crossmodule analytics

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Cross Module Analytics

This overview presents the business intelligence solution developed for the procurement process data extracted from SAP® enabling advanced analytics. This solution provides reporting and control for executives, financial analysts, marketing managers, sales people and controllers – to monitor and visualize real-time data across organisations focused on productivity, costs management, process optimization and governance, and innovation that help tell the story behind a company's data.

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Introduction

Under competitive pressure, enterprises need to protect profitability by finding new ways to boost productivity and drive innovation in procurement processes and practices to lower costs. Opportunities to lower costs and to growth the enterprise can be found via data compounded within the procurement process and other business functions.

Billions of dollars are spent on Business Intelligence (BI) software and services each year worldwide. The BI and analytical software market grew 10.6% in constant currency in 2015 to $17.6 billion[1]. According Market Research, the fastest-growing market in the IT industry is the BI and analytical software market which is expected to increase from $17.90 billion in 2014 to $26.78 billion in 2019, with a compound annual growth rate (CAGR) of 8.4 percent[2]. Despite the billions spent, adoption of BI solutions is still insufficient due to only 22% of employees on average utilizing an implemented BI tool, with a smaller companies having a higher adoption rate. Only 25% BI deployments are successful of which around 28% have had a significant business impact[3].

Despite these metrics, companies are still searching for the new ways to improve and optimize their daily operations as well as tactical and strategic decision making. Unfortunately, there are still not enough business intelligence advantages within SAP® to easily derive operational and strategic advantages. For this reason, there is demand for adoption of new tools and solutions that will create data visualizations, dashboards, and applications that help tell the story behind a company's data. In this paper, such business intelligent solution for SAP® is presented.

This solution provides control and reporting for executives, financial analysts, marketing managers, sales people and controllers to monitor and visualize real-time data across organisations with the focus to productivity, costs, process optimization, governance and innovation.

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[1] Gartner, Inc. More: www.gartner.com
[2] Market Research. More: www.marketresearch.com
[3] BIScorecard. More: www.biscorecard.com

Enabling Business Analytics

Sustainable approaches to improve the procure to pay process are not limited to the procurement suite of ERP systems only, but incorporate the neighboring modules and components as well – such as Sales and Distribution (i.e. demand forecast), Production Planning and Execution (i.e. MRP; material requirement planning) as well as Finance and Controlling (i.e. Accounts Payables and Treasury). Widening the scope of procurement analytics with the help of *P2P application package* allows to support improvement and cost saving steps in the following areas:

Improvement Area	Element	Definition
Purchased cost	*Maverick spending*	Eliminating lost savings from purchasing groups not utilizing *preferred vendor agreements*.
	Supplier non-compliance to contract	Ensuring that *suppliers comply with contracts* (pricing, deliverables, etc.) and are submitting accurate and non-duplicated invoices via the *P2P application package*.
	Consumption reduction	Using *P2P application package* to *facilitate consumption reduction* via substitution, postponement, etc. (i.e. recommending lower price items).
	Spend influence	Using the *P2P application package* to *better capture demand for spending not yet sourced* (i.e. one-time buys, spend not yet strategically sourced) and then applying strategic sourcing best practices.
	Sourcing productivity	Improving productivity of sourcing staff with enhanced access to meaningful spend data generated within the *P2P application package*.
Capital cost	*DPO improvement*	*Lowering the cost of capital* associated with days payable outstanding (DPO) using *P2P application package* for payment timing clocks, invoice/payment process fail-safe, P2P-related aspect of terms conversion (i.e. via supplier on-boarding).
	Early payment discounts	*Improving capture of early payment discounts* against existing payment terms, including the use of dynamic discounting (e.g., using e-invoicing to receive supplier invoices before the early payment date passes).
Transactional quality cost	*Purchased goods and materials transaction quality*	*Reducing the costs associated with incorrect ordering* of purchased finished goods and/or raw materials, including return-to-vendor costs, quality costs, inventory related costs and customer-facing costs.
	Supplier penalties	*Eliminating penalties* due to supplier payments made after the payment due date.
Process cost	*Reduction of processing cost*	*Reduction of the P2P process costs* itself (i.e. direct labour and other costs).

Issues, Challenges and Solution

Nowadays, a largely increased demand for business analytics creates new challenges and solutions that have to be removed and solved. In this chapter, the short overview of issues, challenges and solutions which is used to aid in the development of Cross Module Analytics (CMA) in relation to SAP data, are provided.

1. **Issues**
   - Not so many reports or business analytics available in real-time, since it requires manual and time consuming work via Excel spreadsheets - to combine SAP® data to create simple reports.
   - Difficulties to access, understand and combine SAP® data sources, tables and fields that requires manual and time consuming work to enrich it to understandable and uniform format.
   - Few solutions are available in the market that could overcome above mentioned circumstances.
   - Even extracting data from a SAP® source requires special skills, methods and tools to process and integrate to advanced BI tools.

2. **Challenges**
   - To access and adopt SAP® data at its source to enable advanced BI solutions and organisational decision support quickly and in a cost effective way.
   - To provide solutions for customer's day-to-day problems, provide guidance on how to work better and smarter, and learn and adopt more about industry best practices in usage of BI tools.
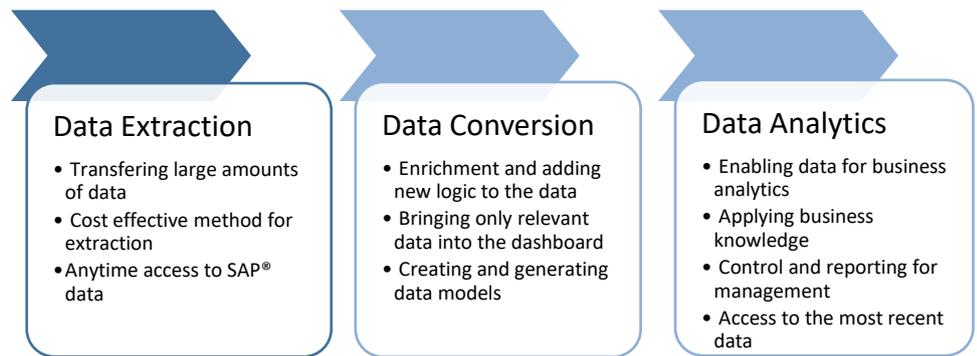
3. **Solutions**
   - Cross Module Analytics (CMA) provides an easy-to-use suite of procurement management dashboards that require only minor customizations to meet your business needs. Users can monitor performance on KPIs with role-specific dashboards – measuring success against spend management goals. With a dedicated Working Capital and Spend Analytics Dashboard, customers can easily drill down to the spend details to see individual transactions across Procurement, Invoicing, Expenses, and more. There's no need to design, implement, and maintain a Business Intelligence (BI) solution from scratch.
   - Cross Module Analytics was created via collaboration of best of breed SAP Procurement and Supply Chain consultants with advanced Qlikview application developers. This combined initiative has resulted in a set of intuitive but flexible in-memory dashboards to help you take control of all aspects of the procurement function.
   - True self service orientated business data discovery
   - Powerful operational reporting to assist in daily business data needs
   - Best of breed analytical tools to help analysts and executives to optimise the procurement and supply chain functions

- Quickly identify and mitigate badly captured data
- Browser and mobile based analytics
- CMA is guaranteed to improve the depth and speed of visibility into your SAP ERP domain – at a fraction of the cost of traditional Business Intelligence solutions.
- CMA Procurement Suite of Dashboards comprises of analytical tools that cover your key business processes and enables rapid analysis and insight into large amounts of data from across all relevant areas and modules of the SAP System – such as Sales and Distribution (SD), Accounts Receivable (AR), Material Management (MM), Accounts Payable (AP) and General Ledger (GL).
- Our proven success stories include rapid deployments, massive operational cost reductions and proven business related savings well in excess of $5 million.
- We provide the long sought after insight for all job functions, from data processing, analysts all the way through to the C-Suite level.

Data Extraction and Integration

Today technology allows anytime access to SAP® data and utilizes it like any other data source. Thanks to Qlik® software company providing business intelligence solutions called QlikView® and supporting distinctive techniques and methods to create an automated process to easily integrate SAP® data to Qlik® BI dashboards.

QlikView® uses in memory intensive computing and analysis technology that speeds up the quantity of data being analyzed. The dashboards are enriched with reports including calculations of business performance indicators, key metrics and insightful visualisations. The data extraction and integration process model covers three stages: extraction, conversion and analytics (see Fig. 1). Since SAP® data does reflect all details relevant to business process steps in particular, the main driver to provide smart data models for reporting is to identify not only the tables but also the sets of relevant fields to be considered for extraction and conversion. The tables extracted from SAP contains various types of data categories that have to be adopted to the understandable format. Generally, organizational and master data have to be presented in reporting environment which is only completed, once all the general (i.e. VAT codes plus descriptions etc.), organizational (i.e. purchase orgs, plants, company codes plus descriptions etc.) as well as the master data details (i.e. vendors, materials, customers etc.) are available.

Data Extraction
- Transfering large amounts of data
- Cost effective method for extraction
- Anytime access to SAP® data

Data Conversion
- Enrichment and adding new logic to the data
- Bringing only relevant data into the dashboard
- Creating and generating data models

Data Analytics
- Enabling data for business analytics
- Applying business knowledge
- Control and reporting for management
- Access to the most recent data

Fig. 1 Data extraction and integration process workflow model

Data extraction and integration process workflow consists of three key stages:

1. **Data Extraction**
   The main goal of this stage is to select only required and related data for extraction from SAP system. Data extraction is mainly performed during the nighttime to ensure at start of business day the most recent data is uploaded and presented in reports and dashboards or data can be extracted by customer requirement or at any time using 24/7 approach.

2. **Data Conversion**
   The main goal of this stage is to prepare data for analytics. This stage is carried out by data conversion that includes transformation and modeling where data contained tables are enriched with new logic and linked together in addition with stand-alone satellite data tables. The key point is to collect major tables in data models of which the most important one is reflecting to the required business processes.

3. **Data Analytics**
   The main goal of this stage is to implement analytics based on the investigation of business performance throw the data models. This stage enables to create business reporting and control for executives, financial analysts, marketing managers, sales people and controllers – to monitor and visualize real-time data across organisations focused on productivity, costs management, process optimization, and innovation that help tell the story behind a company's data.

Dashboards and Functions

Cross Module Analytics (CMA) is enriched with performance indicators to help in control and reporting for executives, financial analysts, marketing managers, sales people and controllers to monitor and visualize real-time data across organisations with the focus to productivity, costs, process optimization, innovation. This chapter consist of short summary of the dashboards names and their core aspects including functionalities in procurement area:

1. Procurement Analytics by Vendor
Utilizing and tracking payment terms will allow you to manage each vendor's terms currently and trended over time. Realise savings opportunities or missed in the past to utilise in the future with the CMA Payment Terms dashboard.

- Procurement Spend by Vendor
- Procurement Spend by country/ Location
- Material Gainers and Fallers
- Invoice Status
- Easy visibility into the current state of your procurement process
- Purchase Order based Invoices that are Material or Goods Receipt purchase orders

2. Supply and Demand
Customize thresholds within the CMA Vendor Management dashboard to identify different levels of supply and demand to determine the current inventory status of your warehouse. By doing so, reordering becomes easier and over ordering becomes a thing of the past. Identify the levels of safety stock and stock at vendor to determine total stock on hand to properly identify next steps in your procurement process.

- Customized Supply and Demand Thresholds
- Safety Stock, Stock at Vendor, Stock on Hand and Total Stock
- Past Due Supply
- Weekly trending of Supply and Demand
- Identify different ABC Planning levels

3. Purchase Requisition
Verifying the appropriate approval details are captured to ensure the correct Purchase Requisitions are converted to Purchase Orders. Effectively track purchase requisitions by vendors and buyers.

- Open Purchase Requisitions
- Purchase Requisitions by vendor
- Purchase Requisitions by buyer

4. Purchase Orders
Managing and tracking purchase orders in a more efficient and visually appealing manner, the CMA Purchase Orders dashboard provides quick insight to your purchase order process. Track the time to fulfil purchase orders and past due orders.

- Purchase Orders past due

- Purchase order creation date
- Vendors past due
- PO Automation Rate

5. Goods Receipt

By analysing the Goods Receipt matching to Purchase Orders, the CMA Goods Receipt Application is able to track what vendors have provided the correct units ordered and the condition. We are able to derive further insights to make your receiving process as seamless as possible.

- PO GR matching
- Goods delivered status
- Stock on Hand
- Duplicate Shipments

6. Invoice Receipt

Track and verify what invoices have been received and accurately reported. Identify outstanding invoices and when they should be realized. Accurately manage discounts from vendors to ensure paying in the proper threshold.

- Average Payment time
- PO Matching
- Time to Process Invoice
- Percentage Duplicated

7. Payment Terms

Analyse and track vendor payment terms to determine adherence and consistency with the CMA Payment Terms dashboard. Identify payment due dates and have the capability to meet discount thresholds.

- Possible Savings
- Savings Missed
- Total Released and not invoiced purchase orders

8. Invoice Payment

By tracking your previous, current and future invoices, the CMA Invoice Payment Application allows companies to easily identify the current status of invoice payments. Identify if invoices have been paid timely, accurately and tracked appropriately.

- Average payment days per vendor
- Purchase Order and Invoice Match
- Payment Terms Compliance
- Invoice Trending per material

Security

In this section an example of security concept related to the business role concept and the access to the SAP® is presented. The target is to allow only the access to the authorized personnel i.e. which has access to the data in SAP® system or is working with this business role. The functions and security settings are fully integrated and flexible with any of proof of concept or required standards by the enterprise. In example, procurement manager is responsible of all procurement processes in procurement department. Following this, procurement manager is provided to have access to all procurement data in comparison than buyer or controller. Buyer, can be allowed to see only related purchasing group data and controller has to be able to access the data required only by controlling, reporting and planning role. In relation to top level managers are able to get full access to the department data.

The role concept of Cross Module Analytics (CMA) is compatible to support SAP standard approach roles that are delivered to the customer when installing the software (i.e. purchase manager, warehouse manager, account manager, account payable, production planner etc.) The main purpose is to keep existing business roles and access rights i.e. in the Procurement business area.

Moreover, CMA is designed to ensure corporate level security and therefore contains all required information security components, which are satisfied even by financial industries with high level security needs. The security standards are designed to support and secure records and users related information. Feature-rich and easy-to-manage security console allows you to control user access to data and metrics to the media and the results of the analysis. You can apply group, role, and individual user access control policies at the level of individual documents down to specific lines and values. BI-platform of QlikView supports standard directory services such as Microsoft Active Directory. Configurable directory service allows you to integrate QlikView with other directories and user databases in your enterprise.

For any enterprise software solution in production, security is an absolute requirement and IT professionals from a DBA all the way to the CIO are tasked with ensuring that:

- Unauthorized access to data never occurs;
- Data is made readily available to those who need it.

Implementation of these twin goals can often be at odds with each other and it is important that software vendors and implementation partners provide clear and accurate information related to how their solutions adhere to any organization's security standards. Mandatory authentication at login to QlikView (for this Microsoft Active Directory may be used, for example); To enter each individual QlikView application, separate login and password can be installed if needed; Access rights differentiation is created for each user (or for each user roles); These differentiations are creating by:

- Any element of any measurement
- Any tab within the model
- Any item on the tab
- Any field in the tables presented

The system has a 3-tier architecture. This means that the user has no contact with the data, only with the server. The QlikView Server contains the security console that manages user access to the system where all the communications between the client and the server are encrypted with 128 bit patterns. The system of QlikView is logging all user actions.

Case Study

Industrial Supply Chain & Procurement

A data discovery implementation with a world leader in material handling systems.

Leading US-based logistical solutions provider whose state of the art systems help deliver over 40 percent of the world's retail orders. This firm sought a transparent visualization process to highlight stock ordering anomalies, premeditate supply chain snags and greatly reduce the costs associated with delayed product delivery.

Improvement Area	Element	Definition
Challenges & Needs	*Lack of real time actual data for decision making*	A lack of business trust in the data quality from excel derived reporting hampering decision making. Over allocation of resources to manual excel data transformation resulting in a lack of time for actual analysis.
	Lack of BI platform	A reliable data platform with transparent business logic to Improve supply chain visibility and drive calls to action.
	No data extraction and integration from SAP	A flexible, lean, and cost effective BI platform that allows cross module analysis of SAP data without extensive report building.
	Missing process improvements	Using the P2P process to better capture demand for spending not yet sourced (i.e. one-time buys, spend not yet strategically sourced) and then applying strategic sourcing best practices.
	Lack of productivity	Improving productivity of sourcing staff with enhanced access to meaningful spend data generated within the P2P process.
Material Benefits	Cost vs. Traditional Business Warehouse Solutions	An agile and scalable BI toolkit at a fraction of the traditional software and infrastructure costs.
	Time and Efficiency Gains	Created through automated QlikView reporting and eliminating manual data extraction and report building.
	Spend & Savings	Improved forecasting ability reducing lost sales caused by supply chain shortfalls. Greater supply chain visibility creating opportunities for cost reduction and cost avoidance
Solution	*Open Purchase Orders*	Full Purchase Order visibility exposing open and incomplete Purchase Orders. Customised business logic allocating actions to incomplete purchasing processes.
	Supply and Demand	Highlight stock and pricing inconsistencies created between order and delivery.
	Material Management	Bring purchasing into equilibrium by balancing known and forecast demand with pending supply and target safety stock levels.
	Working Capital	Ensures continuous supply capability, minimised capital held in idle stock and reduced storage costs for over-bought materials.
	Procurement Navigator	Evaluate vendor and buyer performance on a product by product basis.

		Visualise cross module procurement needs across multiple business functions and streamline purchasing.
Supply Visibility	*Chain*	Assess how vendor performance will impact specific projects downstream based on forecast stock requirements and anticipating supply chain snags.
		Reduce the penalties and costs associated with delayed product delivery.

With an expert understanding of SAP®, combined with a best in class data visualization ability, Cross Module Analytics helped to identify and address the key pain points within the client's vast data environment. A production ready QlikView® Application was delivered within 20 days to respond to the urgent business requirement of visualizing a fast moving purchase order landscape. US-based logistical solutions provider improved its procurement processes by implementing QlikView® analytics based on SAP® data. By enabling contract negotiations, working capital, price tracking, purchase orders analytics at a global level with distributed buying capability, they saved thousands of dollars annually through reducing numbers POs, taking advantage of bulk discounts, and reducing rogue buying and paying for undelivered or over delivered items. The expected savings amounted to approximately $1 billion for every $10 billion spent.

Conclusions

Cross Module Analytics (CMA) provides an easy-to-use suite of procurement management dashboards that require only minor customizations to meet your business needs by eliminating manual and time consuming work to copy or extract the data from SAP® system or using Excel spreadsheets in order to create daily business reports.

CMA enables easy to access and adopt SAP® data at its source to enable advanced BI solutions and organisational decision support quickly and in a cost effective way. It provides the solution of customer's day-to-day problems, guidance on how to work better and smarter, and helps to learn and adopt more about industry best practices.

Sustainable approaches to improve the procure to pay process improvements are not limited to the procurement suite of ERP systems only, but incorporate the neighboring modules and components as well – such as Sales and Distribution (i.e. demand forecast), Production Planning and Execution (i.e. MRP; material requirement planning) as well as Finance and Controlling. Widening the scope of procurement analytics allows as to support improvement and cost saving steps in the enterprises.

CMA is implemented on the BI solution which is one of the best in the world according Gartner's Magic Quadrant for Business Intelligence Platforms. CMA is guaranteed to improve the depth and speed of visibility into your SAP ERP domain – at a fraction of the cost of traditional Business Intelligence solutions.

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