Leadership Strategies in the Age of Big Data, Algorithms, and Analytics

Norton Paley

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Leadership Strategies in the Age of Big Data, Algorithms, and Analytics

Harnessing the power of technology is one of the key measures of effective leadership. **Leadership Strategies in the Age of Big Data, Algorithms, and Analytics** will help leaders think and act like strategists to maintain a leading-edge competitive advantage.

Written by a leading expert in the field, this book provides new insights on how to successfully transition companies by aligning an organization's culture to accept the benefits of digital technology. After reading this book, you will be able to

- Develop a human interface with employees to make digital tools work to the full benefit of the organization
- Apply big data to target market segments, which results in more precisely tailored products and services
- Utilize data analytics to maneuver successfully against aggressive competitors
- Align your leadership style, corporate culture, and competitive strategies with digital age tools

The author emphasizes the importance of creating a team spirit with employees to embrace the digital age and develop strategic business plans that pinpoint new markets for growth, strengthen customer relationships, and develop competitive strategies. Understanding how to deal with inconsistencies when facts generated by data analytics disagree with your own experience, intuition, and knowledge of the competitive situation is key to successful leadership.

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Leadership Strategies in the Age of Big Data, Algorithms, and Analytics

To the next generation:

Zeke, Natalia, Isaiah

Introduction

If you went to bed last night as an industrial company, you're going to wake up this morning as a software and analytics company.

Jeffrey Immelt
Chairman and CEO, General Electric Co.

That transformative comment translates to such marketable capabilities as GE offering customers predictive maintenance services for Internet-connected industrial equipment, ranging from medical equipment to jet engines. GE's sensors collect and analyze essential data. As problems are detected, a robot sends a report to an individual wearing smart eyeglasses where step-by-step repair instructions are downloaded from a cloud database.

The endpoint: Big data, sophisticated analytics, and creative algorithms help GE's customers perform predictive maintenance to reduce downtime, assist in developing additional user applications, and drive overall higher operational efficiencies, all of which contribute to GE maintaining a leading-edge competitive advantage.

IBM is also immersed in data analytics, and more specifically in the Internet of things. It provides services to aid companies in such specialized areas as retailing by providing weather data to guide business decisions for adjusting store merchandising based on forecasts over a specific 48-hour period. Its technology applications also apply to a variety of industries, for instance, auto insurance and energy companies, to target new markets for growth.

The endpoint: Big data allows for more accurate segmentation of customer markets, which results in more precisely tailored products and services.

Caterpillar, along with its partner Uptake, utilizes predictive diagnostic tools to organize the enormous quantities of data spewing from sensors implanted in its bulldozers and hydraulic shovels. In turn, the data becomes meaningful information that its customers use to detect potential maintenance issues before breakdowns occur. As a result, downtime is minimized, efficiency is improved, productivity increases, and profitability soars.

The endpoint: The data analytics generated from these efforts lead to more productive joint projects that create closer relationships with Caterpillar's product users. In turn, these ventures strengthen its competitive strategy.

Then, there are such high-profile firms as Burberry, Home Depot, Uber, Zipcar, Capital One Bank, Nordstrom, Walmart, and Walgreens that also use algorithms and analytics to combine transaction data across a number of businesses or channels. Doing so allows them to accurately document how consumers engage with websites or decide between shopping online or in stores.

The endpoint: Observing such patterns of behavior sharpens managers' abilities to fine-tune promotional offers, optimize inventory levels by channel, and redirect spending across types of media—all of which become a basis for successfully engaging competition and fostering growth for each of those firms.

These companies made significant commitments to the digital age, or were in the process of making the transition. Other companies fed the transition as well with a variety of products and programs, such as PayPal, Square, Stripe, and Cisco Systems.

Within that maelstrom of activity, other far-thinking organizations, including Google, Facebook, and Amazon, which pioneered digitally mined businesses, continue their innovative approaches by making day-by-day progress as they explore machine-to-machine communications, improved platforms for employing big data using artificial intelligence, and advances in the Internet of things with its ever-growing capability to take on complex tasks.*

Yet within these highly publicized and fast-moving developments not all organizations fully internalized the necessity for shifting into the digital age. Instead, they often gave the procrastinating comment of "It's something we'll have to look into." At times, that approach turned into knee-jerk actions that resulted in too little, too late.

However, if not too late, those surviving companies were often pushed into change when jolted by a collapse in sales or fallen market share, or more noticeably, when obscure start-ups appeared from nowhere and began taking away key customers. Examined more closely, these new competitors

* A McKinsey & Co. report indicates that the Internet of things could have up to an $11 trillion impact on the global economy by 2025. That enormous number expands the definition of Internet of things to mean everything and everybody connected to everything and everybody else, and generating massive quantities of data in the process.

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were relying on big data and algorithms to understand who buys what, when, and why. Guided by data analytics, they confidently moved rapidly with the appropriate strategies to decisively attack key market segments.

In reality, many of the digital processes consuming the attention of executives have been around for more than a decade, but several of the original Internet innovators suffered with the dot-com crash. Now the urgency is more pronounced as the digital technologies move forward with greater speed, refinement, and accuracy. And as never before, huge amounts of data are readily accessible from internal and external sources to feed the systems.

Internal data flows in the course of doing everyday business from such areas as call center recordings, meeting memos, reports, and client notes. That includes data from security cameras, traffic monitoring, and other electronic devices.

External sources of additional data come from various touch points along the supply chain or from government sources. And then there are the voluminous quantities of data from the Internet, customer tweets, social network postings, YouTube, and numerous photo sites.

As a way for you to internalize the full scope of data as a remarkable resource of knowledge to be perpetuated, mined, and disseminated, the following two categories provide organization and structure: *explicit knowledge* and *tacit knowledge.*

EXPLICIT KNOWLEDGE

This category forms your internal databases, which include records, manuals, documents, and the raw numbers in spreadsheets. Then, there is the output from sophisticated analytics that incorporates data from a variety of the above-cited customer touch points, proprietary big data, and public sources of open data.

TACIT KNOWLEDGE

This more subtle area of knowledge generally resides in the minds of individuals who have accumulated it through discovery, experience, intuition,

or numerous interactions with others. Since tacit knowledge tends to be less structured, it cannot always be put on paper. Instead, it is transferred indirectly through conversation, anecdotes, observation, or other types of informal interchanges.

Tacit knowledge can originate in a variety of patterns, such as the impressions, feelings, and insights of a sales rep returning from a visit with a key customer. Or it can start with an engineer making an offhand comment about a gestating idea to an associate in a casual setting over lunch.

For many organizations, explicit knowledge is tangible and available on a widespread basis, or minimally, it is accessible to several layers of personnel. On the other hand, tacit knowledge is somewhat unbounded and tends to be used by individuals who need to protect what they know as a personal defense or a power barrier. It is this form of knowledge that is often lost to others, if not captured, organized, and available.

Yet if both categories of knowledge were blended into a disciplined business system built around big data, algorithms, and analytics, it would function as a balanced, multidisciplinary framework for capturing, sharing, and spewing forth immensely valuable intelligence with the result of making more accurate decisions.

To break through the barriers that could prevent aligning such a system with the culture of your firm means establishing a level of trust up and down the organization. It also means instilling a spirit of teamwork to make the digital tools work to the full benefit of the organization.

You would then be in a far more advantageous position to justify (or recommend to a management committee) allocating funds for rolling out a new product or service, adopting a cutting-edge technology, or probing an evolving market segment. Perhaps too, in the context of this book, you would further hone your leadership skills to sustain a competitive edge.

The responsibility for big data can reside with any number of individuals, depending on the size of your company and the level of priority given to the project. The range of titles includes company librarian, information technology (IT) manager, market research manager, chief information officer, and the evolving duties of the data scientist who creates or manages systems to connect employees with the knowledge they need.

In parallel with any of those titles, however, your central responsibility is to make tangible use of the immense fund of knowledge flowing from big data. That, in part, is what living in the digital age is all about. It is anchored to the most fundamental requirements for all decision making

when developing competitive strategies: obtain accurate information and refine it into usable intelligence.*

Expressed another way, the aim is to make better-informed decisions, discover hidden insights about customers' and competitors' behaviors, and develop winning strategies. That need has always been paramount. Now, better tools are available to handle the task.

Thus, armed with organized and integrated intelligence, the uncertain variable is your *readiness* to apply the mass of knowledge to market advantage. Readiness in this context incorporates such vital attributes as your personality and experience. These include the deeply embedded human qualities of ambition, courage, tenacity, and determination, which are essential to taking meaningful action.

Thus, the paradox!

What if the straightforward facts generated by data analytics across digital networks defy what your experience, intuition, and gut feel tell you as you look at market conditions through your own eyes? Now, you face the proverbial horns of a dilemma about deciding which path to take.

Part of that quandary is determining how the selected pathway would impact your day-to-day operations, what effect it would have on employee morale and behavior, and would it align with your corporate culture? As one C-suite executive succinctly remarked, "Remember the human interface or all this data means nothing."

The following company example illustrates the impact of such a dilemma and the influence of the human interface as one leader dealt with digital age technology.

Indra Nooyi, CEO of PepsiCo, faced monumental, and at times confusing, challenges in managing the variety of its product lines, its markets, and diversity of its customers she oversees. The company's formidable market research revealed an inconsistency: consumers wanted healthier fare. Yet at the same time, they were devouring such products as its Lay's chips, which was contributing mightily to PepsiCo's high-growth snacks division. Then, there was its hugely successful big soda brand, Mountain Dew, a highly sugary and acidic drink that was raking in record sales and also adding substantially to PepsiCo's overall performance.

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* The ancient Chinese strategist Sun Tzu summed up the purpose of accurate intelligence more than 2500 years ago (simply substitute *enemy* with *competitor*): "Know the enemy and know yourself; in a hundred battles you will never be in peril. When you are ignorant of the enemy, but know yourself, your chances of winning or losing are equal. If ignorant both of your enemy and of yourself, you are certain in every battle to be in peril."

With big data documenting the trends and eating preferences, and sales metrics revealing a different story, how might these discrepancies be resolved? How should decisions be made about committing resources where data analytics and sophisticated algorithms produce outcomes contrary to actual results? In other words, where do experience, intuitive-based human judgment, and the personality traits listed above interconnect with the machine-generated facts?

Nooyi took several decisive steps: First, she took a bold strategic viewpoint that helped drive her actions by declaring that Pepsi must address "one of the world's biggest public health challenges, a challenge fundamentally linked to our industry: obesity." Subsequently, she put resources behind her proclamation by shifting from junk foods to healthier alternatives. At the same time, Nooyi vowed to improve the healthiness of Pepsi's core products by reducing the sugar content while maintaining the traditional taste experience.

Product developers experimented with new drinks that included healthy versions of old ones, such as Mountain Dew Kickstart, a fruit-flavored, lower-calorie drink, and a super-crunchy potato chip developed first on a three-dimensional printer. The company reports removing 400,000 tons of sugar from its drinks since 2006, and reducing the salt and saturated fat in Lay's and Ruffles chips.

To more readily manage change, Nooyi moved to alter Pepsi's culture. Historically, the company was a decentralized place where local managers operated without much central interference. She restructured the organization into a leaner, top-down design. As Nooyi points out, "The top needs to know all the pieces. And the top better really get into the details ... to know what questions to ask." With that shift in orientation, she was able to more readily take action to develop new, healthier products and initiate change with existing products by altering their ingredients, all while providing customers with the same taste satisfaction of the original products.

In a like manner, what can you do in such a paradox? What action can you take where actual behavior is incompatible with digitally generated data? What thought processes are needed to think and act as a strategist? What are your leadership responsibilities to prepare you and your organization or group for the digital age?

The chapters in this book present ideas, processes, and techniques that you can use as operating guidelines to cope with a variety of competitive situations. These are organized around major forces that would affect your

ability to successfully lead in a work environment where big data, algorithms, and analytics dominate managerial practices.

As illustrated in the following diagram, the forces of leadership shaped by digital technology consist of five sections: *digital technology*, *competitive strategy*, *corporate culture*, *organizational structure*, and *strategic business planning*. In turn, each section is comprised of supporting chapters.

The Five Forces of Leadership Shaped by the Digital Age

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