CPQ/EPS Vendavo in the analysis of the company's transaction data

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Abstract— **The article discusses the subject of price analysis of sales data. This process uses a cascading pricing model/ Price Waterfall Model. It is the theoretical base for the CPQ application (Configure, Price, Quote), which is a tool supporting decision-making processes in the enterprise. CPQ uses transaction data in the (Configure) process - configures, (Price) quotes (Quote) finalizes the transaction. The process supports the mapping of transaction data into the price cascade model discussed in the article.**

Keywords: price, waterfall, model, cost management, price management.

I. INTRODUCTION

Making effective decisions at the levels of tactical, strategic, and operational management requires the full use of the company's information resources. In the economic area for the Business to Business (B2B) sector, the key decision-making process is the price negotiation process. Having information resources describing the history of negotiations for a given client, market, the product is the basic resource for the construction of decision-making systems of the Business Intelligence type (Olszak, et. all. 2012, (Sabherwal, et. all.2012). The search for models supporting decision-making processes within Business Intelligence systems is important in the development and improvement of organization management processes. As part of Business Intelligence systems, a dedicated group of Business Intelligence systems solutions dealing with the control of the price process in the organization is, among others: solutions defined in the literature with the acronym CPQ (Configure, Price, and Quote). The basis for such systems is the implementation of a cascade pricing system - in the literature defined as the Pricing Waterfall Model.

As part of these solutions, the configuration is directed to the marketing and business area. Data on the nature of the market, customer, sales channels, pricing policies, and a number of other solutions focused on managing the sales process are analyzed. The purpose of the solution and process are analyzed. The purpose of the solution and operation of the CPQ system (salesforce.com) is the optimal control of the sales process by generating a price proposal for the customer. The article presents the price cascade system and its exemplary implementation of the CPQ / EPS (Enterprise Pricing System) type. A number of different aspects of this solution are discussed, as well as potential benefits through the implementation of the sales data analysis model.

II. DIGITAL ECONOMY IN THE B2B AREA WITHIN THE USE OF CPQ APPLICATION

The area of B2B interactions between companies puts more and more emphasis and energy on the price negotiation processes because each company wanted to maximize the profit from each business transaction. Therefore, the emphasis on building effective solutions supporting decision-making, also using advanced methods of data analysis, becomes obligatory. The digital economy generates a lot of data as a result of many processes and tools supported by IT. The definition of the digital economy is that it is an economic activity that is the result of billions of daily connections and online transactions between people, businesses, devices, data, and processes. The basis is the data flow in the economic environment as part of the activities related to the exchange of transactional information between the elements involved in many interconnections during the B2B transaction process. Using IT tools supporting the sales process, the digital economy generates the amount of data that can be analyzed with the support of other IT tools.

Professor Walter Brenner from the University of St. Gallen in Switzerland states: "Aggressive use of data transforms business models, facilitates new products. and services, creates new processes, generates greater usability, and introduces a new management culture." (deloitte.com). The Digital

Economy creates a new solution supporting the way of negotiating prices, mainly in the B2B sector. Digital Economy is a must-have strategy for key players (Janicki and Goździewska-Nowicka, 2018). The goal is profit, as shown by Mc Kinsey's research; a price increase of 1% generates a 10-11% increase in profit (Strength of 1%) (E. Maltby, "Raising Prices Pays Off for Some," The Wall Street Journal, 2010). The success of the price negotiation process is very important. Therefore, the implementation of the price negotiation process is often supported by dedicated tools and computing capabilities within the company's IT system to minimize the risk of possible economic losses. The digital economy uses IT system solutions that offer functionalities in negotiating business processes within innovative approaches. CPQ (Configure, Price, Quote) - as an example of an IT tool in the Digital Economy world. CPQ software is an IT support solution focused on generating quotes for orders at the right price. CPQ - is most often used in conditions. - B2B (Business to Business) sector - Huge amount of sales data, millions of records sold - Company size (Revenue - $ 1 billion) - Due to the widely used B2B strategy win/win - Optimization - valuation process - Profit-oriented - maximization, without losing the customer - CPQ - control the main process - setting and enforcing the right prices. The functionalities of CPQ Software (Configure, Price, and Quote, using the Price Waterfall model) are presented in more detail on the example dataset in Vendavo's EPS solution.

III. Digital Economy in the B2B area within the use of CPQ application.

In the world of the Digital Economy, there will soon be no room for organizations that do not analyze their business and related data - it will simply lead to exclusion from the economic world. Contrary to what is quoted in R. Phillips, Why Are Prices Set The Way They Are, Chapter 2, The Oxford Handbook of Pricing Management, New York: Oxford University Press, 2014, A. Hinterhuber, S. M. Liozu, Innovation in Pricing: Contemporary Theories and Best Practices, 2nd ed., Abingdon-on-Thames, Routledge, 2017, pricing is a "clutter" that varies greatly between industries and even companies, and as such is the subject of ongoing research. The Price Waterfall Model starts with a Basepoint where the Base price point is determined based on historical data (i.e. some market verification of the price already exists). In the following steps, the price in subsequent price points changes according to adjustments, which may be positive or negative (due to the nature of the actual correction) like is presented on Figure 1. The calculation of k - price value is done using the Equation (1) where $\pm a_i$ represents the i-th price adjustment out of the total number of n adjustments made after the previous price point was established $PricePoint_{(k-1)}$.

FIGURE 1 GRAPHICAL PRESENTATION OF PRICE WATERFALL MODEL (PWM)
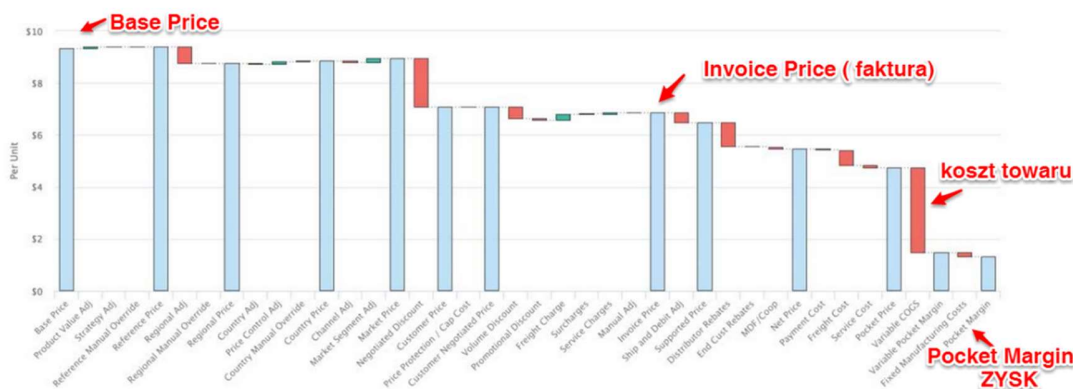
Source: own elaboration

$$PricePoint_k = PricePoint_{k-1} + \sum_{i=1}^{n} \pm a_i , \quad (1)$$

               (1)

Where:
PricePoint – element of Price Waterfall Model;
a - adjustment of Price Waterfall Model;

Each price point relates to a specific point in the pricing and profitability process (Figure 1 shows an example of a price waterfall and the resulting pocket margin). If the sum of the price adjustments is negative (i.e. if there are mainly negative adjustments - $-a_i$), the contract is discounted. Each price adjustment between price points applies to different contexts, such as product attributes, cross-selling rules, regional pricing rules, channel adjustments, standard rebates or negotiated rebates, handling and shipping charges, rebates, handling charges, and finally standard product costs. The market setup

leads to the invoice after the discount point where the price is already fixed and appears on the customer's invoice. After this point, the cost part appears in a cascade, where all costs related to a given transaction are taken into account.

The last price point is called Pocket Margin. By calculating the Pocket Margin value as the last element in the cascade, at the end of a transaction (i.e. the end of the entire pricing process), an estimate of the profit from that transaction is made. This feature of PWM, i.e. a quick estimate of the profit per transaction at the time the transaction is created, seems to be the most important in the entire process.

Pocket Margin value below zero indicates profit leakage (price margin), e.g. too high rebates have been granted, adjustments have not been made correctly at a given stage, etc. (Senczyna 2016) The transaction data and the structure of the price cascade allow the expected profit value to be calculated. Depending on the agreed pricing policy, the transaction will then be prepared for the client who may apply for additional discounts. However, for each transaction, a limiting factor is given, i.e. the Pocket Margin value, which should be greater than zero.

IV. EPS / CPQ Vendavo - overview of modules

The functionalities described are implemented by several modules within the CPQ / EPS application. are presented in the slides below. An overview, in detail, is beyond what is possible in this work.

EPS modules:

Profit Analyzer module like on Figure 2.
– Identification of the price, margin, elements of the price cascade
– The use of transactional data in carrying out multidimensional analyzes with the use of available elements of business graphics
– Identification of business areas where Pocket Margin <0 occurs
– Use of graphic elements, prepared report solutions for ongoing work with data
– Searching for multiple dependencies, models of activities that allow you to trace potential places for increasing profit.

FIGURE 2 GRAPHICAL PRESENTATION OF PROFIT ANALYZER MODULE
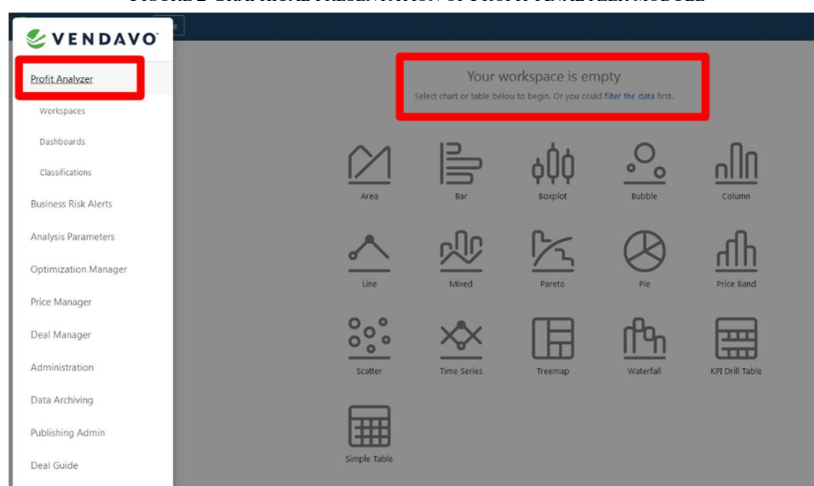
Source: own elaboration

Price Manager module Figure 3.
– Creating pricing rules based on sales data in the application
– Combining data, analysis of various variants of creating rules
– Generating prices based on the created rules for individual groups of goods, blocks, business areas.
– Ease of multidimensional operations, mass product price changes.
– Tracking of changes made with additional control of people makes those changes.
– System integration and data transfer to an external system

Deal Manager module Figure 4
– Evaluation of the pricing strategy for individual transactions• Modeling each transaction as part of the

CPQ process:
– Configure, Price, Quote for profit maximization.
– Automatic redirection of processed transactions for approval at the managerial level in the company.

Ease of handling and working on complex transactions with many records.

Sales data analysis requires multi-dimensional, multi-module applications. Vendavo EPS is one of the related. Many other solutions are available in this field.

FIGURE. 3 PRICE MANAGER / VENDAVO EPS / CPQ MODULE

Source: own elaboration

FIGURE. 4 DEAL MANAGER / VENDAVO EPS / CPQ MODUL

Source: own elaboration

V. CONCLUSIONS

The next steps in the development of the presented CPQ solution will be the extension of the possibilities with the use of AI and machine learning algorithms (deep) and the connection with data sources richer in insight (Big Data sources). This would lead to the creation of a more advanced system that would allow for price optimization as part of the revenue management process (PWM method). Future research on this topic will focus on methods and approaches to optimize revenue and their incorporation into new features that would also enable an optimized implementation of the revenue management process in the software solution interface.

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