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The State of Data-Driven Decision Making in Retailing & CPG

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Abstract

With the abundance of marketing innovations engaging consumers through so many channels, data sources and data volumes multiply at a rate faster than companies can manage. This study of retailers and consumer-package goods (CPG) firms documents their struggles to keep up with multiple, yet simultaneous innovations. We find that traditional maturity-based models of innovation adoption fail to adequately depict how companies successfully manage this data deluge; rather, a migration model describes how organizational learning capacity is developed. Further, we find that leaders must consider building absorptive capacity to work towards the overall goal of data-driven decisioning.

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About the Authors

This study was designed and conducted by Dr. John F. (Jeff) Tanner Jr. and Peter Klingman, with additional data collected by Carlos Gieseken. Ben Becker contributed to writing this paper.

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An earlier version of this paper based on fewer interviews was submitted by Peter Klingman as part of his MBA studies at Baylor. Klingman is now an analyst with Solomon Consulting. Carlos Gieseken gathered additional data for this paper while completing his MBA at Baylor University.

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About the Baylor Business Collaboratory

A "collaboratory" is a mash-up of *collaborative laboratory* – an arrangement through which businesses and Baylor business faculty work together developing solutions to market challenges through innovative research. The Baylor Business Collaboratory partners include Cabela's, HEB, BancVue, and affiliates such as Teradata and Splunk. Key research questions sponsored and developed in conjunction with industry executives, analysts and others include to date:

- How to grow revenue and transactions without discounting.
- Identifying which marketing actions, channels and programs really drive revenue, customer satisfaction, and loyalty.
- Gathering, analyzing, interpreting, and applying "Big Data" to business problems.

For additional information, please visit www.baylor.edu/business/collaboratory.



A New Model of Data Decisioning in Marketing

Customer intimacy at scale seems like an oxymoron, but Big Data makes it possible. Not only does Big Data enable a more complete view of the customer, marketing technologies also enable faster response in order to capture opportunities signaled in the data. But just how far along in the use of data to drive decision making are retailers and consumer-goods manufacturers? And what are the challenges and barriers in effective migration toward data-driven decisioning?

To explore these and similar questions, a qualitative study was conducted with thirty retailers and consumer-packaged goods (CPG) producers. The results provide insight into the maturation process for marketing departments that can be useful in building technology roadmaps and understanding the change management necessary to accelerate the adoption process.

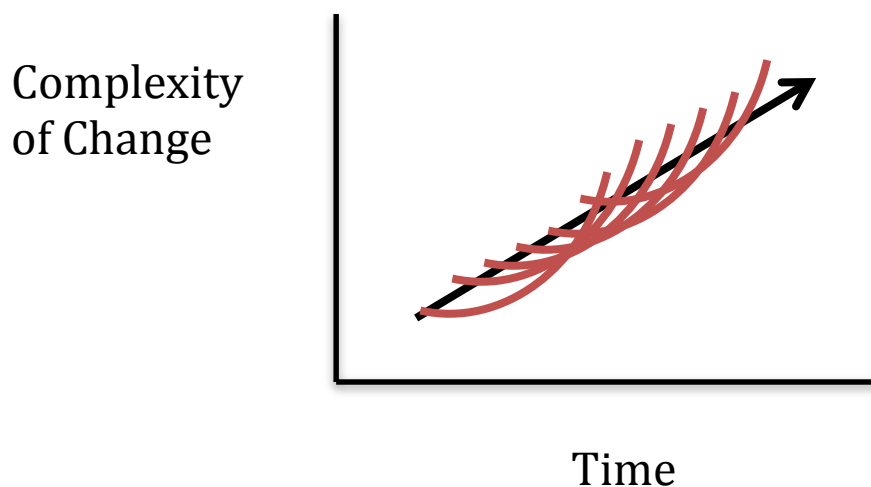
MULTIPLE NEAR-SIMULTANEOUS INNOVATIONS

Adopting Big Data isn't a single decision. Nor is data-driven decisioning the outcome of a single technology adoption. Rather, the challenge is how to absorb the near-simultaneous adoption of multiple innovations, each of which has an impact on people and business processes. This absorption is influenced not only by the technological capability within the organization but also the human capacity to create information from data and, in turn, consume and be changed by what is learned from that information. This "people" capacity is further enhanced or inhibited by the reward and measurement systems imbedded within an organization's management systems and culture.

Accelerating adoption increases the stress on the organization because of the learning needed to understand the impact of each new technology and how it integrates with other technologies and with business processes. Thus, one of the states we observed is under-utilization of applications, sometimes even for the stated purpose of acquiring the technology. In some instances, this leads to what we call **technology bloat**, or the degree to which there are redundant and under-utilized point solutions and systems that waste budget and other resources.

Because Big Data and data-driven decisioning is not a single change, these adoptions of multiple innovations cannot be viewed through the lens of the innovator, early adopter, majority or the laggards (also known as the Diffusion of Innovation curve). For that reason, we adopt a migration perspective that considers how organizations migrate to data-driven decisioning.

Figure 1: The Impact of Near-Simultaneous Adoptions of Multiple Innovations on Learning Curves



Near-Simultaneous Adoptions of Multiple Innovations result in overlapping learning curves (the red curves), which significantly increases the complexity of change, which in turn heightens the likelihood of failure and the need for greater absorptive capacity.

THE MIGRATION MODEL

The Migration Model illustrates how organizations move from traditional decisioning to data-driven decisioning. First, we define data-driven decisioning as operational decision-making based upon (near) real-time data. This definition excludes bigger strategic choices such as what business to be in, whether to offer a particular product or technology platform, or which countries to enter. Rather, this focus is narrower in scope to those operational decisions such as which products to promote at what price using which communication vehicle and message content, for example. Some

of these decisions may be automated, such that if a consumer does X, then the system responds with Y based on a set of business rules that were established through rigorous field experimentation. Thus, at the most mature end, data-driven decisioning includes not only operational analytics that drive marketing machines but also data strategies and field experiments that are used to build those machines.

At the beginning are firms that use traditional data and traditional reporting. These **traditionalists** do not have a customer data strategy; they are still in the traditional “homeland” of decision making. There is significant lag-time between acquisition of data, analysis, and dissemination of results that then are used to make marketing decisions. Firms in this level have minimal, if any, real-time data analytics or reporting systems such as dashboards.

In the second category are **pioneers**. These are organizations in which some users have adopted a single technology application, or point solution, that is data-driven to solve a specific problem; they venture into data decisioning for short trips before they retreat back to the homeland. There may be a few of these applications (such as email marketing, social media listening, etc.), but there is little integration across these channels or applications and likely no data integration with a CRM system – in fact, sometimes these applications pre-date any CRM system. Chances are that decisions are made to solve single problems or answer specific questions. Each application is launched and managed as a project, with no broadly-applied change management. Any change affects only the few users who now have a new tool to address a specific problem.

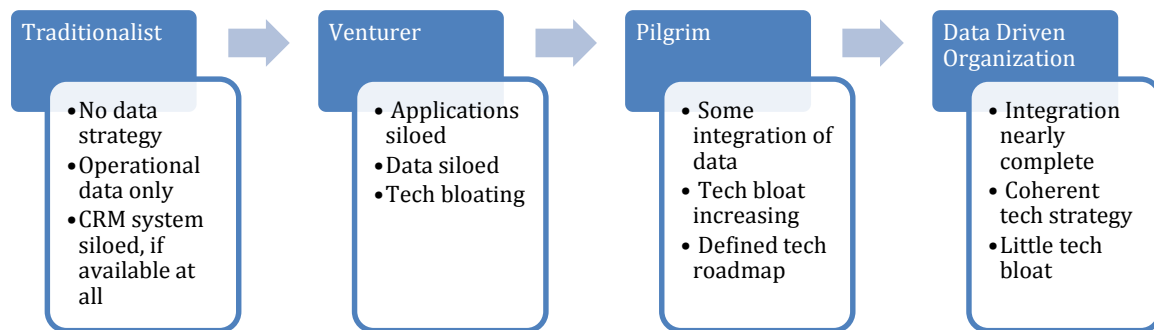
The third level is **settlers**. Note that in our findings, not all companies went from traditionalist to venturer to settlers; in some cases, conversion to pilgrim occurred without much, if any, time in the venturer stage. However, they do have a defined technology roadmap that begins to reduce technology bloat, begins to integrate data sources, and there is an awareness that more than project management may be needed for successful implementation.

Those organizations that have immigrated to the Promised Land of data-decisioning we simply label **data-driven civilizations**.¹ These organizations do not treat data-driven decisioning as an option but inhabit data-driven decisioning. In these

¹ We considered labels such as “inhabitants”, “émigré,” and others but these labels pointed to the individuals within the organization. Unlike the other levels of migration, these are truly organizational-level in scope, making individual or person-level designation inappropriate.

organizations, integration of data is (nearly) complete; sandboxes are available for decision makers to play with data; a data strategy is in place (see our white paper, “Avoid the Data Trap” for detail on data strategy); application adoption is viewed in the context of change management as much as project management; and technology bloat diminishes through the natural process of integration.

Figure 2: Data-Driven Migration Model



One mark of difference between driven organizations and all others is that there is a plan to develop the organization’s **absorptive capacity**; that is, the ability of the firm to manage and master change due to (technology) innovation and adoption. Just as a progressive city has an urban planning department, these organizations plan for an environment of data-driven decisioning and while no firm has an “absorptive capacity development plan” per se, the elements are there. These elements are plans for training, ongoing communication about progress and process, business process re-engineering, and all of the human elements that have to be developed to maximize the value of technology innovation.

A second mark of difference is that data driven organizations see data pulled by decision makers rather than pushed to them. We see, in our data, the growth of self-serve analytics among driven organizations as an indication of the pulling of data by decision makers rather than mindless reporting, for example.

Some experts have recognized the need to develop absorptive capacity. One executive in the measurement and analytics field, Elena Klau, VP and Group Director at Momentum Worldwide, advocates the use of a learning agenda as a great place to start: “...align your objectives with learning questions. Start backwards. Decide where you want to go before you even begin.”ⁱ

She emphasizes that if marketers have compiled a list of objectives, and “that list of ‘what’s important’ includes everything and the kitchen sink, (they) are setting (themselves) up for failure.”ⁱⁱ By attempting to measure everything and generating reports on every single metric, valuable insights can be overlooked simply because there is too much information for employees to process. Absorptive capacity must be developed first.

One question that remains to be studied is whether the venturer stage is needed; if skipping that stage is detrimental. Absorptive capacity may be thought of as a muscle to be developed rather than a pipeline that is either large or small. To be developed may require working with actual change and development that may require moving through the venturer stage. This is an area that needs further research.

WHY COMPANIES STRUGGLE WITH DATA-DRIVEN DECISION-MAKING

Challenge #1: THE REPORT TRAP

A common challenge is the over-generation of seemingly important reports: the report trap. Due to insufficient metrics and lack of strategic objectives in place, firms often fall into a “report-generation trap,” inundating employees with reports that do not yield relevant insight. A regional wholesaler described one such situation:

“Much of the data is being used to generate reports that are not necessarily tied to strategic or marketing goals. This problem has occurred repeatedly and has led to a report pile-up. Reports are generated because they can be, not because they necessarily yield any relevant information.”

Starbucks stumbled across a similar problem with data it collected from loyalty cardholders. The Seattle-based coffee company at one point delivered “300 reports to its managers on a regular basis for them to evaluate and employ to improve store operations.”ⁱⁱⁱ Starbucks has since consolidated the number of reports down to 11.^{iv}

The number of reports is not correlated with increased knowledge. Furthermore, excessive reports create more work for employees, who, in turn, revert back to previous methods of decision-making that are not data-reliant. A specialty store retail chain recounted its struggle with over-reporting, highlighting that the company generated as many as 40,000 different reports daily for employee use. According to the firm, over-

reporting had created a lack of trust in the company's internal resources and led to the marketing department utilizing external resources instead of internally acquired data.

Recommendation #1: AUDIT REPORT GENERATION & DATA USAGE

In some instances, retailers and CPG firms alike reported simply turning off reports and seeing if anyone complained. Alternatively, using the same tools used to monitor marketing automation, customer insight groups can determine which under-utilized reports are the best candidates for dropping. While dropping reports was usually initiated to create resources for new data analysis, one consequence is a sense of frustration on the part of those engaged in generating reports that are likely unused. Rob Jayson, chief data officer for ZenithOptimedia Worldwide, suggests that the key questions marketing professionals must ask themselves “in launching big-data analysis should concern which consumer behaviors” they are trying to influence.^v A beginning step to data-driven decisioning suggested by those who would be considered converts or drivers is to begin by tying report generation to specific routine decisions. While some reports are necessary for monitoring conditions in the field, the more they can be limited to and involved in decision making, the more merchandisers and marketers will begin to ask for data to make additional decisions, leading to a greater reliance on data needed to begin the journey to data-driven decisioning.

As one customer insights leader said, “good information is like crack or heroine – hooking the user after only one use.” His point was that once managers made a decision with data that had overwhelming impact, subsequent opportunities are brought to the decision support team. Evangelizing data is no longer necessary.

As mentioned earlier, another strategy that seems appropriate but is rarely used is to use the same metrics used in marketing automation to understand engagement with information like tracking open and click-through rates and other conversion metrics to see if reports and collaboration systems are being used.

Challenge #2: DEVELOPMENT OF DATA SILOS

The formation of data “silos” within a company inhibits data acceptance across that organization. We sincerely believed data silos to be a thing of the past; however, our data suggested otherwise. Differing slightly from the definition presented by SearchCloudApplications of data silos as “repositories of fixed data that an organization

does not use in its day-to-day operations,”^{vi} this report uses the term “data silo” to define a particular area within an organization that becomes isolated from the rest of the organization with respect to information-sharing. A data silo could mean that data are physically not available to other areas; however, we also use the term to reflect situations where inferences and conclusions are not shared. As such, we broaden the definition to include behaviors that damage the ability to make decisions, the real importance of data silos.

These silos are able to generate and use consumer insights to drive decision-making, yet fail to share those or related findings with fellow departments for use in their decisions. Missing are the tools that make sharing possible, such as sandboxes and interactive business intelligence tools, as well as appropriate data governance policies. Lack of data sharing is made worse by diverting personnel with analytics backgrounds to silos, thereby depriving other areas from developing analytical capabilities. One retailer in this study summarized the problem:

“Data access is limited. Only certain teams have access to some of the information, which requires a different set of skills to access. This issue indicates that not all departments are getting the necessary information needed to make decisions.”

Recommendation #2: FOSTER ANALYTICS CULTURE

An organization-wide culture that embraces the use of data analytics to support decision-making eliminates the creation of data silos and allows employees to experience the benefits of cross-departmental information sharing. The data-sharing process begins with the leadership and support of senior management and the board. Marsha Lindsay, CEO of Lindsay, Stone, and Biggs, suggests that executives are responsible for being “fluent in creating, reading, and acting on marketing data” and given the potential competitive advantages that can be created from marketing data, “it’s imperative that everyone—from the board chair on down—know how to make smarter marketing decisions faster, with the right data and analytics.”^{vii}

Challenge #3: DATA COMPETENCY AND RESISTANCE TO DATA

Often, as the result of both organizational resistance to adopt a more analytical culture and the formation of data silos, employees will fail to properly interpret insights

when they are actually obtained. Lack of data understanding was discussed by one company: “There seems to be an absence in the understanding of data—no one is trained to know what the data means.” Another agreed, highlighting that not knowing what the data actually means is one of the major barriers to further data utilization at the firm, explaining a lack of employees in the organization that even had the skillset required to interpret the analysis.

Moreover, even if employees do have the ability to interpret the data, the organization will be unable to determine whether or not frontline employees actually use the revealed insights, and whether or not the insights were beneficial, because metrics to gauge insight effectiveness and track usage are non-existent. Metrics that are not tied to business objectives can always be slanted to show that the implementation “worked.” Adoption metrics, while a useful tool early in the process, are insufficient to determine the value of data decisioning tools.

Recommendation #3: ENHANCE DATA VISUALIZATION & ESTABLISH TRACKING METRICS

Although further training for current employees and hiring of outside personnel with desired skillsets are necessary to remedy a situation in which no one can understand the data, an additional solution that can make strides towards improving an employees’ understanding of analytical insights is better data visualization.

According to one company interviewed: “we are always looking for ways to add to the ease of communication of the analytics story, and have partnered with a business intelligence firm to help.” For this person’s company, visualization was the most valuable outcome of this assistance.

A company must also develop metrics that measure the strategic impact of consumer insights. Not all data are created equal, nor do they contribute equally to the quality of decision-making. One retailer thought weather may influence its sales; however, after a period of time, an evaluation of the lift achieved by weather-timed promotions was determined to be near zero.

By regularly evaluating the value of data, the firm can continuously rework and reorganize its analytics to yield more pertinent and more effective insights for the organization. The metrics presented here are not to be confused with developing metrics to track an organization’s success, as those metrics actually yield insights to help a company improve.^{viii}

Some recommended questions to ask to lead to such metrics include what impact did they have on sales? How were certain insights used to make more efficient use of marketing funding? Answers to these questions allow companies to measure the effectiveness of customer insights.^{ix}

Additionally, one of the easiest ways to tie consumer insights to particular outcomes can be done by constructing ROI calculations. ROI calculations are derived from strategic goals identified when marketers outline learning agendas in Recommendation #1.

Recommendation #4: DEVELOP ONGOING LEARNING OPPORTUNITIES AND INSTITUTE SELF-SERVE ANALYTICS

If data is to drive decision-making, the process of converting raw data into actionable insight has to be driven to the decision maker. This principle requires that decision makers have access to analytic tools and the skills to use those tools. Further, the need is ongoing, as analytical tools improve and ask individuals grow in their ability to use them.

Building Absorptive Capacity

Absorptive capacity was identified as a major factor contributing to the adoption of multiple innovations. The greater the absorptive capacity, the faster innovations can be adopted which then influences the volume of innovation adoption. Because the focus of this paper is on data and how to build data-driven decisioning capacity, we have focused on how to build absorptive capacity specifically as it relates to data-decisioning. Absorptive capacity, though, also affects the ability to adopt those processes that benefit from data and those technologies that support both data decisioning and application. We will address a broader exposition of how to build absorptive capacity in greater detail in a future paper.

CONCLUSION

With the abundance of consumer data being generated at an increasing velocity, volume, and variety, companies that utilize marketing and data analytics to process data to gain insights can accelerate past the competition. Given the near-simultaneous adoption of multiple innovations required to truly adopt Big Data, leaders must consider

building absorptive capacity in order to speed the migration toward data-driven decisioning.

Arrival into the Promised Land of data-driven civilization is creating competitive advantages for first movers that will be difficult to replicate. One reason for difficulty in replication is because learning organizations stay first movers – that is, they continue to be first to move because of their ability to absorb data-driven change. Therefore, companies must realize the need to improve data analysis capabilities to uncover relevant insights about customers. To summarize the findings and proposed solutions:

1. Avoid the report trap by tying report generation to strategic objectives, using appropriate usage metrics to identify waste
2. Create interactivity with information that allows users to pull the information they need and want
3. Eliminate the formation of data silos by creating an information sharing culture.
4. Improve employee comfort-level and understanding of insights through better data visualization and establish metrics that examine insight effectiveness, as well as ongoing data-driven decisioning techniques and technical skills.

There are additional challenges that were observed; these were deemed those that most inhibit the migration to data-driven decisioning based on the data. By understanding the findings and following the recommendations presented in this paper, an organization can improve its use of marketing analytics to gain a deeper understanding of consumers, thereby enhancing its marketing effectiveness.

ABOUT THIS STUDY

The findings presented are based on research, analysis, and in-depth interviews totaling over 100 hours with 30 marketing, consumer insights, and IT executives in retailing and consumer package goods companies. In order to identify best practices and common problems that many companies face regarding marketing analytics and data usage, companies were asked to answer questions ranging from current data practices to the company's attitude towards and history of data utilization.

ⁱ Elena Klau presents interesting insights for crafting and reforming a company's data strategy in her article "Marketers Could Benefit From a Small Data Strategy," AdWeek, March 25, 2013,

<http://www.adweek.com/news/technology/marketers-could-benefit-small-data-strategy-148115>

ⁱⁱ Ibid.

ⁱⁱⁱ Kaye, Kate. "At Starbucks, Data Pours In. But What to Do With It?" Ad Age: dataworks, March 22, 2013, <http://adage.com/article/datadriven-marketing/starbucks-data-pours/240502/>.

^{iv} Ibid.

^v Jayson, Rob. "Use 'Big Data' to Engage Consumers, Not Just Monitor Digital Costs," Ad Age: CMO Strategy, October 10, 2012, <http://adage.com/article/cmo-strategy/big-data-engage-consumers-shift-real-time/237671/>.

^{vi} Rouse, Margaret. "Data Silo," SearchCloudApplications.com, May 11, 2012, <http://searchcloudapplications.techtarget.com/definition/data-silo>.

^{vii} Lindsay, Marsha. "How Marketers Must Work To Cultivate Data's Asset Value," Forbes, May 7, 2013, <http://www.forbes.com/sites/onmarketing/2013/05/07/how-marketers-must-work-to-cultivate-datas-asset-value/>.

^{viii} Read about Southwest Airlines' intriguing customer service metrics at <http://www.southwestonereport.com/2011/#!/people/customers/customer-insight>

^{ix} Rick Cook presents interesting insights regarding selection of marketing metrics in "Marketing Metrics: The Good, The Bad, And The Irrelevant," CMO.com: Insight/Analysis & Measurement, March 17, 2011, <http://www.cmo.com/articles/2011/3/17/marketing-metrics-the-good-the-bad-and-the-irrelevant.html>.