

Predictive Analytics Today

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1. Introduction

The greatest change in the field of Predictive Analytics (PA) over the past five years is how vastly different organizations and sectors of industry now utilize the advantages of analytics. From its obscure beginnings rooted in complex algorithms, PA has now permeated the vast majority of US business sectors (Y. Ruan 2007; IBM.com 2012). Small and midsize organizations now have access to predictive modeling technology through user friendly software (IBM.com). Take Fleet Risk Advisors, a small business, as an example, whose management integrated PA into driver behavior management to reduce ticket and crash incidents (Crissey 2012). Another change that has occurred over the past five years is who has access to analytical information. In an article from the *Journal of Strategic Finance*, author Rock Gnatovich concludes that as analytics grow and increase in popularity, non-executive decision makers will have access to analytical information in order to grow the organization from all levels (2007). Rock's prediction is exactly what has happened across many industries. In the first edition of *Competing on Analytics*, large, multi-national companies were the exemplary organizations utilizing analytics. The second edition of *Competing on Analytics* will focus on midsize to small companies and non-profit organizations to demonstrate the vast permeation of PA throughout different industries. Organizations such as the Cincinnati Zoo, public schools, professional sports teams, and small businesses have personnel at all levels of the organization integrating analytics to stay profitable, efficient, and growing (IBM.com). The past five years have been very exciting for the field of PA and much change has occurred, which is why a sequel for *Competing on Analytics* is necessary.

Change is inevitable for the field of PA, but some aspects since 2007 have not changed.

Operational models, risk management assessment, and quantitative formulas have remained relevant

and unchanged in the past five years. In *Competing on Analytics*, Davenport and Harris describe the operational modeling Amazon and Harrah's use to cross-sell and up-sell clients (2007). In a recent article titled *The Top 5 Trends in Predictive Analytics* author Fern Helper describes how operational modeling is still a current trend in PA (2011). Banks utilize analytics to understand their clients' behavior. The *Journal of Structured Finance* describes how banks currently use predictive modeling to assess the probability of customer default (Milner, 2010). Royal Bank of Canada utilized similar technology to build customer profiles in order to better understand profitability (Davenport & Harris, 2007). Quantitative techniques are at the heart of PA. The journal *Entrepreneurship: Theory and Practice* published an article that surveyed 32 scholars in regard to their opinions of important quantitative techniques for the future of entrepreneurship research (Dean, Shook & Payne 2007). A total of 24 different techniques were rated and the top nine were: correlation; t-tests; ANOVA; MANOVA; simple, multiple, hierarchical, and logistic regressions; and EFA (2007). It is no coincidence that these relatively old techniques continue to be used to understand data and serve as the foundation for building predictive models (2007; Laursen & Thorlund 2010). The field of PA has changed, but encompasses many unchanged quantitative techniques and still utilizes PA for relatively unchanged internal business processes.

2. Literature Review and Methods Reference List

In order to best understand the changes that have taken place in the past five years, research was conducted on midsize to small companies and non-profits that are integrating PA into their prospective fields. Information sources included: published case studies from IBM; scholarly journals for the fields of analytics, finance, entrepreneurship, data collection, etc.; Business Source Premier and IEEE Xplore databases; books on analytics; periodicals relating to analytics and specific companies; specific organizations' websites; hiring ads; and financial company records. Information was gathered through queries, general reading, and specific library searches through keyword searches and appointments. In

evaluating firms, information that related to the success or failure of integrating analytics into organizational strategy and tactical implementation was evaluated. Examples of such information include press-releases, case studies, financial information, periodicals, and hiring advertisements. Factors I valued as being important indicators of successful analytical integration included deliberate investments into analytical software and systems, managerial support of analytics, and demonstrated organizational efficiency and effectiveness as a result of implementing analytical techniques. Extensive research was conducted on specific organizations such that over 70 unique sources are referenced in order to demonstrate the permeation of analytics into midsize to small companies and non-profit organizations.

3. Results

Papa Gino's, Mobile County Public Schools, SportVU, Cincinnati Zoo, Netflix, and Alameda County Social Services Agency have integrated predictive analytics to remain profitable, grow, and innovate. The firms researched are similar in that they are competing in difficult economic conditions, and every organization utilizes analytics to stay successful. From the industry in which each organization competes, to the customers serviced, every organization studied is distinctly different. Best Buy, on the other hand, has lost touch with its analytical capabilities in remaining profitable and demonstrates the danger of falling behind in PA (Datamonitor, 2012).

3.1 Netflix

With over 16 million subscribers and no stores, Netflix was the first anomaly in the movie rental business (Schulze, Skiera, & Wiesel, 2012). Netflix differentiated itself through predictive modeling, it utilized analytical techniques to define customer equity, valuation, and movie preferences (Schulze, Skiera, & Wiesel, 2012; Davenport & Harris, 2009). The movie rental business is volatile. Other giant

movie rental icons like Hollywood Video and Blockbuster have filed for bankruptcy (Msnbc.com; Bloomberg.com). Even though it utilizes analytics, Netflix is susceptible to run the same route as its predecessors. Netflix was valued at 16 billion in July of 2011, but currently is valued around 4 billion (Wingfield, 2011 & Msn.com, 2012). Its marketing department, which uses analytics, has failed to continue adding subscribers and a botched new segmentation strategy are to blame for the valuation decrease (Beaubien, 2011). CEO Mark Hasting's plan to profitability entails adding desirable content to boost customer subscriptions (Wingfield, 2011). It is no surprise that adding desirable content is steeped in building predictive models based on customer profiles and viewing histories. In order for Netflix to grow, it will have to rely on its analytical background to compete with new competition, online streaming, and an ever changing industry (Anonymous, 2011).

3.2 Papa Gino's Pizzeria

CIO of Papa Johns, Paul Valle set three initiative goals in 2008; improve its POS system, integrate business intelligence, and utilize operational data (Infoweb, 2008). Fast forward four years and his goals have succeeded based on creating interactive dashboards for management, predicting profitable customers, and streamlining communication, recording, and sales into one system (CSA, 2007; NRN, 2009; Ibm.com). Papa Gino's continues to expand its IT infrastructure through offering loyalty cards and sweepstakes (NRN, 2008; Odell, 2010). The future for Papa Gino's is based on its use of business analytics to track valuable customers and attract new customers (WD, 2011). But, with strict personal data laws in its home state of Massachusetts waiting to be enforced, Papa Gino's might be too leveraged with its data growth strategy (Vijayan, 2009). As a mid-size pizzeria, Papa Gino's has differentiated itself through its use of business intelligence, and has reaped great growth.

3.3 Mobile County Public Schools

In the south-western most part of Alabama, lies Mobile County Public Schools (MCPS) with over 63,000 students (Mcpss.com). MCPS partnered with DecisionEd to create one data warehouse that integrated their vast amounts of data ranging from test scores to attendance into one seamless system (desisioned.com). The goal of integrating this large, intricate system was to allow personnel at any staff level of the education process to have access to relevant information (Ibm.com). Through Cognos IBM software, teachers, parents, coaches, and administrators have individual dashboards with unique Key Performance Indicators for students, subjects, and classes (Ibm.com/cognos). MCPS is utilizing the data and information from its warehouse to make informed decisions and grow its knowledge of its students. For example, on its website MCPS has video recordings of meetings where administrators and teachers are exploring data in regard to test scores and state standards (Mcpss.com, Collaborative Planning). From this data, they seek to set goals and target specific students in order to grow/maintain its test score standings. As a school system, MCPS is on the cutting edge of competing using analytics to drive collaboration and results (Davenport & Harris, 2007).

MCPS is using analytics in exciting ways, but it still has opportunities to grow. Listed under its employment section is over 240 job listings, but not one of them is for an analytical position (Mcpss.com Employment). The information technology department only has two Program Analysts, which suggests a myopic taskforce for such a large school district (Mcpss.com IT). While funding is tight for school districts, MCPS should continue to hire analytical talent to integrate its great data infrastructure into all aspects of its school district. MCPS is unique from other school districts in how it has integrated commercial technology into an educational framework to be more effective.

3.4 SportVU

Moneyball was written in 2004, but its statistical, analytical, and metric focused breakdown of baseball still permeates the sports world today (Cross, 2009). The journal *Interfaces* estimates the US

market value for spectator sports to range in the “hundreds of billions of dollars” (Fry & Ohlmann, 2012). Since 2007, MIT has hosted the Sloan Sports Analytics conference and every year the conference has grown. The overall feel is that sports analytics is still in its infancy (Van Riper 2011). Sabermetrics has become the standard analysis doctrine to assess sports (Lewis, 2003). Through real-time tracking data, SportVU is redefining the sports analytical landscape (Sportvu.com, Data Football). Its non-intrusive camera system allows SportVU to analyze over 50 aspects of both player and team interaction (Sportvu.com, Data). Through this analysis, multiple variables can be assessed and modeling is produced to give players an analytical edge (Wilson, 2012). SportVU is unique from the competition in its ability to interact with real-time data and create multi-variable regression models for sporting events (Sportvu.com, Basketball).

With such exciting new technology for the analytical sports industry, SportVU needs to do a better job of capitalizing on its invention. Over 130 analytical journals report on sports analytics and hundreds of universities have some form of sports management degree, but SportVU is relatively unknown to any of the established institutions and journals (Coleman, 2012). The new technology SportVU has created has the ability to transform the sports industry, but time, money, and resources must be given to marketing.

3.5 The Cincinnati Zoo

Only a quarter of the Cincinnati Zoo’s operating budget comes from the government and this forces it to run more like a for-profit business (Leonoard, 2011). Fortunately, the board of trustees is well equipped with personnel steeped in analytical management experience (Cinzoo.com; ispycincy.com; uc.edu; cinnusa.com). Through IBM’s Cognos BI software, the Cincinnati Zoo streamlined its communication process, better optimized its staff, and predicted the most profitable zip codes in which to advertise (Ibm.com). Since utilizing the benefits of analytics, Cincinnati Zoo’s retail has

increased 20 percent, the marketing budget has been cut by \$40,000, and concessions sales have increased 25 percent (Klie, 2011). Applying its analytical edge to selecting animals, exhibits, and themes could be an improvement to Cincinnati Zoo's strategy for continued analytical growth in the future. Cincinnati Zoo is the second oldest zoo in the US, but it is the first to integrate analytics in its management process (cinzoo.com).

3.6 Alameda County Social Service Agency (ACSSA)

Since 2004, Alameda County Social Service Agency (ACSSA) has been leveraging information technology and data trends to serve the public (IT, 2004; Cox 2004). In 2010, ACSSA won a 21st Century Achievement Award for innovating the use of data analytics to improve public services (Betts, 2010). Specifically, it has saved 11 million dollars through fraud detection modeling and software, interactive dashboards for case workers to eliminate redundancy, and real-time data for case analysis (ascc.org; ibm.com). Under Staff Development on its website, ACSSA commits to computer training for its entire staff in an effort to permeate analytical ability at all levels (acss.org). While budgets are tight for social agencies, ACSSA is currently hiring data analysts in an effort to continue its analytical achievements (Jobaps.com). It is clear ACSSA utilizes analytics, but it needs to better communicate and update the public via its website and reporting. Despite its communication challenges, ACSSA distinguishes itself from other service agencies through its use of analytics to serve the public.

3.7 Best Buy

Through studying over 60 million households and developing eight different customer segments, Best Buy utilized analytics to retain its status as the only remaining big box electronic retailer in business (Davenport & Harris, 2007; Prusinski, 2012). Yet, Best Buy has lost focus of its online customer base (Datamonitor, 2011). In the past five years, ecommerce has grown 152 percent, and Best Buy has

captured less than 5 percent of that market share (census.gov; emarketer.com). The company was too myopically focused on in-store analytics and lost its edge to other online retail giants (Datamonitor, 2011 p.11). A review of Best Buy's shareholder meetings reveals a blatant neglect to focus and expand into the online market (Bestbuy Financial Year 08,09,10,11). In such records, the online expansion is mentioned only briefly with no empirical data foundation (FY 2009, p. 3). Best Buy has lost touch with its analytical knowledge of its customers, failed to keep shareholders informed, and should be dropped as a company competently competing on analytics.

Conclusion

The world of PA has grown immensely since 2007. Over the past five years, changes in PA range from the creation of its own definitive field, esoteric information and formulas being understood by many, growth to many different sectors, and utilization by all levels of organizations. The current burgeoning field owes its growth to industries such as defense, risk management, and financial management that aided in defining PA from other similar disciplines such as hierarchy and network process analytics (Eicher & Ruder 2007; Ozorhorn, Dikmen & Birgonul 2007). David Rich, managing director for Accenture Analytics Group, described how PA evolved into its own discipline designed to aid decision makers utilizing quantitative skills (Rich 2010). As demonstrated by the above case examples, companies need the right software, staff, and support from management to successfully compete on analytics. Having the right personnel is most important because they are responsible for integrating and innovating with the software to push the organization to be more efficient and effective. Some organizations gradually integrate analytics into their business model from a tactical implementation, while other companies set it as a core strategy. For example, Papa Gino's set analytics as a strategy and implemented it into their tactical procedures. On the other hand, SportVU was built on analytical tactics but now incorporates analytics as a core strategy. In the future, SportVU has the capability to use

analytics as its sole competitive advantage. SportsVU is an anomaly to the average organization, but it demonstrates that some companies can utilize analytics as a sustainable competitive advantage. Since 2007, analytics has flourished into new industries tactically and strategically to better serve decision makers and help organizations compete and remain successful.

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