

Gestão do Conhecimento e Inteligência Competitiva



UNI7 - Ciência de dados
Pós-graduação

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Eleições EUA 2012 (1)



| | Obama | Romney |
|------------------|--------------|--------------|
| Orçamento | US\$ 985,7 | US\$ 992,0 |
| Voto popular | 65,9 milhões | 60,9 milhões |
| Voto popular (%) | 51,7% | 47,2% |

Eleições EUA 2012 (2)



| | Obama | Romney |
|-----------------------|-------|--------|
| Colégio eleitoral | 332 | 206 |
| Colégio eleitoral (%) | 61,7% | 38,3% |
| Estados indecisos | 12 | 2 |

Eleições EUA 2012 (3)



Cientistas de dados
(#)

10

1



Eleições EUA 2012 (3)



10

Dados + Inteligência

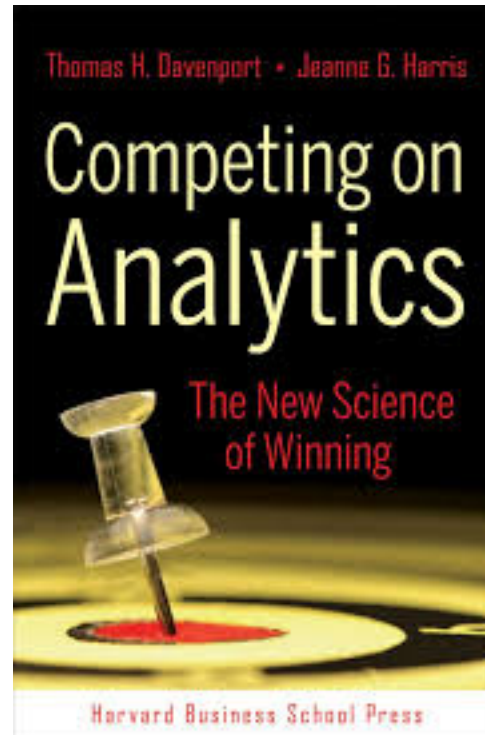
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"The resource in shortest supply continues to be management awareness and understanding of the business potential of big data." Thomas Davenport, 2015



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Inteligência Competitiva

Competing on Analytics

"By analytics we mean the extensive use of data, statistical and quantitative analysis, explanatory and predictive models, and fact-based management to drive decisions and actions. The analytics may be input for human decisions or may drive fully automated decisions."

Davenport, Thomas H.; Harris, Jeanne G.. *Competing on Analytics: The New Science of Winning* (Kindle Locations 196-198). Harvard Business Review Press. Kindle Edition.



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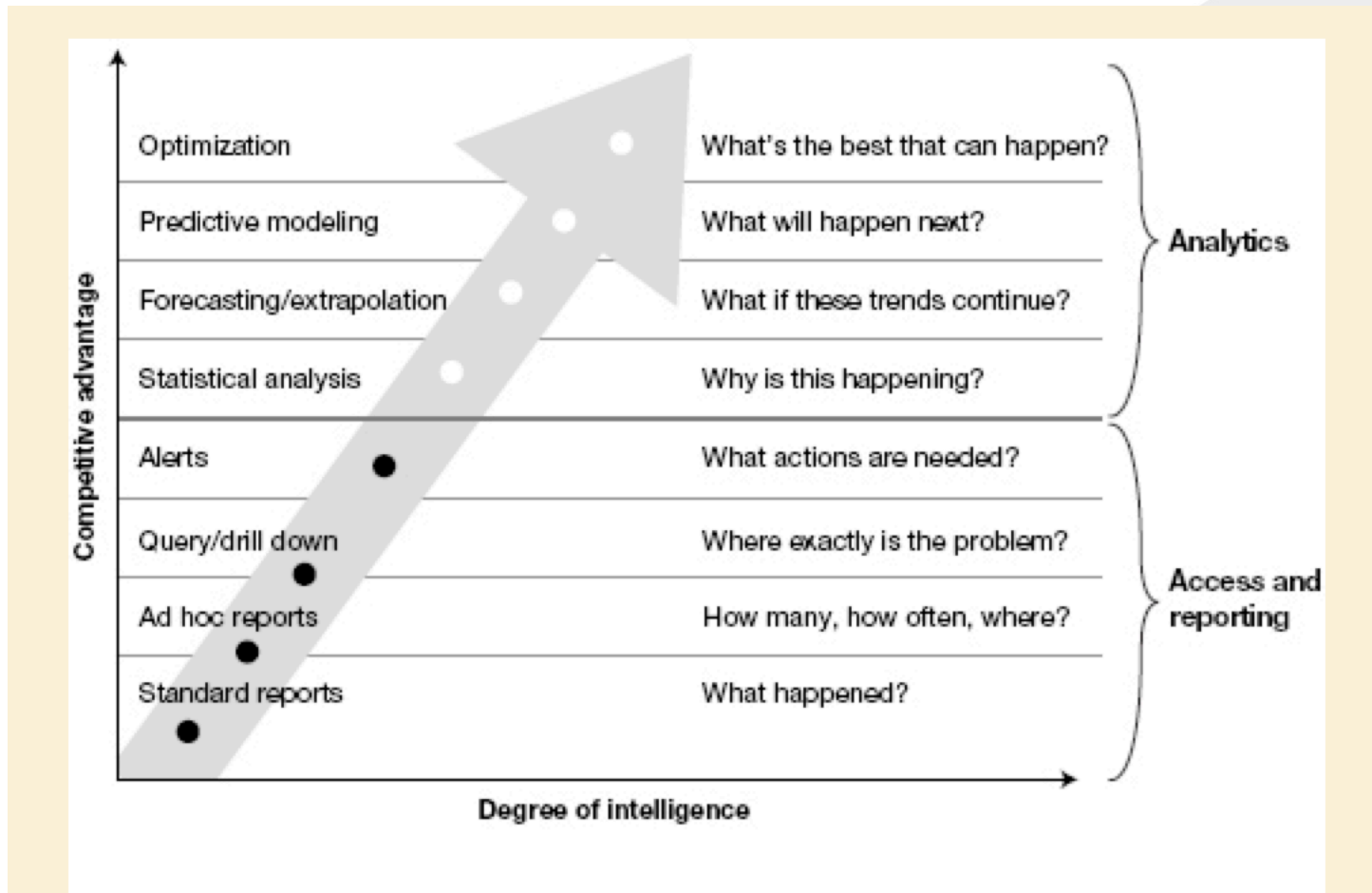
FIGURE 1-1

Analytic competitors are found in a variety of industries

| | | |
|---|---|--|
| Consumer products <ul style="list-style-type: none"> • Anheuser-Busch • E. & J. Gallo Winery • Mars • Procter & Gamble | Financial services <ul style="list-style-type: none"> • Barclays Bank • Capital One • Royal Bank of Canada • Progressive Casualty Insurance • WellPoint | Hospitality and entertainment <ul style="list-style-type: none"> • Oakland A's • Boston Red Sox • Harrah's Entertainment • Marriott International • New England Patriots |
| Industrial products <ul style="list-style-type: none"> • CEMEX • John Deere & Company | Pharmaceuticals <ul style="list-style-type: none"> • AstraZeneca • Solvay • Vertex Pharmaceuticals, Inc. | Retail <ul style="list-style-type: none"> • Amazon.com • JCPenny • Tesco • Wal-Mart |
| Telecommunications <ul style="list-style-type: none"> • Sprint • O2 • Bouygues Telecom | Transport <ul style="list-style-type: none"> • FedEx • Schneider National • United Parcel Service | eCommerce <ul style="list-style-type: none"> • Google • Netflix, Inc. • Yahoo! |

Inteligência Competitiva

Competing on Analytics



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"Analytical competitors, then, are organizations that have selected one or a few distinctive capabilities on which to base their strategies, and then have applied extensive data, statistical and quantitative analysis, and fact-based decision making to support the selected capabilities. Analytics themselves don't constitute a strategy, but using them to optimize a distinctive business capability certainly constitutes a strategy."

Davenport, Thomas H.; Harris, Jeanne G.. *Competing on Analytics: The New Science of Winning* (Kindle Locations 230-233). Harvard Business Review Press. Kindle Edition.



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Today, most large organizations have some sort of analytical applications in place and some business intelligence tools installed. But they are typically marginal to the success of the business and are managed at the departmental level. An insurance company, for example, may have some analytical tools and approaches in the actuarial department, where pricing for policies is determined. A manufacturing company may use such tools for quality management. Marketing may have some capabilities for lifetime value analysis for customers. However valuable these activities are, they are invisible to senior executives, customers, and shareholders— and they can't be said to drive the company's competitive strategy. They are important to individual functions but insignificant to competition overall.

Davenport, Thomas H.; Harris, Jeanne G.. *Competing on Analytics: The New Science of Winning* (Kindle Locations 295-300). Harvard Business Review Press. Kindle Edition.



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Competing on Analytics

In the future, software availability will not be an issue in analytical competition, although the ability to use analytical software well won't ever be a commodity.

Davenport, Thomas H.; Harris, Jeanne G.. *Competing on Analytics: The New Science of Winning* (Kindle Locations 345-346). Harvard Business Review Press. Kindle Edition.



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Among the firms we studied, we found that the most analytically sophisticated and successful had four common key characteristics: (1) analytics supported a strategic, distinctive capability; (2) the approach to and management of analytics was enterprise-wide; (3) senior management was committed to the use of analytics; and (4) the company made a significant strategic bet on analytics-based competition.

Davenport, Thomas H.; Harris, Jeanne G.. *Competing on Analytics: The New Science of Winning* (Kindle Locations 487-489). Harvard Business Review Press. Kindle Edition.

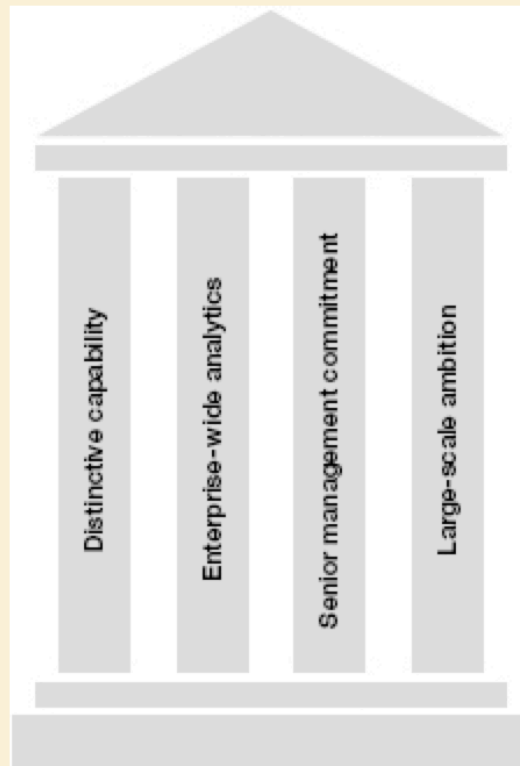


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Four pillars of analytical competition



Inteligência competitiva via *analytics* (estágios)

Competing on analytics stages model

| Stage | Distinctive capability/level of insights | Questions asked | Objective | Metrics/measure/value |
|-----------------------------|---|--|---|--|
| 1 Analytically impaired | Negligible, “flying blind” | What happened in our business? | Get accurate data to improve operations | None |
| 2 Localized analytics | Local and opportunistic—may not be supporting company’s distinctive capabilities | What can we do to improve this activity? How can we understand our business better? | Use analytics to improve one or more functional activities | ROI of individual applications |
| 3 Analytical aspirations | Begin efforts for more integrated data and analytics | What’s happening now? Can we extrapolate existing trends? | Use analytics to improve a distinctive capability | Future performance and market value |
| 4 Analytical companies | Enterprise-wide perspective, able to use analytics for point advantage, know what to do to get to next level, but not quite there | How can we use analytics to innovate and differentiate? | Build broad analytic capability—analytics for differentiation | Analytics are an important driver of performance and value |
| 5 Analytical competitors | Enterprise-wide, big results, sustainable advantage | What’s next? What’s possible? How do we stay ahead? | Analytical master—fully competing on analytics | Analytics are the primary driver of performance and value |

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Competing on Analytics

Regardless of the approach, for companies to sustain a competitive advantage, analytics must be applied judiciously, executed well, and continually renewed. Companies that successfully compete on analytics have analytical capabilities that are: hard to duplicate, unique, adaptable to many situations, better than the competition, and renewable.

Davenport, Thomas H.; Harris, Jeanne G.. *Competing on Analytics: The New Science of Winning* (Kindle Locations 941-943). Harvard Business Review Press. Kindle Edition.



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Inteligência Competitiva *Competing on Analytics*

Hard to duplicate. It's one thing to copy another company's IT applications or its products and their related attributes (such as price, placement, or promotion), quite another to replicate processes and culture.

Unique. There is no single correct path to follow to become an analytical competitor, and the way every company uses analytics is unique to its strategy and market position.

Adaptable to many situations. An analytical organization can cross internal boundaries and apply analytical capabilities in innovative ways.

Better than the competition. Even in industries where analytical expertise and consistent data are prevalent, some organizations are just better at exploiting information than others.

Renewable. Any competitive advantage needs to be a moving target, with continued improvement and reinvestment. Analytics are particularly well suited to continuous innovation and renewal.

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Typical Analytical Applications in Marketing

CHAID. An abbreviation of *Chi-square automatic interaction detection*, this statistical technique is used to segment customers on the basis of multiple alternative variables. The analysis creates a segmentation “tree” and continues to add different variables, or branches, to the tree as long as it is statistically significant.

Conjoint analysis. Typically used to evaluate the strength and direction of customer preferences for a combination of product or service attributes. For example, a conjoint analysis might be used to determine which factors—price, quality, dealer location, and so on—are most important to customers who are purchasing a new car.

Lifetime value analysis. This analysis employs analytical models to assess the profitability of an individual customer (or a class of customers) over a lifetime of transactions. Sophisticated models generate accurate estimates of the costs incurred by the customer in buying and making use of the product, including the cost of the buying channel, the likelihood of returns, the expense from calls for customer service, and so on.

Market experiments. Using direct mail, changes in the Web site, promotions, and other techniques, marketers test variables to determine what customers respond to most in a given offering. Normally involves different treatments based on assumed causal variables for different (ideally randomized) groups, with an outcome measure and a comparison from which the effect of the treatment can be observed.

Multiple regression analysis. The most common statistical technique for predicting the value of a dependent variable (such as sales) in relation to one or more independent variables (such as the number of salespeople, the temperature, or the day of the month). While basic regression assumes linear relationships, modifications of the model can deal with nonlinearity, logarithmic relationships, and so forth.

Price optimization. Also known as yield or revenue management, this technique assumes that the primary causal variable in customer purchase behavior is price. The key issue is usually price elasticity, or the response (changes in demand) of the buyer to increases or decreases in product price. Price optimization initiatives typically construct price elasticity curves in order to understand the impact of price across a range of changes

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and conditions.

Time series experiments. These experimental designs follow a particular population for successive points in time. They are used to determine whether a condition that applied at a certain point led to a change in the variables under study. This approach might be used, for example, to determine the impact of exposure to advertising on product purchases over time.



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Typical Analytical Applications in Supply Chains

Capacity planning. Finding the capacity of a supply chain or its elements; identifying and eliminating bottlenecks; typically employs iterative analysis of alternative plans.

Demand–supply matching. Determining the intersections of demand and supply curves to optimize inventory and minimize overstocks and stockouts. Typically involves such issues as arrival processes, waiting times, and throughput losses.

Location analysis. Optimization of locations for stores, distribution centers, manufacturing plants, and so on. Increasingly uses geographic analysis and digital maps to, for example, relate company locations to customer locations.

Modeling. Creating models to simulate, explore contingencies, and optimize supply chains. Many of these approaches employ some form of linear programming software and solvers, which allow programs to seek particular goals, given a set of variables and constraints.

Routing. Finding the best path for a delivery vehicle around a set of locations. Many of these approaches are versions of the “traveling salesman problem.”

Scheduling. Creating detailed schedules for the flow of resources and work through a process. Some scheduling models are “finite” in that they take factory capacity limits into account when scheduling orders. So-called advanced planning and scheduling approaches also recognize material constraints in terms of current inventory and planned deliveries or allocations.



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US Gov - From Patil's Presentation

This is the most data driven President we've ever had:

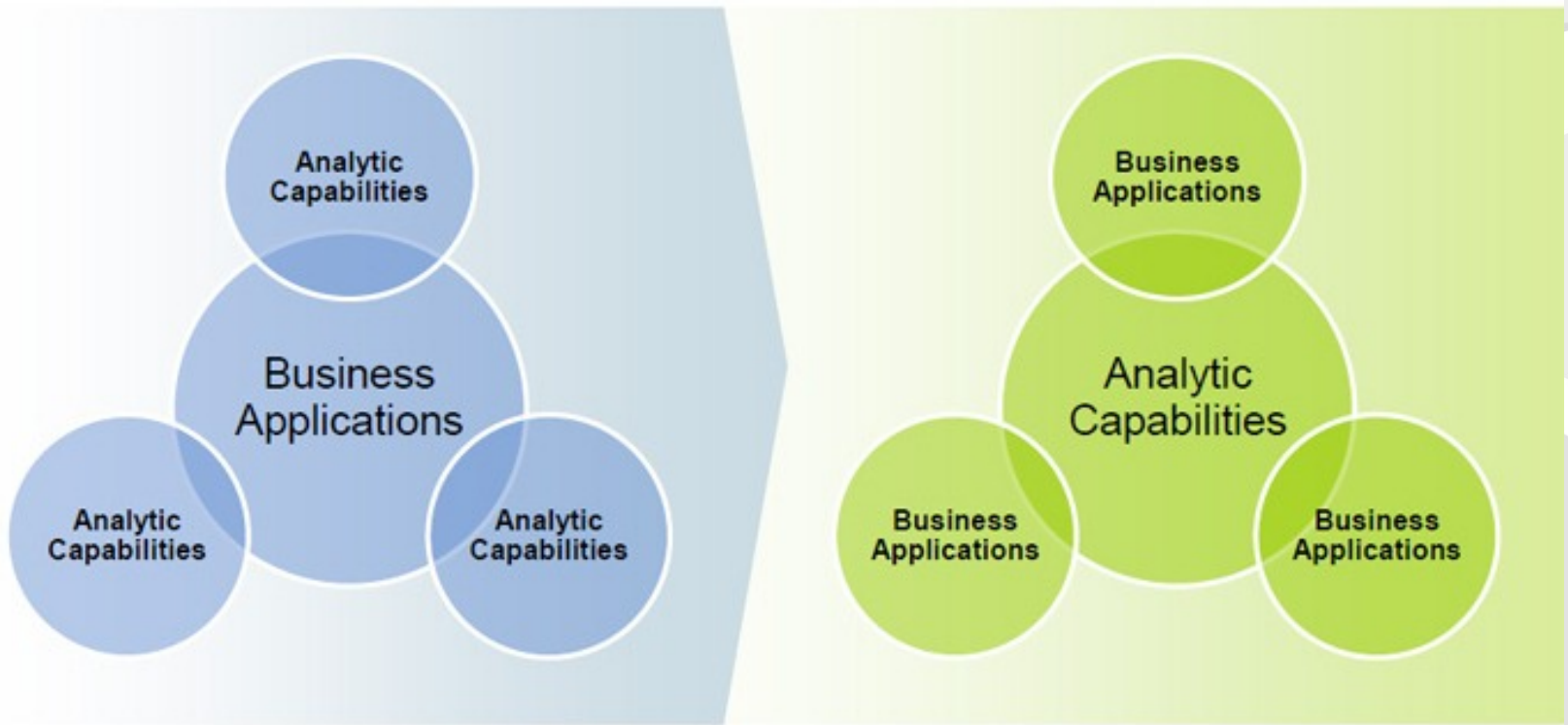
- Created the first set of dashboards at the Federal level to monitor progress on major IT technology investments.
- Established data.gov which hosts over 135,000 data sets (and growing) from the U.S. Government.
- Executive order to ensure that open and machine-readable data is the new default for the government.
- Investing in research and data science to revolutionize how we improve health and treat disease
- Driving privacy for the consumer and ensuring competitiveness through the Big Data report.
- Establishing data driven culture through out the government with key data personnel at agencies like NIH, Dept of Energy, Commerce, Treasury, Dept. of Transportation, ...

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Applications-
centered today

Business analytics-
centered tomorrow



Gartner Group, Julho/2013



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- Assertividade e menor custo em campanhas de marketing
- Detecção de fraude em operações financeiras
- Segurança pública (e.g., LAPD)
- Investimento no mercado de capitais (e.g., inferências com base em análise de sentimento)
- Análise preditiva para antecipar o resultado de processos judiciais
- Risco de conceder liberdade condicional ou outro benefício
- Fiscalização e arrecadação de impostos (GOV)
- Retenção e fidelização de clientes
- Recursos Humanos (e.g., “Flight Risk” p/ 350K+ emp.)
- Análise de venda cruzada (market basket analysis)
- Estratégias para campanhas políticas



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