PREDICTIVE ANALYTICS: KEY APPLICATIONS FOR STRATEGIC ALIGNMENT AND AGILITY

Carol Jones, COB, TWU, 1200 Frame St., Denton, TX, 76204, (940) 898-2930, cjones@twu.edu
Jeanne Murphy, COB, TWU, 1200 Frame St., Denton, TX, 76204, (940) 898-2930, jmurphy@twu.edu
Mahesh S. Raisinghani, College of Business (COB), Texas Woman's University (TWU), 1200 Frame St., Denton, TX, 76204, (940) 898-2930, mraisinghani@twu.edu
Manroup Shoker, COB, TWU, 1200 Frame St., Denton, TX, 76204, (940) 898-2930, mshoker@twu.edu

ABSTRACT

From bar code scanners and RFIDs to ERP and EDI and the Internet, obtaining and sharing data is now easier than ever. The problem becomes what to do with that data. Businesses are slowly moving toward using this data to identify areas in which they are strong and how to meet new strategic goals. Companies that are starting to use predictive analytics are learning that the market place moves quickly and a one size fits all approach does not work as it did in the past. This paper will address three departments in which predictive analytics is helping to align the departments with the business strategy. The additional benefit is that there is more collaboration within the company and businesses are becoming more agile and less 'siloed.'

Keywords: Predictive analytics, customer relationship management, recruiting, retention, supply chain management, inventory management

INTRODUCTION

Predictive analytics moves companies from reactive business decisions to strategic business decisions. Much of the business analytical software has been based on descriptive analytics or "what happened or what is happening" (Delen & Demirkan, 2013). Predictive analytics moves the company from the past and present to the future. It looks at what will or what could happen. The promise of predictive analytics is to help companies compete with innovative products and services and less on price (Delen & Demirkan, 2013). Next we look at three applications of predictive analytics in an organization, i.e., people analytics, supply chain management, and customer service management.

PEOPLE ANALYTICS

How is Predictive Analytics Important to Human Resources?
Deloitte provides an interesting picture of the current workforce: careers that span over 60 years, jobs will be switched once every 4.5 years, and the half-life of a skill is 5 years (Vander Wier, 2017). Using predictive analytics or any big data will help human resources identify and understand current challenges and quickly adapt to new challenges that arise (McIver, Lengnick-Hall, & Lengnick-Hall, 2018). The first area to look at is what type of data is needed and what should be done with that data. As pointed out by McIver, Lengnick-Hall, & Lengnick-Hall (2018), "workforce analytics does not solve HR problems exclusively; it solves business problems, too" (Deloitte, p 399). The HR problems focused mainly on activities for many years for example how quickly can new employees be recruited and on boarded. With analytics the questions turn more toward performance that help business be both agile and improve their profits. Success metrics are expanded to include measurements such as employee success, retention rate, cost to train, and effectiveness of that training (McIver, Lengnick-Hall, & Lengnick-Hall, 2018).

These metrics should derive from the overall business strategy for the company. With analytics what is measured and what the business strategy is together create policies and compensation plans that attract and retain the employees that are right for the company. This will provide better results than trying to use policies and procedures other companies adopted and were successful with. That type of planning does not take into account the current needs of the individual company or the future needs. With analytics HR policies are more in tune with the company's culture and direction and easy to change as the workforce changes (McIver, Lengnick-Hall, & Lengnick-Hall, 2018).

Predictive Analytics and Recruiting

IBM references in its publication *Use of Workforce for Competitive Advantage* a financial company that first used analytics to identify that among their sales force performance and retention rates showed significant variations. The company found out that the type of degree, which college attended, and references did not predict a good candidate. What did predict a good candidate was the writing quality of the resume, successful sales experience with a similar product, and any college degree. Once the company started to source the correct candidates they generated $4 million in new revenue in six months (IBM SRHM Foundation, 2018). McDonald's used analytics and identified stores that had an employee over 60 also had customer service satisfaction up by 60%. Kaiser Permanente found that in one of its market segments the ethnic makeup of its workforce did not match the ethnic makeup of the area. As a result, they hired doctors that spoke more than one language. They attributed this change to attracting more members and delivering better healthcare that depends on cultural competency (IBM SRHM Foundation, 2018). By identifying the problem- sales performance, retention, customer satisfaction, or diversity- HR can identify where their company is strong and where it is weak. Then HR can target current employees that are delivering and find more candidates like them.

People Analytics and Retention

Now that HR has attracted candidates that have the skill set that aligns with the current business strategy, the next focus is to see why employees stay and why they go. It is not always about better pay. ADP in 2012 had a lot of information: they decided to start using that information to try and gauge what the workforce would look like in five years. First they looked at which employees were at risk of leaving based on factors such as absenteeism and using stock options. They were also worried about employee retirement, which as a result of the stock market improvement came about quickly. With predictive analytic software, they were able to identify departments upon which retirement would have the greatest impact. Their mainframe support was in jeopardy. They were able to proactively consider outsource and offshore opportunities as well as use it as a way to attract entry level employees (Overby, 2014) Convergys also ran into a retention problem. In 1999 it had 35,000 employees. It had to recruit 50,000 a year to maintain that level. The company used analytics to reveal that different locations required a different mix of benefits to retain employees. This ultimately reduced the turnover rate by 58,800 employees over the next 4 years (Harris, Jeanne Craig, Elizabeth, and Light, David, 2015).

People Analytics and Headcount

When the CEO of Capital One needed to reduce the number of employees to reduce headcount in 2007, he turned to analytics. He worked with various divisions within the company. They looked at different business environments and what type of headcount would be needed. In that discussion they also looked at the skill sets needed depending on the possible business climate. Workforce planning is a unit department responsibility. Some units are subject to different business climates such as the credit card

division. They review their workforce plan every quarter, whereas the legal department reviews its workforce once every 2 years.

Harris, Craig, and David (2015) sum up how Capital One keeps their departmental goals in line with their overall business strategy: The responsibility for workforce planning at Capital One resides in human resources, but the hard work takes place inside the business units, where the blended teams operate. This grounding in the business units keeps workforce planning focused on corporate goals. The responsibility for workforce planning at Capital One resides in human resources, but the hard work takes place inside the business units, where the blended teams operate. This grounding in the business units keeps workforce planning focused on corporate goals.

People Analytics and Ethics
The Bureau of Labor Statistics responded to job openings using different age profiles, but equal qualifications. What they found is that those over 64 years old experienced less call backs than the candidates with a younger profile (Baker, 2017). In the case referenced above in which McDonald's found that stores with an employee over 60 had higher customer service, data analytics helped to find the value in a group underrepresented in the workforce. This does have the potential of going in a different direction. The same unconscious bias can be inadvertently built into screening software. Used correctly screening software can change job descriptions to encourage more women to apply. It can remove names or anything that may identify the person's gender or race from resumes (White, 2017). Analytics can also be used to identify managers who do not hire diversely and where pay gaps exist (Vander Wier, 2017). When properly applied, predictive analytics is an eye-opening, and climate-altering tool in the hands of HR. The face of a business can be better suited to meet the needs of its clientele, and will in turn improve employee retention and indirectly, the bottom line and return to stockholders.

SUPPLY CHAIN MANAGEMENT

Supply Chain Management and Inventory Analytics

Of all aspects of a business, inventory management is one that can either bring success to the business if managed properly, or cause considerable damage to the bottom line, and overall business, if not managed well. Involving not just the physical aspect of inventory, but human resources as well, it is a key factor in being able to build or supply to the customer's needs, and in a timely manner. Additionally, it is important to maintain a reasonable days on hand, also referred to as working capital, and to not order unnecessary supplies or order in abundance causing inventory to sit on the floor. Poorly managed inventory costs money, in purchase, space, time, and administrative management. Fortunately, predictive analytics has entered the business world.

Predictive analytics used for inventory management purposes pulls the inventory data available to make predictions about movement or whatever design is set up by the business to assist them in managing their stock through predictive analytics (IBM, 2012). Companies like Express Scripts are using predictive analytics to not just analyze their inventory levels, but to observe behavioral patterns of customers to help customize and improve the service experience offered to their customers (King, 2013). UPS has invested heavily in the use of data analytics, "to improve business process, cut costs, and increase efficiency. The effort has been a success...the global company has eliminated 5.3 million miles from its routes, reduced engine idling time by almost 10 million minutes, saved 650,000 gallons of fuel and reduced its carbon emissions by more than 6,500 metric tons" (King, 2013, pp 17-18).

UPS used the data available to determine what their needs would be and where they could make adjustments to the processes of their business to bring more success. As exampled by UPS, there is much to be gained by a business if they are able to integrate the use of predictive analysis into their IT strategy.

Supply Chain Management and Forecasting Analytics

When discussing Big Data and today's global supply chain, McCrea states that "predictive analytics is the modern-day supply chain manager's crystal ball" (McCrea, 2017, p 66S). There are several ways in which a business can apply predictive analytics, one of the most obvious being forecasting. The idea of forecasting for inventory purposes is nothing new. However, given the improved and increased technologies over the last several years, the method of creating a forecast and then what to do with the information has changed. McCrea quotes Marcell Vollmer of SAP Ariba as saying that "predictive analytics makes it possible to analyze data and create assumptions as to what will happen to not only predict the future, but influence it as well" (McCrea, 2017, p 66S). It is an incredibly powerful tool. Utilizing predictive analytics, often built into software suites, businesses are able to efficiently run their business, optimizing their assets, effectively realizing greater productivity and bottom line profit.

Predictive Analytics Implementation

Although influential and powerful, predictive analytics is just a tool and not a complete solution. It must be properly planned, designed, and customized to its user. Vitally important is that there is complete buy in from the business on all relevant or actionable levels in order to successfully implement and use predictive analytics for inventory purposes. In an article on Computerworld, Robert L. Mitchell (2013) gives overview of *12 predictive analytics screw-ups* which points out the mistakes that are made by companies attempting to implement predictive analytics but failing at some level. Two of the most glaring issues involve the lack of or a poorly made plan for predictive analytics specific to the business, and issues with implementation including lack of personnel being on-board and 'tabling' the implementation, or just have a poor deployment plan (Mitchell, 2013). Each step from planning to roll out of the predictive analytics tool should be carefully decided by and/or communicated to all whom are needed to support and utilize it. Even small deviations from original processes can cause the predictive analytics to be less accurate, or worse-case scenario completely useless. If a business can successfully integrate predictive analytics, it can use the data to properly forecast customer pull and therefore what raw materials the business will need to order. Additionally, it can assist the business in more efficiently staffing. Most businesses realize that "well-planned and implemented decisions contribute directly to the bottom line by lowering sourcing, transportation, storage, stock out, and disposal costs" (Souza, 2014, p 595).

Supply Chain Management and Ethics

Another benefit to the modern technologies provided is the real-time data available to manage inventory. The use of RFIDs, UPCs and SKUs makes keeping up with accurate inventory more possible. Not only is it possible to better schedule and order knowing what is on hand, but it helps keep the business more responsible to true inventory and reduce the possibility that inventory would be inflated or deflated. When predictive analytics is used to interpret that data and pull out specifics it can be created to flag items that need review or have large discrepancies, and that is just touching on the possibilities. Often, inventory is one of the largest assets a business has, particularly "for retailers, wholesalers and distributors, inventory is usually the largest single asset on the balance sheet and the cost of that inventory is the single largest

expense item on the income statement" (IBM, 2012, p 3). It is important that inventory is tracked, managed properly, and kept accurate.

Overall Benefit of Predictive Analytics in Inventory Management

Considering the vast amount of data now available or easily accessible thanks to our always improving modern technologies, predictive analytics has given business an incredible opportunity. The correct algorithm used could make or break the bottom line for a company. Used properly though, predictive analytics can help a business identify the needs of their customer base, determine where to purchase the items and use market information to negotiate the best pricing, order raw materials or COGS in timely fashion, and then manage the inventory in-house in real-time, alerting the company when it is time to re-order, or when something has past its prime and needs to be scrapped or discounted. All of this is possible through proper planning, designing, and implementation of predictive analytics. Vollmer perfectly sums up this marrying of information and systems when he stated that "data is the new currency...and predictive analytics is the key in collecting the dividends it pays" (McCrea, 2017, p 65S).

CUSTOMER SERVICE MANAGEMENT

Predictive Analytics and the use of Customer Relationship Management (CRM)

Customer Relationship Management (CRM) is used to manage a company's interaction with prospective customers and current customers. CRM is a strategy designed for customer service to help companies increase productivity and improve customer retention and satisfaction. The main goal of customer service and support is to effectively and quickly help customers retain their business. Many tools are already built into CRM solutions which help service agents serve customers better than before. CRM looks different for each company, so determining what type of product and customer service is needed, evaluation of what meets the company's need to support your team is an important step.

CRM are often viewed as a software system. They are an effective tool when it comes to customer service and support. Business organizations can now can communicate with their customers anytime or place from any type of device rather than having their customers wait on hold on the phone, or in line at a brick-and-mortar establishment. CRM tracks and manages customer purchases, and can touch base on any major points that include email, chat, and phone. The primary factor for a business to succeed or not is based upon customers. Technology and other services like CRM are helping gain new customers and retain them. The goal of CRM is to improve business relationship with customers by practicing and finding different strategies of technologies that companies use to analyze and manage customer interactions by the help of data analysis of customer lifecycle.

CRM and CSRs both focus on strategies to provide better service to customers. When mentioning CRM software, normally it is assumed that people are thinking of a salesperson and the use of a system. However, the CSRs use CRM to provide better service to customers. For example according to Malavika,(2017), cloud computing space proves that companies have changed the way their enterprise software is delivered and used. Big and small companies depend on technology to drive business process in order to connect better with their customers. CRM strategy to provide better service to customers is based on ensuring consistency of knowledge, improving issue resolution time, and determining patterns. Overall, a customer is assured that they will receive correct answers to any problems in a timely manner,

with full trust and loyalty to a business. CRM is consistent and responsible for building customer profiles with information to manage customer relationships to assist CSRs in achieving their goals.

To resolve a client's issue in a timely manner, the knowledge of the database for Customer Service (CS) is to be able to reference information quickly to resolve the issue. For example, New York (2015) discusses the attempt of United airlines to 'Mobilize' Airport Customer Service Representatives with Apple iPhone 6 Plus, suggesting that the iPhone will assist customers with flight information like pre-departure actions, printing boarding passes and baggage tags (New York, 2015). In a hotel setting the number of days is to be tracked to help resolve CRM issues. By collecting and measuring data over time CRM can identify opportunities to improve trust and the level of service to their customers. Quick services are reflected to business by showing care and appreciation of resolving issues in a timely manner. To ensure consistency of knowledge in a hotel setting multiple calls are directed toward the business with various questions and answers: the company tries to not just be consistent with their answers, but to be accurate with anyone they speak to, so any issues can be addressed. With consistency of knowledge a relationship is built on customer confidence that everything has been answered and the CRM system supports the customer needs.

Lastly, to determine patterns is important to CRM and customer service (CS). This allows anyone to track any issue themselves and identify the pattern through classification and category within the CRM system. If there is a recurring problem in the future, it is easily tracked down to determine if CS is receiving information or if there is some other problem that the CRM is not able to detect. With information that is missing due to the lack of CS not receiving adequate training can become useful because this informs the management on decisions about future improvement and the need for system customization. When all three are established in the company, this means that the customer is assured to get the correct information and have their problems solved in a timely manner with CRM and CS. With trust and loyalty, the company is able to increase their business through this process.

CONCLUSION

The business world is realizing that the key to success is to bring unique experiences to its customers through predictive analytics. Predictive analytics is helping businesses strategically align its workforce with its current needs and future needs. It is helping companies to source products, manage inventory, and predict future inventory and supply needs. Finally, predictive analytics is identifying the needs and wants of customers and turning this information into a pipeline of innovation. Agile, adaptive, and strategic are the adjectives that describe companies that effectively embrace and implement predictive analytics.

References available upon request from Mahesh Raisinghani, mraisinghani@twu.edu.