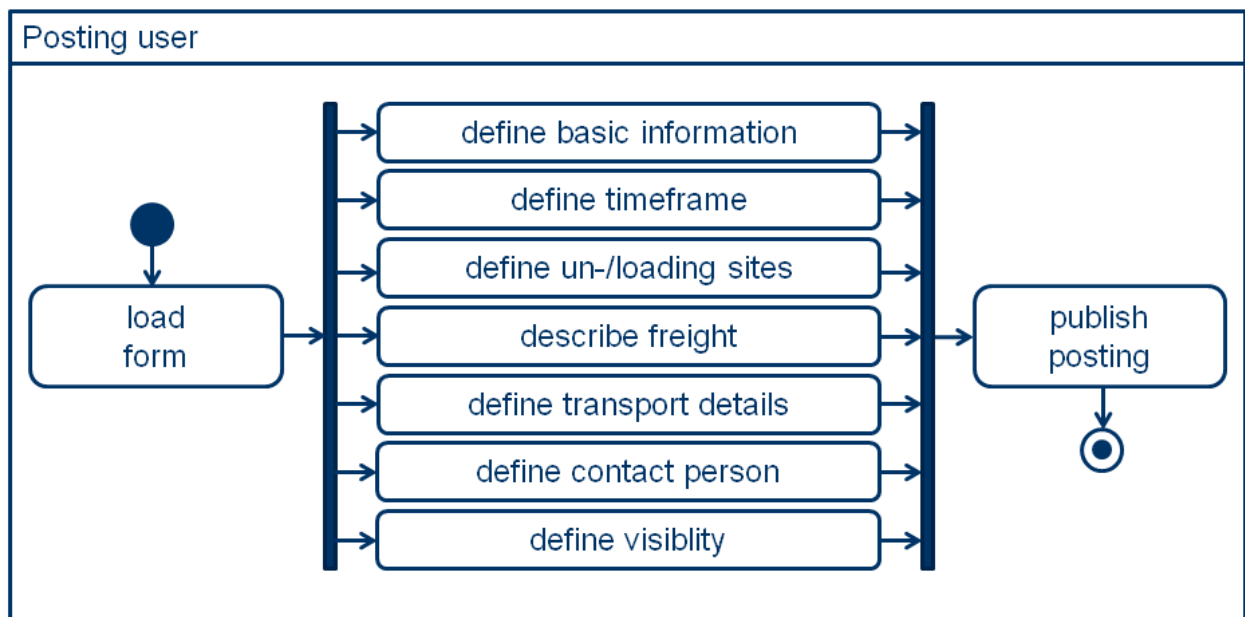


Figure 66: Creating a new advertisement for a transport request

The input happens analogously to the creation of an advertisement for transport offers. The main difference lies in the input of the freight description. If all mandatory data is valid, the advertisement is saved in the system and published from the date of its validity.

If the end-user wants to create a new advertisement for a transport request within the software prototype, he clicks on the button “new transport request” at the top right.



Figure 67: Buttons for creating an advertisement

Afterwards, he is directed to the input mask for creating a new advertisement for a transport request.

New transport request

Upload via excel

NEW TRANSPORT REQUEST

The fields with an asterix (*) are mandatory:

Contractor

Contractor*

Posting valid from*
(Format: MM/DD/YYYY)

Posting valid until*
(Format: MM/DD/YYYY)

Time frame:

Frequency*

Loading site:

Sidetrack available? Yes No

Loading station
Search by number or name

Contractor

Street

(continued)

ZIP

Origin city

Country

Unloading site:

Sidetrack available? Yes No

Unloading station
Search by number or name

Contractor

Street

(continued)

ZIP

Destination city

Country

Freight description:

Product name*

State of product*

Harzardous material* Yes No

NHM-No.

Total weight (t)*

Weight per transport (in t)*

Transports

Own means of transport present?* No Yes

Desired means of transport*

Requirements for means of transport

Requirements for loading of transport

Requirements for unloading of transport

Additional information:

Desired proposal type* price per ton package price other

Contact Person

Company categories:

Railway undertakings

Forwarding agents

Operators of combined cargo

Loading agents

Figure 68: Form for creating new advertisements for transport requests

The entries in the sections “basic data”, “time period” and “loading site of the freight” as well as “unloading site of the freight” happen analogously to the creation of a new advertisement for transport offers.

In the section “freight description” the end-user first enters the name of the freight as a free text and then selects the type of goods.

Freight description:

Product name*

State of product*

Harzardous material*

NHM-No.

Total weight (t)*

Weight per transport (in t)*

liquid

gas

loose

packaged

container

Transports

Figure 69: Selection of the type of goods

Following this, the end-user specifies whether the freight to be transported appertains to dangerous goods. If this is the case, the input mask expands and he is asked to name the dangerous goods class and the UN number of the freight.

Freight description:

Product name*

State of product*

Hazardous material* Yes No

Hazmat classification (RID)

UN-No.

NHM-No.

Total weight (t)*

Weight per transport (in t)*

Figure 70: Selection of “dangerous goods”

In addition to it, the end-user can name the NHM number. The end-user has to state the total weight of the freight in tons as well as the weight per transport (also in tons).

In the section “transport specifics” the end-user decides at first whether he wishes for a means of transportation for his transport request or whether he only needs a traction (as own means of transportation are available).

Transports

Own means of transport present?* No Yes

Desired means of transport*

Requirements for means of transport

Requirements for loading of transport

Requirements for unloading of transport

Figure 71: Selection of “means of transportation wished”

If the end-user wants a means of transportation, he is asked to name what kind of means of transportation he wants and what requirements are being put on the means of transportation.

Transports

Own means of transport present?* No Yes

Desired means of transport*

Requirements for means of transport

Requirements for loading of transport

Requirements for unloading of transport

Figure 72: Selection of the wanted means of transportation

If the wanted means of transportation are not listed in the list box, the end-user can select “other” and describe his wanted means of transportation in a free text field.

Transports

Own means of transport present?* No Yes

Desired means of transport*

Requirements for means of transport

Requirements for loading of transport

Requirements for unloading of transport

Figure 73: Input of an individually wanted means of transportation

If no means of transportation is desired, the end-user is asked to state what kind of means of transportation is available. Analogously to the process for “wanted means of transportation” described above, the end-user can select the option “other” if his means of transportation is not listed in the list box.

Transports

Own means of transport present?* No Yes

Type of wagon

Requirements for loading of transport

Requirements for unloading of transport

Additional information:

Figure 74: Selection of available means of transportation

Additionally, the end-user can provide information on the requirements for the loading and unloading of the means of transportation in two free text fields.

In the section “additional information” the end-user can choose whether he wants an offer with the indication “price per ton” or “price per transport unit” for his request or if a price mark is not necessary.

The screenshot shows a form titled "Additional information:". It contains the following elements:

- Desired proposal type***: Three radio buttons are present: "price per ton" (which is selected), "package price", and "other".
- Contact Person**: A dropdown menu.
- Company categories:** Four checkboxes are listed: "Railway undertakings", "Forwarding agents", "Operators of combined cargo", and "Loading agents". Below these is a small square icon followed by a text input field.
- Create posting**: A button at the bottom of the form.

Figure 75: Selection of the type of the requested offer

The information on the “contact person” and “company category” happens analogously to the creation of an advertisement for transport offers.

With a click on “create an advertisement for a transport request” the end-user finalizes the creation of the advertisement.

2.4.3 Uploading advertisements via Excel chart

Apart from the manual entry of advertisements, the software prototype also provides the possibility to upload several advertisements for transport requests with the help of an Excel chart.

Upload postings

The screenshot shows the "Upload postings" section of the interface. It includes:

- A button labeled "← Zurück zur manuellen Eingabe".
- Text: "You can create multiple postings at once by uploading an excel spreadsheet."
- Text: "You can [download a sample excel file](#) (in german)."
- Text: "Choose the file on your computer:"
- A file input field with a "Browse..." button.
- An "Upload postings" button.

Figure 76: Input mask for uploading several advertisements for transport requests

A click on “download a sample file” directs the user to an exemplary Excel file that describes how advertisements have to be described for uploading.

	A	B	C	D	E	F	G	H	I
	Abgangsbhf Land	Abgangsbhf Name	Abgangsbhf Nr	Bestimmung sbhf Land	Bestimmungsbhf Name	Bestimmungsbhf Nr	Inserat gültig bis (TT/MM/JJJJ)	Produktname	Aggregatzustand
1									
3	Rumänien	Onesti	53530071	Deutschland	Marl	80103911	31.07.2012	Butadien	flüssig
4	Deutschland	Heilbronn	80296301	Tschchien	Sokolov	54764555	31.07.2012	Ethanol	flüssig
5	Deutschland	Marl	80103911	Deutschland	Saal	80263178	31.08.2012	Natriumnitrit	verpackt
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

Figure 77: An example of an Excel file for uploading several advertisements

When the file containing own advertisements has been created, it has to be selected in the input mask for uploading advertisements for transport requests.

Upload postings

← Zurück zur manuellen Eingabe

You can create multiple postings at once by uploading an excel spreadsheet.

You can [download a sample excel file](#) (in german).

Choose the file on your computer:

Figure 78: Selection of the Excel file

A click on “upload new advertisements for a transport requests” launches the process.

Demontage Sprenkler AG

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#N.000.508	Karlsruhe	Karlsruhe	10/17/2012	once	Demontage Sprenkler AG
#N.000.506	Paderborn	Baden	10/11/2012	monthly	Demontage Sprenkler AG
#N.000.507	Hagen	Stuttgart	12/24/2012	weekly	Demontage Sprenkler AG

Figure 79: Successful upload of several advertisements

After the process is finalized, the newly created advertisements are being highlighted in yellow in the advertisement overview.

2.4.4 Browsing through advertisements

Just as with advertisements for transport offers, the software prototype makes it possible to filter the advertisements according to transport requests.

The (combinable) filters for advertisements for transport requests are:

1. advertising company
2. postcode area of the loading and unloading site
3. place of the loading and unloading site
4. station of the loading and unloading site
5. full-text search

The features of the listed filters operate analogously to the ones for advertisements for transport offers.

2.5 Companies

2.5.1 Company profile

Every company registered with the system of the online freight exchange has a profile that is accessible for all other end-users of the software prototype. The company profile is to give other end-users that are interested in the company the possibility to get a quick overview of its advertisements.

Demontage Sprenkler AG

Who works here?

CONTACT INFORMATION

Martin Sprenkler
Chief Executive Officer

Phone +49 (0) 234 569986-1
Fax +49 (0) 234 569986-55
E-Mail m.sprenkler@example.org
Web <http://example.org/team/m.sprenkler>

CONTACT INFORMATION

Bettina Sprenkler
Chief Financial Officer

Phone +49 (0) 234 569986-2
Fax +49 (0) 234 569986-55
Web <http://example.org/team/b.sprenkler>

COMPANY INFORMATION [View profile](#)

Demontage Sprenkler AG

Address Wallstr. 56-58
ZIP 44567
City Bochum
Country Deutschland
Phone +49 (0) 234 569986-0
Fax +49 (0) 234 569986-55
E-Mail demontage@example.org
Web <http://example.org>
Commercial register entry
-
VAT-No.
-
[View all postings](#)

Figure 80: Company profile

In the detail view the interested user is firstly presented with the contact information of each employee. On the sidebar, the general contact information of the company (address, phone, fax, e-mail and internet address) as well as information on the entry in the Commercial Register and the sales tax identification number is situated. The button “show advertisements” directs the end-user to the offers of the company (alternatively, the corresponding sub-navigation point “offers” at the top left side can be used).

2.5.2 Offers

Under the sub-navigation point “offers”, all advertisements for transport offers of the current company can be found.

Demontage Sprenkler AG

ALL TRANSPORT OFFERS

Here you can see all the transport offers.

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#A.000.454	Augsburg	Bremen	08/11/2012	once	Demontage Sprenkler AG
#A.000.381	Baden-Baden	Paderborn	12/05/2012	weekly	Demontage Sprenkler AG
#A.000.382	Hagen	Essen	04/18/2013	once	Demontage Sprenkler AG
#A.000.379	Bremen	Wiesbaden	12/25/2012	yearly	Demontage Sprenkler AG

Figure 81: Transport offers of a company

2.5.3 Requests

Under the sub-navigation point “requests”, the advertisements for transport requests of the current company are located.

Demontage Sprenkler AG



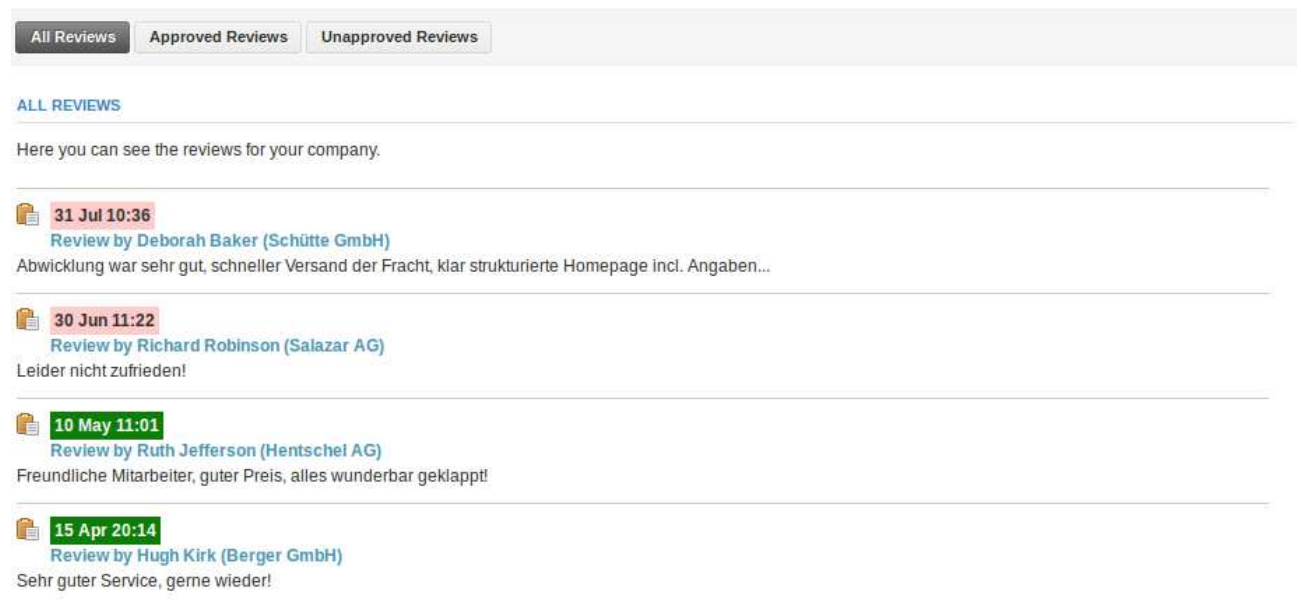
NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
 #N.000.508	Karlsruhe	Karlsruhe	10/17/2012	once	Demontage Sprenkler AG
 #N.000.506	Paderborn	Baden	10/11/2012	monthly	Demontage Sprenkler AG
 #N.000.507	Hagen	Stuttgart	12/24/2012	weekly	Demontage Sprenkler AG

Figure 82: Transport requests of a company

2.5.4 Reviews

Under the sub-navigation point “reviews”, the reviews of the company are situated.

All reviews



DATE	REVIEWER	REVIEW
31 Jul 10:36	Review by Deborah Baker (Schütte GmbH)	Abwicklung war sehr gut, schneller Versand der Fracht, klar strukturierte Homepage incl. Angaben...
30 Jun 11:22	Review by Richard Robinson (Salazar AG)	Leider nicht zufrieden!
10 May 11:01	Review by Ruth Jefferson (Hentschel AG)	Freundliche Mitarbeiter, guter Preis, alles wunderbar geklappt!
15 Apr 20:14	Review by Hugh Kirk (Berger GmbH)	Sehr guter Service, gerne wieder!

Figure 83: Overview of all reviews of a company

Already published reviews are highlighted in green, whereas still not surveyed reviews are highlighted in red. A click on a still not checked review directs the user to its detail view.

Review

← Back to overview
📄 Approve this review
Delete this review

REVIEW BY DEBORAH BAKER (SCHÜTTE GMBH)

Abwicklung war sehr gut, schneller Versand der Fracht, klar strukturierte Homepage incl. Angaben wie alles funktioniert.

Man wusste jederzeit wo die Waren sind, ebenso erhielt man sofort nach Eingang der Waren eine Nachricht.

Verbessert werden sollte noch, dass mitgeteilt wird, wenn Verzögerungen im Betriebsablauf auftreten. Die Kommunikation war sehr effizient und kundenfreundlich, nur leider manchmal nicht sehr ausführlich.

War am Anfang sehr skeptisch, hab mich dann doch entschlossen, es zu probieren. Ich wurde nicht enttäuscht und die Abwicklung war sehr seriös und zügig.

Ich war mit dem Anbieter sehr zufrieden, habe einen besseren Service erhalten, als bei einem Anbieter vor Ort. Danke.

Ich werde Sie auf jeden Fall weiterempfehlen und auch bei einem nächsten Transport wieder in Anspruch nehmen.

WHO WROTE THIS REVIEW?

CONTACT INFORMATION 👁 View profile

Deborah Baker

Phone 📞 011-36-67-2672

E-Mail ✉ dbaker@schuette.dev

Web 🌐 <http://www.schuette.dev/team>

COMPANY INFORMATION 👁 View profile

Schütte GmbH

ZIP 2681

City Wilthen

Country Deutschland

Phone 📞 011-36-67-2670

E-Mail ✉ info@schuette.dev

Web 🌐 <http://www.schuette.dev>

Figure 84: Detail view of a review

In the detail view, the checking user can see the text of the review, the reviewing person and its company. On the navigation bar, he has the possibility to publish or delete the review.

Review

← Back to overview
Delete this review

THIS REVIEW IS PUBLISHED!

REVIEW BY DEBORAH BAKER (SCHÜTTE GMBH)

Abwicklung war sehr gut, schneller Versand der Fracht, klar strukturierte Homepage incl. Angaben wie alles funktioniert.

Man wusste jederzeit wo die Waren sind, ebenso erhielt man sofort nach Eingang der Waren eine Nachricht.

Verbessert werden sollte noch, dass mitgeteilt wird, wenn Verzögerungen im Betriebsablauf auftreten. Die Kommunikation war sehr effizient und kundenfreundlich, nur leider manchmal nicht sehr ausführlich.

War am Anfang sehr skeptisch, hab mich dann doch entschlossen, es zu probieren. Ich wurde nicht enttäuscht und die Abwicklung war sehr seriös und zügig.

Ich war mit dem Anbieter sehr zufrieden, habe einen besseren Service erhalten, als bei einem Anbieter vor Ort. Danke.

Ich werde Sie auf jeden Fall weiterempfehlen und auch bei einem nächsten Transport wieder in Anspruch nehmen.

WHO WROTE THIS REVIEW?

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ZIP 2681

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Country Deutschland

Phone 📞 011-36-67-2670

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Web 🌐 <http://www.schuette.dev>

Figure 85: Detail view of the review just published

If the user decides to publish the review, a green notice appears saying that the review has been published on the company's profile.

All reviews

The screenshot shows a navigation bar with three tabs: 'All Reviews' (selected), 'Approved Reviews', and 'Unapproved Reviews'. Below the navigation bar, the text 'ALL REVIEWS' is displayed. A message states: 'Here you can see the reviews for your company.' The reviews are listed as follows:

- 31 Jul 10:36** (highlighted in green): Review by Deborah Baker (Schütte GmbH). Text: 'Abwicklung war sehr gut, schneller Versand der Fracht, klar strukturierte Homepage incl. Angaben...'
- 30 Jun 11:22**: Review by Richard Robinson (Salazar AG). Text: 'Leider nicht zufrieden!'
- 10 May 11:01**: Review by Ruth Jefferson (Hentschel AG). Text: 'Freundliche Mitarbeiter, guter Preis, alles wunderbar geklappt!'
- 15 Apr 20:14**: Review by Hugh Kirk (Berger GmbH). Text: 'Sehr guter Service, gerne wieder!'

Figure 86: Overview of all reviews of a company including the newly published review

In the overview of all reviews the just published review appears also highlighted in green.

2.5.5 Users

Under the sub-navigation point “users”, the users of the company are situated.

Overview: People

The screenshot shows a navigation bar with five tabs: 'Transport offers', 'Transport requests', 'Profile', 'Reviews', and 'People' (selected). There is an 'Edit profile' button on the right. Below the navigation bar, the text 'ALL PEOPLE' is displayed. A message states: 'Here you can see all the people in your company.' Below this is a table of users:

NAME	JOB DESCRIPTION	
Mrs. Caroline Ampel	Logistics Trainee	✈ Edit Contact
Mrs. Anette Baumann	Junior Logistics Manager	✈ Edit Contact
Mr. Bernhard Baumann	Junior Logistics Manager	✈ Edit Contact
Mr. Jan Etterich	Junior Logistics Manager	✈ Edit Contact
Mrs. Kerstin Fischer	Logistics Trainee	✈ Edit Contact
Mr. Martin Kowalla	Senior Logistics Manager	✈ Edit Contact
Mr. Peter Krause	Senior Logistics Manager	✈ Edit Contact
Mr. Marius Müller	Logistics Trainee	✈ Edit Contact
Mr. Martin Sprenkler	Chief Executive Officer	✈ Edit Contact
Mrs. Bettina Sprenkler	Chief Financial Officer	✈ Edit Contact

Figure 87: User overview

End-users issued with the corresponding privileges can edit the user accounts and the personal data of other users and create new users.

The data of the users of the software prototype is divided into the core data, like the user name and the password, as well as the personal data, like the first name and surname. Every user can change his data at any time within the system of the online freight exchange.

Edit User

EDIT USER

Login credentials

Username
Choose a username to log in to the service

E-Mail
Enter your e-mail address here

Change password (optional)

Password
Choose your password carefully

Password (again)
Please repeat your password

Notifications (optional)

Notify by email

User Roles

Executive
 Regular employee
 Trainee/Intern

Figure 88: Input mask for editing the core data of a user

The core data of a user is divided into his login data, his preferences concerning notifications and his privileges.

Login credentials

Username
Choose a username to log in to the service

E-Mail
Enter your e-mail address here

Figure 89: Input mask for the login credentials of a user

The user name and the e-mail address serve within the core data as an authentication of the user in the system of the online freight exchange. The user name functions as an identification of the user when logging in while the e-mail address serves the sending of notifications or of a new password. Contrary to the e-mail address entered within the personal data, the e-mail address entered here is not visible to the public.

Change password (optional)

Password
Choose your password carefully

Password (again)
Please repeat your password

Figure 90: Input fields for changing the password of a user

The password of a user can be changed optionally with every editing process. For this, the new password has to be entered two times into the input fields depicted in figure 90. If these input fields are skipped, the password of the user stays unchanged.

Notifications (optional)

Notify by email

Figure 91: Input field for the notification settings

Every user can decide whether he wants to check the notifications send by the software prototype only within the system of the online freight exchange or if he wants to subscribe them via e-mail as well. In the second case, all generated notifications are sent to the e-mail address entered in the core data.

User Roles

Executive

Regular employee

Trainee/Intern

Save changes

Figure 92: Input field for the privileges of a user

All users of the online freight exchange are subjected to a rights management that is based on individual privileges. End-users issued with the corresponding privileges can edit the notifications of other users of the relevant company. The more privileges a user has, the more authority has he in the system of the online freight exchange.

In the implementation at hand, the following restrictions apply to the users:

- Holders of the authorization “Executive/board member” are authorized to create new users within their company and to edit or delete existing users. Only these especially authorized users see the control elements depicted in figure 92 when editing a user account.
- Holders of the authorization “dispatcher” are authorized to create advertisements and reviews on behalf of their company.

- Holders of the authorization “other employee” are only authorized to log in the system of the online freight exchange and to sift advertisements, profiles as well as reviews of other companies – for example for research purposes –on behalf of their company.

As described at the beginning, each user is equipped with personal data in addition to the core data. In the following, it will be shown which personal data a user can supply via the software prototype.

Edit person

Edit User Account ↩ Use as template Delete

PERSONAL INFORMATION

Personal information

Gender* Mr. Mrs.

Forename*

Surname*

Job Description

Phone

Fax

E-Mail

Web

Interface Language* ▼

Figure 93: Input mask for editing the personal data of a user

The personal data of a user is divided into his personal information (name, job description) as well as his contact information.

Personal information

Gender* Mr. Mrs.

Forename*

Surname*

Job Description

Figure 94: Personal data of a user

Beyond that, all users can provide comprehensive contact information.

Phone	<input type="text" value="+49 (0) 234 569986-2"/>
Fax	<input type="text" value="+49 (0) 234 569986-55"/>
E-Mail	<input type="text"/>
Web	<input type="text" value="example.org/team/b.sprenkler"/>
Interface Language*	<input type="text" value="German"/>

Figure 95: Contact information of a user

The entered contact information of a user is then visible on the company profile. The user interface of the online freight exchange appears to the user in the language chosen under “user language” (in the implementation at hand German and English).

2.5.6 Expired and future advertisements

Under the sub-navigation point “expired & future advertisements”, those advertisements of the company are situated whose validity period defined by the company has elapsed or whose validity period has not yet begun.

Demontage Sprenkler AG

Transport offers	Transport requests	Profile	Reviews	People	Invalid postings
----------------------------------	------------------------------------	-------------------------	-------------------------	------------------------	----------------------------------

ALL TRANSPORT OFFERS

Here you can see all the transport offers.

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#A.000.387	Moers (#8000644)	Dortmund (#8000080)	08/06/2012	once	Demontage Sprenkler AG
#A.000.385	Hagen	Stuttgart	01/21/2013	once	Demontage Sprenkler AG

Figure 96: Expired and future advertisements of a company

The navigation point “expired & future advertisements” is only available when viewing the own company. Expired and future advertisements of other companies cannot be viewed.

2.5.7 Subscribed companies

All end-users of the online freight exchange have the possibility to specifically highlight the advertisements of other companies. The advertisements of a subscribed company are highlighted in all overviews. This feature can be used, for example, to specifically highlight advertisements of companies whose business branch is in accord with the own one and whose advertisements are consistently of interest for the own company.

Schütte GmbH

Figure 97: Company profile – advertisements are being highlighted

After the user has subscribed to the company via the button “highlight advertisements”, the advertisements of this company are being highlighted in color in the overviews.

All transport requests [Switch to transport offers](#)

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#N.000.521	Hagen	Karlsruhe	05/17/2013	yearly	Lüke GmbH
#N.000.514	Bremen	Essen	12/30/2012	yearly	Zink GmbH
#N.000.515	Wiesbaden	Stuttgart	12/07/2013	yearly	Burghardt AG
#N.000.516	Bremen	Hagen	05/07/2013	monthly	Kretschmer AG
#N.000.517	Wiesbaden	Stuttgart	05/07/2013	weekly	Petersen AG
#N.000.512	Bremen	Karlsruhe	09/23/2013	monthly	Neuber AG
#N.000.513	Karlsruhe	Bremen	03/08/2013	yearly	Schall AG
#N.000.511	Paderborn	Bremen	07/28/2013	weekly	Zink GmbH
#N.000.508	Karlsruhe	Karlsruhe	10/17/2012	once	Demontage Sprenkler AG
#N.000.506	Paderborn	Baden	10/11/2012	monthly	Demontage Sprenkler AG
#N.000.507	Hagen	Stuttgart	12/24/2012	weekly	Demontage Sprenkler AG
#N.000.502	Bremen	Augsburg	08/11/2012	once	Schütte GmbH
#N.000.503	Paderborn	Bremen	07/02/2013	monthly	Schütte GmbH
#N.000.505	Wiesbaden	Wiesbaden	03/20/2013	monthly	Jäckle GmbH

Figure 98: Overview – specific advertisements are being highlighted

The graphic highlighting of the advertisements of a subscribed company ranges over all views, i.e. overviews, full-text searches as well as filtered lists.

2.5.8 Ignored companies

All end-users of the online freight exchange have the possibility to purposefully ignore advertisements of other companies. The advertisements of an ignored company are being hidden in all overviews. This feature can be used, for example, to specifically hide advertisements of companies

whose business branch is not in accord with the own one and whose advertisements are of no interest to the own company.

Schütte GmbH

Transport offers Transport requests Profile Write a review! Subscribe to company Company ignored

Who works here?

CONTACT INFORMATION

Deborah Baker
 Phone 011-36-67-2672
 E-Mail dbaker@schuette.dev
 Web <http://www.schuette.dev/team>

COMPANY INFORMATION View profile

Schütte GmbH
 ZIP 2681
 City Wilthen
 Country Deutschland
 Phone 011-36-67-2670
 E-Mail info@schuette.dev
 Web <http://www.schuette.dev>
 Commercial register entry

Figure 99: Company profile – advertisements are being hidden

After the user has ignored the company via the button “ignore advertisements”, the advertisements of this company are being hidden in the overviews.

All transport requests [Switch to transport offers](#)

Filter by origin ZIP Filter by destination ZIP

ALL TRANSPORT REQUESTS

Here you can see all the transport requests.

NUMERIC ID	ORIGIN	DESTINATION	FIRST TRANSPORT	FREQUENCY	COMPANY
#N.000.516	Bremen	Hagen	05/07/2013	monthly	Kretschmer AG
#N.000.517	Wiesbaden	Stuttgart	05/07/2013	weekly	Petersen AG
#N.000.512	Bremen	Karlsruhe	09/23/2013	monthly	Neuber AG
#N.000.513	Karlsruhe	Bremen	03/08/2013	yearly	Schall AG
#N.000.511	Paderborn	Bremen	07/28/2013	weekly	Zink GmbH
#N.000.508	Karlsruhe	Karlsruhe	10/17/2012	once	Demontage Sprenkler AG
#N.000.506	Paderborn	Baden	10/11/2012	monthly	Demontage Sprenkler AG
#N.000.507	Hagen	Stuttgart	12/24/2012	weekly	Demontage Sprenkler AG
#N.000.505	Wiesbaden	Wiesbaden	03/20/2013	monthly	Jäckle GmbH

Figure 100: Overview – specific advertisements are being hidden

To get a list of all subscribed and ignored companies, the users can call up the business directory.

2.5.9 Business directory

With the business directory a catalogue of all registered companies exists within the software prototype. The company list can be filtered according to name and registration point as well as to subscribed and ignored companies via the buttons on the navigation.

Companies

A - Z **Newest first** Favored Companies Ignored Companies

COMPANIES

Here you can see all companies.


















NAME	ZIP	CITY	COUNTRY
 Alexandra Kwee	47598	Neustadt	Deutschland
 ap genova			
 Bargelink GmbH	46509	Xanten	Deutschland
 Barnett GmbH	54619	Reiff	Deutschland
 Berger GmbH	82380	Peißenberg	Deutschland
 Breit GmbH	70192	Stuttgart	Deutschland
 Burghardt AG	27321	Morsum	Deutschland
 Cargo-Trans			Deutschland
 Demontage Sprenkler AG	44567	Bochum	Deutschland
 DPD GeoPost (Deutschland) GmbH			
 Emons			
 Enders GmbH	49762	Fresenburg	Deutschland
 Ferstl AG	98528	Suhl	Deutschland
 Filog	21079	Hamburg	Deutschland
 Filog 2			
 Freight Exchange Service Provider			Deutschland
 Fröhlich GmbH	34355	Staufenberg	Deutschland

Figure 101: Business directory sorted by name

Companies

A - Z **Newest first** Favored Companies Ignored Companies

COMPANIES

Here you can see all companies.


















NAME	ZIP	CITY	COUNTRY
 HSL Logistik GmbH			
 ap genova			
 Emons			
 MWP GmbH	12345	.	Deutschland
 Filog 2			
 Filog	21079	Hamburg	Deutschland
 Suppenkasper	80802	München	Deutschland
 DPD GeoPost (Deutschland) GmbH			
 RV			
 Mwp gmbh			
 Alexandra Kwee	47598	Neustadt	Deutschland
 SpiritosoniSpA			
 Glocke GmbH	6369	Großpaschleben	Deutschland
 Ulbrich GmbH	58099	Hagen	Deutschland
 Vogler AG	91474	Langenfeld	Deutschland
 Fröhlich GmbH	34355	Staufenberg	Deutschland
 Jäckle GmbH	55566	Bad Sobernheim	Deutschland

Figure 102: Business directory sorted by registration point

Companies

A - Z Newest first **Favored Companies** Ignored Companies

COMPANIES

Here you can see all companies.




NAME	ZIP	CITY	COUNTRY
 Breit GmbH	70192	Stuttgart	Deutschland
 Burghardt AG	27321	Morsum	Deutschland
 Enders GmbH	49762	Fresenburg	Deutschland

Figure 103: Subscribed companies

Companies

A - Z Newest first Favored Companies **Ignored Companies**

COMPANIES

Here you can see all companies.





NAME	ZIP	CITY	COUNTRY
 Brockhaus AG	71717	Beilstein	Deutschland
 Salazar AG	66484	Kleinsteinhausen	Deutschland
 Schaub AG	47226	Duisburg	Deutschland
 Schütte GmbH	2681	Wilthen	Deutschland

Figure 104: Ignored companies

2.6 Additional features

2.6.1 Notifications

Through conversations with practice partners in the course of the development of the software prototype it has become clear that end-users would appreciate it to be informed about new advertisements in the system of the online freight exchange. Also, it became clear that they would prefer to receive the information about new advertisements via e-mail so that they would not have to log in the system of the online freight exchange.

Therefore, a module has been designed and implemented that permits to define settings that decide if, for example, a new advertisement for a transport request is attractive to a specific end-user or not. It has been decided that the settings underlying these decisions have to be defined by the end-users themselves and that they should be individually configurable.

The notifications are generated within the system of the online freight exchange and can be optionally subscribed by the end-users via e-mail.

At the top right of the navigation bar a number appears that is highlighted in red in case of unread notifications and that states how many notifications have arrived for the user.



Figure 105: Notification indicator on the navigation bar

With a click on the number, the end-user is directed to an overview of the notifications generated for him.

Notifications are being sent for three kinds of actions:

1. the creation of advertisements for transport offers,
2. the creation of advertisements for transport requests and
3. the creation of reviews of the own company.

New & interesting



Figure 106: Overview of all notifications

Navigation makes it possible to filter the present notifications according to three categories. Thus, only those notifications can be specifically viewed that, for example, deal with relevant advertisements for transport requests.

New & interesting

The screenshot shows a navigation bar with tabs for 'Overview', 'Transport requests', 'Transport offers', and 'Reviews'. The 'Transport requests' tab is active. A 'Notification settings' button is located on the right. Below the navigation bar, the heading 'NOTIFICATIONS' is displayed. A message states: 'Here you can see postings and reviews that might be of interest for you.' A 'Mark all as 'read'' button is present. The notification list contains two entries:

#N.000.507	Volkenschwand - Schäflarn
#N.000.502	Gallmersgarten - Bad Schussenried

Figure 107: Overview of all notifications concerning advertisements for transport requests

New & interesting

The screenshot shows a navigation bar with tabs for 'Overview', 'Transport requests', 'Transport offers', and 'Reviews'. The 'Transport offers' tab is active. A 'Notification settings' button is located on the right. Below the navigation bar, the heading 'NOTIFICATIONS' is displayed. A message states: 'Here you can see postings and reviews that might be of interest for you.' A 'Mark all as 'read'' button is present. The notification list contains four entries:

#A.000.381	Gomadingen - Marne
#A.000.379	Seevetal - Neuenweg
#A.000.375	Geretsried - Grevesmühlen
#A.000.374	Frauenberg - Jagsthausen

Figure 108: Overview of all notifications concerning advertisements for transport offers

New & interesting

The screenshot shows a navigation bar with tabs for 'Overview', 'Transport requests', 'Transport offers', 'Reviews', and 'Notification settings'. Below the navigation bar, the 'NOTIFICATIONS' section is displayed. It contains the text: 'Here you can see postings and reviews that might be of interest for you.' and a button labeled 'Mark all as 'read''.

Figure 109: Overview of all notifications concerning the reviews of the company

If there are no notifications in a category, the view concerned is empty as Figure 109 shows.

In order to determine about which advertisements one wants to be informed in this way, the end-users have to define settings. These settings stipulate under which circumstances they want to be informed about a new advertisement. A click on “notification settings” directs the users to these settings.

Notification settings

The screenshot shows the 'Notification settings' page. It features a navigation bar with tabs for 'Overview', 'Transport requests', 'Transport offers', 'Reviews', and 'Notification settings'. Below the navigation bar, the text reads: 'You can edit, create and delete conditions for notifications.' There are two buttons: 'New condition for transport offers' and 'New condition for transport requests'. The page displays two notification conditions for transport requests:

- SET FOR TRANSPORT REQUEST** (Delete condition)
 - Origin city is Rotterdam (Edit Delete)
 - Product state is liquid (Edit Delete)
 - Add condition...
- SET FOR TRANSPORT REQUEST** (Delete condition)
 - Origin city is Frankfurt (Edit Delete)
 - Frequency is weekly (Edit Delete)
 - First transport at is 24/12/2012 (Edit Delete)
 - Add condition...

Figure 110: Notification settings

In Figure 110 one condition concerning advertisements for transport requests as well as a condition regarding advertisements for transport offers are depicted. The shown end-user receives notifications for all transport requests that specified “Rotterdam” as their loading site and “liquid” as their

cargo type. Besides, he receives notifications concerning all advertisements for transport offers that specified “Frankfurt” as their loading site and “weekly” as their frequency and whose transports are available from 24.12.2012.

Such conditions can be added by clicking on the buttons “new condition for offers” as well as “new condition for requests”. Existing conditions can be deleted via “delete condition”. The modification of settings is possible by deleting or adding particular conditions.

Thus, for example, the first setting in Figure 110 can be extended by the condition that the advertisements for transport requests coming into question should be available from 01.12.2012. For this, the end-user first clicks on “add condition...” in order to create a new condition.

Figure 111: Adding a new condition

Afterwards, the end-user can choose for which attribute of the advertisement the condition should apply. He chooses “available from:”.

Figure 112: Selection of a comparative attribute

Next, a text field appears in which the end-user enters his specification for the value of the attribute „Available from:”.

The screenshot displays two panels for setting transport conditions. The top panel, titled 'SET FOR TRANSPORT REQUEST', contains three conditions: 'Origin city is Rotterdam', 'Product state is liquid', and 'First transport at' (with a dropdown menu) 'is' (with a dropdown menu) '12/01/2012'. A 'Save condition' button is located at the bottom of this panel. The bottom panel shows the same interface but with the 'First transport at' condition removed, leaving only 'Origin city is Rotterdam' and 'Product state is liquid'.

Figure 113: Input of a reference value

With a click on “save settings“, the end-user saves the additional condition for the extended setting.

The screenshot displays two panels for setting transport conditions. The top panel, titled 'SET FOR TRANSPORT REQUEST', contains three conditions: 'Origin city is Rotterdam', 'Product state is liquid', and 'First transport at is 12/01/2012'. A 'Save condition' button is located at the bottom of this panel. The bottom panel shows the same interface but with the 'First transport at' condition removed, leaving only 'Origin city is Rotterdam' and 'Product state is liquid'.

Figure 114: New condition saved for the first setting

Now, the altered setting is active and only notifications concerning advertisements for transports request are being created that fulfill all conditions.

2.6.2 Station directory

The station directory shows all stations registered in the system of the online freight exchange.

Stations

ALL STATIONS

Here you can see all stations.

NAME	NUMERIC ID				
's-Hertogenbosch	8400319	Transport offers originating from here	Transport offers destined to here	Transport requests originating from here	Transport requests destined to here
's-Hertogenbosch Oost	8400320	Transport offers originating from here	Transport offers destined to here	Transport requests originating from here	Transport requests destined to here
† Harde	8400388	Transport offers originating from here	Transport offers destined to here	Transport requests originating from here	Transport requests destined to here
Aachen Hbf	8000001	Transport offers originating from here	Transport offers destined to here	Transport requests originating from here	Transport requests destined to here
Aachen Schanz	8070704	Transport offers originating from here	Transport offers destined to here	Transport requests originating from here	Transport requests destined to here
Aachen Süd(Gr)	8000403	Transport offers originating from here	Transport offers destined to here	Transport requests originating from here	Transport requests destined to here
Aachen West	8000404	Transport offers originating from here	Transport offers destined to here	Transport requests originating from here	Transport requests destined to here
Aachen-Rothe Erde	8000406	Transport offers originating from here	Transport offers destined to here	Transport requests originating from here	Transport requests destined to here
Aadorf	8506013	Transport offers originating from here	Transport offers destined to here	Transport requests originating from here	Transport requests destined to here
Aadorf, Bahnhof	8573363	Transport offers originating from here	Transport offers destined to here	Transport requests originating from here	Transport requests destined to here

Figure 115: Overview of all stations

To each listed rail station, an overview of all advertisements for transport offers and transport requests can be called up.

2.6.3 Contact form

The end-users of the software prototype have the possibility to address themselves at any time to the operator of the online freight exchange via a contact form.

Contact

CONTACT OUR SUPPORT STAFF

Type your question or suggestion below, and we will contact you shortly!

Submit request

Figure 116: Contact form

A free text field for suggestions and criticism is available for end-users. Its content is being sent with a click on “submit” via e-mail to an e-mail address defined in the operator interface.

3 Features for the operators of the software prototype

3.1 Preliminary remark und registration

In what follows, it will be demonstrated how operators can manage the system of the online freight exchange. It should be noted that the deployment of features for the operators of the software prototype had less priority when developing the software than those features for the potential end-users of the software prototype.

Nevertheless, basic features had been implemented that demonstrate which requirements have to be met by the administration interface in order to serve as a useful instrument to the operators of an online freight exchange.



Figure 117: Link to the administration interface

The operators of the online freight exchange see an additional navigation point in the main navigation of the software prototype. With a click on “administration” the operators are directed to the user interface of the software prototype accessible only by them.

3.2 System assistant

3.2.1 Homepage

When starting the application server for the first time, the system assistant helps the operators to configure the software prototype. However, the system assistant can be also called up anytime in the course of the operation in order to run the tasks bound to it anew.

Welcome

The screenshot displays the 'Welcome' page of the System Assistant. It is organized into four main sections:

- ADMIN ACCOUNT:** A blue header section with the text 'The software just created your admin account. You can customize this account by clicking the button above:'. Below this is a blue button with a cursor icon and the text 'Edit your admin user'.
- DEMO COMPANY:** A blue header section with the text 'You can modify the demo company by clicking the button above:'. Below this is a grey button with a cursor icon and the text 'Create a demo company'.
- SETTINGS:** A blue header section with the text 'You can access the applications settings by clicking the button above:'. Below this is a grey button with a double-headed arrow icon and the text 'Open Settings'.
- LOCALIZATION:** A blue header section with the text 'You can access the 'talk' localization interface by clicking the button above:'. Below this is a grey button with a double-headed arrow icon and the text 'Open Talk'. Further down, it says 'You can also access the main 'talk' rake tasks by clicking the buttons above:'. Below this are three buttons: 'Dump all!' (with an upward arrow icon), 'Sync!' (with a circular refresh icon), and 'Import secondary locales!' (with a document icon).

Figure 118: System assistant

The features of the system assistant encompass the editing of the Admin user, the settings, the translations as well as the demo company.

3.2.2 Editing the Admin-user

By means of the system assistant, the core data of the administrator (Admin user) logged in the system can be edited.

Edit User

EDIT USER

Required Field Hint

Login credentials

Username
Choose a username to log in to the service

E-Mail
Enter your e-mail address here

Change password (optional)

Password Hint

Password
Choose your password carefully

Password (again)
Please repeat your password

Notifications (optional)

Notify by email

Figure 119: Input mask for editing the core data of the Admin user

The input fields of the input mask for editing the core data of the Admin user depicted partially in Figure 119 is identically equal to the standard input mask for the user core data and, therefore, will not be discussed elaborately again at this point. Its special attribute is merely that it enables the operator to easily edit the core data of the Admin user.

3.2.3 Managing the demo company

Furthermore, the software prototype allows the easy creation and management of a “demo company”, i.e. a company for demonstration purposes that is registered with the system of the software prototype along with fictive employees and advertisements.

Demo Company

CREATE OR RESET THE DEMO COMPANY

Administrate your demo company.

There is a demo company. Click the profile in the sidebar to view their profile or the link below to destroy it:

[→ Destroy demo company](#)

[Create transport requests in demo company](#) 14 transport requests present.

COMPANY INFORMATION [View profile](#)

Demontage Sprenkler AG [Edit info](#)

Address	Wallstr. 56-58
ZIP	44567
City	Bochum
Country	Deutschland
Phone	+49 (0) 234 569986-0
Fax	+49 (0) 234 569986-55
E-Mail	demontage@example.org
Web	http://example.org

Figure 120: Overview of the demo company

The purpose of the demo company is to be able to present an exemplary company within the online freight exchange to potential end-users of the software prototype. The end-users can log in as employees of the demo company and change the company itself as well as its advertised transport offers and transport requests. Moreover, they can make use of all features of the software prototype provided for end-users (e.g. creating new advertisements or writing reviews).

After the completion of the demonstration an administrator can reset the demo company by means of the features described above and, thus, undo all effected changes. The demo company (then initiated anew) can thus be demonstrated to another group of potential end-users.

3.2.4 Managing the settings

All settings registered in the system of the online freight exchange can be listed by means of the navigation point “company”. Preferences are being used by the software prototype to make installation-specific configurations possible without adapting the source code of the software prototype. Thus, for example, the standard language of the software prototype can be changed to “German”.¹

All Settings

NAME	VALUE
just_set_up Indicates whether or not the prototype has just been set up.	1
name Name of the running application.	Freight Exchange
reviews.highlight_above How many published reviews does a company need to have to get highlighted in search results.	5
demo_mode Is the application running in demo mode?	0
support_email E-Mail-Address for receiving user feedback	contact@example.org
language The default language of the application.	de
domain The domain under which the application is running.	pim-code24.wiwinf.uni-due.de
contact_info.complete_percentage How much contact info has to be filled out to make a profile 'complete'.	0.5
contact_info.default_country_code Default Country Code	49

Figure 121: Overview of all configuration variables

The operators have the possibility to sort the list by ID (identification number) or by name in ascending order and by registration point in descending order as well as to browse the list by means of a full text search for individual words.

1) To that end, set the variable “language” under “settings” to the value “de”.

Edit setting

Name*	<input type="text" value="support_email"/>
Wert	<input type="text" value="rene.foehring@pim.uni-due.de"/>

Figure 122: Editing the configuration variables

In Figure 122 it is shown exemplary how the value of the configuration variable “support e-mail” is changed. This configuration variable determines the e-mail address to which the software prototype sends the Feedback gathered within the contact form.

3.3 Monitoring

It will be of decisive importance for the operators of the software prototype to be able to capture reliable data on user behavior of the end-users. Because of the focus on end-user directed features, no requirements have been specified for the monitoring by the practice partners. That is why a few exemplary views of data have been implemented that has already been collected by the software prototype.

Monitoring

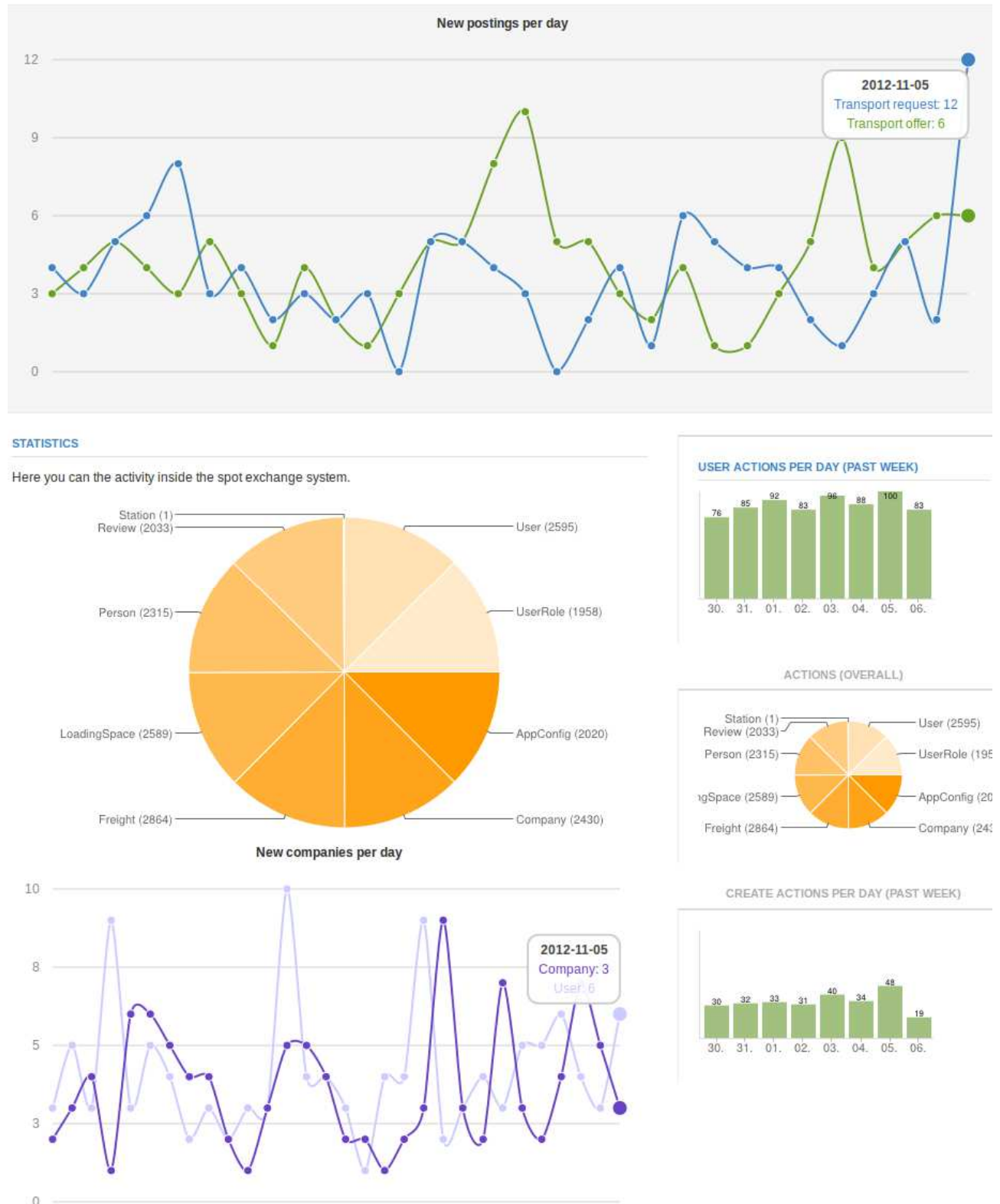


Figure 123: Monitoring

The operators of the online freight exchange can survey the following information:

- new advertisements,
- interactions within the online freight exchange,
- new companies and

- new users.

This data is being edited and displayed in graphics.

The number of newly submitted advertisements per day is being captured for each day and displayed in a graphic. When the administrator moves the mouse over the graph, he sees the exact values for each day.



Figure 124: New advertisements per day

Moreover, the activity of the users is being recorded in the system of the online freight exchange. For example, it can be summarized in pie charts according to the distribution of the activity on the different software modules.

STATISTICS

Here you can see the activity inside the spot exchange system.

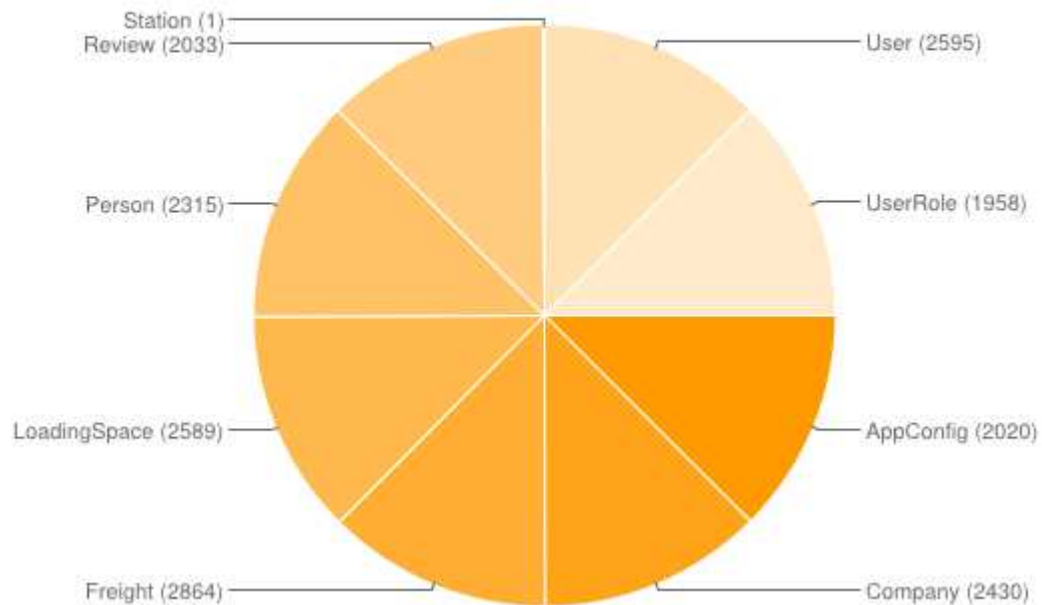


Figure 125: Activity within the online freight exchange

Similar to the graphic concerning new advertisements per day depicted in Figure 124, newly registered companies and users are also being displayed exactly to the day.

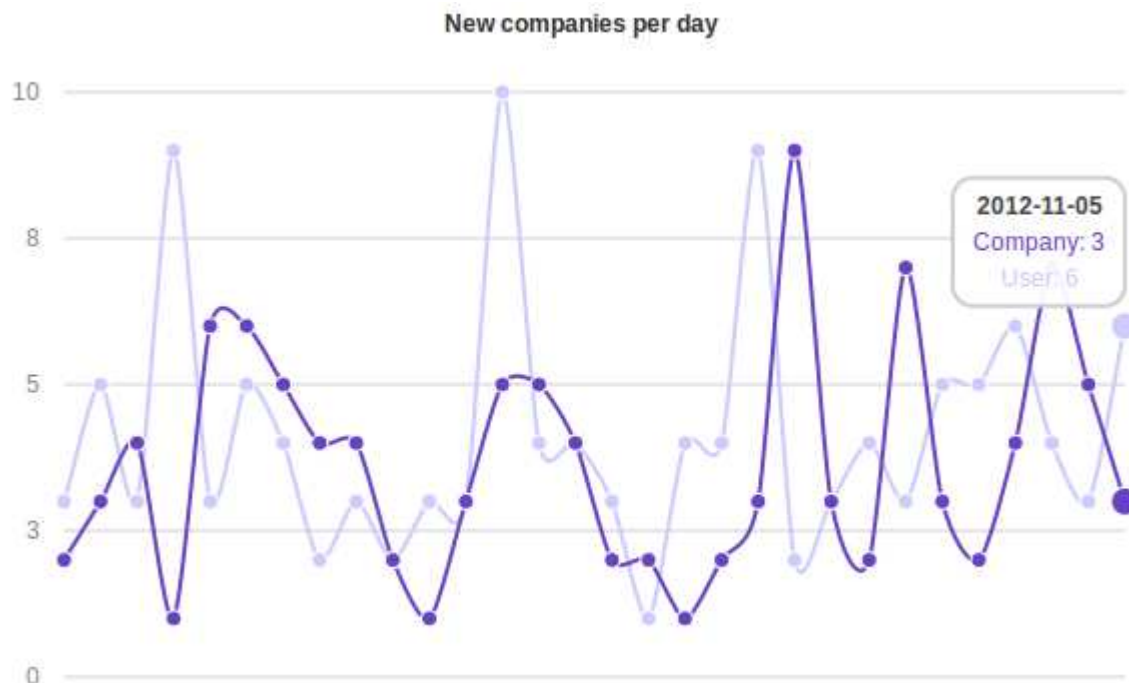


Figure 126: New companies and users per day

All shown graphics are being generated dynamically out of the existing statistical data of the software prototype. It is conceivable to implement additional and narrower defined diagrams like, e.g.

the cumulative development of newly registered companies in a specific country for reviewing the effectiveness of specifically applied marketing operations.

3.4 Companies

All companies registered with the system of the online freight exchange can be listed by means of the navigation point “companies“.

Companies

1 - 100
A - Z
Newest first

COMPANIES

Here you can see all companies in the system.

ID	NAME	PHONE	EMAIL
1	Freight Exchange Service Provider		
3	Polytrans AG		
34	Trans_Uni_Ceyhan		
35	Uni Essen		
36	Trans_Uni_Tarek		
37	PTV		
38	Bargelink GmbH	02801 98 47 30	goetze@bargelink.com
39	Trans_uni_Youssef		
40	RheinMain		
41	uni		
42	Uni-Cargo		
43	Testfirma	0210/12345	testfirma@firma.de
44	Cargo-Trans		
45	SuperTrans		
50	Demontage Sprenkler AG	+49 (0) 234 569986-0	demontage@example.org
51	Transpetrol TEST		
52	Nadine Fückler		

NEW COMPANIES PER DAY (PAST WEEK)

Day	New Companies
30.	0
31.	0
01.	0
02.	0
03.	0
04.	0
05.	0
06.	0

Figure 127: Overview of all companies

The operators have the possibility to sort the list by ID or name in ascending order and by registration point in descending order as well as to browse the list by use of a full text search.

Company

[← Back](#) [✎ Edit](#) [👁 View public profile](#)

USER HEADER

Here you can see all users in this company.

ID	LOGIN	EMAIL
246	demo_user_admin	m.sprenkler@example.org
247	demo_user02	b.sprenkler@example.org
248	demo_user03	p.krause@example.org
249	demo_user04	m.kowalla@example.org
250	demo_user05	a.baumann@example.org
251	demo_user06	b.baumann@example.org
252	demo_user07	j.etterich@example.org
253	demo_user08	m.mueller@example.org
254	demo_user09	c.ampel@example.org
255	demo_user10	k.fischer@example.org

COMPANY INFORMATION [👁 View profile](#)

Demontage Sprenkler AG [✎ Edit info](#)

Address Wallstr. 56-58

ZIP 44567

City Bochum

Country Deutschland

Phone +49 (0) 234 569986-0

Fax +49 (0) 234 569986-55

E-Mail demontage@example.org

Web <http://example.org>

Figure 128: View of a company

In the detail view of an individual company, the contact information of the company as well as its registered user accounts are displayed for the operators.

Edit company

Name	
Name*	<input type="text" value="Demontage Sprenkler AG"/>
Company categories:	
	<input type="checkbox"/> Railway undertakings
	<input type="checkbox"/> Forwarding agents
	<input type="checkbox"/> Operators of combined cargo
	<input type="checkbox"/> Loading agents
	<input type="checkbox"/> <input type="text"/>
<hr/>	
Postal information	
Address	<input type="text" value="Wallstr. 56-58"/>
-	<input type="text"/>
ZIP	<input type="text" value="44567"/>
City	<input type="text" value="Bochum"/>
Country	<input type="text" value="Deutschland"/>

Figure 129: Editing a company

All registered companies can be edited by administrators.

3.5 Users

All users registered with the system of the online freight exchange can be listed by use of the navigation point “company”.

All Users

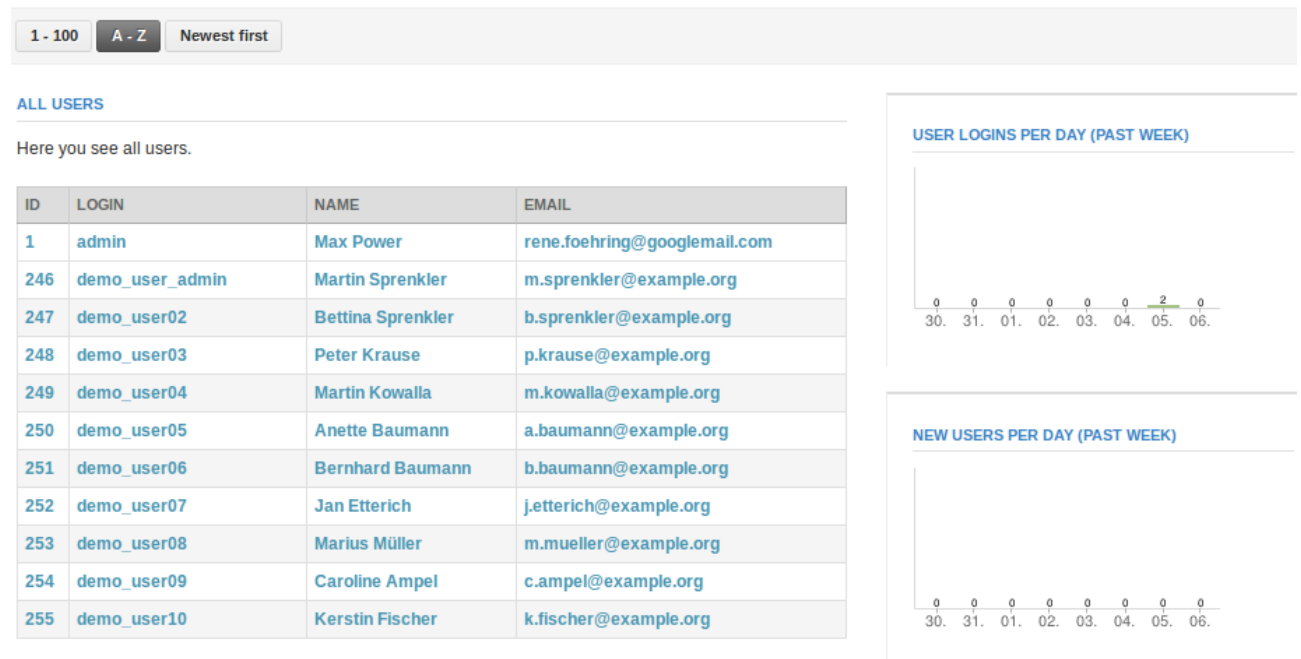



Figure 130: Overview of all users


The operators have the possibility to sort the list by ID or name in ascending order and by registration point in descending order as well as to browse through the list by means of the full text search.


User


[← Back](#) [✎ Edit](#) [👁 View public profile](#)


ACTIONS


 **23 Sep 16:36**
Martin Sprenkler **updated** a User: [Martin Sprenkler](#)


 **26 Sep 11:59**
Martin Sprenkler **updated** a User: [Martin Kowalla](#)


 **11 Oct 10:06**
Martin Sprenkler **updated** a User: [Bettina Sprenkler](#)


 **18 Oct 06:36**
Martin Sprenkler **created** a Transport request: -- deleted object --

 **18 Oct 06:43**
Martin Sprenkler **created** a Company: [Transpetrol TEST](#)

 **18 Oct 06:43**
Martin Sprenkler **created** a Person: [Klaus Becker](#)

 **18 Oct 06:43**
Martin Sprenkler **created** a User: [Klaus Becker](#)

 **01 Nov 08:55**
Martin Sprenkler **updated** a User: [Peter Krause](#)

 **01 Nov 10:07**
Martin Sprenkler **updated** a User: [Bettina Sprenkler](#)

CONTACT INFORMATION [👁 View profile](#)

Martin Sprenkler [✎ Edit info](#)

Phone +49 (0) 234 569986-1

Fax +49 (0) 234 569986-55

E-Mail m.sprenkler@example.org

Web <http://example.org/team/m.sprenkler>

COMPANY INFORMATION [👁 View profile](#)

Demontage Sprenkler AG [✎ Edit info](#)

Address Wallstr. 56-58

ZIP 44567

City Bochum

Country Deutschland

Phone +49 (0) 234 569986-0

Fax +49 (0) 234 569986-55

E-Mail demontage@example.org

Web <http://example.org>

Figure 131: View of a user

In the detail view of a user the operators see the activities of the user, his contact information and the contact information of his company.

Edit User

Login credentials

Username
Choose a username to log in to the service

E-Mail
Enter your e-mail address here

Change password (optional)

Password
Choose your password carefully

Password (again)
Please repeat your password

Unternehmen

User Roles

- Executive
- Regular employee

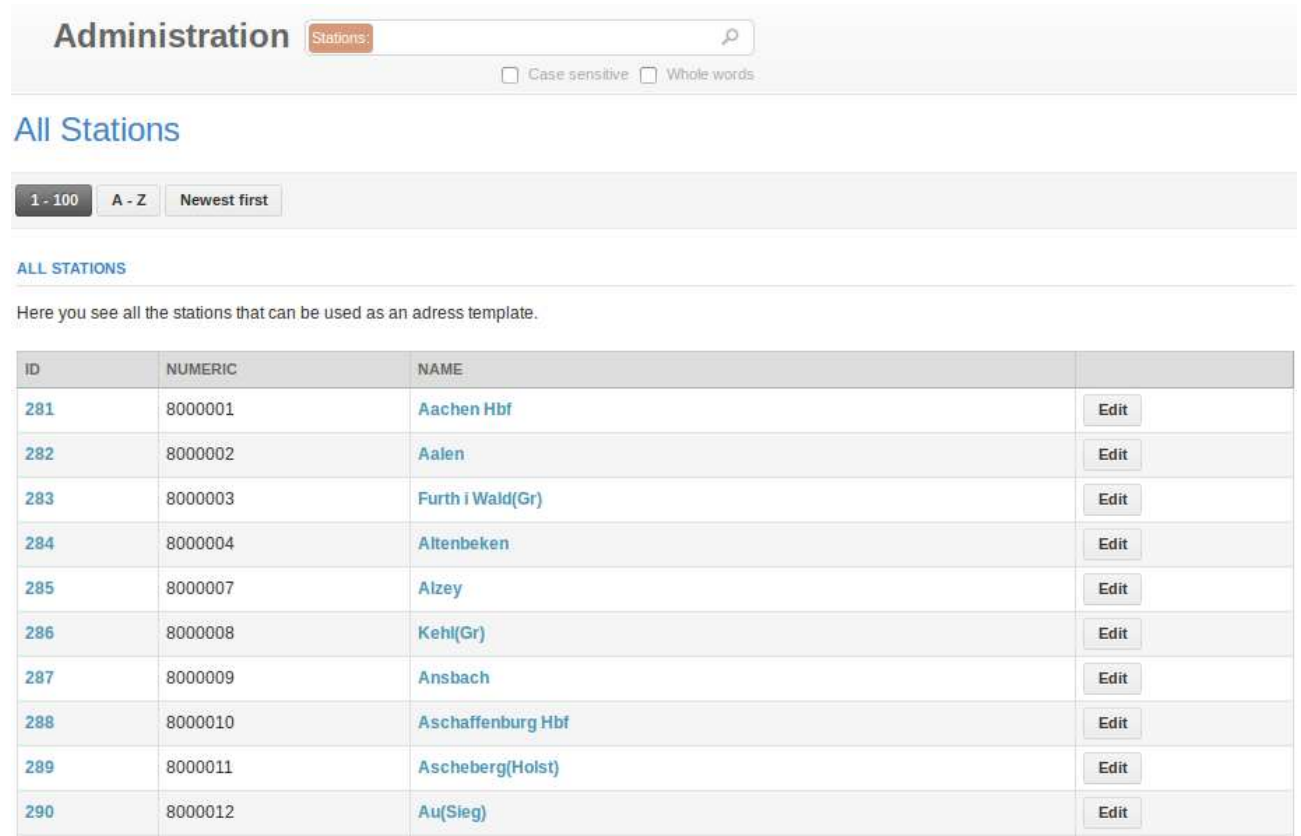
Figure 132: Editing a user

Just like company profiles, the user can also be edited by administrators. Here, the core data and the contact data can be edited separately just like in the end-user surface.

3.6 Stations

All stations registered in the system of the online freight exchange can be listed by use of the navigation point “company”.

The stations serve as a foundation for the selection box “station” situated in the input masks for creating and editing advertisements for transport offers and transport requests. In these input masks only those stations can be chosen that have been fed to the system by the operators.



The screenshot shows the 'Administration' section with a search bar for 'Stations'. Below the search bar are checkboxes for 'Case sensitive' and 'Whole words'. The main content area is titled 'All Stations' and includes sorting options: '1 - 100', 'A - Z', and 'Newest first'. Below the sorting options, the text reads 'ALL STATIONS' and 'Here you see all the stations that can be used as an adress template.' A table lists 12 stations with columns for ID, NUMERIC, NAME, and an 'Edit' button for each row.

ID	NUMERIC	NAME	
281	8000001	Aachen Hbf	Edit
282	8000002	Aalen	Edit
283	8000003	Furth i Wald(Gr)	Edit
284	8000004	Altenbeken	Edit
285	8000007	Alzey	Edit
286	8000008	Kehl(Gr)	Edit
287	8000009	Ansbach	Edit
288	8000010	Aschaffenburg Hbf	Edit
289	8000011	Ascheberg(Hoist)	Edit
290	8000012	Au(Sieg)	Edit

Figure 133: Overview of all stations

The operators have the possibility to sort the list by ID or name in ascending order and by registration point in descending order as well as to browse the list by use of a full text search.

Administration Stations: Essen Case sensitive Whole words

All Stations

1 - 100 A - Z Newest first

ALL STATIONS

Here you see all the stations that can be used as an adress template.

ID	NUMERIC	NAME	
371	8000098	Essen Hbf	Edit
372	8000099	Essen-Steele	Edit
586	8000330	Schwäbisch Hall-Hessental	Edit
1004	8000962	Blessenhofen	Edit
1573	8001896	Essen Stadtwald	Edit
1574	8001897	Essen Süd	Edit
1575	8001898	Essen West	Edit
1576	8001899	Essen(Oldb)	Edit
1577	8001900	Essen-Altenessen	Edit
1578	8001901	Essen-Bergeborbeck	Edit

Figure 134: Full text search in stations

Just as with advertisements, the full text search on the administration interface provides the possibility to browse individual views for individual words. Also analogously to the normal end-user interface, the options “use of capital and small initial letters” as well as “whole word” are provided to further filter the resulting search results.

Edit station

Name*

Straße

(fortgesetzt)

PLZ

Stadt

Land

Figure 135: Editing a station

All registered stations can be edited by the administrators.

4 Conclusion

As has been shown, the developed software prototype is a fully operative software. Through its modular way of programming and its technical infrastructure it provides a solid fundament for further developments and can serve as an example to the impending professional reimplementation in many areas. Above all, the fast and gradual trial of individual features makes a specific evaluation of these features before their elaborated reimplementation in a subsequent online freight exchange possible.

Nevertheless, the software prototype at hand has been conceptualized under other aspects than demanded by professional business software. The development of the software prototype served, like other feasibility studies, predominantly the initiation of a dialogue between practice partners of the project "CODE24". During the development, higher priority has been given to the modularity, the easy adaptability and the expandability than to reflections on security, maintenance and speed of execution. Therefore, the software prototype at hand cannot meet the strict criteria of professional business software. It is one of the next goals of the sub-project "Online freight exchange" in the context of the project "CODE24" to realize such a professional business software through a reimplementation of the software prototype on the part of the practice partners of the sub-project.

If interested in the upcoming stages of the further development of the online freight exchange for the rail freight service and in the participation thereon, especially potential users can address themselves to the following contact persons of the involved CODE24-project partners Regionalverband FrankfurtReinMain and TransCare:

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