

CHOOLS CONSULTING SERVICES

Spend Analysis

Comprehensive Guide to Procurement Spend Analytics

Everything you need to know about procurement spend analytics, from definitions to examples and best practices.



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What is Spend Analysis?

Spend analysis is the practice of reviewing procurement spend data to decrease costs, increase efficiency or improve supplier relationships. Procurement spend analytics is the process to collect, cleanse, classify and analyze spend data through either dedicated software or one-off spend cubes.

Spend analytics is one of the key tools that procurement organizations use to proactively identify savings opportunities, manage risks and optimize the organization's buying power. It is often regarded as the fundamental foundation of sourcing. It is a tool that sourcing executives can utilize to engineer superior performance. Data from spend analysis can improve visibility into corporate spend, as well as drive performance improvement, contract compliance, and most importantly, cost savings.



Analysing procurement spend provides data that can be used as a baseline to measure improvements, and to also provide reliable data for deciding strategies to realize short and long term savings. As procurement moves to a more strategic function in the company, spend analysis is its fundamental strategic technique which establishes a parallel process that guides senior leaders and budget holders in maximizing value for the organization's dollar.

The process of spend analysis involves pulling together purchase history data to answer and assess the who, what, when, where, why, and how of an organization's expenditures.

What are we buying?

Who are we buying it from?

Who is buying it?

How often do we buy?

When did we buy it?

How much did we pay?

Are we getting what we had been promised?

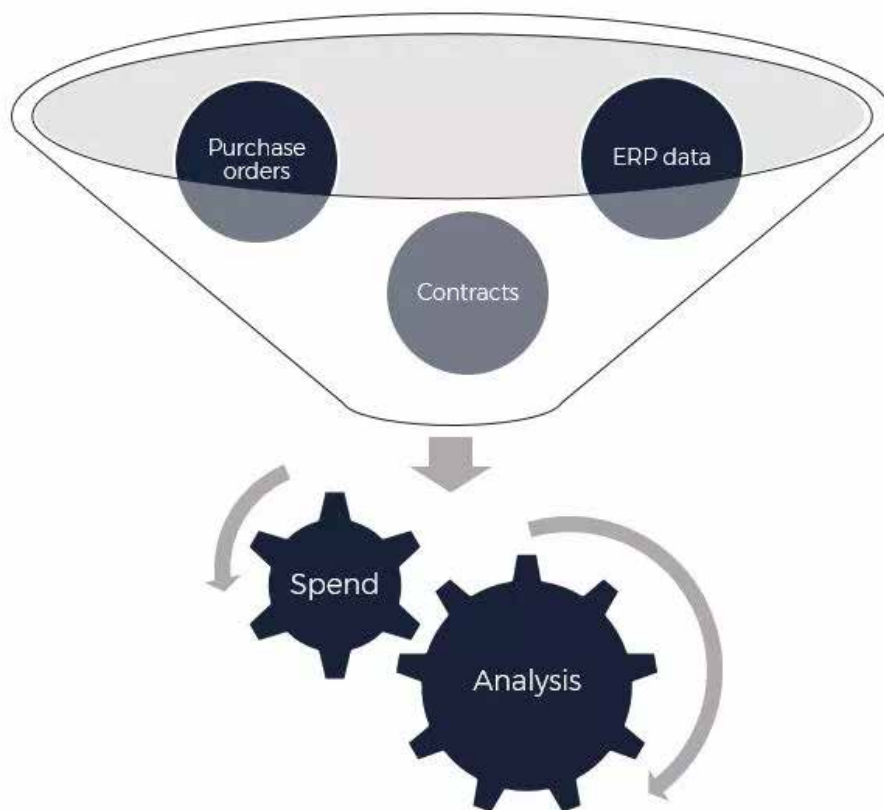
Where were the items delivered to?

(geographical location)

How does the data compare from previous years?

Sources of Spend Analysis Data

Any spend visibility project starts with the identification of relevant spend data sources. So where do you start?



Here are some of the most common sources of procurement spend analysis data.

Enterprise resource planning (ERP) tools

General ledger information

Purchase orders

Data shared by suppliers

Other internal systems

Direct vs. Indirect Procurement Spend

The difference between direct and indirect spend often causes confusion. Let's review definitions and examples for both key areas of procurement.

Direct spend in procurement refers to goods and services that are directly related to making products. Examples may include raw materials, components, hardware and services related to manufacturing processes.

Indirect spend in procurement is the sourcing of goods and services not directly related to manufacturing of products. Indirect procurement enables businesses to maintain and develop its operations.

Examples of indirect spend categories include:

- Marketing services (media buying, agency fees)
- Professional services (consultancies, advisors)
- Travel and lodging
- MRO (maintenance, repair and operations) information technology (hardware, software)
- HR related services (recruitment, training)
- Transportation and fleet management
- Utilities (gas, electricity, water)

Spend Categories in Procurement

Both direct and indirect procurement spend can be grouped into categories, enabling analysis and management of similar goods or services.

A **spend category** is the logical grouping of similar expenditure items or services that have been clearly defined on an organizational level. For example, “information technology” may be considered a spend category covering both IT software and hardware.

The **spend taxonomy** is the way a procurement organisation classifies spend into hierarchies. One way to view spend categories is like a tree with many branches for different levels or sub-categories of spend. The number of levels in a spend taxonomy depends on the procurement organization’s needs, ranging from three to six levels of categories and sub-categories.

Standard taxonomies such as the **UNSPSC** (United Nations Standard Products and Services Code) may be used to categorize procurement spend, or as a starting point to create an organization specific spend taxonomy.

A list of procurement spend categories for the UN includes:

- Audio and Visual Devices
- Building and Maintenance Services
- Business Professional and Administrative
- Services
- Computer Hardware and Software
- Emergency Preparedness Kits
- Engineering, Research and Technology
- Based Services
- Fuels, Additives and Lubricants
- Food and Beverage Products
- Healthcare Services
- Insurance Services
- Medical Waste Disposal
- Specialized Equipment for Agriculture
- Personal Hygiene/Sanitation Products
- Medical Equipment and Supplies
- Pharmaceutical Items
- Public Order, Security and Safety Services
- Vehicles and Fleet Management
- Transportation Storage and Mail Services
- IT Services
- Telecommunications
- Graphic Design
- Postal/Courier Services

Spend Analysis KPIs and metrics

Procurement data can be sliced and diced based on a number of key performance indicators (KPIs) relevant to the procurement organization. Some of the most common spend analysis metrics and KPIs include:

- Spend by commodity or category
- Number of suppliers by commodity/ category
- Number of transactions by commodity/ category
- Key figures and reports regarding compliance (e.g. Maverick Buying Quote)
- Average purchase order value
- Spending distribution of the key customers
- Material prices or material price changes
- Total expenditure by supplier
- Payment terms and conditions
- Number of transactions and transaction distribution by currency
- Spend by procurement function and the number of people involved per commodity

Spend Analysis vs Spend Visibility

Spend analysis is often viewed as part of a larger domain known as spend management. There are three core areas of spend analysis: visibility, analysis and process. Visibility in the spend management area refers to the ability of an organization to have a comprehensive view of the metrics that drive improved cost savings, process efficiency and supply-chain performance. Having spend visibility gives way to the possibility of analyzing past spend that can be utilized for planning future direction.

Spend visibility goes beyond tracking spending as it gives both a detailed and holistic picture of how money is moving through your company. Within the process of collating, cleansing, categorizing and analyzing expenditure information, spend analysis provides consistent spend visibility information on suppliers, spend and compliance.

To understand more, say you're a CEO of a mid-size company, with about 300 employees. Let's say you've run out of papers and pens. Will you still place more orders when your budget for office supplies is on the verge of maxing out? You need to determine what portion of your budget for office supplies has already been spent, and if more can be spent without exceeding the budget.

Without spend visibility — in this case, a real-time count of how much of their budget has already been spent — most companies would have ordered the office supplies anyway. They would find out later on that they exceeded the budget for office supplies after the finance publishes a quarterly report.

Spend visibility is the cornerstone of a superior procurement performance. It brings about knowledge into the core components of spend categories. Organizations with clearer spend visibility into their sourcing activities can utilize their reports and insights more to drive performance, and to make more informed business decisions. Real value is achieved only when visibility is gained into spend.

Spend Analysis Benefits

Spend analysis offers procurement organizations a number of key benefits.

- Full visibility on procurement spend
- Identify savings opportunities and realize incremental savings
- Align and streamline procurement processes across business units
- Manage risk and maverick spending to ensure compliance
- Evaluate supplier performance for better relationship management
- Benchmark performance internally or with peers
- Data-driven strategic sourcing



Get a comprehensive visibility into all corporate spend and improved data quality.

The key benefit that spend analysis can provide to an organization is heightened visibility and actionable spend intelligence. Spend analysis offers an organization greater transparency into the amount of money it spends purchasing materials and services. It allows the procurement organization to have a look into the core of their expenses and purchases. Data accuracy and consistency can only be achieved if organizations take full advantage of spend analysis. Quality and depth of analysis improves over time. It does not only give them a more effective way to collect, store, and manage the enormous amount of data they have but also provide a deeper understanding that can be used to develop initiatives and make confident spending decisions.

Identify savings opportunities and realize incremental savings.

As a sourcing manager, one reason why you want to conduct a spend analysis is to meet your cost reduction goals. When all the numbers have been crunched, the resulting metrics will show the spending patterns and the potential savings in several categories. Depending on the reports conducted, purchasing managers may then be able to cut costs through the use of alternative products, supplier consolidation, and merging products that were purchased separately into contractible groups. Price reductions can be achieved through contract buying, improved contract compliance, and reductions in maverick spending. Organizations can also achieve additional savings on indirect items ranging from office supplies to temporary staffing, contractors and consulting services.

Streamline and centralize procurement process and other administrative efficiencies.

Spend analysis has been proven to contribute to driving cost effectiveness and process efficiency in a lot of organizations. The whole process will vastly improve, from financial reporting to budget preparation if there is a detailed information organized around multiple dimensions. A more productive and efficient procurement function conducting spend analysis will build deeper relationships with fewer key suppliers and need fewer employees for unnecessary delegated tasks. There will be a significant reduction in cycle time for creating reports and ad-hoc analyses therefore reducing labour costs or reassessment to more productive work.

Manage risk and maverick spending to ensure compliance.

When your spend data is enriched with credit scores and other revenue information, you can better assess the overall supply chain failure risk of your organization. Good spend analysis data will allow you to track and identify suppliers who have non-contracted spend as well as spend with non-contracted vendors. You can identify the categories of spend where there may be too many suppliers with no contract in place. The risk in the contract is reflected in the pricing, and that can be from a lack of orders being made or alternatively not being able to scale up fast enough to deliver the volume of goods and services required. The reduced contract risk to the vendor often translates into lower costs. Contract compliance information is crucial to being the bridge to savings, while enriching spend data with supplier risk information helps the organization in utilizing spend data to avoid supply chain disruptions.

Evaluate supplier performance for better relationship management.

The starting point for superior procurement performance and supplier relationships is information. Spend analysis provides insights and knowledge into their potential value for improved supplier relationships. Once the organization determines which suppliers offer the best value, it can work with them to establish more evolved procurement processes and inventory programs. Procurement professionals can peer into the performance of their suppliers to encourage proactive supplier development. At the same time, it can root out non-performing suppliers and help boost contract compliance by monitoring pricing on a continuous basis. Scorecards help evaluate suppliers and vendors by capturing metrics that evaluate performance. Having a comprehensive spend analysis gives more information on the amount of money an organization spends on purchasing materials and services, and to which suppliers it spends the most. This information is useful on contract negotiations and can be used to maximize the money the organization spends on procurement. When successfully implemented, this would leave an organization with fewer suppliers that it can work with to attain greater value from their suppliers and establish a more efficient and leaner procurement process.

Benchmark internally.

Having spend analysis gives you the opportunity to benchmark your performance internally across business units in different locations. It could measure how much is spend on office supplies globally. This paves way to meaningful comparisons that can be used for strategic decision-making. Collecting and organizing spend data together in one place enables you to answer a wider range of questions such as the average number of vendors or spend by category, and which vendors are generating the highest cumulative revenues.

Understanding this is crucial to set targets for improvement that are realistic and achievable.

Leverage spend data across business units.

Data extracted and analysed in spend analysis systems plays a major role in the strategic planning of the procurement function. However, other internal business units are also currently leveraging spend analysis to achieve their business objectives. The finance department can leverage spend analysis in the vein of the procurement's main goal: gain a better understanding of corporate spend. Finance professionals can leverage spend analysis systems to analyze data from purchasing card, invoice, requisition or invoice sources as a means of generating more accurate accounting reports.

Work collaboratively with other organizations.

Each individual organization should develop their own blueprint to deliver savings and efficiencies, but working with a group can help generate a more powerful strategic plan. A collaborative spend analysis project will provide the group the visibility to plan the most effective time to carry out a joint competitive solicitation for a commonly procured good or service. Having a firm understanding of which members of the group are buying those goods or services already can go a long way towards delivering savings and efficiencies for all involved. Having all spend data in a consolidated format makes it easier to get everything in one place. This generally has the effect of making your collaborative efforts more strategic. When you can easily identify the common suppliers, then it will be quicker to gain a better view of the opportunities. A collaborative spend analysis provides a proactive conversation and strategic discussion.

Spend Cube

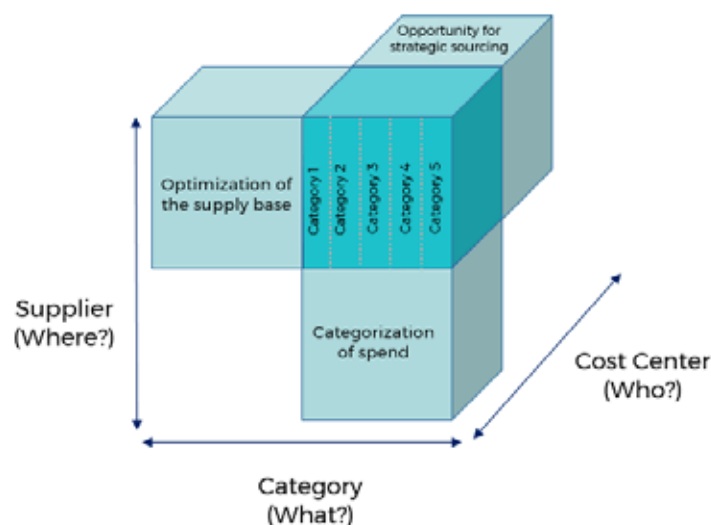
The spend cube is a unique way of taking a look at spend data because it is projected in a multidimensional cube. It refers to the three dimensions of the cube – Suppliers, Corporate business units, and Category of item. The dimensions could include subcategories of the different units across the organization, from suppliers, categories, and cost centers.

The spend cube is typically the final output of the spend analysis process. It allows you to look at all of the analyzed data from a variety of angles. A spend cube is usually needed if a company is not managing the full percentage of expenditures across all business units.

The 3 axes represent Category (What you are buying), Cost Center (Who you are buying it for), and Supplier (Who are you buying it from). These are the 3 legs of the stool – if any one leg is not there, the entire model falls apart.

Each axis of this cube contributes critical information. Category analysis tells what specific types of goods and services you have. Cost center analysis reveals who among the functions within the organizations drive the demand. It could also be the end users. Supplier analysis tells you which suppliers are getting the money today. One benefit is knowing if expenditures are scattered or cumulative, or if suppliers have simultaneous contracts in the organization.

Once you've got this data together, you can set your strategies. You can slice and dice data to analyze it from many different directions. This ensures that you have just one sourcing strategy and not hundreds. Getting this data at hand lets you decide which high spending end users to align with, and which suppliers you want to target for renegotiation.



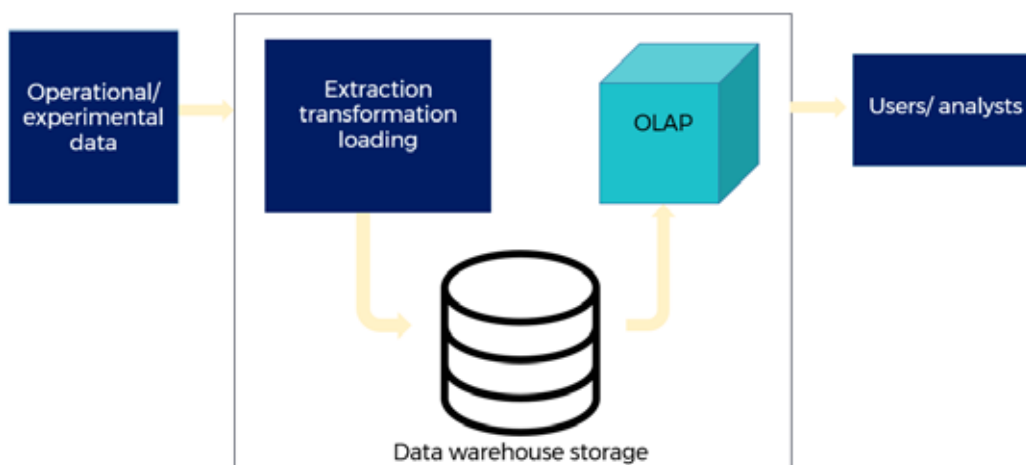
OLAP

OLAP (Online Analytical Processing), is the traditional approach used when sources are scarce, as it provides the ability to do a multidimensional analysis of data and to take the complicated calculations into consideration. As the foundation for many kinds of business applications, OLAP enables end-users to perform ad-hoc analysis of data in multiple dimensions, thereby providing the insight and understanding they need for better decision making.

The OLAP engine is the core feature of the Spend Analysis module. It is the enabling technology that provides answers to the most analytical questions in spend analysis and enables users to easily extract and view data from different points of view.

The OLAP capabilities of your spend analysis vendor can be categorized based on whether the product is endowed with its own OLAP engine or it relies on third-party analytical services- and therefore it solely acts as a presentation layer on top of the third-party OLAP engine.

Providing a multidimensional conceptual view on data is one powerful key feature of OLAP. Covering full support for multiple hierarchies, it allows users to analyze database information from multiple database systems at one time. Every data attribute is considered as a separate dimension in this multidimensional database. This includes product, time range or even the sales location. The information can be compared in many different ways. Moreover, attributes such as time periods can be broken down into sub-attributes.



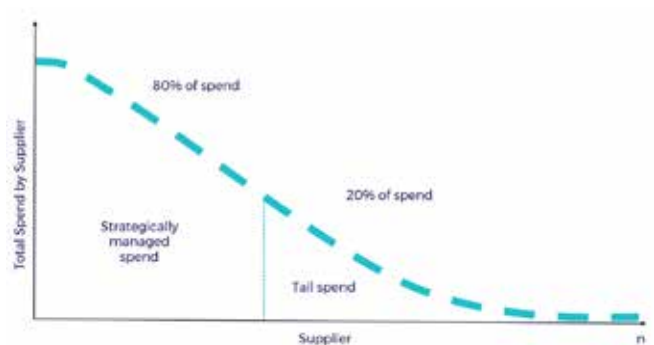
Types of Spend Analysis

Tail Spend Analysis

Tail spend is the spend in any organization that is not actively and strategically managed in all the spend categories. It is the place where procurement organizations may be leaving money and utilizing their resources inefficiently because it is usually least focused. Though it is generally considered as low-value purchasing, as it contains a small portion of the spend (usually 10-20% under each spend category), it is a significantly important area of any organization's spend management. Because large number of suppliers are accounting for it, it has an impact on the company's financial performance.

With companies making millions of purchases every year, there are those that are too small or too infrequent that often get neglected. Procurement teams invest heavily in their core spend areas, but the tail-end remains a largely untapped opportunity for most companies. There is little understanding of how much money is involved in tail spend, and even less knowledge on how to manage it to realize the potential savings. This can lead to potentially losing millions of dollars annually.

Doing an in-depth spend analysis on tail spend helps encourage compliance and identify maverick spend, which refers to non-compliant transactions. The most common way of doing this is carrying out a traditional spend analysis, and then ranking the suppliers based on annual spend. The smaller suppliers that add up to around 20% of total spend are defined as the tail.

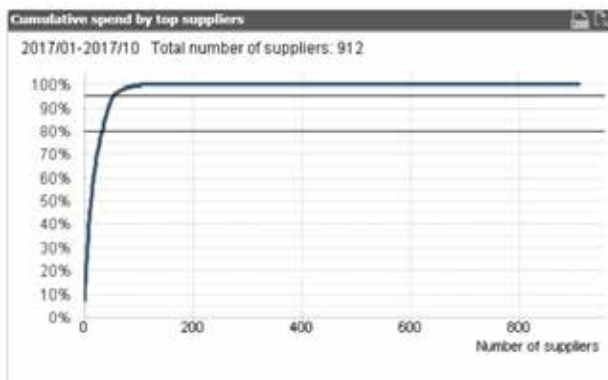


Vendor Spend Analysis

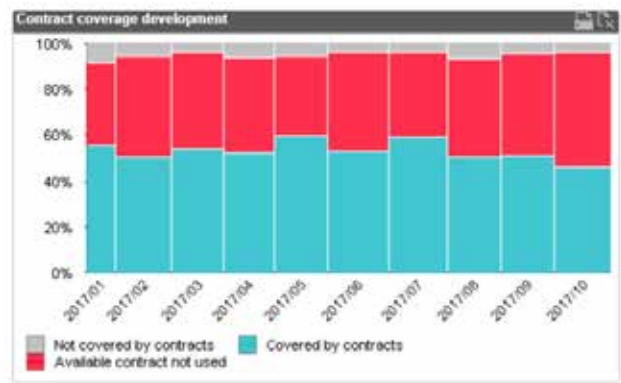
Vendor spend analysis is identifying how much of the spend comes from the critical vendors. It allows one to create a detailed spend profile for each vendor using historical consumption data. Knowing this can help one focus on getting the best value from these preferred vendors and consolidating the relationships.

A vendor type report collects spend based on the vendor, and gives users the ability to select a comparable year and a review year. Spend data is optimized by identifying opportunities for consolidation and enhanced compliance. It helps visualize spend insights in several ways by vendor, category, geography, etc. and enables multi-faceted analysis for data-driven decisions.

There are usually many low-value transactions with multiple vendors across many business units. The total number of one-off and small value vendors is usually big. Knowing this can help in streamlining and leveraging spend by identifying contract leakages and maverick spending. The aim is to reduce the number of vendors in each category. In the chart below, you can see what portion of the spend is with your core vendors.



Every dollar spent is important and savings opportunities can be missed through off-contract purchases. Vendor spend analysis will facilitate the identification of purchasing trends, buying patterns, as well as monitoring utilization and spend consolidation of key strategic suppliers.



Category Spend Analysis

The first step in doing a category spend analysis is understanding the scope and breadth of the category. Are you buying the similar good and services from too many different vendors? This analysis is built on hierarchies, and the spend transactions are categorized into the most appropriate category. The reporting allows one to explore the spend in the defined spend category hierarchy, which in turn allows you to identify spend leakage issues.

Allocating spend consistently into categories makes the data easier to navigate, interpret, and understand. When organizations can focus on prioritizing their top spend categories, it helps them identify and forecast savings opportunities. Prioritization will allow better negotiations for key spend categories to ensure more favourable contracts and pricing. By drilling into their spend data, procurement professionals are also gaining a deeper understanding of their spend categories.

When you have a high-level overview of spend by category, it is easier to identify categories that help in delivering savings and to realize which projects bring strategic importance to the organization. With this, you can easily figure out which action to take based on what gives the most impact on staff or operations, and what the risks associated are. Access to detailed information on spend by category gives you the data to determine priorities and allocate resources in order to deliver the highest return on investment for the level of effort required.



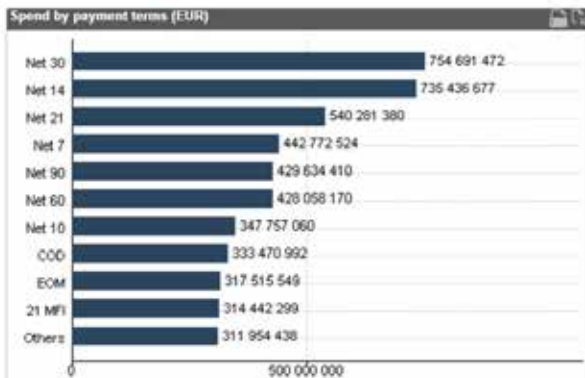
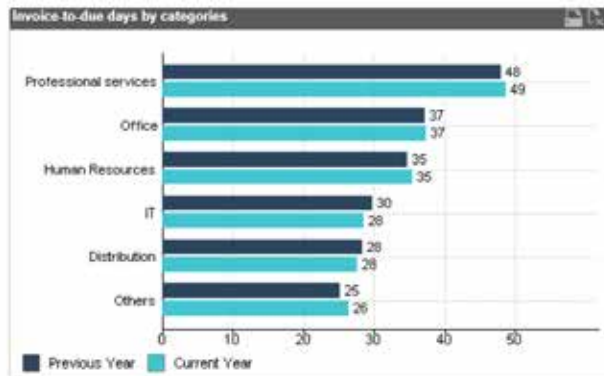
Item Spend Analysis

Item spend analysis refers to analyzing expenditure at an item/ SKU level. It takes into account every individual purchase, classifying each one of them to identify what department it was for and what supplier was used. This analysis warrants the ability to know whether a specific item is being purchased from various suppliers, or in several locations and different item prices. Doing this analysis can highlight the different ways of purchasing in the business and potentially identify spend leakage issues, such as purchasing from non-preferred vendors and maverick spend.

Price opportunity details						
Unit	Product	Material	UOM	Supplier		
Production Frankfurt, Germany	Plastic box 40x20x10	Plastic box, mod 4002	EA	Accutech Packaging Inc.	Spend (EUR)	2 853 762
					Quantity	4 572 260
					Price	0.6241
					Local lowest price	0.5408
					Local price delta	0.0833
					Local opportunity	380 982
					Global lowest price	0.4467
					Global price delta	0.1774
					Global opportunity	811 304
					Kerr Group Inc.	Spend (EUR)
				Quantity		3 014 976
				Price		0.5408
				Local lowest price		0.5408
				Local price delta		0.0000
				Local opportunity		0
				Global lowest price		0.4467
				Global price delta		0.0941
				Global opportunity		359 049
				Penn Plastics, Inc.		Spend (EUR)
					Quantity	2 580 864
Price	0.5779					
Local lowest price	0.5408					
Local price delta	0.0371					
Local opportunity	95 795					
Global lowest price	0.4467					
Global price delta	0.1312					
Global opportunity	338 695					
Plastohm packaging	Spend (EUR)	1 921 467				
	Quantity	2 960 320				
	Price	0.6491				
	Local lowest price	0.5408				
	Local price delta	0.1083				
	Local opportunity	320 460				
	Global lowest price	0.4467				

Payment Term Spend Analysis

Payment spend analysis provides excellent insight for companies to analyze payment practices and terms within their P2P processes to identify issues such as unrealized discounts through late payments of invoices. It utilizes the data and gives a comprehensive view that enables one to identify unrealized interest from early payments of invoices. It explores the opportunities of leveraging all possible discounts or interest from the invoice payment process. It also covers the review of payment patterns so a company could identify practices and activities that are not done properly.

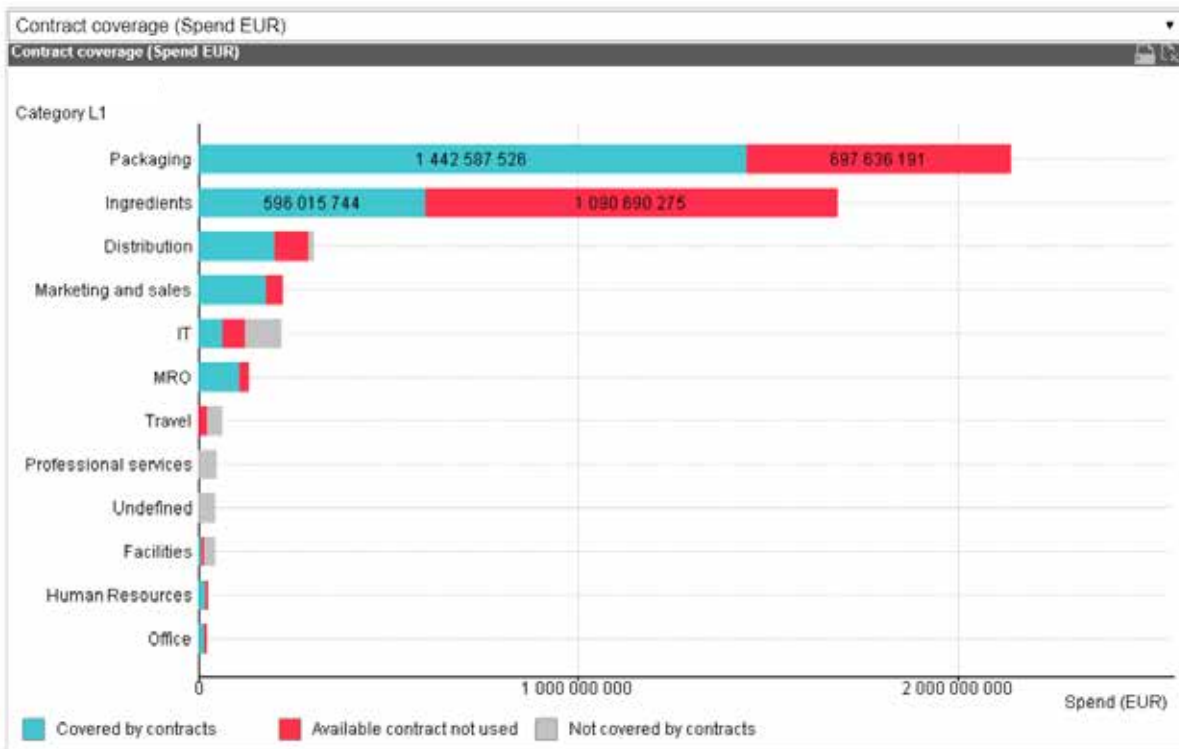


Average payment terms by supplier (EUR)

Supplier	Average payment terms	Spend
	27	4 956 014 973
Vallo	8	336 389 148
Arla	16	273 270 503
Graphic Packaging Corporation	3	243 439 059
Colbert Packaging Corporation	3	220 532 750
Resolution Packaging	61	220 198 706
CCC (Chicago Concentrate Company)	92	184 530 704
Pohjolan Karma	18	181 250 877
Rex Corporation	92	172 364 206
Ingman	3	160 268 610
Plestoim packaging	16	140 502 969
MixedMedia Agency	39	123 393 711
Accutech Packaging Inc.	16	122 683 230
Equadorian National Fruit Products Ltd	15	118 275 872
Warneke Paper Box Company	3	109 769 895
ABB Outsourcing	16	107 823 350
DirectToTarget Media Corp	8	100 395 042
VairiPack	38	99 489 100
Rock-Tenn Company	11	91 871 937

Contract Spend Analysis

This spend analysis tells companies if they are complying with their existing negotiated contract terms. It analyzes spend with vendors by contract to identify spend leakage through non-compliant contracts. It ensures that the best contract deals per supplier have been negotiated and that all the buyers are purchasing from preferred suppliers.



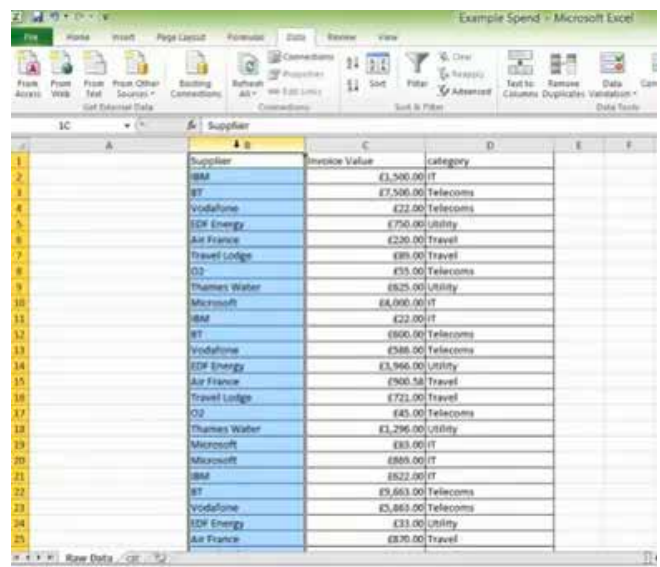
Spend Analysis Tools

Spend Analysis in Excel

Microsoft Excel, though traditional, is an excellent tool to making powerful dashboards that can provide analysis and deliver insights in a timely manner. A lot of people use Excel to analyze spend data but fail to do so in the most effective and efficient way. The spend data that is categorized by supplier or by name is usually found in the raw data. When this data is in an Excel spreadsheet, it provides the company an overview of the spend structure and helps it understand which part of supply chain needs to be prioritized.

While doing spend analysis on excel is doable, there will still be a lot of issues that most organisations will encounter. For example, excel is not scalable for spend data in the hundreds and thousands of rows. Challenges like over generalized classification, data inconsistencies and data formatting issues, same supplier different names, and regional settings causing inconsistency will cause a normal analyst to do more data cleaning work than actual data analysis. Say you've been able to do all this properly and you've spent 2 days in a month doing it, you will then need to update the data and classify new data the next month which will not be scalable. There are solutions in the market that have developed this into actual science and the service is provided as a cloud solution.

By leveraging manual spend analysis processes, like Excel and Access-based tools, organizations fail to execute on the repeatable process that spend analysis automation enables. Manual processes for this function also lack timeliness and speed of data updates and refreshes, as well as present the risk of limited reporting and analysis capabilities. Without the 'slice-and-dice' allure to many spend analysis systems (presenting the ability to cut spend data in a myriad of ways for efficient analysis), the reporting process of the spend analysis function is limited.



	A	B	C	D	E	F
		Supplier	Invoice Value	Category		
1		Supplier	Invoice Value	Category		
2		IBM	£1,520.00	IT		
3		BT	£7,526.00	Telecoms		
4		Vodafone	£22.00	Telecoms		
5		EDF Energy	£750.00	Utility		
6		Air France	£230.00	Travel		
7		Travel Lodge	£85.00	Travel		
8		O2	£55.00	Telecoms		
9		Thames Water	£825.00	Utility		
10		Microsoft	£4,000.00	IT		
11		IBM	£22.00	IT		
12		BT	£600.00	Telecoms		
13		Vodafone	£586.00	Telecoms		
14		EDF Energy	£3,966.00	Utility		
15		Air France	£900.58	Travel		
16		Travel Lodge	£723.00	Travel		
17		O2	£45.00	Telecoms		
18		Thames Water	£1,296.00	Utility		
19		Microsoft	£83.00	IT		
20		Microsoft	£888.00	IT		
21		IBM	£822.00	IT		
22		BT	£9,663.00	Telecoms		
23		Vodafone	£3,863.00	Telecoms		
24		EDF Energy	£33.00	Utility		
25		Air France	£870.00	Travel		

Pros and Cons of using Excel in Spend Analysis:

Pros

Spreadsheets are both the comfort zone and inexpensive and work with templates and formulas to aggregate data

Spreadsheets are proficient in documenting and reporting very simple stand-alone requirements

It is easy to create data collection tools and simple to create charts

No need to extract data from external systems, all data is right at your fingertips

Using Excel, reporting is usually easier and more hassle-free

Cons

Spreadsheets are time consuming and users are spending a significant amount of time collecting data

They become exponentially difficult to manage when multiple compliance sets and multiple locations are involved

They are not designed to record an audit trail of accountability and struggle to assign owners to processes

They do not deliver automated workflow driven processes and require manual intervention to deliver reports that are more prone to error

This is not a secure process due to people using email to send to others for updates and creating different versions of the spreadsheet

Spend Analysis with BI Tools

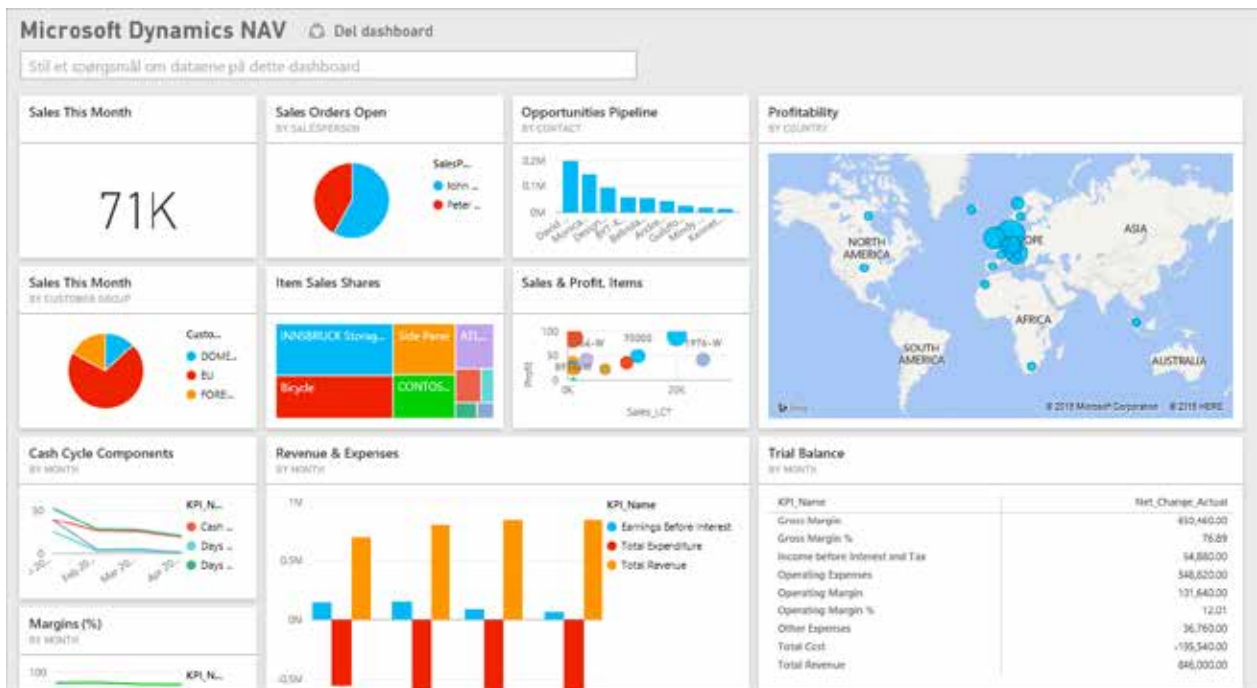
Using business intelligence enables companies to have a better understanding of costs which makes it easier to align expenditures with revenue. One focus is the spend analysis because it provides the visibility and insights needed to pave way to many cost reduction and improved procurement performance measures.

Microsoft Power BI

Power BI (Business Intelligence) is a suite of business analytics tools used to analyze data and share insights. It is a cloud based data analysis which can be used for reporting and data analysis from a wide range of data source. Power BI dashboards provide a 360-degree view for business users providing them the ability to see all of the most important metrics in real time, and usually in different kinds of devices. Users can examine the data behind the dashboards with just one click. The intuitive tools help make finding answers easier. The pre-built dashboards and hundreds of connections to the known business applications make doing analysis simple and quick.

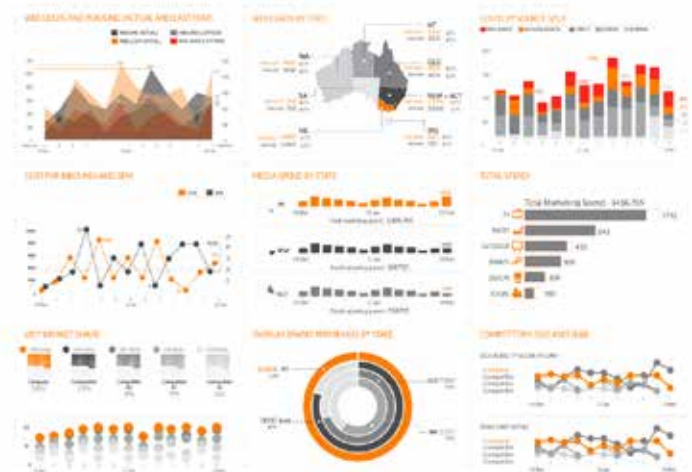
Power BI, with all its portals and applications, can unify all of your organization's data. With better data management and access, companies can get the visibility and insight they need to improve procurement performance. These are some things that can be addressed:

- **Materials (volumes and prices included) that the procurement organization purchased this period and if there are any changes within a specific period of time**
- **The number of vendors whom the company has purchased from a particular year and the amount of money spent per vendor in a given time**
- **The number of transactions done in several stages of the procurement cycle**
- **The number of requisitions, contracts, and purchase orders processed across the organization by buyer and the average value of each transaction**



Tableau

Tableau is an industry leading business intelligence tool that focuses on data visualization, dashboards and data discovery. As a leader in the Gartner magic quadrant for the past couple years, it is an interactive tool that provides side by side analysis of spend data with tons of visualization possibilities. It is very simple for non-technical people to easily create customized dashboards that provide insights that can be used for company strategies. With its easy user-friendly interface, drill-down capabilities and intuitive way of working with data, it transforms the way people use data to solve problems. It also comes with real-time data analytics capabilities and cloud support. n decisions.



QlikView

QlikView is a Business Intelligence (BI) tool that enables a user to create reports and dashboards for any use case. It is commonly used by business users who consider the power of modelling the data as well as data preparation before doing the analysis and visualizations/dashboards as a key differentiator. On top of that, Qlik and its patented associative technology allow a user to unearth relationships within the various data sources. It also encapsulates the data into compressed memory for faster analytics vs. other providers who mainly rely on direct connections to data sources.

Because it offers guided and collaborative analytics, even non-professional users without IT skills can build and deploy analytics apps easier and in shorter time. This results to a faster response in changing business requirements and driving more insights across the organization.

A flexible platform, the tool consolidates data from multiple sources to provide centralized data for high level reporting.

The intuitive click through dashboards makes it easy for users to understand hidden trends and gather insights from them. With Qlikview, possibilities are endless for making adhoc queries because it does not require tedious defined structures and hierarchies. Effective and accurate decisions are made faster with the right and easily accessible information



Image source: Executive Dashboard Best

Pros and Cons of BI Tools in Spend Analysis:

Pros

- Data visualization is easier, quicker and nicer
- Manage big data in real time
- People can go 'hands-on' with the data
- More possibilities for customization
- Many solutions available today that can let you operate at a scale that is right for your organization
- The platforms usually give content developers and line-of-business analysts a more rapid approach to defining, executing and saving queries

Cons

- Data security is questionable
- People can see different conclusions from the same data
- There might be a need for multiple BI applications
- More expensive

Spend Analysis Software

Spend analysis software provides a consolidated view on procurement spend including data from invoices, purchase orders and other business financial records. Spend data may be collected from a number of different sources such as enterprise resource planning systems (ERPs), purchase-to-pay suites or even shared excel reports.

Spend Analysis Software Types

Spend analysis software is either bought from a specialized software vendor or created specifically for the needs of a procurement organization.

In-house solution – a bespoke software solution is created for the procurement organization, either on top of an existing business intelligence solution or as a dedicated piece of software. Maintenance and upgrades are dependent on the organization's information technology resources.

Licensed software – Software is sold as a commodity, where a single-use license allows for an installation of the software for a set amount of machines. Depending on the update agreement, larger updates might mandate for a new purchase of a license. Most of the time licenses are sold as a lump-sum purchase.

Software as a service (SaaS) – Software is sold as a subscription and is delivered flexibly. Often the software is hosted in a separate location, allowing for centralized management by the provider. Updates are carried out as part of the software subscription agreement.

Enterprise vs. Small Business Solutions

Spend analysis software comes in all forms, shapes, and sizes ranging from self-service solutions for small businesses to configurable dashboards for large enterprise organizations.

Small Business software – is designed for smaller operations and a smaller amount of data. These can be provided as self-service software, add-ons to ERP packages or on-premise solutions with limited need for configurations or custom data processing steps.

Enterprise systems – are designed to handle a large amount of data and provide deep and bespoke insights from the organizations different source systems. Enterprise level software deployed with larger software deployment projects are increasingly sold and maintained on the cloud under a Software-as-a-service (SaaS) model.

Where is spend analysis software data hosted?

There are a number of options for hosting spend analysis data ranging in complexity and resources of the team conducting spend analysis.

On-premise – Software installed inside a private user network and operated on a server location managed by the procurement organization. Updates are performed on a case-by-case basis, depending on the software license agreement scope. On-premise installations also include local installations of software. Private cloud – Software is accessed via -

a thin client or a web browser, while all the essential elements are hosted in a private cloud server maintained by the spend analysis software vendor. A cloud server is a centralized system that can be scaled according to the load and demand to provide centralized software deployments. Public cloud – Similar to private cloud hosting, but data is hosted on public cloud services, such as Amazon Web Services (AWS) or Microsoft Azure.

How to Compare Spend Analysis Software

With dozens of different types of spend analysis software to choose from, it may be challenging to compare different alternatives. Popular ways to evaluate alternatives include:

- Seeking expert advice from procurement consultancies or management consultancies.
- Reviewing customer reference cases or interviewing existing customers of different software vendors.
- Investigating independent analyst benchmarks or reports, such as the Spend Matters SolutionMap for Spend and Procurement Analytics.
- Conducting a spend analysis request for proposal (RFP) with a detailed list of questions for a shortlist of possible software solution providers.
- Developing a proof-of-concept (POC) where one or more vendor is given a set of spend data to analyse with a limited scope and time-period. In cases where spend classification speed or quality is an issue, POC can help identify suitable alternatives.

Spend Analysis Reports

Here are some data visualization techniques:

OLAP Reports

Pivot Tables

Pivot tables are a convenient way to build intelligent, flexible summary tables. You can look at the same information in different ways when analysing large amounts of data.

Pivot table	Category L1	Category L2	Category L3	Year	total	2016
Total					10 466 499 152	5 510 494 180
	Air	Air			33 271 952	17 950 129
	Distribution/Unit	Distribution/Unit			22 466 656	12 293 949
	Ocean	Ocean			38 489 123	19 737 027
	Road bulk	Road bulk			247 766 747	156 195 187
	Road fine	Road fine			133 480 653	74 282 489
	Road Other	Road Other			85 410 856	44 936 500
		Beverages			340 488	405 492
		Dishes etc.			1 041 702	567 029
		Food supplies			576 826	292 095
		Cleaning			15 017 903	7 729 545
		Electricity			26 682 073	14 251 782
		Facility management			25 434 511	13 392 297
		Facility management			1 718 098	850 186
		Heating			5 237 650	2 836 893
		Heating and water			1 528 202	808 111
		Leasing and rental			14 904 713	8 190 379
		Cars			21 142 548	11 856 439
		Recruiting			2 420 317	1 371 699
		Training			30 720 884	15 485 382
		Chocolate			282 152 774	151 512 093
		Coffee/Cocoa			169 813 447	87 325 742
		Colors			67 364 756	30 822 451
		Flavours			136 917 500	69 630 956
		Fruit			14 520	1 235
		Apple essence			7 807 040	4 118 208
		Apple juice conc.			682 382 207	382 483 901
		Berry juice conc.			10 094 618	5 310 713
		Black cherry juic.			7 502 419	4 029 084
		Cherry juice con.			10 204 925	5 340 996

Cross-tabular Reports

When you start nesting more dimensions into pivot tables, they tend to become very large and cumbersome. In this case, you can use a cross-tabular report, which shows the same information but with dimensions both as rows and columns.

Year	Month	Spend (EUR)	Price (EUR/Multi...	Material count
Total		10 466 499 152	0,216	346
		267 687 410	0,195	259
		505 496 529	0,222	282
		478 569 543	0,205	291
		450 659 736	0,188	289
		491 600 602	0,207	294
		557 268 364	0,226	290
		531 001 528	0,234	290
		485 496 025	0,221	296
		468 711 979	0,246	295
		529 448 214	0,261	288
		534 037 236	0,255	292
		210 507 014	0,231	245
		279 174 043	0,185	264
		525 560 216	0,209	284
		485 276 765	0,190	291
		478 005 865	0,182	293
		504 580 673	0,194	296
		579 196 999	0,214	289
		551 599 765	0,218	293
		507 731 494	0,209	292
		499 615 780	0,232	299
		544 273 371	0,239	286

Graphical Reports

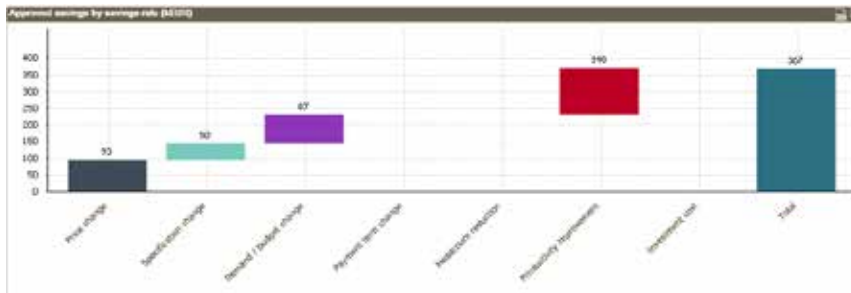
Information in pivot tables and cross-tabular reports can also be presented in a variety of graphs, including several types of 3D-bar, 2D-bar, line, area, pie, box, plot and error bar charts.



Specialized Charts

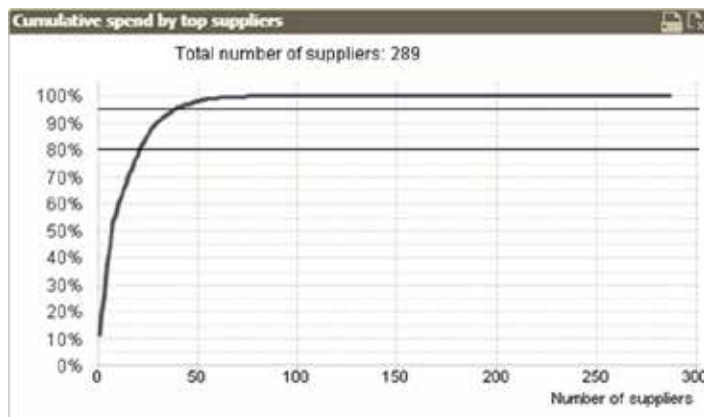
Waterfall Chart

Waterfall charts are usually not part of the standard charts, but are extremely useful in depicting information in a very simplified manner.



Pareto Chart

In spend analysis, Pareto charts are very useful in opportunity identification because they visually show the 80/20 rule; which refers to the top 20% commodities (or suppliers) that account for 80% of the spend.



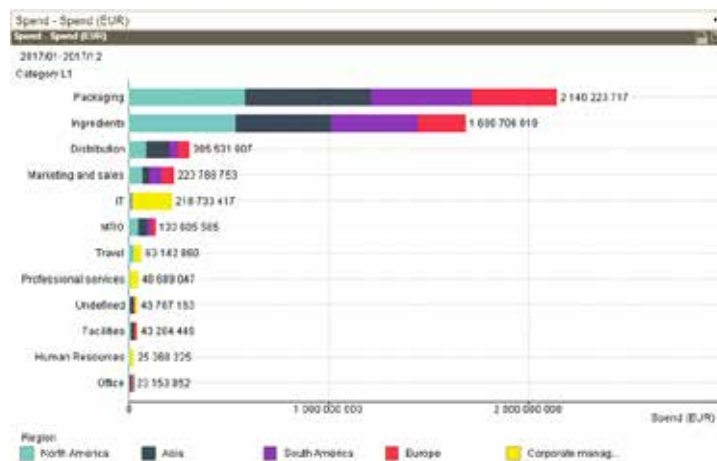
Treemap

Treemapping is a method of visualizing hierarchical data with proportionally sized squares. For spend analysis, this plot shows relative spending by the size of a block. Treemaps can be very sophisticated and interactive. They are also very powerful for visualizing the relative spend across a single dimension such as commodity, suppliers, etc.



Multidimensional Report

A multidimensional report is probably the most powerful type of interactive report. These reports show spend across all dimensions at the same time. The interactive nature of this report means that when the user drills into the cube, all of the dimensions refresh simultaneously to show the spend corresponding to the drill point.



Map Report

A map report is a new type of chart that shows spend on a geographical map. Map reports are usually interactive, so clicking on a particular country or geography will open a specific chart into which the user can further drill.



Deep Dive: Procurement Big Data

What is Big Data?

Big Data describes extremely large sets of structured and unstructured data that can be mined for information and analysed through complex data-processing techniques. The data can be collected from a number of internal and external sources and stored in Big Data repositories.

Internal Data Assets

Internal data assets typically refer to data gathered from an organizations' own IT-infrastructure, such as the enterprise resource planning (ERP) systems, but can include data provided by suppliers, or collected through ad hoc processes using Excel or Sharepoint.

External Data Assets

Any data that originates from outside of an organizations existing IT-framework can be considered external data assets. This includes data publicly available on the Internet, 3rd party proprietary assets and data enriched and anonymized by external organizations.

Procurement Big Data

Procurement Big Data refers to the adaption of Big Data techniques and technologies within the framework of procurement performance optimization. In the context of procurement analytics, Big Data tools and techniques can be used to collect, organize and analyse internal and external data to identify savings opportunities and other value-adding activities.



Deep Dive: Machine Learning Spend Classification

Some of the greatest recent advancements in procurement spend analysis involve machine learning in spend classification.

Machine learning is the field of artificial intelligence where computer systems are given ability to learn from large amounts of data without explicitly being programmed.

In the context of Procurement, machine learning techniques can be utilized to classify spend more accurately or efficiently than data classified by human practitioners alone.

Examples of spend classification techniques include:

Supervised Learning in Spend Classification

When humans train algorithms to detect patterns in spend, removing dull work of repetitive new spend classification.

Unsupervised Learning in Vendor Matching

When algorithms are programmed to detect new and interesting patterns in vendor relationships without intervention or support from humans.

Classification Reinforcement Learning

Where spend classification actions taken by algorithms are reviewed by humans and rewarded or punished depending on the consequences.

While machine learning techniques can prove highly effective within procurement spend classification, human input is still required to capture category and customer specific knowledge.

Example of unsupervised learning – vendor matching:



Best Practices in Spend Analysis

Here are some strategies common among organizations with the most successful spend data management programs:

- Classify spend data at a detailed level and adopt a common classification schema in the company.
- Pursue a permanent solution versus one-time efforts.
- Have an automated approach to cleansing and classification.
- Access all spend-data sources within and outside the organization.
- Continuously improve and expand scope of spend data management program.
- Collaborate with IT and other key stakeholders like finance in the whole process.
- Define category strategies and measure impact.
- Take actions based on data insights to deliver savings opportunities/ savings program management.

Classify spend data at a detailed level and adopt a common classification schema in the company.

Categorizing at the item level proves to be the most effective spend analysis. This does not only provide visibility but also enables more details of all the attributes, enough to do estimates and comparisons. Aim for at least 95% accuracy. Higher-level classification has its own benefits, but item-level proves to be more effective as it gives a precise view of spending with each supplier and for each commodity.

Organizations should adopt a common internal taxonomy or industry-standard classification schema. For example, UNSPSC provides a universally accepted metadata layer for organizing and controlling spend data. This standardization is key to driving accurate organization and correlation of spend data and to enabling actionable analyses. Often broader than internally developed classification codes, these standards allow organizations the ability to map all spend data to a single schema.

Pursue a permanent solution versus one-time efforts.

Using traditional, labour-intensive procedures and systems are not recommended due to the volume and complexity of spend data within an organization. External services usually provide a temporary solution, which requires the organizations to engage with the consultants on a continuous basis to keep data up-to-date. Outsourcing also limits the transfer of the process knowledge and expertise to the organization, leading to dependence upon consultants in the future. Adopting a more sustainable and standard procedure can help organizations get monthly refreshes of their spend data, and a more efficient operation of examining the spend categories.

Have an automated approach to cleansing and classification.

Automated spend analytics solutions capture data classification rules and attributes for a wide range of spend categories. Because of the self-learning abilities, these solutions can present what the sourcing experts know into the system. But there will be a need for commodity managers to classify exceptions from time to time. Establishing automated extraction routines to aggregate and refresh data on a regular basis allows accurate and repeatable spending analyses. Automation also increases the frequency of your analysis which is critical as the business environment is dynamic, with prices changing and contracts expiring all the time.

Access all spend-data sources within and outside the organization.

There are times when your vendors, suppliers or other affiliates have better data than you. Organizations that access spend data from all relevant sources can gather a more comprehensive and accurate idea of the total spending.

Continuously improve and expand scope of spend data management program.

Spend data is a work in progress. Continuously improve your spend analysis. Organizations should constantly look for ways on how to expand the uses and scope of spend and its data cleansing and classification capabilities. Conducting reviews will help identify immediate areas for improvement and illustrate the positive impact that a particular initiative has on the performance of the organization.

Collaborate with other key stakeholders like finance in the whole process.

To achieve full potential savings, a collaborative partnership between procurement, and other business units must be created, and everyone should be held accountable for results. Leveraging spend data requires cooperation within the entire procurement organisation. When procurement and finance work together, they can create systems that reliably capture and deliver real cash savings to management. This in turn creates a loop for improving performance.

Define category strategies and measure impact.

Develop category plans aligned to the business objectives and key stakeholders with a strategic approach to maximize value, reduce risk and effectively manage the supply of goods and services. These plans should influence sourcing strategies and initiatives. A careful review of these strategies will assess and confirm the business impact and determine if a revision or repetition is required.

Take actions based on data insights to deliver savings opportunities/ savings program management.

The data provided by the procurement teams can prove valuable as it makes a significant effect on what an organization buys and how it makes the purchase. With the data on hand, there should be necessary steps to unlock the potential of these insights. The ideas generated must be implemented into actual strategies that will drive savings to the bottom line. Act on these strategies and make sure that they will be translated into savings opportunities.

Why Spend Analysis Projects Fail

There are organizations tackling the problem of spend visibility. Several projects tend to fail in delivering the value that was expected initially, despite the significant need that the organization had for effective spend analytics.

Here are some reasons why spend analysis projects fail:

- **Poor quality data/ dirty data**
- **Complex and labour-intensive cleansing and classification process**
- **Leaders without data-driven mindset**
- **Lack of planning results in unrealistic expectations, unclear goals and misplaced priorities**
- **Wrong tools or having too many tools to choose from**
- **Lack of skills and user competence**
- **Fear of losing relevance or control of data**
Limited analytics solutions
- **Spend analysis as a one-time effort**

Poor quality data/ dirty data

The most common reason why most spend analysis projects fail is because of the poor quality of data. There are times that suppliers have better data than the systems the organizations can provide. Many organizations spend 80% of their time cleaning up data. Common examples of dirty and inconsistent data include basic hygiene issues like empty data fields and wrong spellings which can interfere analysis. An effective spend data classification and analysis requires detailed information but often has unstructured data within different business systems. The information is often rife with errors and discrepancy in different departments or missing critical data fields, such as supplier name, product attributes, or account codes. Part/item descriptions for the same category might vary significantly, words can be abbreviated, and supplier names be misspelled.

Complex and labour-intensive cleansing and classification process

For most large organizations, classifying the billions of dollars of spend is not easy. The problem is not just in volume, but also in the fact that the data is extremely immense to the point that it could take years to properly classify all of the spend.

But this granularity is required to achieve the necessary business actions that generate value. Some methods to overcome this problem have been proven to not be effective, like classifying spend data at the highest level commodity class. Such methods provide insufficient insights and often give inaccurate analysis. One method collaborates with humans, but it is also not sustainable as the tremendous efforts exerted would require repetition of the process frequently and this would render the newest data out-of-date. No solution will give you 100% classified data all the time. The key thing is to build in appropriate checks and balances so most errors can be caught and corrected immediately. Making sure that this is done consistently will maintain trust in the data and in the classification process, and enable the data to be used consistently for ongoing decisions.

Leaders without data-driven mindset

The leadership team also has a role to play in why some spend analytics projects fail. There's a lack of agility and continuous involvement or sponsorship by executives in the analytics process. Many business leaders trust the more familiar way of doing things. They would rather review the old fashioned way which is a time-consuming process instead of deciding based on actionable insights and useful results. At the same time, the top management has little knowledge on how to maximize and link the insights gained from spend analysis with the strategy and the objectives of the organization. The solution to this is to adopt a more lightweight approach. This does not necessarily mean that the management team needs involvement all the time, but there has to be periodic, short feedback loops. Letting them know of the progress will ensure they see immediate, accumulative results. Getting them in the loop drives better engagement.

Lack of planning results to unrealistic expectations, unclear goals and misplaced priorities

Part of the reason that many spend analytics projects fail is that organizations rush to accumulate and analyze as much data as possible all at once and without much of a plan. This usually leads to huge costs and an overwhelmed team. Starting big isn't always the way to go. With more data and more heavyweight tools and capabilities to rationalize data across silos, it can feel like there are more opportunities than there are resources to exploit them. These organizations would fail to see the insights for the data. Start small. It is not only much more fruitful and has lower cost, but also minimizes risk. Some of the most valuable business insights have been derived from surprisingly small data sets. Starting small also leads to a clearer path to smarter business decisions and priorities ensuring data analytics success. Spend analytics is not a one-time project for you to set up and reap the benefits right away. It needs a plan, and everything has to be transparent with immediate, disciplined, and regular feedback loops.

Wrong tools or having too many tools to choose from

A spend analysis is a project that should start with the right tools. It is always about understanding what your organization needs and getting the proper solutions that will address the current situations. Attempts on doing spend analysis incorrectly and without the proper solution have put the validity of analysis in jeopardy. Organizations should base their initiative on a proper spend analysis tool weighing all the considerable shortcomings of each before deciding.

Most spend analysis initiatives fail to deliver additional results after 12 to 18 months because they have insufficient or ineffective systems in place. Challenges are daunting and many solutions fail to address all of them. An organization should ensure that the solution selected addresses all issues and associated challenges that are relevant to its own situation.

Lack of skills and user competence

A deep product and domain knowledge is needed for correcting spend data classification errors. This expertise varies across the company, resulting in different and unpredictable results. Many organizations put data cleansing and classification duties in the hands of IT professionals who may not have complete understanding of the parts and services that require review. There is a lack of ability among existing staff to access, organize and analyze spend data for sustainable use. For example, when you do a deep dive on classification on some categories, where the knowledge is limited to a few people, there needs to be the right expert associated with the right spend items. As a result, the initial data is mapped out poorly which leads to many repeated efforts before the reports will be useful. Very often category teams are the ones with the right information, but they are usually not involved. When this happens, the sourcing analysts might have already missed out on the valuable opportunities.

Fear of losing relevance or control of data

When you've had control of something for a long period of time, it is often hard to let go and lose control of it. Data owners like the IT team may feel like they have no choice but to share data sets with other departments.

More so when an external expertise is brought in to support the data analytics project. The leading challenge that needs to be addressed regarding this is the data silo problem. To resolve that, it is important to note that analyzing data requires clean integration. Silos are conquered when technology is contained in a place that lets the owners have access to the relevant data. When errors have been identified, it is easier to recognize actionable insights and fear is eventually overcome.

Too many data sources/ disparate systems

Multiple disparate systems drive complexity and confusion. Spend data is often sprinkled throughout different systems across the organization, including AP, GL, ERP, and many others. These employ different classification schemes, making it difficult to extract and analyze. When there are too many or incompatible data sources, organizations cannot efficiently leverage their spend analytics efforts in sourcing activities. To reap the full benefits of spend analysis, spend data must be migrated to one centralized repository in a standardized fashion.

Limited analytics solutions

Spend analysis is not a black box effort. Therefore, using basic spreadsheet applications as primary analysis tools limit the possibilities that analyses can offer. Home grown systems are not spend analysis solutions. Some organizations have powerful data warehouse solutions and a well-equipped IT team who can build their own spend analysis solutions by acquiring report builders. But even this powerful typical solution also has its limited flexibility.

This often results to canned reports because of the lack in expertise in the construction of analytics solutions. So if an organization wants more return on investment and real value from spend analysis, they need to consider a solution that is built on proper technical foundations and capabilities.

Spend analysis as a one-time effort

Spend analysis should be a continuous process. It is time-consuming but is an evolving part of your long-term procurement transformation. It is a project that will continue to yield incomplete and inaccurate results and therefore has to be done several times to achieve the desired results. Doing it just once yields only a one-time benefit. Repeated analysis is often required to identify changes in an organization's spend and monitor progressive spend against contracts to ensure that real value is delivered.