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OLAP Cubes 101:

An Introduction to Business Intelligence Cubes

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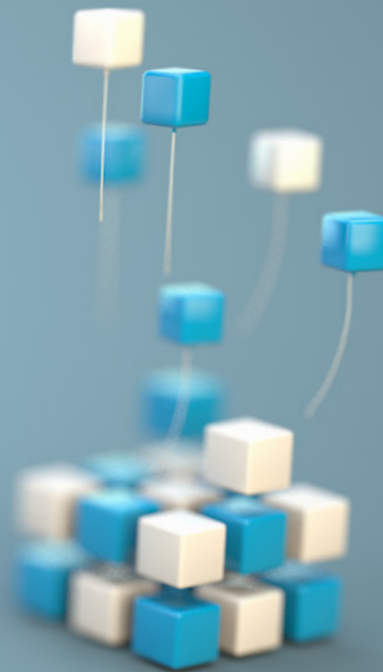
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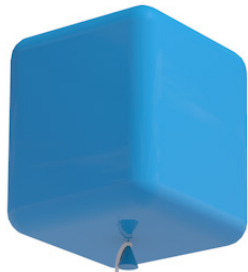
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OLAP Cubes 101: An Introduction to Business Intelligence Cubes

It's a data-driven world; we just live in it.

In today's fast-paced, hypercompetitive business environment, having near-instantaneous access to the data can be the difference between a wildly successful organization and one that goes belly up. The importance of business intelligence is significant: companies who utilize analytics to drive decision making are 5x more likely to make decisions faster¹.

Business intelligence begins and ends with data—not just how the data is collected, but also how it's stored, organized and accessed. Whether we know it or not, most of us use databases in our daily lives: ERP systems, SQL databases, CRM systems and even Excel files that are cobbled together in a rudimentary “database”. These databases are wonderful for collecting and storing information, but not always so great at showing that data in a meaningful or actionable way when the situation calls for in-depth analysis. This is because these varieties of databases are designed to get data ENTERED in the most efficient manner—frequently creating headaches when data-driven business leaders try to EXTRACT insights from that data.



In this guide, we'll explore how your databases are failing you—and how OLAP cubes are enabling employees to identify and access the data they need to drive true business intelligence.

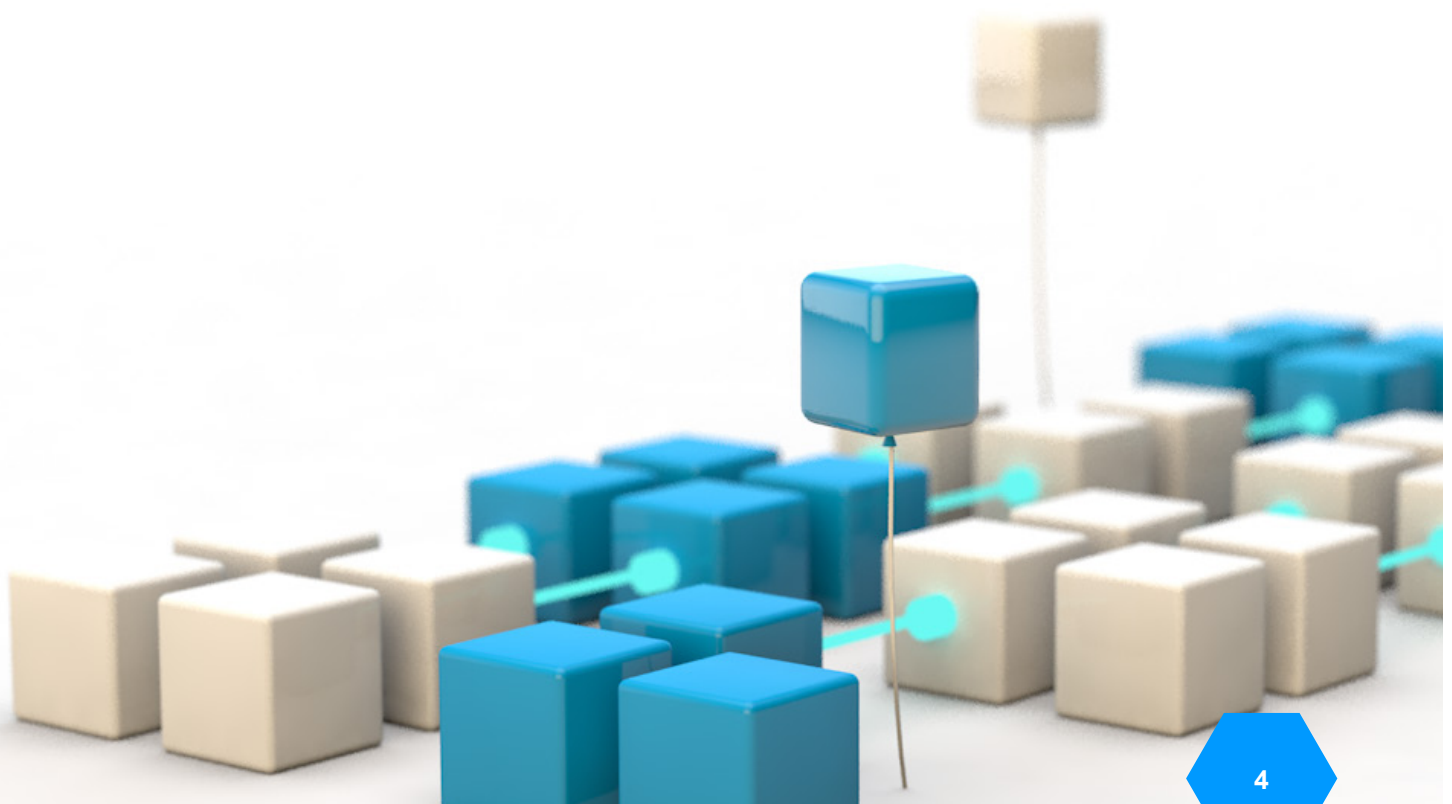
¹<https://www.betterbuys.com/bi/business-intelligence-stats/>

Clear the Tables

Databases frequently store information in hundreds or thousands of disparate tables which relate to each other in sometimes esoteric ways (imagine the most complicated Excel spreadsheet you've ever witnessed). To report on that data, in a sales-by-salesperson report, for example, we must understand the relationships between these tables and their dependencies. We take the salesperson's name from the 'Salesperson' table, the items sold from the 'Sales Transactions' table, the product description from the 'Product' table, and so on, until a report that paints the entire picture is reached.

This process of building reports from multiple tables can be time-consuming and tedious, if not utterly impossible—particularly for non-technical staff. Table-based reporting routinely causes performance issues as well, particularly with large data sets. According to Information Week magazine, **“In spite of performance tuning capabilities, it is still too easy to lose control of performance [when dealing with tables].”**

So, how are OLAP cubes improving data hierarchy?





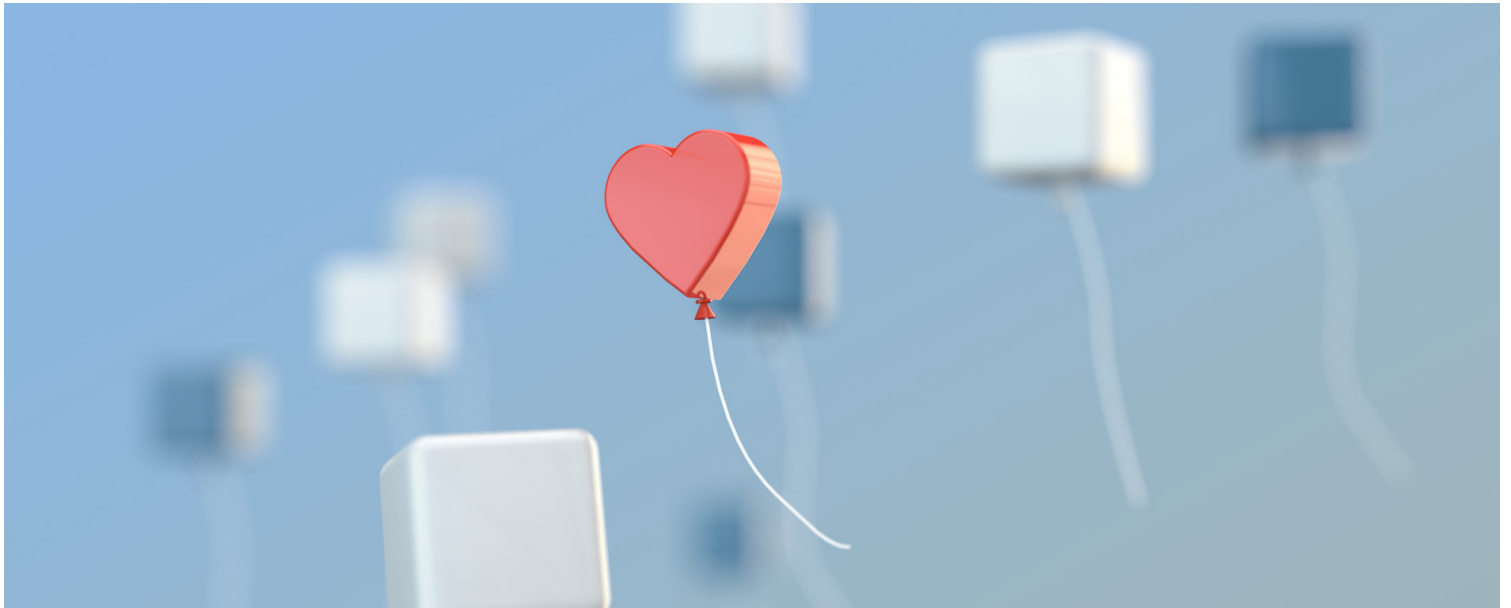
Embracing Cubism

Let's start by stating what cubes are NOT: cubes are not relational databases. Microsoft Dynamics NAV, AX, GP and SQL are all examples of relational databases. Relational databases include tables and fields which are joined together by keys. Relational databases are perfectly useful – in many cases, we couldn't run our businesses without them. However, relational databases are optimized to get information into a system in a cohesive manner—they aren't optimized for getting the information out.

In simple terms, cubes are multi-dimensional sections of data built from tables in your database. They contain calculations and formulae and are often grouped around specific business functions; one cube for sales, one for purchasing, another for inventory, and so on, with each cube containing contextual, pertinent, and useful metrics for that particular area of the business.

Cubes are a tremendous benefit because of the way they are structured: the heavy lifting is already done through pre-calculation. When you want to get answers from your data, instead of searching multiple tables in your database(s), your request goes directly to the appropriate cube. Reports that used to take 5 minutes or more to generate are now assembled in seconds, and end users no longer need to understand the complex web of references tying multiples tables together.

When organizations start to collect data in multiple databases, the size of the data sets grows exponentially. Running a standard query against large data sets causes serious performance issues which not only sacrifice productivity but can lead to users abandoning reports altogether. When this happens, important insights are discarded because the business users simply do not have the time for the data to be compiled. When utilizing cubes, whether looking at yesterday's sales transactions or sales over the past 5 years, it takes the same amount of time to run your reports – just a few seconds in most cases – thanks to the power of pre-calculating the values.



Everybody Loves Cubes

If you're hoping to roll out business intelligence for your sales team or purchasing department, business intelligence cubes are the way to go. Cubes are designed to allow non-technical users to choose from any number of role-specific and highly contextual data points to uncover new insights and adjust tactics and decisions on the fly. Chances are good that your average non-technical sales rep or purchasing agent will have difficulty joining multiple tables together with a standard report, but with business intelligence cubes, all that's required is drag and drop the metrics and dimensions that matter to them into their own personalized dashboard. IT teams appreciate cube environments too because end users learn to create their own reports – freeing up the technical staff to do, well, technical things.

Simplicity and user friendliness are what gets departments and companies on board with business intelligence. In many cases this kind of wide user adoption can spur a data revolution within a company as more and more managers rely on these systems to help them make fact-based decisions.

“Cubes help regular business users like us take advantage of all the money we've spent on data collection and storage. Now we can use the data to run our business more efficiently and effectively without having to enlist or tie up high-value resources like developers, specialists, programmers and the IT department. This is putting the power to make decisive 'game changing' decisions back in our own hands at a fraction of the cost of past lengthy, manual, and time consuming processes, if we had access to the data at all.”

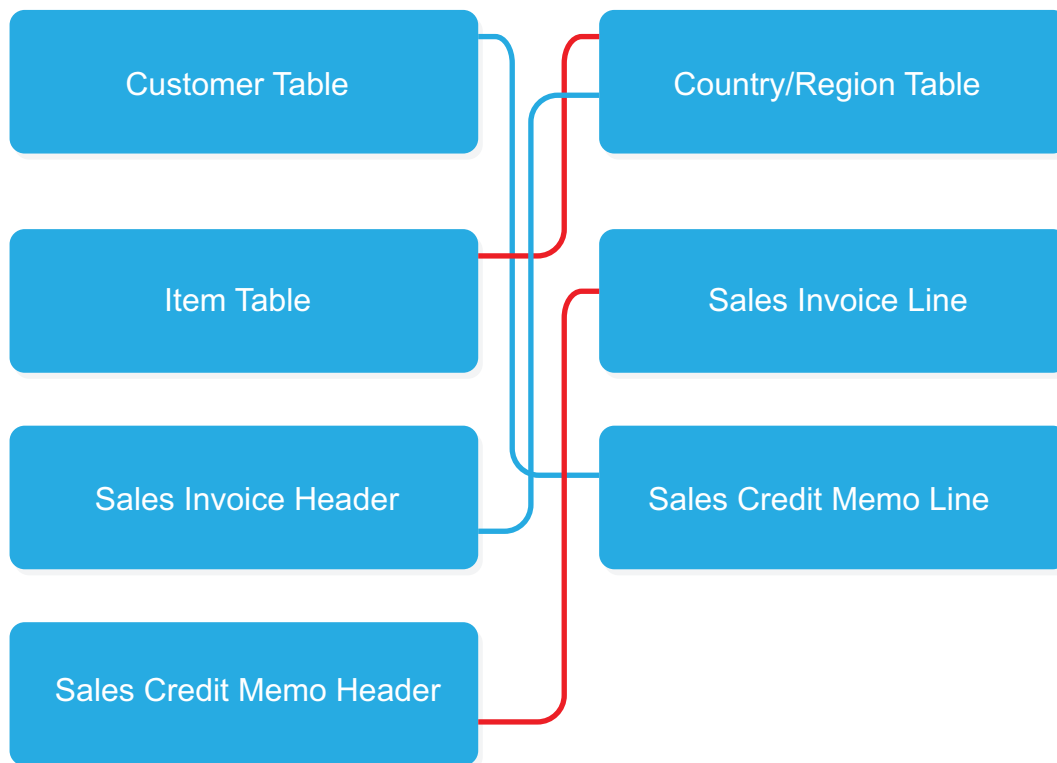
- **Mat Ealy**,
Jet Enterprise customer

Cubes in Action

To demonstrate the effectiveness of OLAP Cubes, let's look at a hypothetical situation:

Imagine you're a global sno-cone conglomerate wondering how much profit was made on sno-cones you sold in a particular country (say, Iceland) in a particular year.

To answer that question with a relational database, the information you require is scattered across many different tables. In a Dynamics NAV database, to answer this question you may need to combine data from:



Once you've identified where the data is located, it must be extracted and mashed up to provide a reasonable facsimile of the information that you need. Combining the information from multiple data streams in the way you want can be a slow and resource-intensive process.

What every stakeholder really wants is a way that's a) simple; and b) fast – and that's where cubes come in.

There's a second, less obvious issue around this hypothetical question: once you know how much profit we made selling sno-cones to Icelanders last year, it raises other questions:

- ▶ Who were these customers?
- ▶ Are sales growing or shrinking?
- ▶ Did sales fluctuate month-over-month?
- ▶ Who was our top salesperson?
- ▶ Could we put that person to a better use?

OLAP cubes make it easy to answer additional questions that will drive strategy with near-instant analysis of large amounts of data.

This image shows a cube with three dimensions (though really, the number of dimensions that can be contained within a cube are limitless): products, customers (by country) and posting date (year). If we want to see our profit for sno-cones in Iceland in 2015, that data is already indexed by the cube and it's set up to effortlessly pull that information out, no matter the level of technical expertise.



Cube Terminology

Dimension

A category that can be used to slice data. In the image above, we have three dimensions: products, customer/country and the year. Cubes can have many dimensions. In a typical “Sales” cube, you will see dimensions for all the different ways you can categorize a sales transaction (for example – Company, Salesperson, Sell-to Customer, Bill-to-Customer, Sales Document type, Location, Item, etc.).

Measure

A measure is a calculated numerical value. It can be a sum, a count, an average, a percentage, etc. Examples of measures would be sales, profit, profit percentage. In cubes, many measures are pre-calculated, providing extremely fast performance when analyzing data. Examples of measures in a Sales cube may include Sales Amount, Profit YTD, Average Unit Cost, Document count, etc.

Level

A level is a grouping within a dimension. For example, customers can be grouped by city or country. When grouped in this way, customer, city and country are categorized as different levels within a cube. Similarly, dates can have different levels in a Cube (day, month, quarter, year, is a common example.)

Hierarchy

A hierarchy is a way to organize different levels of a dimension by granularity; usually from largest to smallest. For a date, a typical hierarchy would be organized by year, quarter, month, day. Country, state, city, customer is another example of a hierarchy of levels within a cube.

OLAP

OLAP is an acronym for Online Analytical Processing and is often used interchangeably to refer to cubes.

Correcting Mis-cube-ceptions

Systems utilizing cubes have evolved rapidly over the last few years, rendering a number of the historical concerns organizations had about employing them obsolete:

Myth #1:

Cubes require months of planning and implementation before users can get value out of them.

As recently as a few years ago, this myth was true—it would take months or years for organizations to get any value out of cube deployments. Now, with solutions like Jet Enterprise, cubes are typically installed and running in two hours or less for Dynamics NAV and Dynamics GP customers. With pre-built cubes, it's a snap from deployment to running your first report—without the months and months of planning.

Myth #2:

Customizing cubes is slow and difficult.

This myth can be true, depending on the warehousing system you're utilizing. Unless you have an easy-to-use data warehouse automation tool like the Jet Data Manager, customizing cubes requires programming skills and deep knowledge of various data platforms (SSAS, SSIS to name a few).

The Jet Data Manager, which is included with Jet Enterprise, allows you to customize or create cubes in a simple drag-and-drop interface. You can add dimensions, measures or create unique measures on the spot and apply these into the cubes – often in minutes, with no engineering degree required.

Myth #3:

Cubes are a luxury, applicable only to large companies with BI development teams and large budgets.

This is no longer true. As of mid-year 2016, Jet Reports has more than 1,100 customers currently running cubes—from large multi-national corporations to small non-profits—and, on average, adding more than one a day to that tally. You no longer have to have a large company with a BI development team to be take advantage of the incredible value of cubes.

With the power of cubes and business intelligence, organizations big and small are easily achieving double digit revenue growth and beyond. If you want to see how Jet Reports can give you organization-wide access to the data used to drive smart business decisions, contact us for a personalized demo today.



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To learn more about OLAP Cubes and business Intelligence visit us online today.

www.jetreports.com

Jet Reports delivers unparalleled access to data through fast and flexible reporting and business analytics solutions that are cost effective, provide rapid time-to-value and are built specifically for the needs of Microsoft ERP users. Embedded within the familiar Excel environment, Jet Reports leverages the existing skillsets of users and offers out-of-the-box reports and dashboards so companies can immediately eliminate all expensive, time consuming and error-prone manual tasks to get the accurate business information they need, when and where they need it.

Over 11,300 companies rely on Jet Reports every day for their financial reporting.

