XLCubed 10

XLCubed and Data-Connected Pivot Tables

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Introduction

With each new version of Office, Pivot Tables change to some degree, and the newer versions have added some additional cube and tabular reporting capabilities. In all cases though, data-connected reporting and analysis is something which Excel does 'as-well as' all the other areas it covers. While Power BI is a rich environment for interactive dashboard reporting, it does not deliver what many business users would consider to be self-serve or ad hoc reporting capabilities, instead leaving that part to Pivot Tables.

XLCubed has been developed from the ground up to provide the most complete user reporting and analysis experience within Excel, letting users leverage existing skills with no programming, and with a simple web deployment model. This core focus, and a decade of refinement and corporate customer experience provides a much more productive and extensible reporting environment, freeing time for business users to add value through analysis rather than producing reports.

XLCubed delivers a managed self-service reporting model where users can access the full power of Analysis Services, PowerBI.com datasets, TM1 and many others**,** and display it as needed in Excel, on the web, or on mobile devices without having to revert back to IT for reporting changes.

This paper addresses some of the most commonly identified limitations in the native Pivot Tables approach, and how these are handled within XLCubed.

Common issues and limitations with cube connected pivot tables

Excel integration

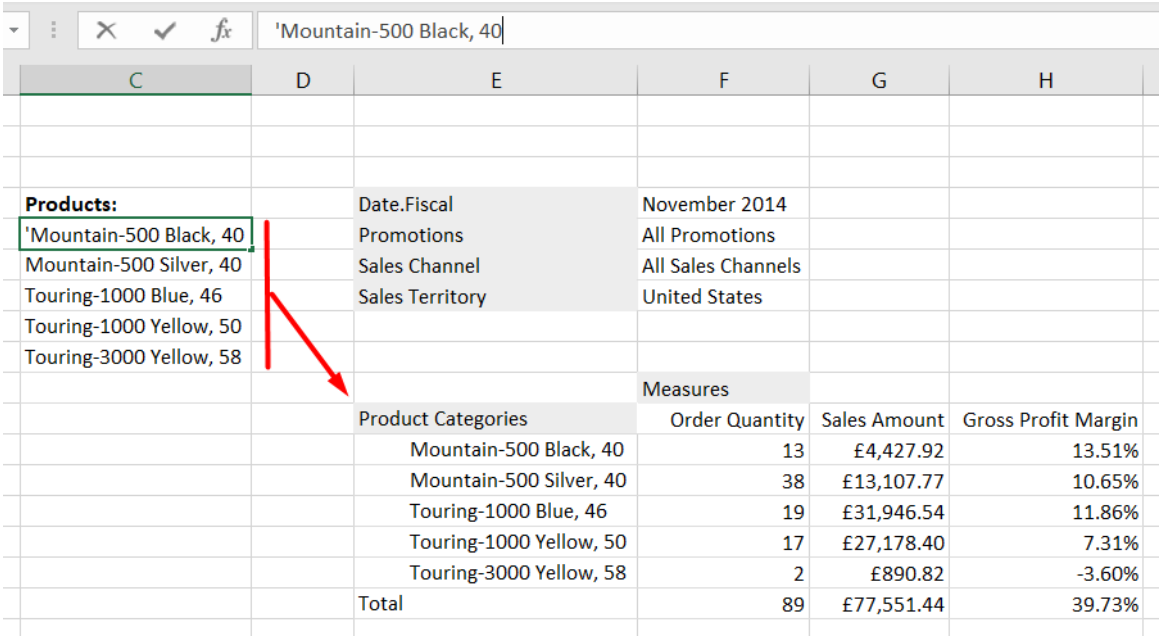
People like working in Excel: it's a familiar environment, they have a good understanding of how it works, and it's a hugely powerful productivity tool. When a product which operates within Excel forces user selections and calculations exclusively through its own dialogs, it's losing a lot of the power, flexibility, and intuitive nature of Excel. In many ways, this is true of the cube-connected pivot table.

Part of XLCubed's design goal is to let users leverage their existing skillset as much as possible. Key to this is the ability to use a standard Excel cell or range of cells as a selector, or criteria input for any part of a report. As soon as that's the case it opens the whole Excel model to the report building experience and capability.

Users can populate cells through simple text input, copy-paste, formulae, combo boxes or any other Excel based approach. One cell can be the driver for an individual formula based cube retrieval, for a grid, or for multiple grids and formulae across multiple sheets. It makes the process of building a 'joined-up' report straightforward and almost limitless in terms of flexibility.

Business Scenario:

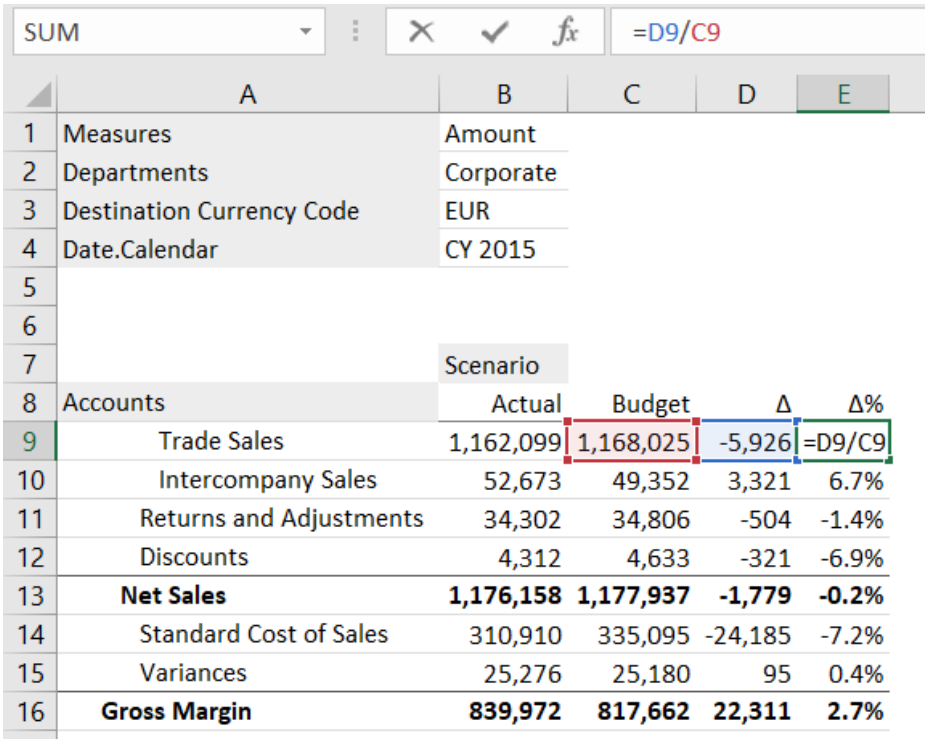
An analyst in a retailer is frequently asked to provide recent sales performance reporting on a list of SKUs which are running low on central stock. The SKUs are simply listed in an email request, having been sourced from the inventory system. The requests are typically for between 25 and several hundred SKUs. While the required information itself is simple enough, the repetitive process of searching a large hierarchy, finding each SKU and then repeating this in each pivot table making up the report was hugely time consuming. Replacing this process with range-driven XLCubed grids meant a time saving of 10 minutes to several hours per request depending on the number of cases involved and complexity of the report. The user simply pastes the required cases into an Excel range, and all grids are driven from that range.



Calculations

Not every calculation required in a report will already exist in the cube. When an Excel user wants to add a calculation to a report they expect to add it using Excel and the formulae they already know. XLCubed lets users do exactly this. Dynamic calculations can be added to both grids and formula reports by simply typing a standard Excel formula. The calculation will fill down as needed when the report is drilled, but understands the cube-context when the users starts to slice and dice across axes.

XLCubed also provides GUI driven workbook level calculations, where users can create custom groupings, and add time calculation logic etc.



	A	B	C	D	E
1	Measures	Amount			
2	Departments	Corporate			
3	Destination Currency Code	EUR			
4	Date.Calendar	CY 2015			
5					
6					
7		Scenario			
8	Accounts	Actual	Budget	Δ	Δ%
9	Trade Sales	1,162,099	1,168,025	-5,926	=D9/C9
10	Intercompany Sales	52,673	49,352	3,321	6.7%
11	Returns and Adjustments	34,302	34,806	-504	-1.4%
12	Discounts	4,312	4,633	-321	-6.9%
13	**Net Sales**	**1,176,158**	**1,177,937**	**-1,779**	**-0.2%**
14	Standard Cost of Sales	310,910	335,095	-24,185	-7.2%
15	Variances	25,276	25,180	95	0.4%
16	**Gross Margin**	**839,972**	**817,662**	**22,311**	**2.7%**

Use of cube hierarchies

A key aspect of Analysis Services' appeal as a data platform is the flexibility that hierarchical reporting provides. Users can start at the higher levels and drill down to additional detail as needed, which most reporting tools handle. However, there are other important elements in terms of being able to make flexible selections within a hierarchy not catered for in standard Pivot tables.

XLCubed addresses these difficulties with dynamic level-based selections and searching.

Level based selections from a chosen member

Select a member then choose to display members beneath it in the hierarchy:

- Descendants at a level
- Lowest descendants
- All descendants

Dynamic exclusions

Show all currently active products except those specified in a range of Excel cells.

Member searching from cell content

Helpful in product hierarchies where the product names or codes are structured, e.g. p0078*

Member searching at a specific level

Pivot tables limit a member search to the currently selected level in the hierarchy. That's fine if you know the structure, but in a deep hierarchy can be problematic and time consuming. XLCubed gives you the option of searching either the entire hierarchy or a specific level.

Business Scenario

Management want a report listing the sales by city, in rank order for the selected country. The available hierarchy is modelled as Region > Country > State > City. To handle this in pivot tables requires the addition of a new hierarchy to the cube, which will typically require significant elapsed time. In XLCubed, it's already in the user's control, using 'descendants at level', and can be implemented straight away at a report level and in the control of the business user.

Growing table size

Business changes over time through new products, new services, and new entities to name but a few. Structured reports need to be able to handle not just changing numbers, but also variable rows and columns based on the underlying data. Pivot tables are destructive if they grow (i.e. they will overwrite data/other pivot tables).

XLCubed grids can 'push' other data or grids to allow for data expansion. There is no need to worry if your formulae will be overridden when new rows appear in your report.

To further aid with layout challenges, XLCubed provides a custom control called a 'viewport' – this acts as a window to another part of the workbook. This means that you can build a grid on one sheet, then create a view to it on a formatted summary or dashboard sheet. The viewport is not constrained to row heights or column widths and will become scrollable if its size is smaller than the range it is displaying. A viewport is a dynamic view to a range or grid, so remains interactive, refreshes with slicer changes and will grow and shrink as rows or columns are added. This solves a number of layout challenges otherwise unavoidable with pivot tables.

Ranking & Sorting

XLCubed enables rich and very flexible ranking and filtering, from simple top 10's to nested rankings and filters. It also caters for combining sets of data and dynamic member exclusions. It lets users do significantly more in terms of analysis and interactivity than is possible in the standard pivot table environment.

- ### Drive from an Excel cell

  Drive ranks, sorts and filters from an Excel range. This lets users dynamically select what value to filter by, which direction to sort etc.

- ### Outlier groupings

  Display a subset of the selected members, with all remaining members grouped together into a set, often called "Others". This is useful for showing, for example, top 10 products while keeping visibility of the remaining value contributing to the total.

- ### Subsets

  Subsets take a top/bottom selection of the returned members, or the top members with an offset

- ### Hide levels

  Hide levels to skip that level when drilling a report

- ### 'Between' selections

  Report on a particular range in a hierarchy, e.g. between two dates.

- ### Combine sets

  Create additional member lists with any selections then combine by either adding, subtracting, or taking the common members from both lists

Flexible slicers

Slicers are often used in reports to allow users to make dynamic selections and filter results. Native Excel slicers are limited to buttons, which can be cumbersome if there are many possible choices.

XLCubed provides truly flexible report slicers. They can be displayed as treeviews, combo boxes, buttons, list-boxes, and calendar selectors. Slicers are virtually unlimited in their content and can combine elements from different levels in the hierarchy. They can also be filtered and ranked to the requirements of a specific report.

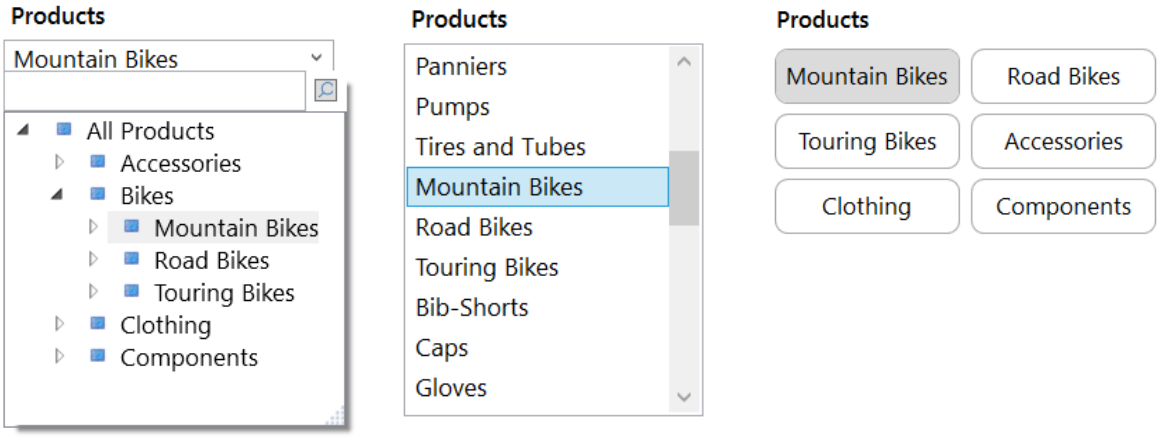
Individual XLCubed slicers are flexible enough to be used for multiple data sources. So one slicer can control the retrieval for data held in cubes, tabular, and relational SQL.

Business Scenario:

A report designer wants users to be able to select products from a hierarchy under certain conditions:

- They only want products with more than $500K sales in the last 6 months to be available for selection.
- They want the product slicer to display the top 10 products, in rank order.

- They have a deep product hierarchy, and for the purposes of this dashboard want the user to select the top level category in Slicer 1, and then be able to choose the appropriate lowest level products in Slicer 2.
- On a changing dimension, they want the user to be able to choose all products with several exceptions which we can manage in an Excel range.



Treeview Listview Buttons

Simple formula reporting

Building reports using formulae provides total flexibility in layout and formatting. This can be extremely useful in dashboards or scorecards, and also in formal financial reporting, where the required layout is more than a straightforward data table.

The Excel Only approach

A cube-connected pivot table can be converted to CubeValue and CubeMember formulae, however our experience is that users resist working with these due to usability and maintenance:

- The formulae themselves are not straightforward to understand
- CubeValue formulae can't reference standard Excel text as input arguments (can only reference CubeMember() formulae)
- No user interface to insert new members or edit
- No ability to drill down to next hierarchy level
- No ability to decompose the number within the cube
- No way to jump in-context to another part of the report

Formula Reporting in XLCubed

XLCubed has always provided an option to convert a grid to formulae. Once converted, the key formulae are XL3Member() and XL3Lookup() to retrieve members and values directly from the cube. XL3Lookup is more easily understood as it is a collection of hierarchy:member arguments (e.g. hierarchy1, member1, hierarchy2, member2…). Users generally pick this up quickly, and there are user dialogs for both formulae where the user can easily build the formula and select members.

All XLCubed formulae can accept the text in a cell, or range of cells as an argument. These could be populated by slicers, custom logic or simply copying and pasting (e.g. product codes).

XLCubed formula reports retain interactivity and can be drilled down to the next level of a hierarchy. Users can even run a breakout on a value to split it by any hierarchy in the cube.

XLCubed also provide a number of other formulae that can:

- dynamically display rows, columns or XLCubed objects
- link to another location in the workbook while passing parameters
- retrieve cube and member properties
- run SQL stored procedures
- open published web reports

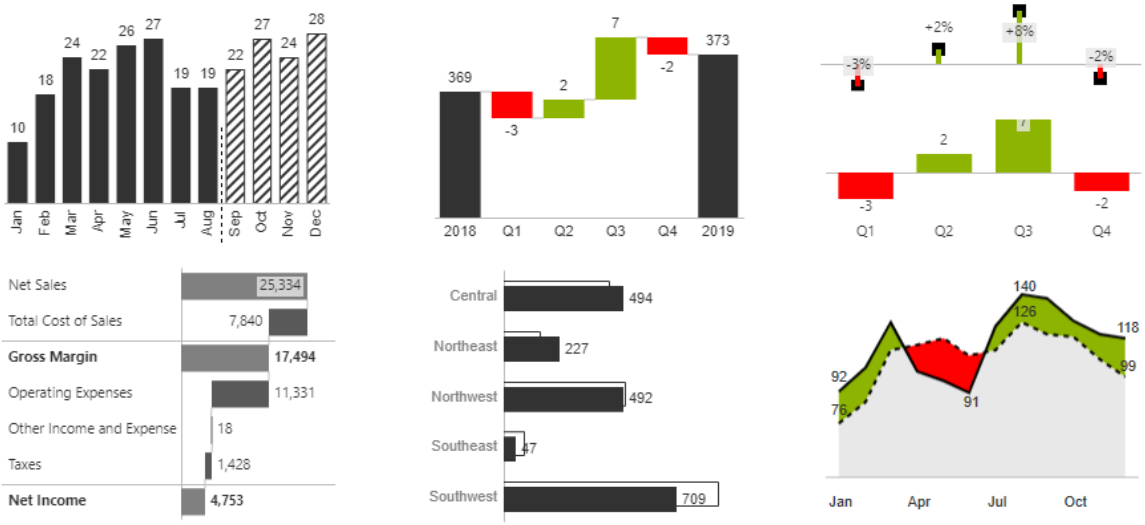
The combination of these creates highly customisable, sophisticated, and dynamic reports otherwise impossible in native Excel. They are especially effective in formal financial reporting where layout is key.

Advanced visuals

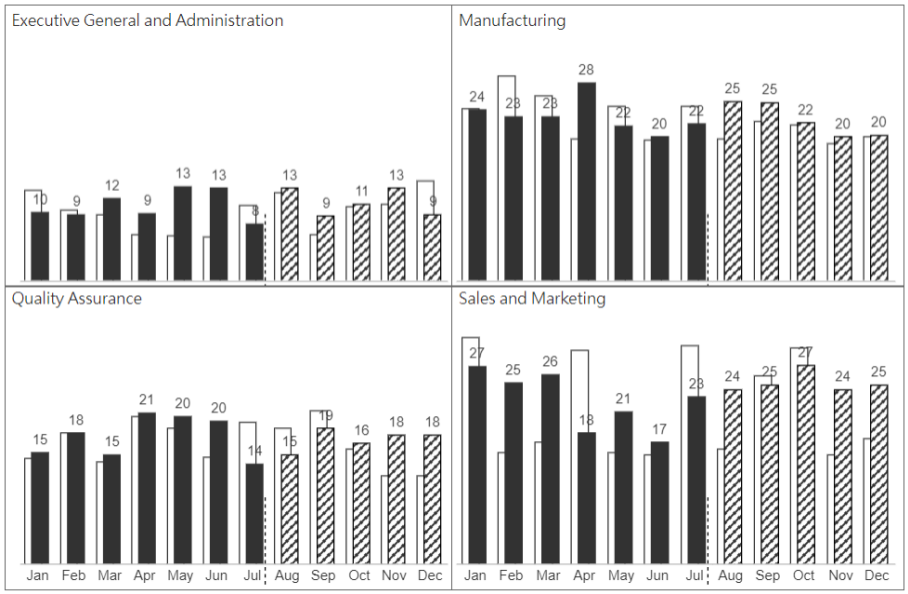
Excel visuals are restricted to data in the worksheet and can be difficult to format. XLCubed provides a number of additional visualisations that are directly connected to your data. This approach avoids the manual process of maintaining complex ranges of data within Excel and enables further exploration of the data directly through interactive charts.

Dynamic charts

XLCubed's Dynamic Charts help users rapidly and easily create best-practice visually effective charts to provide viewers a deeper understanding of the data more quickly. Drawing on the best-practice visualisation approach of IBCS (International Business Communications Standards), our chart library helps communicate key business trends and comparisons clearly, effectively and professionally.



Charts connect directly to corporate data and can be further explored as required by drilling to a 'Small Multiple' view of the contributing categories, or zooming to specific areas of interest.

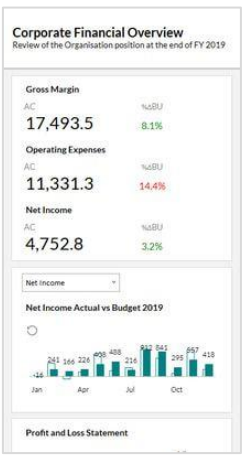


In-cell charts

XLCubed contains a rich library of in-cell charts which display within an individual Excel cell. They can be highly effective as part of a data table to show historical context, relative volumes, actual to target variances, distributions or to flag issues. They can be inserted directly into a grid or as a formula and are easy to use and highly configurable. They are a great addition to business reporting as they require very little screen real estate.

Responsive dashboards

XLCubed allows for the creation of special sheets which are responsive to any screen size. Any XLCubed component can be added to the sheet to create highly dynamic and interactive dashboards suitable for viewing on any device. Different layouts can be designed for optimal viewing on any screen size and orientation.



Business logic and best-practice financial reporting

Consistent communication practices are essential for effective business intelligence. The way a report is formatted has a huge impacted on its understandability. Pivot tables are limited in how they can be formatted and often not all suited to formal financial reporting.

XLCubed implements the best practice rules of the International Business Communication Standards (IBCS). These are practical proposals for the design of business communication, applied to conceptual, perceptual and semantic design of charts and tables.

Business Rules can be added to and shared across workbooks. These rules allow users to map data to common financial reporting types, including actual/plan/forecast scenarios and revenues/expenses. Any XLCubed chart or table will use these rules to apply the correct IBCS formatting automatically.

A choice of template tables can be quickly created for displaying numeric and chart based comparisons of dates and scenarios.

	PY	AC	AC-PY	(AC-PY)%
+ Trade Sales	440,614	489,268	+48,654	+11
+ Intercompany Sales	17,624	29,356	+11,732	+67
= Gross Sales	**458,238**	**518,624**	**+60,386**	**+13**
- Returns and Adjustments	6,609	9,785	+3,176	+48
- Discounts	111	11	-100	-90
= Net Sales	**451,518**	**508,828**	**+57,310**	**+13**
- Standard Cost of Sales	95,800	129,640	+33,840	+35
- Variances	11,015	7,339	-3,676	-33
= Total Cost of Sales	**106,815**	**136,979**	**+30,164**	**+28**
= Gross Margin	**344,703**	**371,849**	**+27,146**	**+8**
- Labor Expenses	100,402	132,101	+31,699	+32
- Travel Expenses	2,354	4,226	+1,872	+80
- Marketing	790	1,097	+307	+39
- Telephone and Utilities	4,499	6,801	+2,302	+51
- Depreciation	3,177	5,249	+2,072	+65
- Commissions	13,218	8,807	-4,411	-33
- Office Supplies	565	958	+393	+70
- Professional Services	527	734	+207	+39
- Other Expenses	368	587	+219	+60
- Rent	1,283	2,025	+742	+58
= Operating Expenses	**127,183**	**162,585**	**+35,402**	**+28**
= Operating Profit	**217,520**	**209,264**	**-8,256**	**-4**
- Taxes	44,406	39,504	-4,902	-11
+ Other Income and Expense	94	132	+38	+40
= Net Income	**173,208**	**169,892**	**-3,316**	**-2**

Web & mobile deployment

Any XLCubed report or dashboard developed in Excel can be published to the XLCubed Web server, allowing users in your organisation to view and interact with the report directly from a browser. The reports are dynamic, secure, and always connected to their data source.

Our use of Excel as the presentation layer and not the database ensures that existing corporate security within the data is fully respected. Existing Active Directory roles and groups or SSO authentication can be quickly assimilated into XLCubed Web for folder level access rights.

Reports can be viewed from phone or tablet devices through any web browser or our dedicated mobile app.

The server also provides a platform for ad-hoc analysis, report automation and scheduling, and for integration to SharePoint and other custom portals.