

OpenQuotesAndContracts Manual

<http://www.sugarforge.org/projects/openqc/>

Version 1.6.2

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1 Introduction

This document describes the installation process and the use of the SugarCRM module `OpenQuotesAndContracts` - also known as *openqc* [1].

Four students have started the `openqc`-development in winter 2007/2008 at the Hasso-Plattner-Institut [3] which is situated in Potsdam, Germany. It is build together with a department called LDS [2], which provides IT-services for other german departments.

The aim of `openqc` is making business processes more transparent, increase productivity and improve service quality.

It is developed by two students of the Hasso-Plattner-Institut at the moment - the authors of this manual. Together with the components that are integrated into `openqc` (e.g. `FckEditor`, `dhtmlxTree`), `openqc` consists of more than 35000 lines of PHP and 65000 lines of JavaScript code.

At the time of writing `OpenQuotesAndContracts` has the following features:

- The creation of PDF files from contracts, offerings, contract additions and product catalogs. Documents can be attached (PDF, DOC) or embedded (all other formats) into the PDF file.
- The management of contracts, offerings and contract additions (see chapter 5).
 - Automatic versioning of offerings, contracts and contracts additions.
 - Creation of contracts from offerings.
 - Creation of contracts additions from contracts.
 - Integration of the SugarCRM autocompletion feature for selection of contacts and employees.
 - Select products to produce and configure lists of services that are sold in a contract.
 - Select and edit textblocks with the integrated WYSIWYG editor: `FckEditor`.
 - Upload documents that give further details about offerings or contracts.
- The management of product catalogs (see chapter 6).
 - Create product categories and change their hierarchies using drag and drop.
 - Duplicate existing category and product hierarchies when creating new product catalogs.

We appreciate for all kind of feedback to `openqc` but also to this manual. Just leave a message at the `openqc` website or write a mail.

- <http://www.sugarforge.org/projects/openqc>

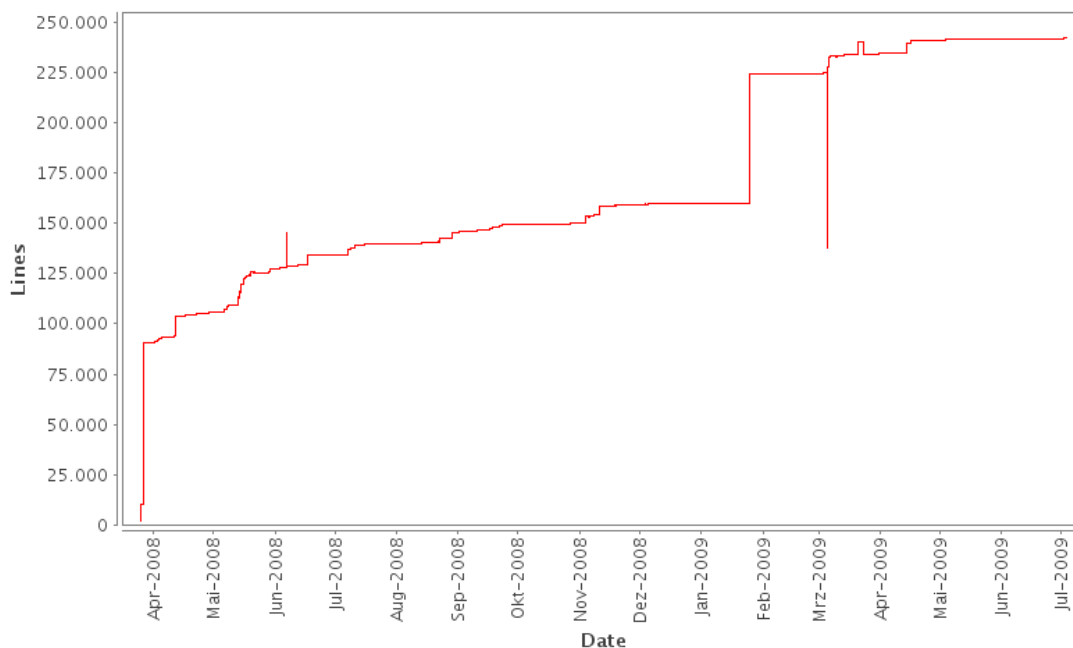


Figure 1: Lines of code of the openqc-project

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2 Requirements

2.1 Client

- Firefox 3: Most features only work in Firefox. Especially the management of offerings and contracts. It is not planned to create Internet Explorer compatible releases.

2.2 Server

- SugarCRM 5.2: We currently support SugarCRM 5.2. You probably have to edit some openqc source files to use openqc with another version of SugarCRM.
- DocumentConverter.py
- pdftk
- pdflatex
- OpenOffice.org with headless-support and python-uno-bindings

- Python
- PHP Module FileInfo: Can be installed by `pear install FileInfo`.
- Linux: We develop and test openqc for using it on Linux. However, all features but the pdf-export should work on Windows as well. It is not planned to create a Windows compatible release. See http://www.sugarforge.org/forum/forum.php?thread_id=5490&forum_id=2788 for installation instructions on the Windows platform.

3 Installation

3.1 Installation of the OpenQuotesAndContracts ZIP file

You can install OpenQuotesAndContracts using the module loader that comes with SugarCRM. This requires the following steps:

1. Download the current ZIP file from the openqc website [1].
2. Upload the file into SugarCRM using the module loader (see figure 2).

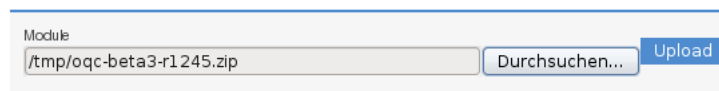


Figure 2: openqc ZIP file opened in the module loader

3. Click on the “Install” button and accept the license (see figure 3).

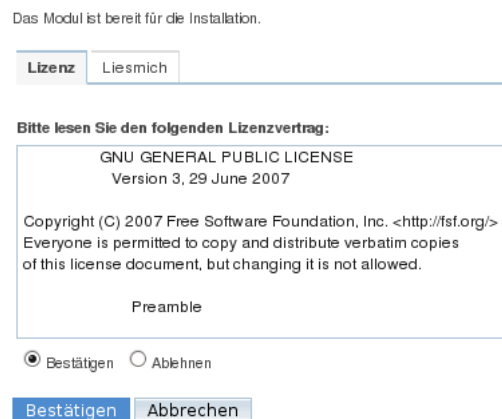


Figure 3: starting the installation process

Everything but the pdf creation feature should work immediately after the installation. Activation of the pdf creation feature is discussed in the next section.

3.2 Getting the pdf creation feature working

1. Several software packages are required for the generation of PDF documents. The installation procedure for these software packages is specific to the deployed operating system, because package managing tools and package names differ. In the following paragraphs the installation procedures for three major linux distributions are covered.

OpenSuse 11 You should have enabled the OpenSuse and the Packman repositories so that zypper can find the tools we want to install.

```
# zypper in apache2 apache2-mod_php5 python
# zypper in php5 php5-mysql php5-zlib php5-mbstring mysql
# zypper in OpenOffice_org-pyuno pdftk texlive texlive-latex
```

CentOS 5 All packages but pdftk can be installed from the default repositories using yum. To install pdftk you have to download a CentOS-compatible rpm from <http://dag.wieers.com/rpm/packages/pdftk/>. Depending on your architecture you should download the 32-bit or 64-bit version.

```
# yum install httpd php php-mysql mysql-server mysql php-mbstring python
# yum install openoffice.org-headless openoffice.org-pyuno libstdc++
# yum install libgcj tetex tetex-latex tetex-fonts tetex-dvips
# wget http://dag.wieers.com/rpm/packages/pdftk/pdftk-1.41-1.el5.rf.i386.rpm
# rpm -ihv pdftk-1.41-1.el5.rf.i386.rpm
```

If mysqld and httpd are not running you should start them now:

```
# /etc/rc.d/init.d/mysqld start
# /etc/rc.d/init.d/httpd start
```

Ubuntu All required packages can be easily installed by using apt.

```
apt-get install apache2 mysql php5 php5-mysql python
apt-get install texlive texlive-latex-extra pdftk
apt-get install openoffice.org-headless python-uno
```

2. After that you have to compile the `html2tex.c` file which is located in the `tools` directory of the `openqc` ZIP file.

```
gcc html2tex.c -o html2tex
```

Alternatively, you could try to use the already compiled version of `html2tex` that is shipped with the `openqc` ZIP file.

3. Download the DocumentConverter script [4].

```
wget http://artofsolving.com/files/DocumentConverter.py
```

4. Copy all necessary files into a directory which is in \$PATH (e.g. /usr/local/bin/). The DocumentModifier.py file can be found in the tools directory of the openqc ZIP file as well.

```
cp html2tex /usr/local/bin/  
cp DocumentConverter.py /usr/local/bin/  
cp DocumentModifier.py /usr/local/bin/
```

5. Update the permissions of these files.

```
chmod +x /usr/local/bin/html2tex  
chmod +x /usr/local/bin/DocumentConverter.py  
chmod +x /usr/local/bin/DocumentModifier.py
```

6. Start OpenOffice each time you start your SugarCRM server.

```
/opt/openoffice.org2.4/program/soffice \  
"-accept=socket,host=localhost,port=8100;urp;StarOffice.ServiceManager" \  
-norestore -nofirststartwizard -nologo -headless &
```

After these steps the pdf creation feature should work. If this is not the case please have a look at the `error.log` file of your Apache webserver and at the SugarCRM log file `sugarcrm.log`. You probably have to increase the log level of SugarCRM to get more detailed information by changing the logging settings in the `SugarRootDirectory/log4php.properties` file to this:

```
....  
//log4php.rootLogger=fatal, A2  
//log4php.rootLogger=error, A2  
//log4php.rootLogger=warn, A2  
//log4php.rootLogger=info, A2  
log4php.rootLogger=debug, A2
```

Try to create a pdf document again and look for debug output in the log file afterwards.

If you need more help during the installation process, feel free to post a message at the openqc website [1]. We will try to help you as fast as we can.

3.3 Installation of more patches

You can use most openqc feature without installing any patches. However, to be able to use all feature you should install the following SugarCRM patches. You can find them in the download section of the openqc project. You should be able to apply them with `patch -p0 <file.patch` in SugarCRM 5.2.0f. If this is not the case please have a closer look into the patch, write a message into the forum or send us an email.

- `csv_export_internal_customization_5_2_0_c_v5.patch`: This patch is required for the csv export. Additionally it contains fixes for the searching and sorting user interface. Without the patch you may not get any results when you are searching for accounts in the openqc modules for example. The same applies (without the patch) if you want to sort by accounts.
- `all_openqc_specific_sugarcrm_patches.patch`: This patch extends the quick-search feature for the openqc modules. Additionally it fixes the problem that you cannot install openqc (or other modules adding custom fields to sugarcrm) several times.

We suggest the installation of all listed patches.

3.4 Clear Firefox Cache

After you installed a new oqc zip file on the SugarCRM server you have to clear the firefox cache on all clients accessing the SugarCRM installation.

A new version of oqc changes files that are usually stored in the browser cache after downloading them the first time. The old files have to be removed from the cache. New versions of the files will be downloaded when the updated server is accessed by the client the first time.

When you cleared your cache and accessed the updated server again your browser should use the updated JavaScript files from the new zip file.

3.5 Known Issues

3.5.1 Displaying editor iframes

In some webserver configurations iframes that display text formatting editors may not be displayed correctly. All modules which are currently using these editors (products, product catalogs, quotes and contracts) are affected.

If you want to test your configuration, just create a new product catalog. While you are editing your new product catalog you should be able to edit and view all of the displayed description fields. If, however, the description field is missing or displays the SugarCRM index page, then your configuration is affected.

The problem is caused by a redirection, which gets automatically activated whenever an text formatting editor is displayed. In order to resolve the problem you have to comment out the following two lines in your SugarCRM `.htaccess` file:

```
RedirectMatch /sugar/include/(.*)\.php http://localhost/sugar/index.php
RedirectMatch /sugar/include/(.*)/(.*)\.php http://localhost/sugar/index.php
```

Notice that your directory and server names may vary slightly. Afterwards your two lines should look like this:

```
# RedirectMatch /sugar/include/(.*)\.php http://localhost/sugar/index.php
# RedirectMatch /sugar/include/(.*)/(.*)\.php http://localhost/sugar/index.php
```

3.5.2 Search on multitenum fields in MySQL databases

In SugarCRM versions less than 5.1, especially 5.0.* versions, searching on multitenum fields will result in bogus results when using a mysql database. This bug is already fixed in SugarCRM 5.1. A patch for all 5.0.* versions is provided on the project page.

4 Restrictions

4.1 Formatting Texts

If you are filling in the description fields and want to use enumerations or itemizations, you should use the builtin formatting feature. Copying text from other sources, such as Microsoft Word, into the description fields will insert special characters that are not interpreted correctly. This can result in problems during the pdf creation process. That is why you should avoid copying text from other sources into the description fields that have formatting support.

4.2 Sorting by category number makes products disappear

If you select products in offerings or contracts, a popup will open showing a list of products. In this popup there is a column 'category number'. Beginning at version 1.5.1 of openqc the products disappear from the list of you sort the products by the 'category number' field. So please do not sort by this field or you will not be able to select products from the popup.

5 Contract Management

OpenQuotesAndContracts allows the user to manage offerings, contracts and contract additions. We suggest the following workflow.

1. Create an offering.
2. Create a contract from the previously created offering.
3. Create a contract addition from the previously created contract.

However, it is possible to skip the offering stage as well. You can create existing contracts and upload the signed contract documents.

All changes that are done in the modules, are automatically controlled by a integrated versioning system.

HISTORY

vorherige Versionen:	Revision	Name	Status	Date Modified	Modified by
	<u>1</u>	Der neue Vertrag		23.08.2008 22.34	admin
	<u>2</u>	Der neue Vertrag		23.08.2008 22.35	admin
	<u>3</u>	Der neue Vertrag		23.08.2008 22.36	admin

Figure 4: versioning of a contract

It is possible to create pdf files from the offerings and contracts all the time.

In the next sections we will describe the basics of offerings and contracts: products, product categories and textblocks.

5.1 Products

Products have the following attributes:

- name
- price
- contact person
- category
- description

You can easily associate existing documents with the product to store additional information about it.

5.2 Product Categories

Products are organized in categories which can be structured in hierarchies. Every product is associated with exactly one category. The hierarchy of the categories itself is called the product catalog which is complex enough to be a seperate module (see chapter 6). You cannot manage categories directly but within a product catalog.

Produkte

Bearbeiten	Duplikat	Löschen	Duplikate finden	Änderungs-Log zeigen
Titel: Garfield "The Fat Cat"				
Preis: 1.500			Aktiv: <input checked="" type="checkbox"/>	
Verantwortlicher: Chris Olliver			Einheit: Stück	
Kategorie: Garfield T Shirts			Zeitbezug: einmalig	
Service Level: Basic			Produktkatalog: Produktkatalog 2009	

INFORMATION

URL:	
Kurzbeschreibung:	
Beschreibung:	Garfield tut was alle Katzen tun: Schlafen und Fressen .

Figure 5: detail view of a product

5.3 Textblocks

Textblocks are templates describing the matter of the contract. These templates should describe your contracts in general. You can insert and edit the textblocks when editing a contract. If you do any changes in the textblocks while editing the contract, they will effect only this particular contract.

Each contract has another textfield for everything which has not been described in the other textblocks.

5.4 Offerings

This section has to be written.

5.5 Contracts

Contracts have some additional attributes in comparison to offerings:

- Information about the schedule
 - start date
 - end date
 - deadline for cancellation
- The signed contract as a file.

5.6 Contract additions

You can define additions to existing contracts. These extend or update the existing contract. You can only access additions from the contract referenced by them.

6 Product Catalog

6.1 Introduction

In the product catalog module you can create categories and structure them in hierarchies. You can create a pdf file from each product catalog which you can give your customers for example. It contains the category structure and of course a listing of all products (see figure 6).

Produktkatalog [Drucken](#) [? Hilfe](#)

[Bearbeiten](#)
[Duplikat](#)
[Löschen](#)
[Duplikate finden](#)
[Erzeuge PDF](#)
[Produkte editieren](#)
[Änderungs-Log zeigen](#)

Name: Produktkatalog 2009

Beschreibung: **Unser neuer Katalog für das Jahr 2009.**

VALIDITY

Status: Neu

Aktiv: Gültig ab: 23.08.2008

Amtsblatt: Erschienen im Amtsblatt für Brandenburg 17 (2008) 29, S. 498.

PRODUCT CATEGORIES

Produkt Kategorien:

- T Shirts
 - Garfield T Shirts
 - Superman T Shirts
 - Batman T Shirts
 - Pullover
- Hosen
 - Kurze Hosen
 - Lange Hosen
 - Dreiviertel Hosen
 - Siebenachtel Hosen
- Mützen

Figure 6: detail view of a product catalog

Activity You can create several product catalogs but only one can be set to active at a time. Only products from the active product catalog can be selected during the creation of an offering or a contract. Do not forget to activate your catalog. You will not be able to select any products until you have an active product catalog. However, you can view contracts referencing products from old product catalogs that are not active anymore.

If you activate a catalog, all other catalogs will be set inactive. The field “valid from” will be filled automatically if you do not fill it. This means if you activate a catalog but leave the field “valid from” empty, OpenQuotesAndContracts will set “valid from” to the current date. If you deactivate a catalog, the “valid from” field will be emptied automatically.

Please note that we added the 'Activate' button at the top of every detail view page in the products catalog module. So you can active a catalog with just one click.

Duplicate You should use the duplicate mechanism if you want to create a new catalog on the basis of an older one. This will duplicate all categories and products of the existing catalog and still lets you update what you want.

Editing products To create, view and update the products of a catalog, you have to open the detail view of this product catalog and click the "Edit Products" button. If you then start creating or updating products they will always reference the categories of the catalog, which you came from.

Updating category sequence At the moment there is no easy way to update the category sequence. However, with repeated insertion of categories into their container you can modify the sequence. You drag the category and drop it on its container. This inserts the category again and places it at the bottom. If you repeat this with different categories you can create the desired order.

6.2 Step By Step: Create a Product Catalog

1. Open the product catalog module in SugarCRM.
2. Click on "Create Product Catalog".
3. Click on the 'Add' button. This will add another node in the tree representing a category in the hierarchy. Double click the node to update its name. If you select a node by clicking on it you will see its description in the editor at the bottom (see figure 7).
4. Create other categories as well. New categories will be inserted as subcategories of the selected (blue background) category. You can change the resulting hierarchy with drag and drop. Play around with the category creation and update process to find out how it is working. If you click on a category you can start updating it. You should avoid creating hierarchies deeper than five levels because this will not look very good in the pdf file. It is possible but will result in a layout that is not very clear.

7 External Contracts

7.1 Create postions

New external contracts do not have a table enumerating the cost positions (see figure 8).

Product Catalog: Catalog 2009

Save Cancel View Change Log

Name: * Catalog 2009

Description:

some **formatting**

- *examples.*
- just

try them.

VALIDITY

Active:

Official Gazette:

PRODUCT CATEGORIES

Product Categories:

- First
- First
- Second
- Second

Add Delete

The *description* of the **first** category.

Figure 7: editing of product categories

If you click the add position button new rows in the table are created (see figure 9). The positions table has no effect on the finalcosts fields at the bottom of the page. It is only there to explain the costs in more detail.

7.2 Create Costs

To create new costs select some of the contract matter values (see figure 10). Hold the CTRL key to select several contract matter values.

The creation of cost tables is influenced by the begin and end dates of an external contract as well. All necessary cost tables are created automatically. If you change the contract matter values or the lifetime of the external contract, the tables are updated correctly (see figure 11).

The system caches your input as you type. You can update the lifetimes or modify the contract matter values without losing your already entered data. This means you can enlarge the lifetime, fillout the fields of the cost tables (see figure 11), shrink the lifetime and enlarge it again, you will see your previously entered data again. Just try

Positionen:

Arbeitslog:

Figure 8: Instead of a cost positions table a new external contract only has a button for adding position rows.

Name	Anzahl	Preis	Art	Beschreibung	
<input type="text" value="HP Bladeserver"/>	<input type="text" value="2"/>	<input type="text" value="333100"/>	<input type="text" value="Hardware"/>	<input type="text"/>	<input type="button" value="Löschen"/>
<input type="text" value="Schreibtische"/>	<input type="text" value="10"/>	<input type="text" value="200"/>	<input type="text" value="Büromöbel und Güter"/>	<input type="text"/>	<input type="button" value="Löschen"/>
<input type="text" value="Wartung der PCs"/>	<input type="text" value="160"/>	<input type="text" value="100"/>	<input type="text" value="Dienstleistung"/>	<input type="text"/>	<input type="button" value="Löschen"/>

Figure 9: Add some cost positions.

KSt. / Produktnr.:

Vertragstyp: *

Vertragsgegenstand:

Positionen:

Name
<input type="text" value="HP Bladeserver"/>

Figure 10: Select several contract matter values to create cost tables.

Vertragsbeginn: 21.11.2008
 Vertragsende: sonstiges
 Kündigungsfrist: 1 Monat
 Mindestvertragsdauer:
 Gewährleistungsfrist (in Monaten):
 Garantiefrist:

Vertragsende: 19.11.2010
 Kündigungsfrist A G:

COSTS
 Kosten:

Software			
Beschreibung	Summe	Bezahlung	Jahr
Lizenzen für MS Office 2003	20000	einmalig	2008
Lizenzen für MS Windows Server 2008	30000	einmalig	2009
Lizenzen für MS Windows XP	20000	einmalig	2010

Hardware			
Beschreibung	Summe	Bezahlung	Jahr
Desktop PCs Dell	12000	monatlich	2008
Server Dell	40000	einmalig	2009
Neue Festplatten für Server	200	monatlich	2010

Dienstleistung			
Beschreibung	Summe	Bezahlung	Jahr
Einrichtung Software und Hardware und Betreuung	4000	monatlich	2008
Betreuung der PC Umgebung	3000	monatlich	2009
Betreuung der PC Umgebung	3000	monatlich	2010

Figure 11: Edit the description, prices and payment fields in the cost tables.

Name

12

1234

Figure 12: Usage of the Quicksearch feature during the selection of contract numbers.

it!

7.3 Contract Numbers

In the contract number section you can enter the numbers of existing contracts or those that have not been registered in the system yet. This is useful if you want to associate the external contract with other contracts. You can use the quicksearch feature for entering the contract numbers (see figure 12).

However, it is also possible to enter numbers of contracts not registered in your sugar-crm installation (see figure 13).

7.4 PDF creation

Like in other modules (product catalog, offerings, contracts) you can create a pdf file from every external contract summarizing it into a printer-friendly version (see figure 14).

Figure 13: Enter the contract numberst of existing and not existing contracts.

Externer Vertrag

Bearbeiten Duplikat Löschen Duplikate finden Erzeuge PDF Änderungs-Log zeigen

Titel: ExternerVertrag1

Vertragsnummer A G: 1234 Vertragsnummer AN:

Contract Numbers:

Name
ABCDEF

DMS Nummer:

Figure 14: The create pdf button in the detail view of an external contract.

7.5 Export to CSV

You can export lists of external contracts to work with them in Excel. To do so you have to sort the contracts in SugarCRM by a criteria like accounts. In the CSV file you will see sums of the finalcosts for the contracts with a row for sub-totals after each group. If you sort by accounts the finalcosts of all contracts will be added to a subtotal foreach account. The sub-totals will be listed after the contracts.

The following steps are required to for the CSV export:

- Decide on which field you want to group the contracts and *sort the list by this field*. Please note that you can use the results of a search as a basis for your selection as well.
- Select the contracts from the list that should appear in the CSV export. Please note the shortcuts for selecting all contracts from the list.
- Click on Export. A CSV file will be generated that you can download and open with Excel or OpenOffice.org for example.

7.5.1 Setting up the CSV export

To be able to open the generated CSV files in Excel please go to the admin area in SugarCRM and do the following:

- Set the default export delimiter character to ;
- Set the default export character set to ISO-8859-15.

Perhaps you will need other settings for different office software or different client operating systems. Please note, that you can use OpenOffice.org to import the CSV files as well.

7.6 E-Mail notifications

With the e-mail notification feature, all employees that are in a certain role are informed about external contracts that will end in the next weeks (see figure ??). For each contract only one notification will be send.

A notification e-mail could look like the following:

Hello Ingo Jaeckel,

the following external contracts will run out soon:

On 30.06.2009 ends "Contract ABC", see link.

On 30.07.2009 ends "Contract 123", see link.

Best regards, SugarCRM :-)

7.6.1 Customization

You can easily customize the e-mail notification feature to your needs. Have a look on the `ChangeNotifier` class in the `include/oqc/common/ChangeNotifier.php` file. For sending e-mails an instance of the `ChangeNotifier` class is created and the `notifyUsersOfChange` method is called on it.

7.6.2 Configuration

Warning deadline For each external contract you can set the number of months before the contract enddate you should be notified of the ending of the contract. This number defaults to two months. But you can set in the edit view of the contract.

Role The name of the notification role can be configured as well. It defaults to `ExternalContractsNotification` and you can change it by setting the variable `notificationRole` in the configuration file `include/oqc/conf/documents.properties`.

Sender address Change the address of the sender by updating the variable `changeNotifierEmailAddress` in the configuration file.

Text template The text templates used in the email can be changed in the language files of the SugarCRM installation¹ or in the openqc installation zip file². The templates

¹See `custom/application/Ext/Language`.

²See `SugarModules/language/application`.

are stored in the variable `$app_list_strings["oqc"]["Email"]`. The meaning of the variables keys are discussed now:

- **subject**: The subject of the notification email.
- **hello**: The “hello” to the employee receiving the email.
- **greetings**: The greetings at the end of the email.
- **introduction**: The introduction sentence before the list of contracts that will end in the near future.
- **notificationLine**: The text that describes a single ending external contract. It contains the contract name, the enddate and a link to the contract in your SugarCRM installation.

Cronjob To automatically send the notification emails the file `oqc/notifyUsers.php` has to be executed periodically. This can be done as a Cronjob directly in SugarCRM or as a cronjob of a nonprivileged user on the SugarCRM webserver. We recommend the daily execution of the script.

8 PDF Generation

The generation of PDF documents is fundamentally composed of the following steps:

- Preprocess data originating from the webinterface using *PHP code*.
- Convert formatted HTML texts by running *html2tex*.
- Merge preprocessed and converted data into the static template by the use of *smarty*.
- Generate PDF document out of filled in template using *pdflatex*.
- Attach attachments to PDF document using *pdftk*.

If the generated PDF document is to be redesigned, essentially the static template, which consists of LaTeX and smarty code, has to be changed. New data has to be preprocessed in the PHP code and passed to smarty before processing the template.

8.1 Quotes and Contracts

Data-preprocessing PHP code is in `modules/oqc_Contract/oqc_CreatePdf.php`, which depends on `include/oqc/Pdf/Common.php`.

The static template, which consists of LaTeX and smarty code, is structured into the following parts under `include/oqc/Pdf/Contract/`:

Template frame (Contract.tpl): Definition of document properties, pdf informations and listing of parts.

Title page (Titlepage.tpl): Logos, contract data, addresses.

Contract arrangements (TextBlocksSkeleton.tpl): Text blocks.

Service tables (Services.tpl): Tables containing services.

8.2 Product Catalog

Data-preprocessing PHP code is in `modules/oqc_ProductCatalog/ProductCatalogPdfCreator.php`, which depends on `include/oqc/Pdf/Common.php`.

The static template, which consists of LaTeX and smarty code, is structured into the following parts under `include/oqc/Pdf/ProductCatalog/`:

Template frame (Contract.tpl): Definition of document properties, pdf informations, static text, formatting definitions and listing of parts.

Categories, service part (Categories.tpl): Description of categories and detailed descriptions of products.

Products, fee directory part (Products.tpl and ProductTables.tpl): Listing of categories and their products including price and unit.

References

- [1] The OpenQuotesAndContracts project, <http://www.sugarforge.org/projects/openqc/>
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