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| <b>Document:</b>    | <b>SQL Reports Manual</b>  |
| <b>Description:</b> | <b>Administration and User Guide for installing and using SQL Reports. A technical module for writing reports using native SQL</b> |
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|                         |                   |
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## Introduction

SQL Reports is a special kind of module for the Open Source version of vtiger from Libertus Solutions. It allows a user to create completely custom reports using native SQL (Structured Query Language) of vtiger's relational database. SQL Reports is available to use ONLY by vtiger administrators. If you know how the vtiger database is structured and are familiar with SQL then this tool can help you to extract information which is not possible to do using the standard Report module.

For example:

- *You want a Report where there are more than two related modules*
- *You want a Report where you need to collate data from records and data from related records and data from records that are related to related records*
- *You have custom modules which do not work well with the standard vtiger Report module*
- *You need a report which bypasses all user-level restrictions*
- *You need a report which includes deleted records*

## Important Information

***SQL Reports can be used to bypass ANY and ALL security constraints that apply to normal vtiger users. There is also a small possibility that you could damage or even destroy your database (although most SQL verbs which could cause harm are not permitted so this is extremely unlikely).***

***Please make sure you know what you are doing.***

## **Administration Guide**

This section is primarily intended for the administrators of the vtiger CRM system but other users might find the content interesting or useful.

### **Minimum Requirements**

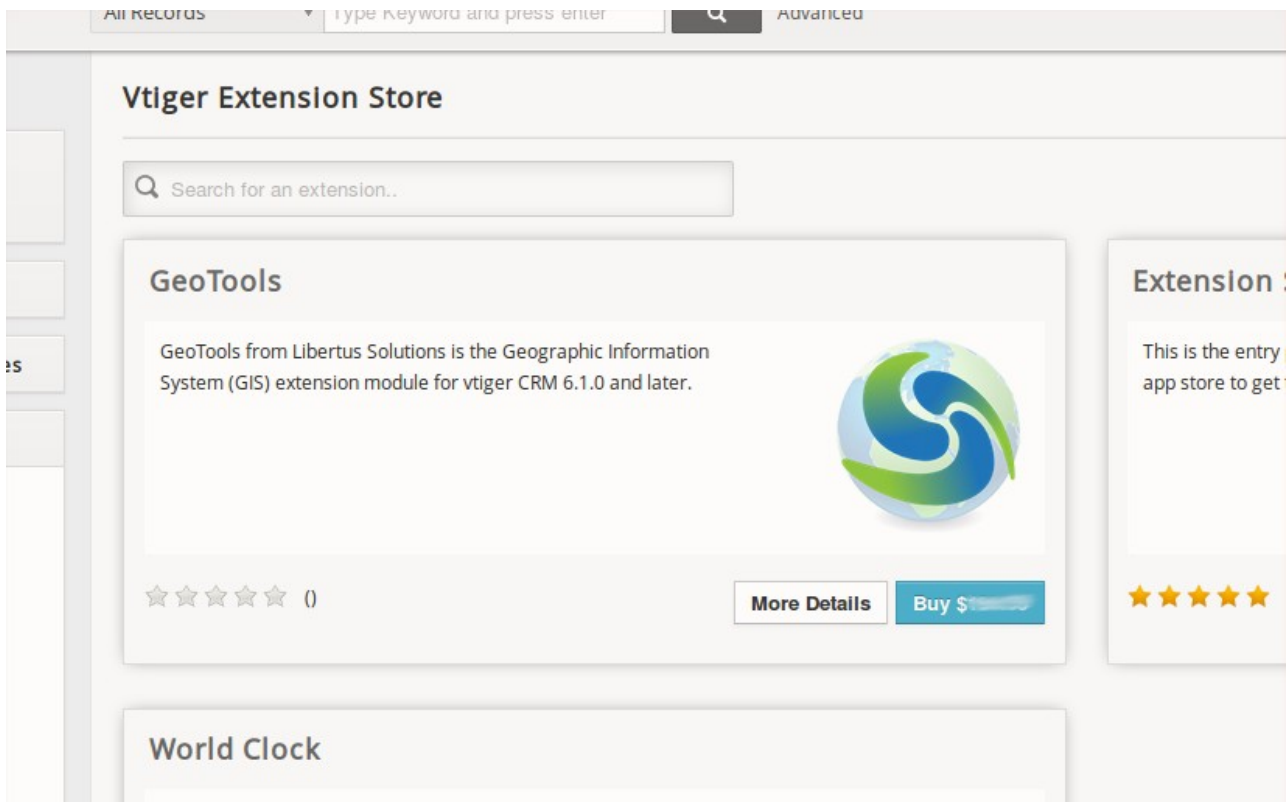
SQL Reports requires a properly installed vtiger 7 Open Source system from a minimum version of 7.2.0.

You should be familiar with SQL and the vtiger database schema to make use of this tool.

## SQL Reports installation

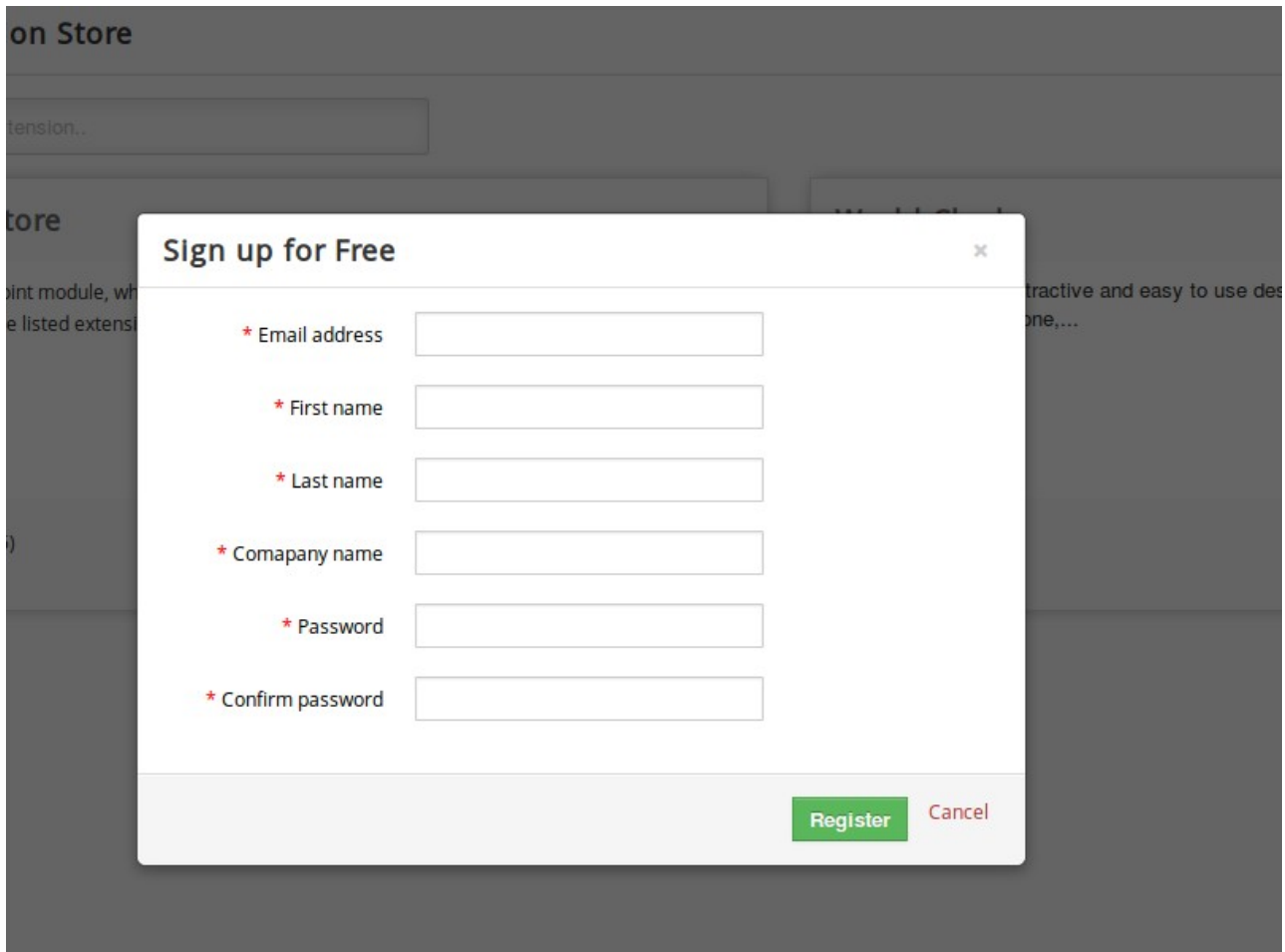
The SQL Reports module is installed via the **Extension Store** which is an application within vtiger itself. This ensures that the version of SQL reports installed has been approved and tested by the vtiger team. The Extension Store also informs the administrator when updates are available, and enables easy upgrading, for any installed modules.

To install SQL Reports navigate to the CRM Settings area and click the button on the left column called "Extension Store". This will display the various optional extension modules that are currently available in the vtiger Marketplace<sup>1</sup>. The extension modules in the Marketplace have been approved and tested by vtiger before being allowed to be installed by end users.



1 <https://marketplace.vtiger.com>

If this is the first time you have visited the Extension Store you will need to register a new user...

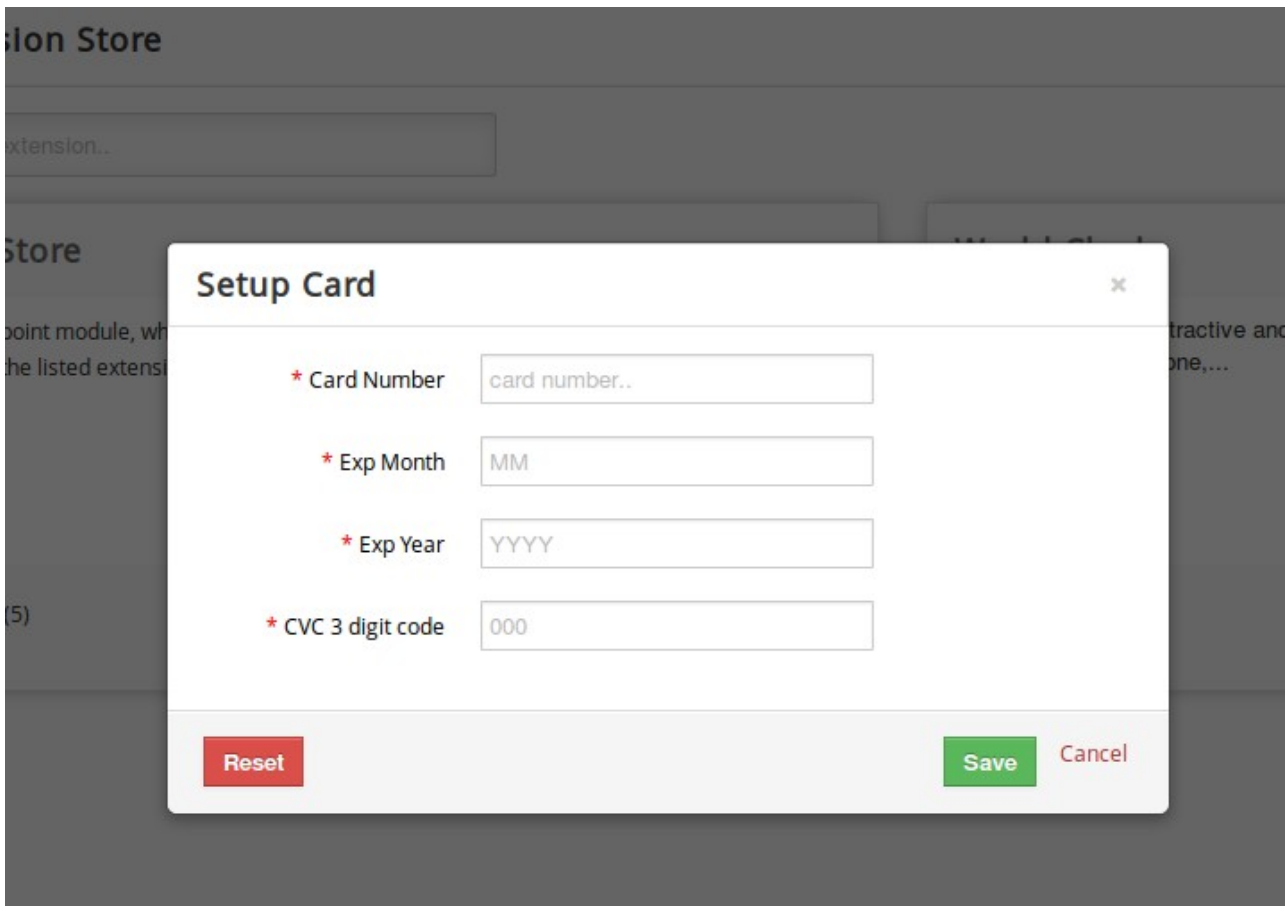


The image shows a screenshot of a web application interface. At the top left, the text "on Store" is visible. Below it, there is a search bar containing the text "tension..". The main content area is titled "Store" and contains several extension cards. A modal window titled "Sign up for Free" is overlaid on the page. The modal has a close button (X) in the top right corner. It contains the following fields, each with a red asterisk indicating it is required:

- \* Email address
- \* First name
- \* Last name
- \* Comapany name
- \* Password
- \* Confirm password

At the bottom right of the modal, there are two buttons: a green "Register" button and a red "Cancel" button.

and you may also need to supply a credit card to allow the purchase of any non-free extension modules.



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extension..

Store

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tractive and

one,...

(5)

### Setup Card

- \* Card Number
- \* Exp Month
- \* Exp Year
- \* CVC 3 digit code

**Reset** **Save** Cancel

Once you have provided the necessary information you can either browse or search for the SQL Reports module. Once found click on the “More Details” button to view more information about the module. If you wish to install SQL Reports you should pay the requested amount via your credit card and then you will be able to install the module simply by clicking on the green “Install” button.

## Configuration

Although there isn't really any module specific configuration to do, once installed, the administrator should familiarise themselves with the way SQL Reports is accessible to vtiger users, because it is rather different from other normal entity modules.

When SQL Reports is initially installed it is configured to be invisible to ALL users (it is disabled in every Profile – see the last module in the screenshot). The only users who can see or use the SQL Reports module at all are users who have the **Admin** checkbox checked in their Preferences.

| Modules              | View | Create | Edit | Delete | Field and Tool Privileges |
|----------------------|------|--------|------|--------|---------------------------|
| ✓ Dashboards         |      |        |      |        |                           |
| ✓ Opportunities      | ✓    | ✓      | ✓    | ✓      | ▼                         |
| ✓ Contacts           | ✓    | ✓      | ✓    | ✓      | ▼                         |
| ✓ Organizations      | ✓    | ✓      | ✓    | ✓      | ▼                         |
| ✓ Leads              | ✓    | ✓      | ✓    | ✓      | ▼                         |
| ✓ Documents          | ✓    | ✓      | ✓    | ✓      | ▼                         |
| ✓ Calendar           | ✓    | ✓      | ✓    | ✓      | ▼                         |
| ✓ Emails             |      |        |      |        | ▼                         |
| ✓ Tickets            | ✓    | ✓      | ✓    | ✓      | ▼                         |
| ✓ Reports            |      |        |      |        | ▼                         |
| ✓ Campaigns          | ✓    | ✓      | ✓    | ✓      | ▼                         |
| ✓ Mail Manager       |      |        |      |        |                           |
| ✓ Recycle Bin        |      |        |      |        |                           |
| ✓ Comments           | ✓    | ✓      | ✓    | ✓      | ▼                         |
| ✓ Project Milestones | ✓    | ✓      | ✓    | ✓      | ▼                         |
| ✓ Project Tasks      | ✓    | ✓      | ✓    | ✓      | ▼                         |
| ✓ Projects           | ✓    | ✓      | ✓    | ✓      | ▼                         |
| ✓ Assets             | ✓    | ✓      | ✓    | ✓      | ▼                         |
| ✓ Webforms           |      |        |      |        |                           |
| ✓ Email Templates    |      |        |      |        |                           |
| ✗ SQL Reports        | ✗    | ✗      | ✗    | ✗      | ▼                         |



In the Sharing rules page, SQL Reports is configured to be **Private**.

In a normal vtiger module this means that any existing record of that module can only be accessed by the user configured in the Assigned To field or users who are higher in the Role Hierarchy or to Admin users. With SQL Reports, Sharing only works between Admin users and even this is somewhat limited. Even other Admin users, to whom a SQL Report is NOT assigned, can only view; they can't edit or even run the Report.

Sharing Rules

| Module             | Public: Read Only     | Public: Read, Create/Edit | Public: Read, Create/Edit, Delete | Private                          | Advanced Sharing Rules |
|--------------------|-----------------------|---------------------------|-----------------------------------|----------------------------------|------------------------|
| Task               | <input type="radio"/> | <input type="radio"/>     | <input type="radio"/>             | <input checked="" type="radio"/> | ▼                      |
| Opportunities      | <input type="radio"/> | <input type="radio"/>     | <input checked="" type="radio"/>  | <input type="radio"/>            | ▼                      |
| Contacts           | <input type="radio"/> | <input type="radio"/>     | <input checked="" type="radio"/>  | <input type="radio"/>            | ▼                      |
| Organizations      | <input type="radio"/> | <input type="radio"/>     | <input checked="" type="radio"/>  | <input type="radio"/>            | ▼                      |
| Leads              | <input type="radio"/> | <input type="radio"/>     | <input checked="" type="radio"/>  | <input type="radio"/>            | ▼                      |
| Tickets            | <input type="radio"/> | <input type="radio"/>     | <input checked="" type="radio"/>  | <input type="radio"/>            | ▼                      |
| Campaigns          | <input type="radio"/> | <input type="radio"/>     | <input checked="" type="radio"/>  | <input type="radio"/>            | ▼                      |
| Documents          | <input type="radio"/> | <input type="radio"/>     | <input checked="" type="radio"/>  | <input type="radio"/>            | ▼                      |
| Comments           | <input type="radio"/> | <input type="radio"/>     | <input checked="" type="radio"/>  | <input type="radio"/>            | ▼                      |
| Project Milestones | <input type="radio"/> | <input type="radio"/>     | <input checked="" type="radio"/>  | <input type="radio"/>            | ▼                      |
| Project Tasks      | <input type="radio"/> | <input type="radio"/>     | <input checked="" type="radio"/>  | <input type="radio"/>            | ▼                      |
| Projects           | <input type="radio"/> | <input type="radio"/>     | <input checked="" type="radio"/>  | <input type="radio"/>            | ▼                      |
| Assets             | <input type="radio"/> | <input type="radio"/>     | <input checked="" type="radio"/>  | <input type="radio"/>            | ▼                      |
| Emails             | <input type="radio"/> | <input type="radio"/>     | <input checked="" type="radio"/>  | <input type="radio"/>            | ▼                      |
| SQL Reports        | <input type="radio"/> | <input type="radio"/>     | <input type="radio"/>             | <input checked="" type="radio"/> | ▼                      |

***In the initial release of SQL Reports these two access restrictions are hard-coded into the module itself and changing the Sharing Rules or the Profile settings will make no difference.***

Perhaps in a later release these strict access control restrictions may be relaxed a little, but initially because of the nature of the module we decided it was better to be safe.

So to be clear, a report record created in SQL Reports can only be edited, or run or export data by the user to which that Report is assigned, and that user **MUST** be an Admin user. (The Assigned To field in SQL Reports will **only** show active Admin users).

The List View page is only accessible as an Admin User.

## **SQL Reports Settings**

SQL Reports has no custom settings or special configuration requirements.

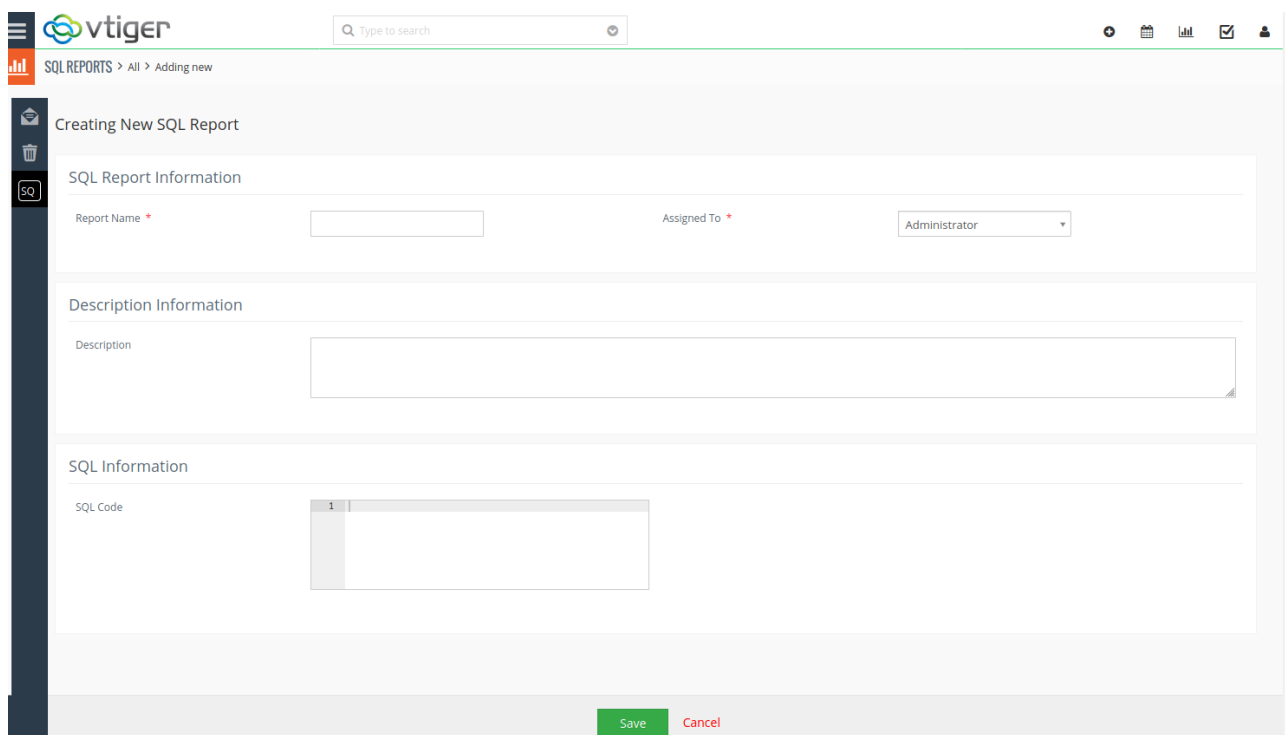
It supports standard vtiger tools to allow an administrator to add custom fields and the like.

## User Guide

### Using SQL Reports

Creating a new report in SQL Reports is very much like creating any other record in vtiger. From the Tools menu, choose SQL Reports to be taken to the List View. If there are no existing records you will be offered a choice to create or import records – just like with any other normal module. The only difference is that you must be an Admin user to even access the SQL Reports at all.

Creating a new SQL Report record is straightforward. Click the Add record button at the top right of the List View page and you will see an empty report screen.



The screenshot shows the 'Creating New SQL Report' form in the vtiger application. The form is titled 'Creating New SQL Report' and is divided into three sections: 'SQL Report Information', 'Description Information', and 'SQL Information'. The 'SQL Report Information' section contains a 'Report Name' field with an asterisk indicating it is mandatory, and an 'Assigned To' dropdown menu currently set to 'Administrator'. The 'Description Information' section contains a 'Description' field. The 'SQL Information' section contains an 'SQL Code' field. At the bottom of the form, there are 'Save' and 'Cancel' buttons.

The only mandatory fields are the Report Name and the Assigned To. There is a description field to allow you add some notes about the report and below that is another large editable field called "SQL Code".

This is where you enter the SQL to create your report. As you type, you may notice that this editable box has “syntax highlighting”. This makes it easier for you design, view, and edit your code. The box has line numbering on the left, a thin grey line at 80 characters and will grow to a maximum of 30 lines long on screen before a vertical scrollbar will appear. The Syntax highlighting is provided by the Open Source Ace code editor<sup>1</sup>

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## SQL Information

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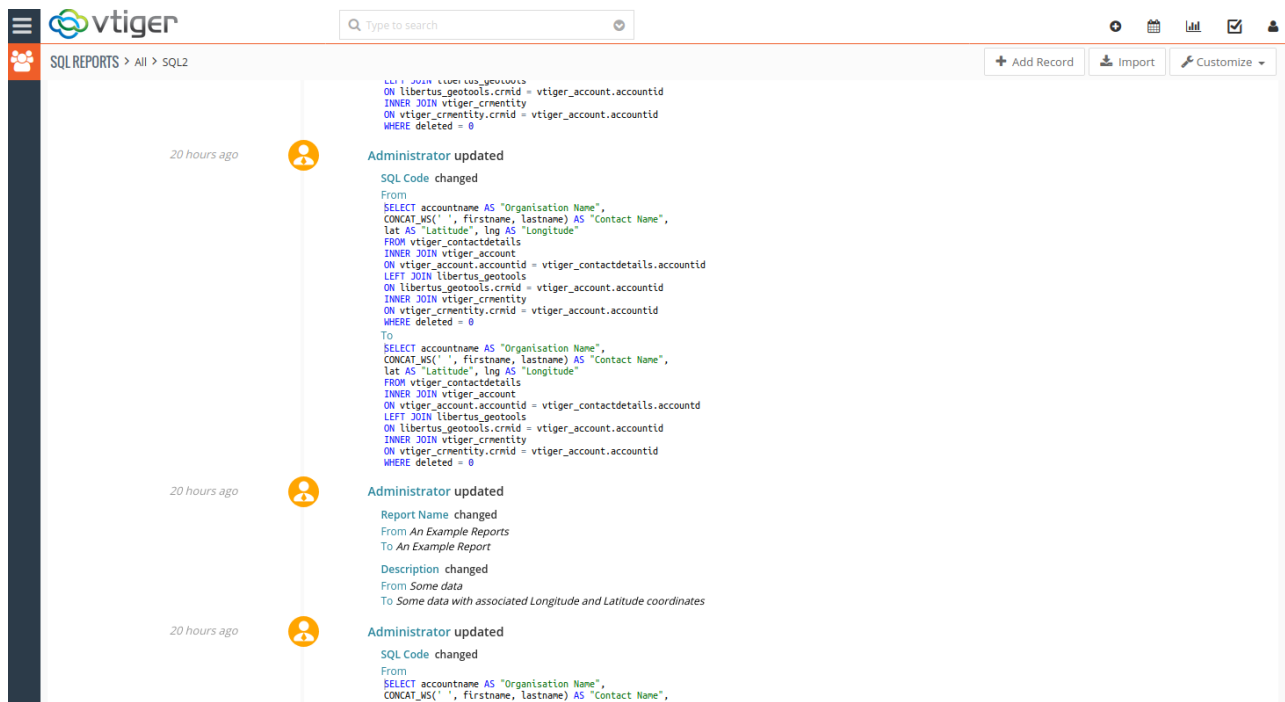
SQL Code

```
1 SELECT vtiger_account.*
2 FROM vtiger_crmentity
3 INNER JOIN vtiger_account
4 ON vtiger_account.accountid = vtiger_crmentity.crmid
5 WHERE deleted = 0
6 AND accountname LIKE 'B%'
```

When you save the Report, you will be taken to the Detail view where you can access three buttons that enable you to run the report and get an out put on-screen (as you would with a normal report), or export to Excel or CSV or to a plain browser tab page for easy printing.

1 <https://ace.c9.io/>

SQL Reports captures the history of changes made to each SQL Report record in the “Updates” tab. This tab displays any changes made to the SQL field using the syntax highlighter.



The screenshot shows the 'SQL REPORTS' section in the vtiger application. The interface includes a search bar, navigation tabs, and a list of updates. Each update entry shows the time since it was made (e.g., '20 hours ago'), a user icon, and the type of change (e.g., 'Administrator updated', 'SQL Code changed'). The SQL code is displayed in a syntax-highlighted format.

**Update 1:** Administrator updated  
SQL Code changed  
From  

```

SELECT accountname AS "Organisation Name",
CONCAT_WS(' ', firstname, lastname) AS "Contact Name",
lat AS "Latitude", lng AS "Longitude"
FROM vtiger_contactdetails
INNER JOIN vtiger_account
ON vtiger_account.accountid = vtiger_contactdetails.accountid
LEFT JOIN libertus_geotools
ON libertus_geotools.crmid = vtiger_account.accountid
INNER JOIN vtiger_crmentity
ON vtiger_crmentity.crmid = vtiger_account.accountid
WHERE deleted = 0

```

To  

```

SELECT accountname AS "Organisation Name",
CONCAT_WS(' ', firstname, lastname) AS "Contact Name",
lat AS "Latitude", lng AS "Longitude"
FROM vtiger_contactdetails
INNER JOIN vtiger_account
ON vtiger_account.accountid = vtiger_contactdetails.accountid
LEFT JOIN libertus_geotools
ON libertus_geotools.crmid = vtiger_account.accountid
INNER JOIN vtiger_crmentity
ON vtiger_crmentity.crmid = vtiger_account.accountid
WHERE deleted = 0

```

**Update 2:** Administrator updated  
Report Name changed  
From *An Example Reports*  
To *An Example Report*  
Description changed  
From *Some data*  
To *Some data with associated Longitude and Latitude coordinates*

**Update 3:** Administrator updated  
SQL Code changed  
From  

```

SELECT accountname AS "Organisation Name",
CONCAT_WS(' ', firstname, lastname) AS "Contact Name",

```

You can also add normal vtiger Comments to your report if required to help document changes etc.

## Creating a report using SQL

This manual is not intended to be an introduction into SQL or the schema of vtiger. This is purely an example to illustrate some of the benefits and features of SQL Reports.

### Requirement:

Extract Organisation name, Contact name (First and Last) along with the stored location coordinates of each Company from the GeoTools table in the database and export to a CSV. (Exporting GeoTools data is not possible using the standard vtiger Report module).

### Method:

Create a new SQL Report with a suitable name and a description if required.

#### SQL Report Information

Report Name \*

An Example Report

#### Description Information

Description

Some data with associated Longitude and Latitude coordinates

#### SQL Information

SQL Code

```
1 SELECT accountname AS "Organisation Name",
2 CONCAT_WS(' ', firstname, lastname) AS "Contact Name",
3 lat AS "Latitude", lng AS "Longitude"
4 FROM vtiger_contactdetails
5 INNER JOIN vtiger_account
6 ON vtiger_account.accountid = vtiger_contactdetails.accountid
7 LEFT JOIN libertus_geotools
8 ON libertus_geotools.crmid = vtiger_account.accountid
9 INNER JOIN vtiger_crmentity
10 ON vtiger_crmentity.crmid = vtiger_account.accountid
11 WHERE deleted = 0
```

Here's a closer look at the SQL code:

## SQL Information

SQL Code

```
1 SELECT accountname AS "Organisation Name",
2 CONCAT_WS(' ', firstname, lastname) AS "Contact Name",
3 lat AS "Latitude", lng AS "Longitude"
4 FROM vtiger_contactdetails
5 INNER JOIN vtiger_account
6 ON vtiger_account.accountid = vtiger_contactdetails.accountid
7 LEFT JOIN libertus_geotools
8 ON libertus_geotools.crmid = vtiger_account.accountid
9 INNER JOIN vtiger_crmentity
10 ON vtiger_crmentity.crmid = vtiger_account.accountid
11 WHERE deleted = 0
```

Notice how each column name in the table is being given a “proper name”, e.g.

```
SELECT accountname AS “Organisation Name”
```

When the report is run, each column in the data will be displayed with this proper name, rather than the internal name of the column in the database. This is not necessary but it helps to make the report output more readable.

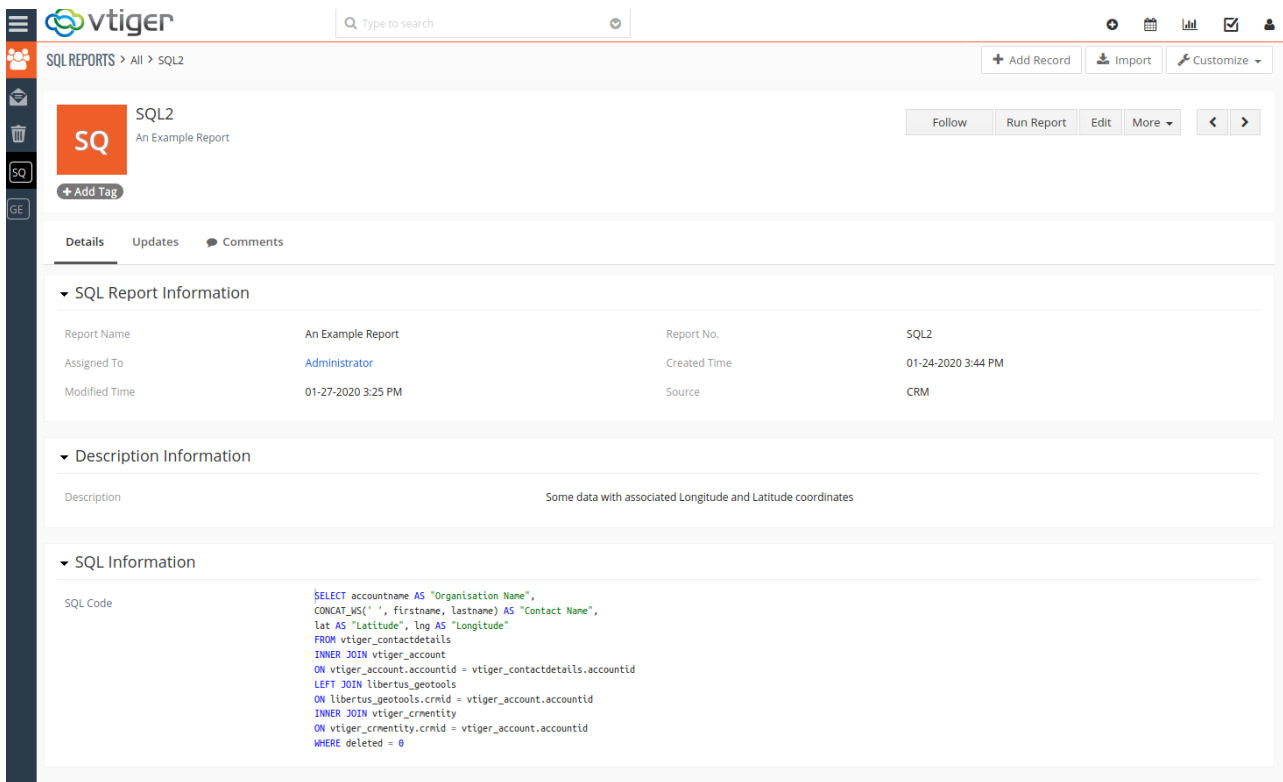
Also note the use of an MySQL function called CONCAT\_WS. This function concatenates values passed into it with a separator – which in this example is a space character. If a value is NULL then no separator is included making this a very useful function.

This query SELECTS data from the primary Contacts table, then joins the main Organisations table using the accountid column in each Contact (this is the internal id stored in the Organisation Name reference field of each Contact). This is an INNER JOIN, meaning that if a Contact has no value in its Organisation Name field, then it would not be included in the output of the query.

Then we join the libertus\_geotools table onto the Organisation table using a LEFT JOIN (so NULLS will be acceptable) and choose to display just the lng and lat columns but with more sensible names.

Finally we join the core vtiger\_crmentity table – which holds the metadata about all entity module records in vtiger – to the Organisation table and we filter out any Organisations which might be deleted. Deleted records still exist if they haven't been emptied from the Recycle Bin and in that case the deleted column in the crmentity table contains 1. When you restore from the Recycle Bin, the deleted column is set back to 0 indicating it is no longer deleted. When you empty records from the recycle bin they are permanently removed from the database and cease to exist.

Once we are happy with the query we can save it. We will then be taken to the Detail View page. Unlike other modules in vtiger, editing in Detail View is not permitted.



The screenshot shows the 'vtiger' interface for an SQL report. The breadcrumb trail is 'SQL REPORTS > All > SQL2'. The report title is 'SQL2' with the subtitle 'An Example Report'. There are buttons for '+ Add Record', 'Import', and 'Customize'. Below the title are buttons for 'Follow', 'Run Report', 'Edit', and 'More'. The report is categorized under 'Details', 'Updates', and 'Comments'. The 'SQL Report Information' section contains a table with the following data:

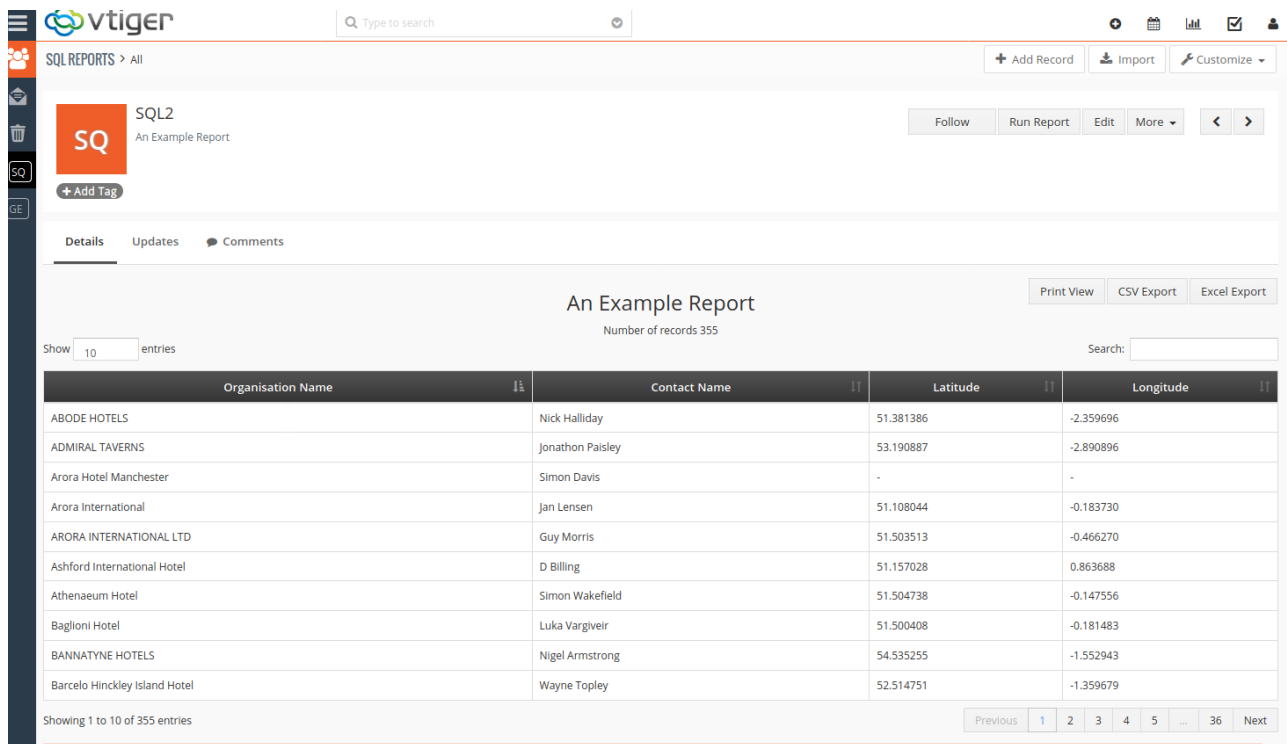
|               |                    |              |                    |
|---------------|--------------------|--------------|--------------------|
| Report Name   | An Example Report  | Report No.   | SQL2               |
| Assigned To   | Administrator      | Created Time | 01-24-2020 3:44 PM |
| Modified Time | 01-27-2020 3:25 PM | Source       | CRM                |

The 'Description Information' section shows a description: 'Some data with associated Longitude and Latitude coordinates'. The 'SQL Information' section displays the following SQL code:

```
SELECT accountname AS "Organisation Name",
CONCAT_WS(' ', firstname, lastname) AS "Contact Name",
lat AS "Latitude", lng AS "Longitude"
FROM vtiger_contactdetails
INNER JOIN vtiger_account
ON vtiger_account.accountid = vtiger_contactdetails.accountid
LEFT JOIN libertus_geotools
ON libertus_geotools.crmid = vtiger_account.accountid
INNER JOIN vtiger_crmentity
ON vtiger_crmentity.crmid = vtiger_account.accountid
WHERE deleted = 0
```

Toward the top right is a button called Run Report. If you click that you should see the resulting data from your SQL query:





The screenshot shows the vtiger SQL Reports interface. At the top, there's a search bar and navigation icons. Below that, the report title 'SQL2' and 'An Example Report' are displayed. There are buttons for 'Follow', 'Run Report', 'Edit', and 'More'. Below the title, there are tabs for 'Details', 'Updates', and 'Comments'. The main content area shows the report title 'An Example Report' and the number of records '355'. There are buttons for 'Print View', 'CSV Export', and 'Excel Export'. A search box is located to the right of the record count. Below the search box, there's a table with the following columns: Organisation Name, Contact Name, Latitude, and Longitude. The table contains 10 rows of data. At the bottom of the table, there's a pagination bar showing 'Showing 1 to 10 of 355 entries' and buttons for 'Previous', '1', '2', '3', '4', '5', '36', and 'Next'.

| Organisation Name             | Contact Name     | Latitude  | Longitude |
|-------------------------------|------------------|-----------|-----------|
| ABODE HOTELS                  | Nick Halliday    | 51.381386 | -2.359696 |
| ADMIRAL TAVERNS               | Jonathon Paisley | 53.190887 | -2.890896 |
| Arora Hotel Manchester        | Simon Davis      | -         | -         |
| Arora International           | Jan Lensen       | 51.108044 | -0.183730 |
| ARORA INTERNATIONAL LTD       | Guy Morris       | 51.503513 | -0.466270 |
| Ashford International Hotel   | D Billing        | 51.157028 | 0.863688  |
| Athenaeum Hotel               | Simon Wakefield  | 51.504738 | -0.147556 |
| Baglioni Hotel                | Luka Vargveir    | 51.500408 | -0.181483 |
| BANNATYNE HOTELS              | Nigel Armstrong  | 54.535255 | -1.552943 |
| Barcelo Hinckley Island Hotel | Wayne Topley     | 52.514751 | -1.359679 |

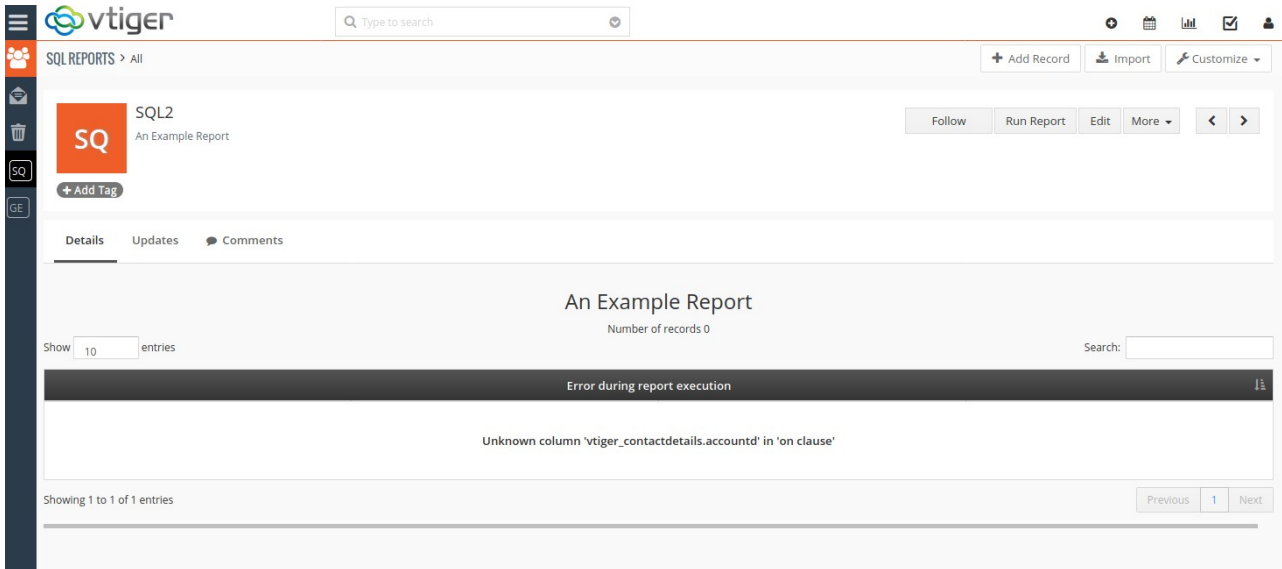
Note how the headings of the Columns in the result are using the proper names we assigned to them in the SQL rather than the internal column names in the database.

The tabular display in SQL Report uses DataTables<sup>1</sup> to format and display the results. It provides pagination, sorting on any column (just click the heading name) and extremely fast searching and filtering of the data.

Just above the DataTables search box which is on the right just above the table headings (Longitude in this example) There are three buttons that allow you print the data to plain web page for printing, and to export the data to either a CSV or Excel file.

1 <https://datatables.net/>

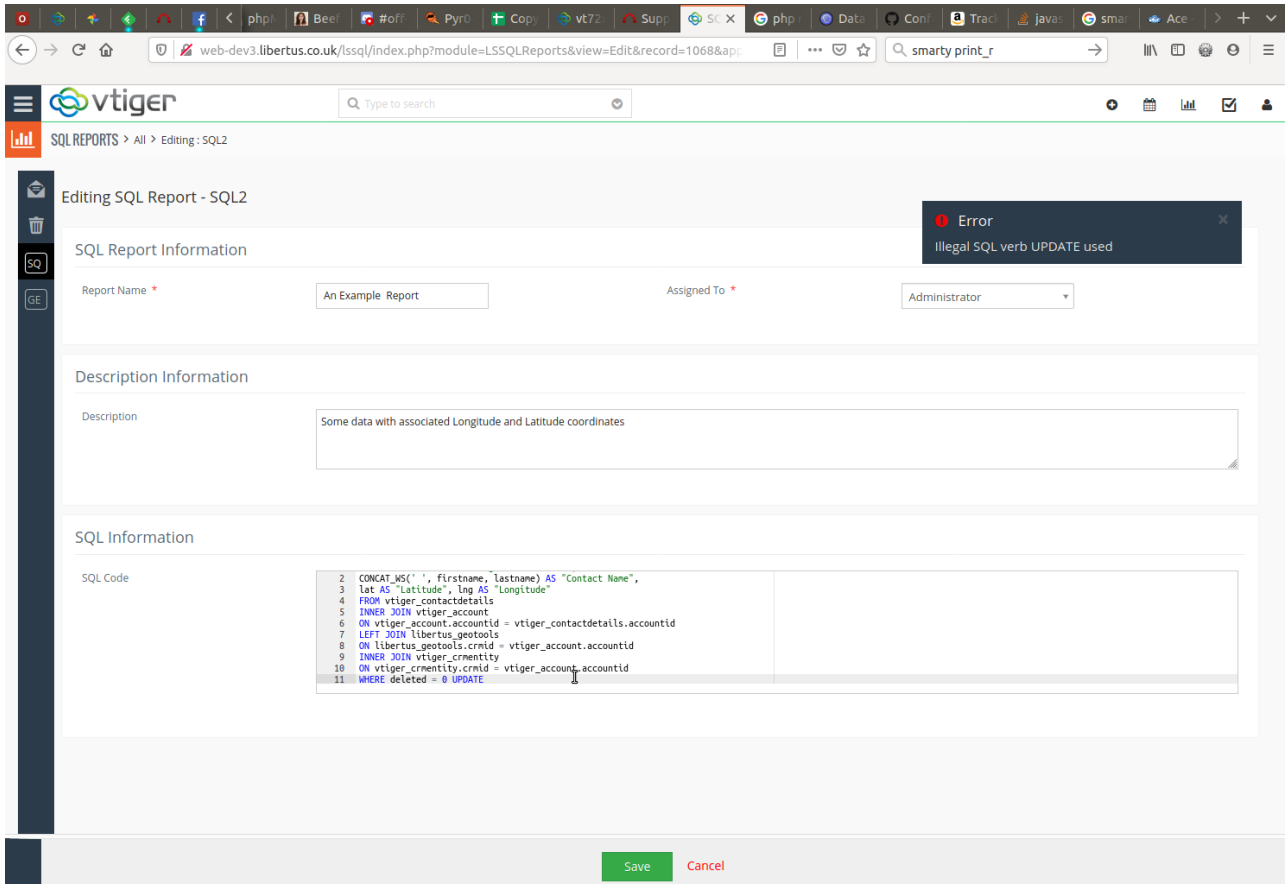
If you make a mistake in your SQL code which is not picked up by the Syntax Highlighter, perhaps you spell a column name wrong for example, the the error reported by the MySQL database will be displayed instead. Below you can see how this would be presented:



The screenshot shows the vtiger SQL Reports interface. The main content area displays an error message: "Error during report execution" followed by "Unknown column 'vtiger\_contactdetails.accountd' in 'on clause'". The interface includes a search bar, navigation buttons like "Add Record", "Import", and "Customize", and a sidebar with "SQL" and "GE" icons. The report title is "SQL2 An Example Report".

See above how the column name is spelled incorrectly.

Finally, there are several SQL verbs (commands) which could, if used incorrectly – destroy your database. The following commands are not permitted to be entered into the editor, and even if somehow one of these verbs managed to be entered, they are also checked during the save operation and will be removed and replaced by a message “--FORBIDDEN SQL--”



The screenshot shows the Vtiger SQL Reports editor interface. The page title is "Editing SQL Report - SQL2". The "SQL Report Information" section shows "Report Name" as "An Example Report" and "Assigned To" as "Administrator". The "Description Information" section has a description: "Some data with associated Longitude and Latitude coordinates". The "SQL Information" section contains the following SQL code:

```

2  CONCAT_WS(' ', firstname, lastname) AS 'Contact Name',
3  lat AS 'Latitude', lng AS 'Longitude'
4  FROM vtiger_contactdetails
5  INNER JOIN vtiger_account
6  ON vtiger_account.accountid = vtiger_contactdetails.accountid
7  LEFT JOIN libertus_geotools
8  ON libertus_geotools.crmid = vtiger_account.accountid
9  INNER JOIN vtiger_crmentity
10 ON vtiger_crmentity.crmid = vtiger_account.accountid
11 WHERE deleted = 0 UPDATE

```

An error message box is displayed in the top right corner, stating: "Error: Illegal SQL verb UPDATE used". At the bottom of the editor, there are "Save" and "Cancel" buttons.

The MySQL commands which cannot be entered in SQL Reports are:

INSERT  
UPDATE  
DELETE  
TRUNCATE  
CREATE  
DROP  
ALTER

SQL Reports is not sensitive to case.

## Information about SQL Reports

This release of SQL Reports was based on an original idea by AG Consulting (a-g-c), Andreas Goebel. Unfortunately it appears that AG Consulting is no longer active ([www.a-g-c.de](http://www.a-g-c.de)).

Libertus re-wrote their idea from scratch for vtiger version 7, introduced some new features and locked down the user access.

SQL Reports uses two excellent Open Source javascript libraries:

### **Ace**

Ace is an embeddable code editor written in JavaScript. More details can be found on the website: <https://ace.c9.io/>

### **DataTables**

DataTables is a plug-in for the jQuery Javascript library. It is a highly flexible tool, built upon the foundations of progressive enhancement: <https://datatables.net/>