

Oasys Report Builder Guide

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1 TEST AND SURVEY CHARTING OVERVIEW

1.1 FEATURE DESCRIPTION

In addition to the ability to download scoring results and raw response data, Oasys now has the ability to render survey and test results graphically in an assortment of plot types. Additionally, a variety of descriptive statistical data are now calculated, presented, and available for download.

2 REPORT BUILDER MODULE

2.1 GENERAL INFORMATION

From the Test Results editor, the “Report Builder” button will launch the chart reporting module which contains numerous options for graphical report building. From this initial interface, you will be presented with the two primary plot types: single, and multi.

2.2 SINGLE ITEM PLOTTING

Single plot types only use the data from a single survey or test question, and allow the data to be plotted in a variety of common types (histogram, violin plot, pie chart, box and whisker plot, and an optional standard deviation line as an overlay). Some of these chart types contain sub-options which are shown when selected. Additionally, “open question” items which do not contain chartable data can be included in the report.

2.3 MULTI-ITEM PLOTTING

Multiplot plot types have the ability to present data from multiple items for the purpose of direct comparison and analysis. This special plot building feature is primarily aimed at survey result items which use the same scale (i.e., a series of questions on a LIKERT scale). Any number of test/survey items are selectable for the group plot, and can be ordered in any possible combination. The 3 varieties of plots available in this mode are histogram (with standard deviation line), profile line, and horizontal bar chart.

2.4 MISCELLANEOUS FEATURES

Other options include downloading of the test/survey’s descriptive statistics, customizable text blocks, page break insertion, repositioning report blocks, saving/loading of reports, and PDF output; these options are covered in detail further below.

3 SINGLE CHART PLOTTING

3.1 MAIN PLOT TYPE OVERVIEW

The primary plot types available in single plotting mode are histogram, pie chart, violin chart, and box and whisker chart. All of these primary types can be overlaid on top of one another, except for the pie chart option. Once a single plot is added to the report layout, it can be updated and modified by clicking on its entry in the “REPORT CONFIGURATION” section on the left-hand panel from the main report builder view.

(See Figure 1 Single Plot Options Screen)

3.2 NOMINAL DATA OVERRIDE

It should be noted that the charting system will attempt to force numerical value to all item data. An example would be a survey question which states “I am happy with this course”, and the responses setup categorically as “strongly disagree”, “disagree”, “agree”, and “strongly agree”. Although these responses do not inherently contain numerical values, the charting logic will apply integer values 1 through 4 across the responses. In this way, categorically ordered responses *can* be numerically analyzed as if they were natively quantitative. *This forced numerical application on the data can be disabled by clicking the “nominal mode” toggle option in the chart configuration dialog.* With the “nominal mode” option is enabled, a number of other chart configuration options are disabled, since those would only apply to quantitative data.

3.3 HISTOGRAM PLOT

The histogram plot type displays response data with each bar representing a percentage of the total response values. Various configuration options are present, depending on the type of data being analyzed. Native quantitative response items contain the most configurability, whereas numerically assigned category data will contain fewer configurable options. The sub-options for the histogram plot type are as follows:

- **Histogram Point Labels Option**

This option will show the percentage value of each histogram bar, and when applicable, the bin range of each bar.

- **Show 0 on X-Axis Option**

Depending on the type and range of the data being plotted, the 0 on the X-Axis may not be automatically visible. This option ensures that 0 on the X-Axis is visible on the initial plot creation.

- **Override auto bin size Option**

When charting questions with a high variation of responses, the charting system may automatically group ranges of responses together for readability. An example would be a demographics question with a large variation of responses ranging from 20 to 80. The automatic grouping may select a bin size (grouping range) of 5 or 10. This automatic bin size selection may be overridden with a value of the operator’s choice. This option is available to any natively quantitative dataset.

(See Figure 3 Histogram Sub-options)

3.4 SD LINE (STANDARD DEVIATION LINE)

The standard deviation line is most commonly used as an overlay on a histogram in order to visually demonstrate the range of 1 standard deviation, along with the calculated median and average values. It is, however, not mandatory to overlay on top of another chart. Available charts to combine this option with are histogram, violin, or box and whisker.

(See Figure 4 Standard Deviation Line)

3.5 PIE CHART

The pie chart will render all data as a percentage of a “pie” graph. The largest portion of responses start at the top-right of the chart, and continue counter-clockwise in descending order of percentage. Colors are auto-assigned and may not currently be modified.

- **Label Layout**

This option allows the override of the label positioning for the response value and percentage labels. By default, the “auto” mode is selected, and inside/outside positioning is determined for each label automatically based on total number of elements, and visual “best fit”. The auto-selection may of course be overridden by selecting a specific option.

The “**Percent with Legend**” option was specifically implemented for cases wherein there is a large number of unique responses recorded, and a pie chart is the desired plot type (although this type of chart is not recommended in these cases). This option moves the actual values into a color-coded legend, while leaving the percent values inside the pie chart. In this mode, specific response values may be removed from the pie chart by clicking on value in the legend area.

(See Figure 5 Pie Chart Positioning)

3.6 BOX AND WHISKER PLOT

The box and whisker chart allows for a quick visual analysis of the main distribution points of data, along with suspected outliers. The only option contained with this plot type is the ability to hide outliers. The box and whisker plot is a standard formulation showing the upper hinge and whisker, lower hinge and whisker, mean, and median markers (dashed and solid horizontal lines, respectively.)

(See Figure 6 Box and Whisker Plot)

3.7 VIOLIN PLOT

The violin plot is used in visually analyzing the distribution frequency of data by way of density curves. The mean line is shown within the plot, and there are no configurable options for this plot type. This type of chart can be useful in comparing equally scaled survey data against each other to demonstrate the density distribution of responses.

(See Figure 7 Violin Plot)

3.8 INVERT X-AXIS OPTION

This option is primarily intended for “forced” or “converted” nominal data which have been assigned numerical values. In our example of a survey in section 3.2 “Nominal Data Override”, we have our nominal responses “strongly disagree” to “strongly agree” assigned values 1 through 4. There may be a scenario however where the survey was incorrectly designed to have “strongly agree” to “strongly disagree” being assigned values 1 through 4 which requires reversal of the ordered direction to match other the question items’ layouts. The enabling of the “Reverse X-Axis” option for the errant question will flip the direction of the response values to correctly match the intended layout.

3.9 OPEN QUESTION OPTION

This option is specifically for “open question” or “open text” item responses which do not contain any statistically analyzable data. The responses are directly inserted into the report layout as a single block of text, and it does not contain any configurable options. The Oasys charting logic attempts to automatically detect which question items are open text, and when successful, prevents the selection of any other option. If the automated detection fails, the option is still available for the operator to manually select.

4 MULTIPLE CHART PLOTTING

The multiplot charting section allows for direct comparison of different series’s data against each other. There are 3 chart types available: histogram, profile line, and horizontal bar (essentially, a histogram rotated 90°). Only questions/results that contain identical scales should be compared against each other in this mode, otherwise the resultant plots will not be useful in any meaningful way. Survey questions with LIKERT type scales are the primary target of this submodule.

It is important to note that the ordering of the series is based on the order in which they are clicked. In this way, the series’ data can be arranged in any desired position. The “item ordering” label at the bottom of the dialog will always show the order in which the data series were selected.

It should be noted that question types which do not contain analyzable data are automatically excluded from being selectable (e.g., “open question” type items).

Any multiplot chart generated by this submodule are grouped into one singular “report block” entry in the report configuration area on the left side of the main report builder screen. Once a multiplot is added to the report layout, it can be updated and modified by clicking on its entry in the “REPORT CONFIGURATION” section.

(See Figure 2 Multiplot Options Screen)

4.1 SERIES IS NOMINAL DATA

As with the single plot option, this toggle option reverts the forced numerical value assignment to nominal data. Activating this option removes the histogram and profile line plot type selections, since those plot types specifically rely on numerical calculability, which this option removes. Only the horizontal bar option will remain when this option is active.

4.2 HISTOGRAM WITH SD LINE

The histogram with SD line is the initial default option for multiplot charting. Although the same chart output can be achieved by individually selecting question items through the single plot builder, this method offers a quick and efficient way to select and compare 2 or more series' data. Histograms are stacked one on top of the other in the order selected.

As is available in the single plot dialog, all selected series items have a "Invert X-Axis" option to correct any reversed axes that may require it.

(See Figure 8 Multiplot with SD Line)

4.3 PROFILE LINE

The profile line plot is a special customized chart type which graphs the mean values of multiple series' data. Each red dot on the graph is the mean value for the particular item, and a dashed line is drawn to the next mean value point for the proceeding item. This chart type is helpful in quickly analyzing the means of same-scale series data.

Each charted series will additionally contain the respective population, mean, median, and standard deviation values adjacent to the data points.

(See Figure 9 Profile Line)

4.4 HORIZONTAL BAR

This plot type is a simplified and rotated histogram view without any additional elements such as population, mean, etc. This mode will simply graph the selected series' data, and shows their respective distribution percentage values without any additional statistical information.

(See Figure 10 Horizontal Bar)

5 REPORT BUILDING

The ultimate goal for the report builder and charting module is to be able to generate quick out-of-the-box reports with predefined and commonly used plot types. There are a few ways to customize and finalize the layout of the final report layout by using various organizational, formatting, and text editing tools.

5.1 TITLE AND LABEL EDITING

For any chart which is created, there are some customizable labels which can be added or modified. The chart title itself may be manipulated regardless of the pre-filled source data text which is used by clicking on the title itself in the plot area. The same is true for the X-Axis and Y-Axis labels (which are never pre-filled).

(See Figure 11 Custom Axes Labels and Title)

5.2 REPORT BLOCK REORDERING

Individual charts (and other report elements) can be reordered in any desired state by dragging and dropping the various report block elements on the left-hand side of the main report builder screen ("REPORT CONFIGURATION"). There are a total possible of 4 types of "report blocks" which are all able to be repositioned in the report configuration area:

- **Single Plot**
- **Multiplot (charts within a multiplot are considered all one single "report block" element)**
- **Page break (for page separation between desired sections)**

- **Custom Text**

(See Figure 12 Report Configuration Block)

5.3 CUSTOM TEXT AND PAGE BREAKING

The “Add Custom Text” will launch a full-featured text editor to add customized and formattable text and tables anywhere in the report. As with chart blocks, clicking on the entry in the report configuration section allows for updating existing content.

The rather self-explanatory “Add Page Break” button will insert a page break anywhere between any other report blocks.

Both of these report block types are able to be repositioned in the report layout configuration without restriction.

(See Figure 13 Custom Text Block Editor)

5.4 SCALING, PANNING, AND ZOOMING

The single and multiplot chart objects have some limited interactive options, and changes to the chart views are retained when saving or generating a report.

The X and Y axes are able to be scaled and panned to any desired position or level, and the chart itself can be zoomed in on, and panned.

- Axis scaling is achieved by clicking and dragging on the axis line near the corner where it intersects the opposing axis.
- Axis panning is achieved by clicking and dragging near the middle of the axis.
- Zooming into a section of the chart is achieved by drawing a rectangle around the desired area.
- Panning inside the chart is achieved by SHIFT+clicking and dragging around the pointer in the chart area.
- The chart view can be reset to default at any time by double-clicking inside the chart.
- Individual Axes can be reset by double-clicking directly on them.

(See Figure 14 Custom Scale, Zoom, and Pan)

5.5 SAVING, LOADING, AND DELETING REPORTS

5.5.1 Saving and Access Control

Any report with at least one report block may be saved and loaded later. The default access control options allow for only the creator of the report to load it at a later time. To allow sharing of the report to others with access to the base test on which the report is built, the “**Report visible to others with test access**” checkbox must be selected at the time of saving – this will allow others with access to the test the ability to load the report. An editor account which does not already have access to the underlying test on which the report is built upon will not have load or view rights to the saved report.

5.5.2 Loading and Deleting

A report in the load/delete dialog created by the user may be loaded and/or deleted by that user. A report in the load/delete dialog which has been shared by another account may be loaded, but may not be removed. Only the creator *or superadmin* accounts may remove reports.

5.6 DESCRIPTIVE STATISTICS

A table of standard descriptive statistics (kurtosis, standard deviation, range, minimum, maximum, mode, median, mean, and population) are presented for each data series in a loaded test. These values can be downloaded in CSV format by clicking the button below the analysis table.

(See Figure 15 Descriptive Statistics Box)

Note that there is no assignment of numerical values to nominal data, so purely non-quantitative data series will only be able to show the population value in the descriptive statistics table.

6 PDF GENERATION

After the report has been configured to the targeted specifications, clicking the “**Generate PDF Report**” button will generate a downloadable file with all the elements found in the “report configuration” block in standard A4 page format.

Note that the PDF output files are not saved on the server, and only the report layout and options themselves may be saved server side.

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Configure Report Variables for Age

Please indicate your age.

Color

Nominal Data ☐

Histogram ☐

SD Line ☐

Pie Chart ☐

Box and Whisker ☐

Violin ☐

Invert X-Axis ☐

Open Question ☐

Cancel OK

Figure 1 Single Plot Options Screen

Multi-plot Configuration

Multiplot Type

Series is Nominal Data ☐

Color

Q01 ☐ Invert X-Axis ☐

Q02 ☐ Invert X-Axis ☐

Q03 ☐ Invert X-Axis ☐

Q04 ☐ Invert X-Axis ☐

Q05 ☐ Invert X-Axis ☐

Q06 ☐ Invert X-Axis ☐

Q07 ☐ Invert X-Axis ☐

Q08 ☐ Invert X-Axis ☐

Q09 ☐ Invert X-Axis ☐

Item Ordering:

Cancel OK

Figure 2 Multiplot Options Screen

Histogram ☒

Histogram Point Labels ☐

Show 0 on X-Axis ☐

Override auto bin size ☐

☒ ☐ ☐

Figure 3 Histogram Sub-options



Figure 4 Standard Deviation Line

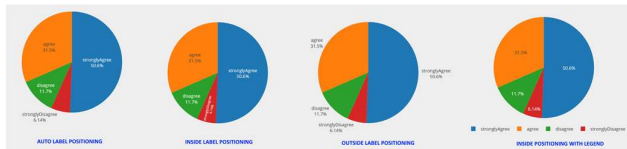


Figure 5 Pie Chart Positioning



Figure 6 Box and Whisker Plot



Figure 7 Violin Plot

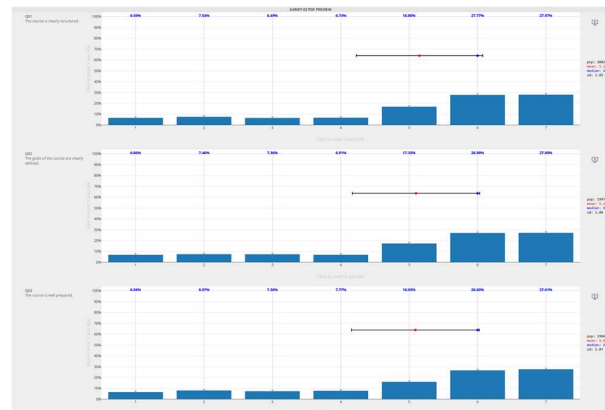


Figure 8 Multiplot with SD Line

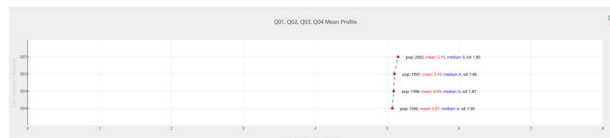


Figure 9 Profile Line

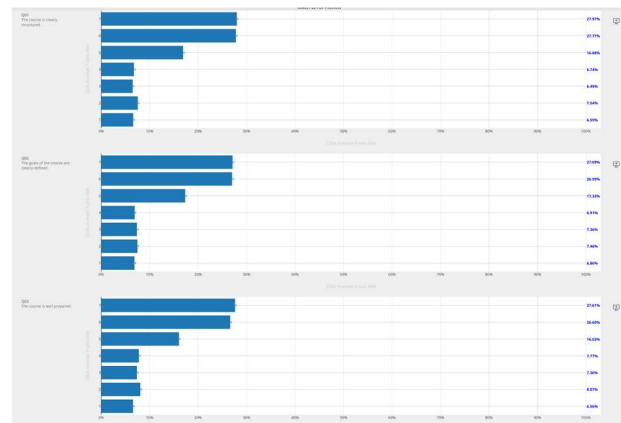


Figure 10 Horizontal Bar

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Figure 11 Custom Axes Labels and Title

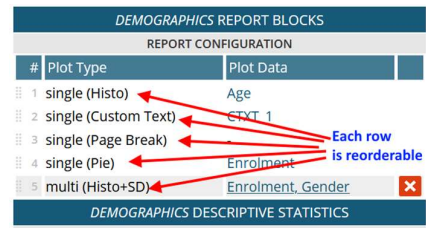


Figure 12 Report Configuration Block

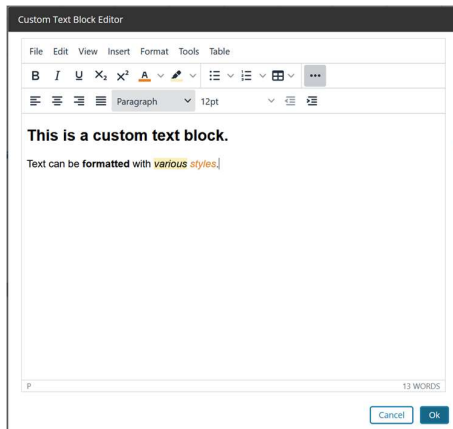


Figure 13 Custom Text Block Editor

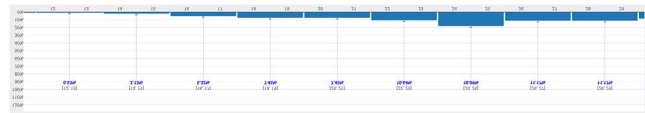


Figure 14 Custom Scale, Zoom, and Pan

| | K | σ | range | min | max | Mo | \bar{x} | μ | N |
|-----|-------|----------|-------|-----|-----|-----|-----------|-------|------|
| Q01 | -0.29 | 1.85 | 6 | 1 | 7 | 7 | 6 | 5.15 | 2002 |
| Q02 | -0.4 | 1.86 | 6 | 1 | 7 | 7 | 6 | 5.1 | 1997 |
| Q03 | -0.48 | 1.87 | 6 | 1 | 7 | 7 | 6 | 5.09 | 1996 |
| Q04 | -0.53 | 1.9 | 6 | 1 | 7 | 6 | 6 | 5.07 | 1996 |
| Q05 | -0.33 | 1.86 | 6 | 1 | 7 | 7 | 6 | 5.11 | 1992 |
| Q06 | -0.31 | 1.85 | 6 | 1 | 7 | 7 | 6 | 5.13 | 1987 |
| Q07 | -0.42 | 1.86 | 6 | 1 | 7 | 7 | 6 | 5.11 | 1986 |
| Q08 | -0.49 | 1.87 | 6 | 1 | 7 | 7 | 6 | 5.1 | 1984 |
| Q09 | -0.29 | 1.87 | 6 | 1 | 7 | 7 | 6 | 5.13 | 1981 |
| Q10 | -0.26 | 1.85 | 6 | 1 | 7 | 7 | 6 | 5.15 | 1982 |
| Q11 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1050 |
| Q12 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 818 |
| Q13 | -0.41 | 1.89 | 6 | 1 | 7 | 6 | 6 | 5.08 | 1963 |
| Q14 | -0.37 | 1.87 | 6 | 1 | 7 | 7 | 6 | 5.12 | 1964 |
| Q15 | -0.13 | 1.85 | 6 | 1 | 7 | 6 | 6 | 5.17 | 1964 |
| Q16 | -0.44 | 1.9 | 6 | 1 | 7 | 6 | 6 | 5.09 | 1957 |

Figure 15 Descriptive Statistics Box