Joomla! custom reports using "TinyButStrong"

A "get started" guide: Part 4 – Smarter tables

Summary

Joomla! Administrators familiar with the database and with SQL can use TinyButStrong (TBS) to present information from the database in web pages without needing to create a module or component. Part 1 of this series looked at simple tables and how to format data in the cells. Part 2 addressed security issues in principle and Part 3 demonstrated the principles with a practical example. This article looks at formatting the tables themselves rather than just the data within the cells.

Background

You have already used TBS to produce a report in record time but instead of being grateful to you, your customer/boss/partner/club committee complain that the layout is not what they want. Much as you would like to tell them what they should do with their complaint, you decide to press ahead with delivering yet another miracle.

This article assumes that you have already worked through parts 1 to 3 of this series.

Data source

The data for the report in this article is taken from the tables jos_content, jos_section and jos_categories in the Joomla! database. Columns used in the example are set out in the table below:

Column name	Sample content	Comment
id	1	primary key for this table
title	Welcome to Joomla!	
sectionid	1	key for jos_sections table; NULL if uncategorised
catid	1	key for jos_categories table; NULL if uncategorised
modified	2008-08-12 10:00:00	date and time last modified
hits	92	number of times article has been read
state	1	1: published; 0: unpublished; -1: archived; -2: deleted
access	0	0: public; 1: registered users; 2: "special"

Table 1: Columns used from jos_content

The columns from table jos_section used in the examples are set out in the table below:

Column name	Sample content	Comment
id	3	primary key for this table
title	FAQs	
published	1	1: published; 0: unpublished
access	0	0: public; 1: registered users; 2: "special"

Table 2: Columns used from jos_section

The jos_categories table is similar in structure:

Column name	Sample content	Comment
id	1	primary key for this table
title	Newsflash	
published	1	1: published; 0: unpublished
access	0	0: public; 1: registered users; 2: "special"

Table 3: Columns used from jos_categories

The "access", "state" and "published" columns contain information that determines if information should be displayed and if so, to whom it should be displayed.

As with the jos_content table, there are other columns that are not used in the examples.

Please note that the sample data has been modified as described in part 3 of this series and summarised in Appendix 2 of this document. If you want to try the examples yourself, you will need to make the changes described. Some of the articles shown in the examples will not appear in the sample data as they are part of this series!

Report 1 – subtitling a table

This report starts from the final report in article 1. The columns have been re-ordered and the "Hits" column has been added:

Article Information - smarter tables

This article is the fourth in a series demonstrating custom reporting from the Joomla! database using the "Tiny but Strong" (TBS) plugin. The data used for these reports is mainly in the table jos_content but the tables jos_sections and jos_categories will be used to demonstrate relational data retrieval. Please note that some changes have been made to the tables used. These are noted in part 3 of the series.

Example 1

This is the final report from the first article modified to put "Section" and "Category" in the first two columns of the table and adding the "Hits" column:

Section	Category	Article title	Date last changed	Hits
uncat.	uncat.	Example Pages and Menu Links	12th Aug 2008	44
uncat.	uncat.	Article Information	10th Feb 2011	42
uncat.	uncat.	Article Information - smarter tables	31st May 2011	69
uncat.	uncat.	TBS sub-blocks	21st Apr 2011	109
uncat.	uncat.	TBS security	31st May 2011	28
About Joomla!	The CMS	Content Layouts	12th Aug 2008	70
About Joomla!	The CMS	Extensions	11th Aug 2008	103
About Joomla!	The CMS	Joomla! Features	8th Aug 2008	59
About Joomla!	The CMS	Joomla! Overview	9th Aug 2008	151
About Joomla!	The CMS	What's New in 1.5?	11th Aug 2008	92
About Joomla!	The Community	The Joomla! Community	12th Aug 2008	52
About Joomla!	The Community	Joomla! Facts	9th Aug 2008	50
About Joomla!	The Project	Platforms and Open Standards	11th Aug 2008	11
About Joomla!	The Project	Joomla! License Guidelines	20th Aug 2008	100
About Joomla!	The Project	Support and Documentation	9th Aug 2008	6
FAQs	General	What are the requirements to run Joomla! 1.5?	11th Aug 2008	25
FAQs	General	How do I install Joomla! 1.5?	11th Aug 2008	5
FAQs	General	What is an Uncategorised Article?	11th Aug 2008	6
FAQs	General	Is it possible to change A Menu Item's Type?	10th Aug 2008	18
FAQs	General	Why does Joomla! 1.5 use UTF-8 encoding?	5th Aug 2008	29
FAQs	General	What is the FTP layer for?	6th Aug 2008	23
FAQs	General	Can Joomla! 1.5 operate with PHP Safe Mode On?	6th Aug 2008	8
FAQs	General	My MySQL database does not support UTF-8. Do I have a problem?	7th Aug 2008	9
FAQs	New to Joomla!	Is it useful to install the sample data?	11th Aug 2008	3
FAQs	New to Joomla!	How do I remove an Article?	11th Aug 2008	4
FAQs	New to Joomla!	What is the difference between Archiving and Trashing an Article?	11th Aug 2008	5
News	Latest	Welcome to Joomla!	12th Aug 2008	92
News	Latest	We are Volunteers	7th Jul 2007	54

Illustration 1: Simple TBS table with NULL replaced by "uncat."

The output shown above is just a re-arrangement of that shown in illustration 13 of article 1. Note that the PDF icon has been removed from the icon list at the top right as noted in article 1.

By using the TBS "headergrp" feature, it is possible to simplify the display of headers and make changes more obvious.

```
<td
colspan="2"><em>[tbs4b.section;block=tr;headergrp=section;ifempty=
uncat.]</em></td>
```

The "headergrp" parameter causes this block to be generated whenever the value of "section" changes. Normally the argument of "headergrp" will the subject of an "ORDER BY" clause in the associated SQL but this is not mandatory. The output from this is shown in Illustration 2.

Example 2

The report above is now modified using "headergrp=section" to subdivide the report where the value of "section" changes:

Section/Category	Article title	Date last changed	Hits
uncat.			
uncat.	Example Pages and Menu Links	12th Aug 2008	44
uncat.	Article Information	10th Feb 2011	42
uncat.	Article Information - smarter tables	31st May 2011	77
uncat.	TBS sub-blocks	21st Apr 2011	109
uncat.	TBS security	31st May 2011	28
About Joomla!			
The CMS	Content Layouts	12th Aug 2008	70
The CMS	Extensions	11th Aug 2008	103
The CMS	Joomla! Features	8th Aug 2008	59
The CMS	Joomla! Overview	9th Aug 2008	151
The CMS	What's New in 1.5?	11th Aug 2008	92
The Community	The Joomla! Community	12th Aug 2008	52
The Community	Joomla! Facts	9th Aug 2008	50
The Project	Platforms and Open Standards	11th Aug 2008	11
The Project	Joomla! License Guidelines	20th Aug 2008	100
The Project	Support and Documentation	9th Aug 2008	6
FAQs			
General	What are the requirements to run Joomla! 1.5?	11th Aug 2008	25
General	How do I install Joomla! 1.5?	11th Aug 2008	5
General	What is an Uncategorised Article?	11th Aug 2008	6
General	Is it possible to change A Menu Item's Type?	10th Aug 2008	18
General	Why does Joomla! 1.5 use UTF-8 encoding?	5th Aug 2008	29
General	What is the FTP layer for?	6th Aug 2008	23
General	Can Joomla! 1.5 operate with PHP Safe Mode On?	6th Aug 2008	8
General	My MySQL database does not support UTF-8. Do I have a problem?	7th Aug 2008	9
New to Joomla!	Is it useful to install the sample data?	11th Aug 2008	3
New to Joomla!	How do I remove an Article?	11th Aug 2008	4
New to Joomla!	What is the difference between Archiving and Trashing an Article?	11th Aug 2008	5
News			
Latest	Welcome to Joomla!	12th Aug 2008	92
Latest	We are Volunteers	7th Jul 2007	54

Illustration 2: Use of "headergrp" on the section field

In this example, it makes sense to highlight changes in category as well as section. This is quite possible as mutiple fields may be designated as "headergrp" fields. In Illustration 3 not only are both section and category treated as headers but the data rows are given alternating background colours for older readers hankering back to "pyjama paper". JCE users can easily give a row background colour by right-clicking in the row then following Row > Row properties > Advanced

and selecting a background colour.

Example 3

By using headergrp both for section and for category, the table can be made clearer

Section/Category		Article title	Date last changed	Hits
uncat.				
	uncat.			
		Example Pages and Menu Links	12th Aug 2008	44
		Article Information	10th Feb 2011	42
		Article Information - smarter tables	5th Jun 2011	85
		TBS sub-blocks	21st Apr 2011	109
		TBS security	31st May 2011	29
About Joomla!				
	The CMS			
		What's New in 1.5?	11th Aug 2008	92
		Content Layouts	12th Aug 2008	70
		Extensions	11th Aug 2008	103
		Joomla! Features	8th Aug 2008	59
		Joomla! Overview	9th Aug 2008	151
	The Community			
		Joomla! Facts	9th Aug 2008	50
		The Joomla! Community	12th Aug 2008	52
	The Project			
		Platforms and Open Standards	11th Aug 2008	11
		Joomla! License Guidelines	20th Aug 2008	100
		Support and Documentation	9th Aug 2008	6
FAQs				
	General			
		What are the requirements to run Joomla! 1.5?	11th Aug 2008	25
		How do I install Joomla! 1.5?	11th Aug 2008	5
		What is an Uncategorised Article?	11th Aug 2008	6
		Is it possible to change A Menu Item's Type?	10th Aug 2008	18
		Why does Joomla! 1.5 use UTF-8 encoding?	5th Aug 2008	29
		What is the FTP layer for?	6th Aug 2008	23
		Can Joomla! 1.5 operate with PHP Safe Mode On?	6th Aug 2008	8
		My MySQL database does not support UTF-8. Do I have a problem?	7th Aug 2008	9
	New to Joomla!			
		Is it useful to install the sample data?	11th Aug 2008	3
		How do I remove an Article?	11th Aug 2008	4
		What is the difference between Archiving and Trashing an Article?	11th Aug 2008	5
News				
	Latest			
		Welcome to Joomla!	12th Aug 2008	92

Illustration 3: Clarifying category breaks as well as section breaks

The TBS "footergrp" parameter works much the same but appears at the bottom of a section.

Report 2 - Summarising data

The reports presented above will generally be too detailed for more senior readers so the data may have to be summarised. To achieve this, an SQL statement of the form

```
GROUP BY sectionid, catid WITH ROLLUP
```

is needed. For further information on "WITH ROLLUP" in SQL, please search the internet. The SQL

```
SELECT sec.title AS section, cat.title AS category, sectionid,
catid, SUM(hits), AVG(hits), COUNT(*) AS articles FROM jos_content
AS content LEFT JOIN jos_sections AS sec ON sectionid = sec.id
LEFT JOIN jos_categories AS cat ON catid = cat.id WHERE
(sec.published=1 OR ISNULL(sec.published)) AND (cat.published=1 OR
ISNULL(cat.published)) AND content.state=1 AND (sec.access=0 OR
ISNULL(sec.access)) AND (cat.access=0 OR ISNULL(cat.access)) AND
content.access=0 GROUP BY sectionid, catid WITH ROLLUP
```

can be used to create a report such as shown in Illustration 4

Example 4

Summary data

Sectionid	Catid	Total Hits	Average hits	Articles
0	0	303	60.6	5
0	subtotal	303	60.6	5
1	1	174	34.8	5
1	3	11	2.2	5
1	subtotal	185	18.5	10
3	27	12	4.0	3
3	31	123	15.4	8
3	subtotal	135	12.3	11
4	25	117	39.0	3
4	29	475	95.0	5
4	30	102	51.0	2
4	subtotal	694	69.4	10
grandtotal	subtotal	1317	36.6	36

Illustration 4: Summarised data

Unfortunately, non-technical readers will not like numeric values for section and category. Meeting this requirement is not as straightforward as it might seem because in jos_content, NULL values for sectionid and catid mean "Uncategorised" but ROLLUP uses NULL to indicate totals. Another feature of SQL comes to our aid:

```
SELECT sec.title AS section, cat.title AS category,
(IFNULL(content.sectionid,-1)) AS newsec, (IFNULL(content.catid,-
1)) AS newcat, sectionid, catid, SUM(hits), AVG(hits), COUNT(*) AS
```

```
articles FROM jos_content AS content LEFT JOIN jos_sections AS sec
ON sectionid = sec.id LEFT JOIN jos_categories AS cat ON catid =
cat.id GROUP BY sectionid, catid WITH ROLLUP
```

so new fields newsec and newcat are created with the value -1 where sectionid and catid were originally NULL. These new values can then be used in the TBS template:

```
<td colspan="2"><strong>Grand total</strong></td>

         <td><strong>[tbs4e.SUM(hits);block=tr;when
[tbs4e.newsec] = -1]</strong></td>

         <td><strong>[tbs4e.AVG(hits);frm='0.0']</strong></td>

         <td>[tbs4e.articles]</td>
```

in which the Grand Total row is output only when tbs4e.newsec is -1. The newsec field is never displayed in the table, it is simply used to control the display of other information. The TBS "when" command is very useful for more advanced data presentations. It cannot, however, be used to test for NULL values, hence the SQL "IFNULL" to change a NULL value to -1. The result of this is shown in Illustration 5

Example 5

Summary data suitable for non-geeks

Section	Category	Total hits	Average hits	Articles
uncat.	uncat.	309	61.8	5
uncat.	*Section subtotal*	*309*	*61.8*	*5*
News	Latest	174	34.8	5
News	Newsflash	11	2.2	5
News	*Section subtotal*	*185*	*18.5*	*10*
FAQs	New to Joomla!	12	4.0	3
FAQs	General	123	15.4	8
FAQs	*Section subtotal*	*135*	*12.3*	*11*
About Joomla!	The Project	117	39.0	3
About Joomla!	The CMS	475	95.0	5
About Joomla!	The Community	102	51.0	2
About Joomla!	*Section subtotal*	*694*	*69.4*	*10*
Grand total		**1323**	**36.8**	**36**

End of custom report as at 2011-06-05 11:39

Illustration 5: Summarised table with non-geek information

This version combines summarisation with row colouring. A useful feature at the bottom is the date and time of the report. This is produced by the following HTML

```
<p>End of custom report as at [onshow..now; frm='yyyy-mm-dd
hh:nn']</p>
```

and could be handy if you expect the report to be printed.

Conclusions

Joomla! administrators can produce custom reports using TBS that don't just present the information – they can present it helpfully. Even if you are very familiar with PHP, SQL and HTML, it is highly likely that a TBS based approach will save you time and make amending the report an easier job.

Acknowledgement

Thanks to skrol29 for his work in developing TBS.

CheshireCat

31 May 2011

Appendix 1

As before, the scripts can be copied into a script folder while the HTML can be copied into a Joomla! article so that you can try them for yourself. Changes to the database mentioned in the HTML are documented in Appendix 2.

Example 1 – subtitling tables

Version 1

Script

This script is the same as that used for the final example in article 3, except for the change in mergeblock name.

```php
<?php

$TBS->MergeBlock('tbs4a','mysql','SELECT content.title, hits,
modified, sec.title AS section, cat.title AS category FROM
jos_content AS content LEFT JOIN jos_sections AS sec ON sectionid
= sec.id LEFT JOIN jos_categories AS cat ON catid = cat.id WHERE
(sec.published=1 OR ISNULL(sec.published)) AND (cat.published=1 OR
ISNULL(cat.published)) AND content.state=1 AND (sec.access=0 OR
ISNULL(sec.access)) AND (cat.access=0 OR ISNULL(cat.access)) AND
content.access=0 ORDER BY section, category LIMIT 0 , 90');

?>
```

HTML

As in article 1, ifempty=uncat. has been used to replace NULL by "uncat." in the output of the table.

```
<p>This article is the fourth in a series demonstrating custom
reporting from the Joomla! database using the "TinyButStrong"
(TBS) plugin. The data used for these reports is mainly in the
table jos_content but the tables jos_sections and jos_categories
will be used to demonstrate relational data retrieval. Please note
that some changes have been made to the tables used. These are
noted in part 3 of the series.</p>
<p> </p>
<p>{tbs} script=tbs4a.php{/tbs}</p>
<p>Example 1</p>
<p>This is the final report from the first article modified to put
"Section" and "Category" in the first two columns of the table and
adding the "Hits" column:</p>
<p> </p>
<table border="1">
    <tbody>
        <tr>
            <td><strong>Section<br /></strong></td>
            <td><strong>Category <br /></strong></td>
```

```
            <td><strong>Article title</strong></td>
            <td><strong>Date last changed</strong></td>
            <td><strong>Hits</strong></td>
        </tr>
        <tr>
            <td>[tbs4a.section;ifempty=uncat.]</td>
            <td>[tbs4a.category;ifempty=uncat.]</td>
            <td>[tbs4a.title;block=tr]</td>
            <td>[tbs4a.modified;frm=dxx mmm yyyy]</td>
            <td>[tbs4a.hits]</td>
        </tr>
    </tbody>
</table>
```

Version 2

Script

The script is unchanged from example 1, except for the mergeblock name.

```
<?php

$TBS->MergeBlock('tbs4b','mysql','SELECT content.title, hits,
modified, sec.title AS section, cat.title AS category FROM
jos_content AS content LEFT JOIN jos_sections AS sec ON sectionid
= sec.id LEFT JOIN jos_categories AS cat ON catid = cat.id WHERE
(sec.published=1 OR ISNULL(sec.published)) AND (cat.published=1 OR
ISNULL(cat.published)) AND content.state=1 AND (sec.access=0 OR
ISNULL(sec.access)) AND (cat.access=0 OR ISNULL(cat.access)) AND
content.access=0 ORDER BY section, category LIMIT 0 , 90');

?>
```

HTML

Here "headergrp" has been used to alter the rows in which the value of "section" changes.

```
<p>Example 2</p>
<p>The report above is now modified using "headergrp=section" to
subdivide the report where the value of "section" changes:</p>
<p>{tbs} script=tbs4b.php{/tbs}</p>
<table border="1">
    <tbody>
        <tr>
            <td colspan="2"><strong>Section/Category</strong></td>
            <td><strong>Article title</strong></td>
            <td><strong>Date last changed</strong></td>
            <td><strong>Hits</strong></td>
        </tr>
        <tr>
            <td
colspan="2"><em>[tbs4b.section;block=tr;headergrp=section;ifempty=
uncat.]</em></td>
```

```
            <td><br /></td>
            <td><br /></td>
        </tr>
        <tr>
            <td>  </td>
            <td>[tbs4b.category;block=tr;ifempty=uncat.]</td>
            <td>[tbs4b.title]</td>
            <td>[tbs4b.modified;frm=dxx mmm yyyy]</td>
            <td>[tbs4b.hits]</td>
        </tr>
    </tbody>
</table>
```

Version 3

Script

Yet again, the only change is the mergeblock name.

```
<?php
```

```
$TBS->MergeBlock('tbs4c','mysql','SELECT content.title, hits,
modified, sec.title AS section, cat.title AS category FROM
jos_content AS content LEFT JOIN jos_sections AS sec ON sectionid
= sec.id LEFT JOIN jos_categories AS cat ON catid = cat.id WHERE
(sec.published=1 OR ISNULL(sec.published)) AND (cat.published=1 OR
ISNULL(cat.published)) AND content.state=1 AND (sec.access=0 OR
ISNULL(sec.access)) AND (cat.access=0 OR ISNULL(cat.access)) AND
content.access=0 ORDER BY section, category LIMIT 0 , 90');
```

```
?>
```

HTML

Now there are separate rows for changes in section and in category. Fuller use is made of "colspan" to emphasise the headings. There are two rows for the normal data, the first of which has a background colour set. These two rows are used alternately, thus giving a stripy effect that can make it easier to follow the rows.

```
<p>Example 3</p>
<p>By using headergrp both for section and for category, the table
can be made clearer</p>
<p>{tbs} script=tbs4c.php{/tbs}</p>
<table border="1">
    <tbody>
        <tr>
            <td colspan="2"><strong>Section/Category</strong></td>
            <td><strong>Article title</strong></td>
            <td><strong>Date last changed</strong></td>
            <td><strong>Hits</strong></td>
        </tr>
        <tr>
```

```
            <td
colspan="5"><strong>[tbs4c.section;block=tr;headergrp=section;ifem
pty=uncat.]</strong><strong> </strong><strong> </strong>
</td>
        </tr>
        <tr>
            <td> </td>
            <td
colspan="4"><em>[tbs4c.category;block=tr;headergrp=category;ifempt
y=uncat.]</em><em> </em><em> </em></td>
        </tr>
        <tr style="background-color: #b0e0e6;">
            <td> </td>
            <td> </td>
            <td>[tbs4c.title;block=tr]</td>
            <td>[tbs4c.modified;frm=dxx mmm yyyy]</td>
            <td>[tbs4c.hits]</td>
        </tr>
        <tr>
            <td> </td>
            <td> </td>
            <td>[tbs4c.title;block=tr]</td>
            <td>[tbs4c.modified;frm=dxx mmm yyyy]</td>
            <td>[tbs4c.hits]</td>
        </tr>
    </tbody>
</table>
```

Example 2 – summarising data

Version 1

Script

This script uses the ROLLUP feature of SQL to create summary rows. The SUM, AVG and COUNT functions are used as might be expected. The "LIMIT 0,90" clause has been removed as it is inappropriate when summarising a full table.

```
<?php

$TBS->MergeBlock('tbs4d','mysql','SELECT sec.title AS section,
cat.title AS category, sectionid, catid, SUM(hits), AVG(hits),
COUNT(*) AS articles FROM jos_content AS content LEFT JOIN
jos_sections AS sec ON sectionid = sec.id LEFT JOIN jos_categories
AS cat ON catid = cat.id WHERE (sec.published=1 OR
ISNULL(sec.published)) AND (cat.published=1 OR
ISNULL(cat.published)) AND content.state=1 AND (sec.access=0 OR
ISNULL(sec.access)) AND (cat.access=0 OR ISNULL(cat.access)) AND
content.access=0 GROUP BY sectionid, catid WITH ROLLUP');

?>
```

HTML

The SUM and AVG functions may be referenced directly in the TBS template.

```
<p>Example 4</p>
<p>Summary data</p>
<p>{tbs} script=tbs4d.php{/tbs}</p>
<table border="1">
    <tbody>
        <tr>
            <td><strong>Sectionid</strong></td>
            <td><strong>Catid</strong></td>
            <td><strong>Total Hits</strong></td>
            <td><strong>Average hits</strong></td>
            <td><strong>Articles</strong></td>
        </tr>
        <tr>
            <td>[tbs4d.sectionid;block=tr;ifempty=grandtotal]</td>
            <td>[tbs4d.catid;ifempty=subtotal]</td>
            <td>[tbs4d.SUM(hits)]</td>
            <td>[tbs4d.AVG(hits);frm='0.0']</td>
            <td>[tbs4d.articles]</td>
        </tr>
    </tbody>
</table>
```

Version 2

Script

The SQL code sets newsec and newcat to -1 if sectionid and catid respectively are NULL. They will be set to NULL by the ROLLUP operator for sub-total and grand-total rows. Neither sectionid nor catid can be -1 as they are defined in the database as unsigned.

```
<?php

$TBS->MergeBlock('tbs4e','mysql','SELECT sec.title AS section,
cat.title AS category, (IFNULL(content.sectionid,-1)) AS newsec,
(IFNULL(content.catid,-1)) AS newcat, sectionid, catid, SUM(hits),
AVG(hits), COUNT(*) AS articles FROM jos_content AS content LEFT
JOIN jos_sections AS sec ON sectionid = sec.id LEFT JOIN
jos_categories AS cat ON catid = cat.id WHERE (sec.published=1 OR
ISNULL(sec.published)) AND (cat.published=1 OR
ISNULL(cat.published)) AND content.state=1 AND (sec.access=0 OR
ISNULL(sec.access)) AND (cat.access=0 OR ISNULL(cat.access)) AND
content.access=0 GROUP BY sectionid, catid WITH ROLLUP');

?>
```

HTML

The TBS "when" operator identifies sub-total and Grand total rows. The final line uses the "onshow" operator to display the current time and date.

```
<p>Example 5</p>
<p>Summary data suitable for non-geeks</p>
<p>{tbs} script=tbs4e.php{/tbs}</p>
<table border="1">
    <tbody>
        <tr>
            <td><strong>Section</strong></td>
            <td><strong>Category</strong></td>
            <td><strong>Total hits</strong></td>
            <td><strong>Average hits</strong></td>
            <td><strong>Articles</strong></td>
        </tr>
        <tr style="background-color: #00bfff;">
            <td colspan="2"><strong>Grand total</strong></td>
            <td><strong>[tbs4e.SUM(hits);block=tr;when
[tbs4e.newsec] = -1]</strong></td>
            <td><strong>[tbs4e.AVG(hits);frm='0.0']</strong></td>
            <td>[tbs4e.articles]</td>
        </tr>
        <tr style="background-color: #afeeee;">
            <td><em>[tbs4e.section;block=tr;ifempty=uncat.;when
[tbs4e.newcat] = -1]</em></td>
            <td><em>Section subtotal</em></td>
            <td><em>[tbs4e.SUM(hits)]</em></td>
            <td><em>[tbs4e.AVG(hits);frm='0.0']</em></td>
            <td>[tbs4e.articles]</td>
        </tr>
        <tr>

  <td>[tbs4e.section;block=tr;ifempty=uncat.;default]</td>
            <td>[tbs4e.category;ifempty=uncat.]</td>
            <td>[tbs4e.SUM(hits)]</td>
            <td>[tbs4e.AVG(hits);frm='0.0']</td>
            <td>[tbs4e.articles]</td>
        </tr>
    </tbody>
</table>
<p> </p>
<p>End of custom report as at [onshow..now; frm='yyyy-mm-dd
hh:nn']</p>
```

Appendix 2

Summary of changes to sample data

These are documented in the third part of this series. As a quick recap:

1. Three new articles have been added in the "New to Joomla!" category of the "FAQs" section. The article entitled "Special access" has access set to "Special". The articles "Reg only 1" and "Reg only 2" have access set to "Registered".

2. A copy of the article "TBS sub-blocks" was put into the "New to Joomla!" category of the "FAQs" section and then deleted.

3. The category "Current users" in the "FAQs" section has had access set to "Registered".

4. The category "Languages" in the "FAQs" section has had access set to "Special".

5. Some new uncategorised articles have been created as part of the process of writing this series of articles.