Next generation analytics for price recommendations to increase market share and optimize revenue

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1 INTRODUCTION

1.1. General

For any company, it is imperative to identify the optimal price to sell that matches the customer's willingness to pay. In general, the optimal price is the combination of multiple other factors such as competitive prices, value proposition of the product along with the customer's willingness to pay. For companies which have a handful of products, this approach is fairly straight forward. However, the process of finding analytically driven optimal prices becomes exponentially complex as the number of products in the company increases.

About 80% of a typical company's revenue comes from its standard products, which often number in the thousands. Manual practices for setting prices makes it virtually impossible to see pricing patterns in the data and unlock the true value of price. It gets more complex in a B2B industry where every customer pays a different price based on the discount levels and volume commitment. It's simply too overwhelming for large companies to get granular and manage the complexity of these pricing variables, which change constantly, for thousands of products. At its core, this is a big data issue. Data Analytics especially pricing analytics leverages transactional and competitive data at a customer – product level to identify trends and patterns in data to make a well informed decision based on the customer value proposition and willingness to pay to recommend optimal prices to maximize the overall revenue for the organization.

This project seeks to further investigate the novel data analytics tools/systems that were evaluated in the GRAD 695 course and further propose new innovative methods of pricing in the big data world.

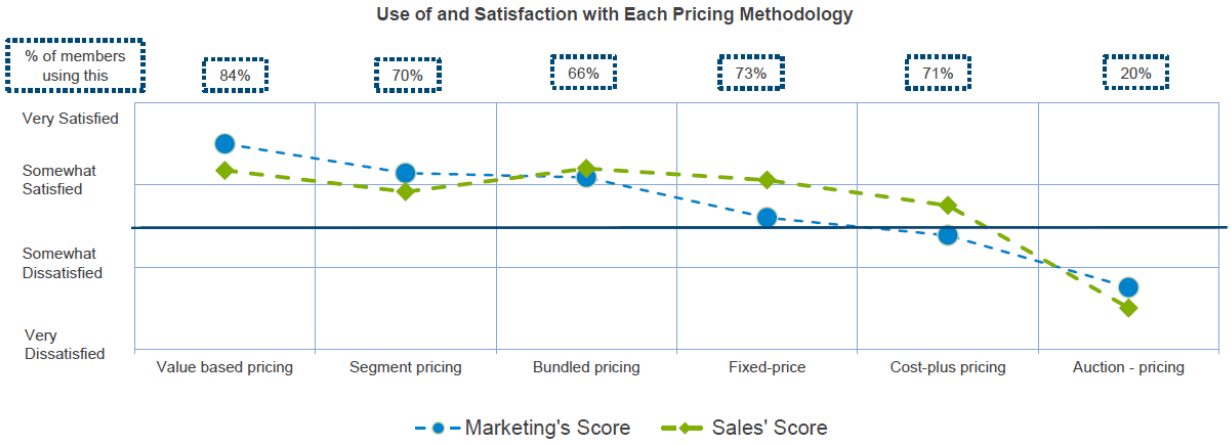
1.2. Current situation in the corporate world

With the advent of data analytics, pricing continues to drive most of the profitability of the firms. Companies have started to realize the importance of pricing and are doing their best to establish the pricing and data analytics center of excellence. According to a survey results done through professionals in top companies, the following results were found. Value-based pricing is the most widely used pricing methodology (used by 84% of respondents), followed by fixed-price (73%), cost-plus (71%), segment pricing (70%), bundled pricing (66%) and auction pricing (20%). Marketing executives were on the whole more satisfied with the value delivered by value-based pricing and segment pricing than were Sales executives. On the other hand, Marketing executives were less satisfied with the results from fixed-pricing and cost-plus pricing strategies than were Sales executives. Although over half of respondents have dedicated pricing headcount at corporate, only 15% have a VP-level pricing executive. Nearly three-quarters of respondents have conducted a thorough pricing study in the last three years. Only a third of these companies, however, did the study with third party help (which many members indicated is a best practice).

Companies that the most members consider best-in-class in pricing: Parker Hannifin, Apple, GE, and W.W. Grainger. 84% of respondents currently use value-based pricing

techniques, and of those, three-quarters have instituted sales force training around value-selling. However, only 10% have changed sales compensation to be margin-based. Around three-quarters of members incorporate pricing gates into their new product development process, which many told us they consider to be a best practice.

Numerous members told us that careful segmentation (down to the micro-level) must be done before embarking on any value-based pricing initiative. Although 59% of members currently use industry-based segmentations, only 22% use value-based segmentation. Value-based pricing is the methodology most widely used by respondents, followed by fixed-price, cost-plus segment pricing, bundled pricing and auction pricing. Marketing executives were on the whole more satisfied with the value delivered by value-based pricing and segment pricing than were Sales executives. On the other hand, Marketing executives were less satisfied with the results from fixed-pricing and cost-plus pricing strategies than were Sales executives.



Some of the Characteristics of Best-in-Class Value-Based Pricing Organizations

- Has value-based pricing that takes into account customer's lifecycle costs.
- Has good market intelligence on competition along with price elasticity detail.
- Has strategic pricing analytics in place.
- Has a dedicated strategic pricing role with executive management support.
- Uses pricing IT tools to enable data capture and analysis.
- Has strong links between Finance, Operations, Sales, and Marketing.
- Understands the customer's business as well as she does.
- Understands the customer's supply chain and where the offering fits.
- Understands customer's next best alternative.
- Ensures sales compensation reflects profit as well as revenue goals.
- Conducts market pricing experiments to measure elasticity and cannibalization.

1.3. Research Objective and the need for next generation price analytics

The objective of this paper to assess existing pricing methodologies, evaluate the validity of existing pricing metrics in the real world and propose new metrics that would add additional insights in recommending pricing guidance. In this paper, we will also evaluate various pricing related processes and could benefit for the right execution of the next generation analytics.

2 Literature Review

I have my research based on the research from 10 articles / research papers. My research is also based on my current work related experience. As mentioned, I intend to evaluate existing best practices in the market and apply that to the real world problem. This would entail to build next generation analytics. The end goal is to identify opportunities in pricing to gain market share and maximize revenue.

The research paper aims at identifying and evaluating the best practices of the relevant literature and then establishing pricing analytics to maximize revenue and gain market share. The organization in question is an American multinational product development company, and is one of the leading companies in the genetic testing and precision laboratory equipment markets. The company manufactures more than 150,000 products and pricing them appropriately in the market poses the biggest challenge for the company.

Demand Elasticity

Identifying demand elasticity along with supply considerations is an integral component while evaluating a pricing strategy. There is usually an inverse association between product pricing and supply if demand is constant. The general trend if demand remains the same and supply increases, prices tend to fall. Therefore it is imperative to understand

what the demand forecast looks like in the market. Based on the demand forecast, companies can plan their supply and come up with an optimal price strategy.

Dynamic Pricing

Bertsimas and Boer (2002) evaluate a pricing, supply problem in a network and come up with interesting approaches to dynamic pricing and supply strategies. In their research paper, they show mathematically that by considering demand variations, controlling resources (supply) and a strong analytically driven pricing strategy, a company can maximize their revenue potential. Research on pricing for revenue management by Chen and Chen (2015) examine product pricing with unlimited supply. They articulate the problem over continuous as well as discrete time interval. The authors have received excellent reviews in this area of research. Research by Gershkov, A., & Moldovanu, B. (2014) talks about dynamic pricing in a retail context. The topics included in the research is very relevant to the problem at hand include the likes of sequential assignment of heterogeneous objects, dynamic revenue optimization, revenue maximization and the interaction between learning about demand and dynamic efficiency.

Competitive dynamics

An oligopoly is a market that is dominated by small numbers of large businesses. This kind of market is a result from collusion which reduces the competition and leads to higher prices for customers. Gallego and Hu (2014) study competitive pricing in an oligopolistic

market with a wide variety of complementary products. They also try to understand the impact of strategic pricing in the presence of price sensitive customers.

Customer price elasticity

Some recent studies have investigated pricing strategies based customer elasticity and demand analysis. Nasiry and Popescu (2011) provide a model for price strategy where consumers' price sensitivity follows and adaptive expectation process. They get into the particulars of how a balanced and strategic firm will increase or decrease the price of the product over time. Their price strategy will be based on the overall business strategy of ether skimming or penetration in the market. In their research, they find that the optimal price strategy is the result of constant pricing policy and that customers' behavioral anomalies restricts the benefits of varying prices. Coulter and Krishnamoorthy (2014) consider evaluation of optimal pricing strategies in the competitive environment. According to the research, firms tend to price high even in a competitive landscape. The prices, however decrease over time.

Pricing strategies

In the following literature review, I would like to evaluate what are the other price strategies have been considered which will help gain a holistic understanding of organizational strategy in revenue analytics. Nan, G., Li, X., Zhang, Z., & Li, M. (2018) talk about a "freemium strategy" which is getting increasingly popular with companies who are looking to penetrate the market. This "freemium strategy" is primary executed to induce

more adoption of the new product. It is in fact the combination of the words "free" and "premium" used to describe a business model that offers both free and premium services. The freemium business model works by offering simple and basic services for free for the user to try and more advanced or additional features at a premium. In this research, the authors evaluate how network externalities impact the adoption of a heterogeneous products and what strategies can be adopted in pricing to enable more sales. It is also seen that freemium strategy is dominant only when the network intensity falls within a given threshold.

Price as a decoy

Prices is often used as a decoy to inform customers of the product quality. Tellis, G. J. (1987) determines whether the retail prices convey information on the product quality. The model indicates that several consumer related strategies may be optimal depending on the market dynamics but there are applications where price can be used to communicate information of product quality under certain conditions.

Predictive analytics in competitive market

Competitive dynamics play a big role in how organizations determine their pricing strategy. In the research proposed by A. Plyasunov., & A. Panin. (2016), the authors inform the use of uniform and discriminatory pricing. The model in the paper will be used to assess the competitive situation to inform the predictive analytics in my research. Research by Maisel, L., & Cokins, G. (2014) is filled with examples the emergence

of predictive business analytics and how it can help businesses grow. This helps in understanding the business aspect of analytics and the change management. This article gives specific industries have applied these techniques and tools and how predictive business analytics can be applied to pricing decision making.

The research paper introduces the next generation pricing analytics that leverages the elasticity of demand, evaluates competitive landscape in the market, looks into customer's price sensitivity and willingness to pay and identifies trends in historical product level transactional data to come up with price analytics and strategy to maximize revenue opportunities for the organizations. The analytics developed in the research takes the model developed by Maglaras and Meissner (2006) into consideration. The model encapsulates historical customer prices and customer discounting over multiple periods along with product value proposition.

3 Feedback from Professor Rand and further enhancements

Prof Rand had some valuable feedback on my previous proposal. He suggested that not only I evaluate current pricing best practices in the industry but also develop relevant price analytics that can be leveraged in industry and potentially identify areas of opportunities for revenue growth. My intention of this proposal is to further enhance my proposal and build the next generation analytics. I would identify scalable analytics that would identify trends in transactional / historical data to identify opportunities to gain markets share by using price as a lever.

4 References

- Bertsimas, D., de Boer, S., 2002. Joint network pricing and resource allocation. Working paper, Massachusetts Institute of Technology, Cambridge, MA.

- Chen, M., Chen, Z.L., 2015. Recent developments in dynamic pricing research: multiple products, competition, and limited demand information. Production and Operations Management 24, 704–731.

- Coulter, B., Krishnamoorthy, S., 2014. Pricing strategies with reference effects in competitive industries. International Transactions in Operational Research 21, 263–274.

- Gallego, G., Hu, M., 2014. Dynamic pricing of perishable assets under competition. Management Science 60, 1241–1259.

- Nasiry, J., Popescu, I., 2011. Dynamic pricing with loss-averse consumers and peak-end anchoring. Operations Research 59, 1361–1368.

- Nan, G., Li, X., Zhang, Z., & Li, M. (2018). Optimal pricing for new product entry under free strategy. Information Technology & Management, 19(1), 1-19. doi:10.1007/s10799-016-0271-7

- Tellis, G. J. (1987). Consumer Purchasing Strategies and the Information in Retail Prices. Journal Of Retailing, 63(3), 279

- Gershkov, A., & Moldovanu, B. (2014). Dynamic Allocation and Pricing: A Mechanism Design Approach. Cambridge, MA: The MIT Press.

- A. Plyasunov., & A. Panin. (2016). On Three-level Problem of Competitive Pricing. AIP Conference Proceedings, 1776(1), 1-4. doi:10.1063/1.4965327

- Maisel, L., & Cokins, G. (2014). Predictive Business Analytics: Forward Looking Capabilities to Improve Business Performance. Hoboken, New Jersey: Wiley.