Digital Insights Are The New Currency Of Business

by Brian Hopkins and Ted Schadler, April 27, 2015 | Updated: May 19, 2015

KEY TAKEAWAYS

Insights-Driven Actions Matter -- Not Just Data
How good are you at turning data into insights into business actions that matter? Despite significant investments in customer insights, big data, and business intelligence, three problems prevail: 1) too much data and too little insight; 2) poor linkage between insights discovery and business action; and 3) scarce learnings from actions taken.

Build Systems Of Insight To Consistently Turn Data Into Action
Digital startups and advanced firms are taking a new approach we call systems of insight -- the business discipline and technology to harness insights to consistently turn data into action. The key to this is multidisciplinary teams and an insights-to-execution process to embed insights in software, digital experiences, and everyday work.

Assemble A Digital Insights Architecture From New And Existing Technology
To become insights-driven, CIOs will connect and extend big data, analytics, and execution technology into a converged digital insights architecture that makes data and insights accessible to all, translates insights into actions, and enables a learning path to improve data and insights over time.

CIOs: Partner With Your CMO To Fund Your First Insights Teams And Process
As CIO, you have responsibility for the business technology your firm needs to understand and serve powerful customers. But your CMO will help fund the technology, assemble your first insights teams, and help implement the insights-to-execution process. The payoffs are more intelligent customer engagement and better customer experiences.
Digital Insights Are The New Currency Of Business
Build Systems Of Insight To Consistently Turn Big Data Into Business Action
by Brian Hopkins and Ted Schadler
with Christopher Mines, Carlton A. Doty, Sharyn Leaver, and Elizabeth Cullen

WHY READ THIS REPORT
Businesses are drowning in data but starving for insights. Worse, they have no systematic way to consistently turn data into action. This can't continue. Demanding customers and competitive pressures require firms to treat insights — not just data — as a business asset. Forrester's research into incumbents like Ford Motor, General Electric (GE), and USAA as well as digital insurgents like Netflix and LinkedIn found that these leaders are fusing a new business discipline with technology to create “systems of insight.” This combination of people, process, and technology closes the gap between insights and action. Read this report to see how CIOs can lead their firms to find, test, and codify digital insights in software, leading to more intelligent engagement and better decisions. Start by partnering with the CMO, integrating disparate data technologies, and building a new insights-to-execution operating model.

Table Of Contents
2 Insights-Driven Actions Matter — Not Just Data
3 Build Systems Of Insight To Power Your Digital Business
7 How CIOs Build Systems Of Insight
WHAT IT MEANS
15 Digital Insights Are The New Currency Of Business
17 Supplemental Material

Notes & Resources

Related Research Documents
It's Time For A User-Driven Enterprise BI Strategy
Market Overview: Digital Experience Delivery Platforms
Predictive Analytics Can Infuse Your Applications With “Unfair Advantage”
Reset On Big Data
INSIGHTS-DRIVEN ACTIONS MATTER — NOT JUST DATA

You have invested in business intelligence tools to put data into business hands. And you are establishing big data practices to pool data and mine it for insights. Your marketing organization even has dedicated teams to translate data into customer insights. But how good is your company at systematically turning all this data (through insights) into business actions that matter across all departments? Three problems prevent firms from systematically turning data into action (see Figure 1):

1. **Too much data and too few insights.** Despite their investment in big data practices and technologies, many firms still paddle in a sea of data without the ability to prioritize results and find insights they can use. One global bank told us, “We are a company with so much data but very little insight, even with all the tools and capabilities in place. We are literally drowning in data and starving for insight.”

2. **A gaping hole between insights and business actions.** An insight without action is like fuel without an engine — potential energy not yet unleashed. Even if big data investments are paying off in a steady stream of insights, they offer little value until you test and act on the insights. For example, the chief data scientist at a global payment-processing firm said that his biggest challenge is getting his team to develop actionable insights for real business problems.

3. **Little learning from the actions you take.** Taking action based on perceived insights might work. Or it might fail. To win in this age of powerful customers, firms need to learn quickly from the actions they take and then modify their approach based on what they learn — and the new data they gather. For example, if you implement an insight in software to deliver exactly what a customer needs on her smartphone at that moment, you had better also learn from her action to be ready for her next need.

**Figure 1** The Best Efforts Of Today Don’t Effectively Link Data And Actions
BUILD SYSTEMS OF INSIGHT TO POWER YOUR DIGITAL BUSINESS

In today’s data deluge, only digital insights — information about customers, products, and business environment refined into meaning — can generate the actions you need to win, serve, and retain customers. And you must be in a position to embed insight into business operations and continuously learn from what works and what doesn’t (see Figure 2).

Forrester interviewed technology managers and business leaders from 35 firms, both incumbents and digital insurgents, to find out how they are becoming insights-driven and are able to consistently turn data into action and learn from the results. We found many people at the digital firms and a handful of leaders at enterprises like 7-Eleven, Ford Motor, General Electric (GE), Nordstrom, TD Bank, Telefónica, TIAA-CREF, and USAA who are going beyond a typical big data or business intelligence (BI) practice to implement what we call systems of insight, defined as:

*The business discipline and technology to harness insights and consistently turn data into action.*

A system of insight (and your firm will have many of them) comes together under the sponsorship of a business leader as part of a business operations group or function. You will build systems to support your digital experience team, marketing strategy or operations group, product development group, sales organization, risk management process, and so on. Furthermore, a system of insight is more than technology; it is a business capability composed of people, process, and technology (see Figure 3):

- **Insights teams with business, technology, and analytics expertise** . . . A system of insight brings business practitioners, data scientists, BI professionals, and software developers onto the same team. By working across functional boundaries, this team will make insight discovery, testing, implementation, and learning mainstream business activities. Stock photo company Shutterstock uses this approach to test hundreds of insights every month on its website.

- **. . . using an agile insights-to-execution process** . . . Big data practices help you turn data into insight. Systems of insight convert those insights into meaningful business actions in software, intelligent engagement, and decisions. We call this agile and collaborative operating model “insights to execution” — i.e., the ability to find and implement insights, capture results, and learn from what works. Starbucks’ digital organization uses this process to make sure insights drive actions that work online and also in the coffee shops.

- **. . . anchored by a digital insights architecture.** A system of insight uses a technical architecture that makes data broadly available; empowers insights teams with analytics, collaboration, and governance tools; and reduces the friction between insight discovery, testing, and implementation. For example, Netflix has implemented a digital insights architecture using open source software hosted on Amazon Web Services. This gives them enormous flexibility to create new insights-driven services, such as multiprofile personalization.
**Figure 2** Digital Businesses Will Link Data And Action Through Digital Insights

![Figure 2](image)

Source: Forrester Research, Inc. Unauthorized reproduction or distribution prohibited.

**Figure 3** Systems Of Insights Drive Business Actions With People, Processes, And Technology

![Figure 3](image)

Source: Forrester Research, Inc. Unauthorized reproduction or distribution prohibited.

**How Systems Of Insight Turn Data Into Action**

The biggest difference between systems of insight and previous approaches is that in this holistic process, firms systematically implement, embed, and test digital insights in the context of tangible business actions (see Figure 4). By adding developers and business practitioners to the insights team, you are in a position to:
- **Implement digital insights directly in software.** Digital businesses are software-powered. That means you will test and implement insights in the systems of engagement your customers touch. On an insights team, developers work side-by-side with data scientists and marketers to immediately figure out which insights affect customer outcomes, then implement those insights in software. USAA uses this approach to turn insights derived from mobile data to further improve the mobile experience.

- **Embed tested insights into everyday work to improve customer engagement.** Two-thirds of information workers touch customers and your systems of engagement. Systems of insight empower these practitioners by harnessing relevant data and using insights visualization tools to consider, for example, what marketing message or social campaign will work best. After years of flailing we now know that Facebook “likes” don’t drive sales — only loyalty and referrals do. An insights-to-execution process would have discovered this much sooner.

- **Empower employees to make insight-driven decisions.** Supported by a Roambi tablet app, Constellation Brands puts insights into the hands of a salesperson calling on a wine retailer. Armed with insights into what product mix is working best in that region or how to maximize placement in an end-cap display, the conversation focuses on growing the retailers’ business. Elevating this kind of business intelligence support by embedding it in a business practitioner’s workday was the best way to operationalize insight in this case.

---

**Figure 4** How Systems Of Insight Are Different From Previous Approaches

<table>
<thead>
<tr>
<th>Previous approaches were limited</th>
<th>Systems of insight are a holistic approach</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal</strong></td>
<td>Systems of insight: Find, test, and implement digital insights to improve a specific business outcome</td>
</tr>
<tr>
<td>• Big data: generate insights from data</td>
<td></td>
</tr>
<tr>
<td>• Agile BI: put data into employees’ hands</td>
<td></td>
</tr>
<tr>
<td>• Customer insights: understand customers</td>
<td></td>
</tr>
<tr>
<td><strong>Business alignment</strong></td>
<td>Part of a business organization generating revenue</td>
</tr>
<tr>
<td>• Managed by function (e.g., marketing or IT)</td>
<td></td>
</tr>
<tr>
<td>• Seen as cost centers assisting primarily in operational efficiency</td>
<td></td>
</tr>
<tr>
<td><strong>Sponsorship</strong></td>
<td>CMOs and CIOs share responsibility for insights teams, technology, and process</td>
</tr>
<tr>
<td>• Marketing owns customer insights</td>
<td></td>
</tr>
<tr>
<td>• IT owns big data and business intelligence</td>
<td></td>
</tr>
<tr>
<td><strong>People</strong></td>
<td>Small insights teams include business, technology, and analytics skills drawing on shared resources for specialty data skills</td>
</tr>
<tr>
<td>• Customer insights is a separate team</td>
<td></td>
</tr>
<tr>
<td>• Big data and BI are owned by IT</td>
<td></td>
</tr>
<tr>
<td>• Pockets of expertise are in different groups</td>
<td></td>
</tr>
<tr>
<td><strong>Technology</strong></td>
<td>Those tools plus insights visualization, collaborative environment, links to software execution, and reusing capture and feedback</td>
</tr>
<tr>
<td>• Big data management</td>
<td></td>
</tr>
<tr>
<td>• Analytics</td>
<td></td>
</tr>
<tr>
<td>• Business intelligence</td>
<td></td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc. Unauthorized reproduction or distribution prohibited.
Systems Of Insight Will Improve Customer Engagement

Armed with this new business discipline and technology, companies will be in a position to lower the friction and accelerate the pace of insight discovery and execution. Turning insights into action will improve your entire organization, but results first show themselves in more intelligent customer engagement (see Figure 5). Firms that master systems of insight will be able to:

- **Market with full intelligence of a customer’s context.** The days of customer segment-based marketing are over; marketing is now contextual. Armed with digital insights the new discipline will deliver, customer insight professionals and the marketers they serve can target a customer based on her full context — history, actions, and location, even her likely emotional state. Contextual marketing comes to life when teams have the full picture of a customer, including insights drawn from data currently locked away in transaction systems merged with environmental data.

- **Power great mobile moments.** Mobile moments are the new battleground of business. Systems of insight help by correlating mobile behavioral data with customer actions, so you find insights that power mobile apps or web to deliver the information a customer needs right away. A customer running Sephora’s mobile app is notified of a promotion when he or she walks into the store. That’s a system of insight in action.

- **Shape digital experiences.** Customers leave digital fingerprints on your firm’s systems with every click. Systems of insights help by putting insights into the hands of practitioners running the processes and technologies that touch customers. For example, a customer experience team at a large commercial bank used customer journey analysis and ClickFox to discover a pattern of credit card activation, web activity, and service calls indicating a painful experience for its new customers. This insight led them to streamline the process and fix the technology.

- **Fuel conceptual product and services breakthroughs.** Product designers at your firm continuously search for ways to create new and better products and services. For product teams, systematically finding insights about product and service usage based on all the data will help designers have “ah ha” moments. For example, Tesla Motor’s designers use data collected from its connected cars to help design its upcoming innovative autopilot system.
Figure 5 Systems Of Insight Let Teams Turn Data Into Action Across The Organization

Common processes and technology

Customer insights anchor strategy with complete customer intelligence

Product insights improve products and find new products

Customer service insights optimize service delivery and improve offerings

Marketing insights improve customer acquisition, engagement, and loyalty

Sales insights optimize sales, renewals, and lifetime value

Risk insights improve real-time risk response

Other insights

Source: Forrester Research, Inc. Unauthorized reproduction or distribution prohibited.

HOW CIOS BUILD SYSTEMS OF INSIGHT

CIOs have a responsibility to implement and manage the business technology their firms need to understand and serve powerful customers. Systems of insight play a vital role in transforming technology systems into this engine of business growth. And so CIOs must play a major part by extending the business technology agenda to include systems of insight (see Figure 6).

Building out systems of insight is not a complete change from the work your company is already doing in customer insights, business intelligence, and big data. It is, instead, a convergence and extension of these things as well as a shift in mindset and organization to take insights-driven action and not just supply data. CIOs should take three steps today to build systems of insight:

1. Partner with your CMO to fund the first insights team and processes.

2. Extend your technology into a digital insights architecture.

3. Take advantage of new digital insights technologies as they mature.
1. CIOs: Partner With Your CMO To Fund The First Insights Teams And Process

We estimate that assembling a digital insights architecture and setting up the first few systems of insight could cost anywhere from $2 to 10 million over two years. A lot depends on how much data infrastructure you have in place already. While you may have to hire more data scientists or data engineers, you already have many of the right skills in place to create one or more insights teams of five to 15 people (see Figure 7).

But you shouldn’t do this on your own. In fact, you can’t. The first insights teams will be directly focused on customer insights and engagement, something your CMO cares deeply about. So work with her to identify the best places to get started.

- **Look to the customer insights team for best practices.** This team probably has many of the skills and processes in place already. Extend the capabilities of this team in two important ways. First, support them with more and better data sources and technologies. Second, add software
developers and technology managers to test and implement insights and collect data and results. At Shutterstock, the entire company behaves like a customer insights team, so it already operates from insights to execution.

- **Find leaders who own a business metric and speak digital.** Systems of insight elevate insights into the realm of business strategy and operations. That’s only possible if an executive that owns both a budget and a business metric — sales, service costs, conversion rates, customer satisfaction, and so on — and leads the insights team. These relatively unique individuals must also be able to talk data. And it’s not just one leader. So the chief data officers at firms like Ford Motor and American International Group (AIG) can’t do it alone.

- **Implement an insights-to-execution process to turn data into action.** Extend existing big data practices to test and implement digital insights, track results, and capture learnings and new data to improve insights discovery (see Figure 8). The “new” thing here is for developers on the team to implement digital insights in software — for example, rules engines driving digital experiences or mobile employee apps bringing insights to everyday work. SAP’s Concur Technologies uses this process to continuously find, test, and implement insights.16

- **Support insights teams with data, tools, and dedicated technology managers.** Technology is an essential ingredient in an insights-to-execution process. CIOs thus play two crucial roles on insights teams: operate the digital insights architecture technologies and contribute developers and technical talent. At Pizza Hut, for example, the CIO and CMO worked together with mobile, loyalty, and point-of-sale data to implement a mobile app with one-button ordering.
**Figure 7** Roles And Contributions On A Typical Insights Team

<table>
<thead>
<tr>
<th>Role</th>
<th>Contribution to the insights team</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business leader</td>
<td>Manages the team to drive toward a specific business outcome</td>
<td>To translate insights into execution, this executive will manage the team and bring a pragmatic business view to the data collected, models built, correlations explored, and insights tested.</td>
</tr>
<tr>
<td>Technology leader</td>
<td>Brings technology managers and business data into the shared insights architecture</td>
<td>To support the end-to-end process, this technology manager ensures that the technology, systems, and processes are in place to support domain experts and the business leader.</td>
</tr>
<tr>
<td>Domain experts</td>
<td>Recognize insights worth potential investment</td>
<td>All the data chops in the world won't find an insight without the help of experts in a particular domain — marketing engagement, product development, pricing, sales process, customer service, and so on.</td>
</tr>
<tr>
<td>Developers</td>
<td>Test and implement insights in systems of engagement software and BI tools</td>
<td>Many of the customer insights you seek will be drawn from the realm of digital experiences, i.e., online or mobile. Developers will implement insights to see if they pay off in your systems of engagement.</td>
</tr>
<tr>
<td>Data scientists</td>
<td>Explore data, build models, and exercise them to reveal potential insights</td>
<td>Data science has become the hottest job in tech — today there are over 2,500 data scientist jobs on LinkedIn. This analytics expert plays a crucial role in applying domain knowledge to data and insights.</td>
</tr>
<tr>
<td>Data engineers</td>
<td>Gather, assess, integrate, prepare, and manage data</td>
<td>These specialized technology professionals find and acquire data from the universe of internal and external data available. They are responsible for assuring quality and preparing the data for analysis.</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc. Unauthorized reproduction or distribution prohibited.
2. Extend Your Technology Into A Digital Insights Architecture

Your firm has a lot of technology already — perhaps a data warehouse from Microsoft, analytics tools from SAS, application programming interface (API) management from Appian, cloud-based Hadoop, data service from The Weather Company, and a business process management (BPM) suite from Pegasystems, just to name a few. To become insights-driven, you will need to connect and extend these building blocks into a digital insights architecture that securely democratizes data and insight, translates insights into actions, and enables a learning path (see Figure 9). Start the transition to being insights-driven by meeting with business colleagues, department heads, enterprise architects, and vendors to weave together and extend existing capabilities to:

- **Securely supply data and insights from everywhere through an insights fabric.** You will need too much data to centralize it all, even in a data hub. Instead plan to call data from everywhere, including one or more big data hubs and cloud and legacy systems stitched together with common metadata, governance, and federation technology — i.e., an insights fabric. Vendors, including Cisco Systems, IBM, Informatica, Oracle, and Teradata, offer partial solutions, but CIOs should plan on integrating a lot of technology and data operations.

- **Reduce the friction between digital insights and action with execution engines.** Insights must easily flow from development into software systems. Your digital insights architecture will catalog, unify, and integrate insights development tools and execution engines, such as API gateways, digital experience delivery platforms, BPM suites, low-code platforms, streaming technologies, and mobile development tools. For example, start up WibiData helps insights teams develop and update predictive models in real-time to create digital experiences that change based on customer interactions.
- **Allow a wide variety of analytics and data science workbench tools to plug in.** Business practitioners already use tools like Alteryx or Adobe for customer analytics. Insights teams need to use these plus data science technologies like R, SAS, or Skytree Infinity; agile BI tools from Tableau Software; and data preparation functions from vendors like Trifacta. The digital insights architecture provides a framework for plugging these tools into a collaborative process, provisioning them with data and implementing insights directly in systems of engagement.

- **Tap and manage data feeds from everywhere.** Every business action produces a customer, employee, or partner reaction — and this means more data to analyze and learn from. Data stream processing tools like Apache Kafka are gaining traction, and Amazon Web Services, Google, and IBM are building cloud solutions for high-velocity data capture. But there is still too much data. The architecture will need to tap data and insights on-demand from products, devices, brokers, partners, and open data — then prioritize and filter the data you can use.

- **Integrate collaboration, preparation, and governance tools to expedite teamwork.** A digital insights architecture includes tools that make it easy to work collaboratively and within the bounds of policy. Some of the tools are in place: collaboration platforms, for example. You will need to connect others, like search, business glossaries, and metadata managers. And you will need some new tools to do things like link customer engagement to employee actions in content marketing tools. For example, startup Adatao provides natural language processing that helps teams work with data in a Microsoft Word-like format.
3. Take Advantage Of New Insights Technologies As They Mature

A robust digital insights architecture is far from a packaged solution; it is a mesh of old and new components with many evolving technologies and practices that will drive new business capabilities and applications over the next five years. Forrester has analyzed many of these technologies already (see Figure 10). Beyond these, we have identified four new insights technologies that will underpin systems of insight:

1. **A composable insights fabric will arise from federation, caching, and API technologies.**

   Today new federated query technology like Teradata QueryGrid or IBM Fluid Query as well as mature data virtualization tools like those from Cisco Systems or Informatica offer a similar promise: pull data from anywhere in a simplified way. By 2018, composable insights fabrics will combine these technologies through API management and data grids to deliver information and insight no matter where it is.
2. **Big data management infrastructure simplifies complex environments.** Today, firms set up different analytics infrastructures for different needs, but this is inefficient and complex. Large-scale resource management tools like Apache YARN and Mesos promise to help firms run many different types of analytics on a shared infrastructure. Ultimately, vendors will develop an open source, pluggable “data operating system” to simplify the process of matching analytics and needs to the best technology options.

3. **Cloud-hosted, insights-driven services help small teams quickly find meaning in data.** An explosion of public cloud big data services offers a wide range of capabilities from infrastructure components on Amazon Web Services to advanced cloud analytics platform offerings like Microsoft Azure or Qubole. Vendors like Cognitive Scale are going a step further. They deliver contextual insights in natural language as a cloud service. Firms will ultimately plug analytics infrastructure, platform, and insights cloud services into their fabrics.

4. **Machine learning and cognitive computing make insights easier to find, test, and implement.** Today, vendors like Paxata, Wise.io, and Persado use machine learning in their software to help with everything from complex data preparation to customer behavior prediction and content generation. While IBM is pioneering the application of machine learning to cognitive computing, emerging deep learning systems from Google and Microsoft also will help firms find meaningful patterns — digital insights — in even bigger and less structured data with far less human assistance.

**Figure 10** The Building Blocks Of Digital Insights Are Well Researched And Available

<table>
<thead>
<tr>
<th>Topic</th>
<th>Forrester report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced analytics</td>
<td>“Instant Insight: The Truth About Advanced Analytics”</td>
</tr>
<tr>
<td></td>
<td>“Predictive Analytics Can Infuse Your Applications With ‘Unfair Advantage’”</td>
</tr>
<tr>
<td>Big data</td>
<td>“Reset On Big Data”</td>
</tr>
<tr>
<td></td>
<td>“TechRadar™: Big Data, Q3 2014”</td>
</tr>
<tr>
<td>Business capabilities</td>
<td>“Emerging Business Technology Priorities”</td>
</tr>
<tr>
<td></td>
<td>“Linking Customer Engagement To Business Capabilities In The Age Of The Customer”</td>
</tr>
<tr>
<td>Cognitive computing</td>
<td>“Artificial Intelligence Can Finally Unleash Your Business Applications’ Creativity”</td>
</tr>
<tr>
<td></td>
<td>“Cognitive Engagement: A New Force Of Creative Destruction”</td>
</tr>
<tr>
<td>Customer insights</td>
<td>“The Power Of Customer Context”</td>
</tr>
<tr>
<td></td>
<td>“TechRadar™: Customer Analytics Methods, Q1 2014”</td>
</tr>
<tr>
<td>Data management</td>
<td>“Data Technology Pathfinder”</td>
</tr>
<tr>
<td></td>
<td>“Information Fabric 3.0”</td>
</tr>
<tr>
<td>Digital experience delivery</td>
<td>“The Forrester Wave™: Digital Experience Delivery Platforms, Q3 2014”</td>
</tr>
<tr>
<td></td>
<td>“Market Overview: Digital Experience Delivery Platforms”</td>
</tr>
<tr>
<td>Systems of engagement</td>
<td>“Mobile Needs A Four-Tier Engagement Platform”</td>
</tr>
<tr>
<td></td>
<td>“Top Technologies For Your BT Agenda”</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc. Unauthorized reproduction or distribution prohibited.
WHAT IT MEANS

DIGITAL INSIGHTS ARE THE NEW CURRENCY OF BUSINESS

As firms and vendors begin to master systems of insight, they will find digital insights — not just data — to be a currency of business leverage and success, hence a new asset to manage and monetize.

- **Firms turning digital insights into customer value will have higher margins.** When you begin to tap the deep and counterintuitive meaning buried in the customer, product, and market data locked in your systems of record and engagement, you will discover a new role in the data economy. One shipping insurance company realized that it had hundreds of years of weather data about the North Atlantic in a form that its shipping customers could use to hedge risk, plan shipment strategies, and bolster business cases for equipment and staffing. It doesn’t yet sell the insights from that massive data set, but it could.

- **Spontaneous insights-driven outcomes will spring up everywhere.** An amazing thing happens when you put digital insights into the hands of the people you trust to touch customers, build products, and generate ideas for growing your business — they feel empowered to act based on insights. If you watch carefully, you will find what Eric Schmidt of Google calls “smart creatives” in your company, those grabbing onto insights to make a business case or innovate the adjacent possible. And don’t be surprised if these creative employees bring in dramatically new data sets — location data, affiliate data, or aggregated customer data — to mine it for even deeper meaning.

- **Insights-driven pricing will pressurize every market.** Systems of insight help firms turn data about customer demand, environmental drivers, and product or service availability into even more dynamic pricing. Hotels change prices based on demand for rooms, but how about based on weather forecasts? Media prices don’t change much, but what if a snowstorm stimulates demand for streaming video so prices for premium content rise in response? With digital insights as a business asset, pricing becomes a sledgehammer of competition for firms that can accurately predict the impact of an external event on demand, hence the price of their offerings.

- **A new generation of insights-driven technocrats will become CEOs.** The battle between data-driven and intuition-driven leadership has raged since Alfred Sloan turned customer segmentation into a corporate strategy at General Motors. In an insights-driven economy, executives that learn to trust but verify digital insights will gain prominence while those that rely only on their gut will be overlooked — especially as the feedback loop on what works and what doesn’t becomes days rather than years.
Privacy concerns will drive the need to analyze the risks in your data assets. Which important data sources are most at risk of going away? In this insights-driven world, you had better know. For example, if do-not-track laws gain momentum and browser cookies go the way of the dodo bird, then the flow of web and mobile data shuts off almost overnight. Firms that rely on this behavioral and situational data could be forced to abandon or scale back marketing activities using this data. To consider the risk and likelihood of interruptions in the flow of data, firms should inventory and analyze the quality, availability, and risk-adjusted return on all their data sources.22

In addition to these changes in digital businesses, the insights-driven economy will drive big changes in the technology industry.

Analytics service giants will gain new prominence as business strategists. With insights-to-execution as the final link in the analytics chain, consulting firms like Deloitte, KPMG, and PwC will find themselves in the attractive position of advising firms on customer insights, building on their deep experience in risk, finance, and product analysis models. For example, when mobile data reveals that business customers crave everything on a phablet, consultants will pitch new selling and service models to business-to-business (B2B) firms that take advantage of the mobile moments of engagement.

Cognitive computing will find many footholds in insights-driven services. While advanced firms in healthcare and finance may use raw cognitive computing tools as part of their digital insights architecture, every company will be need to take advantage of sophisticated cognitive technologies embedded in a business service, particularly those hosted in the cloud. A growing number of business service providers, Google Word2Vec and Persado among them, use advanced machine learning capabilities to turn unstructured data into action. Forrester expects a lot of vendor innovation in insights-driven business services.

IBM, Microsoft, Oracle, and SAP will reassert their relevancy through insights services. As insights become the new currency of digital business, traditional enterprise software vendors will find they are not competing with each other, but with disrupters. This is already evident in the cloud, but systems of insight will bring a new round of competition from firms like Salesforce and Fair Isaac Corporation (FICO).23 Software giants will battle back with two investments: 1) creating domain expertise through data linkages as IBM has done with Twitter and The Weather Company, and 2) by linking insights directly into the software that drives engagement through digital experience delivery platforms and BPM suites.
SUPPLEMENTAL MATERIAL

Contributors To This Research
The authors would like to thank the experts we interviewed and also our Forrester colleagues: Martha Bennett; George F. Colony; Carl Doty; Boris Evelson; Mike Gualtieri; Michele Goetz; Jeffrey Hammond; Holger Kisker; Jens Kueter; Abigail Komlenic; Sharyn Leaver; John C. McCarthy; James McCormick; Kyle McNabb; Jason McNellis; Victor Milligan; Leslie Owens; Steve Peltzman; Henry Peyret; Jody Sarno; Srividya Sriharan; and Noel Yuhanna.

Companies Interviewed For This Report

<table>
<thead>
<tr>
<th>Adatao</th>
<th>LinkedIn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apigee</td>
<td>MapR Technologies</td>
</tr>
<tr>
<td>ClickFox</td>
<td>MetaScale (Sears Brands)</td>
</tr>
<tr>
<td>Concur Technologies (part of SAP)</td>
<td>Nordstrom</td>
</tr>
<tr>
<td>Decibel Insight</td>
<td>Persado</td>
</tr>
<tr>
<td>Deloitte</td>
<td>Pivotal Software</td>
</tr>
<tr>
<td>eBay</td>
<td>Platfora</td>
</tr>
<tr>
<td>EMC</td>
<td>The Pythian Group</td>
</tr>
<tr>
<td>Fair Isaac Corporation (FICO)</td>
<td>RelateIQ, a Salesforce Company</td>
</tr>
<tr>
<td>Ford Motor</td>
<td>SAS</td>
</tr>
<tr>
<td>Fractal Analytics</td>
<td>Tata Consulting Services</td>
</tr>
<tr>
<td>Georgian Partners</td>
<td>TD Bank</td>
</tr>
<tr>
<td>Here</td>
<td>Telefónica</td>
</tr>
<tr>
<td>Hortonworks</td>
<td>TIAA-CREF</td>
</tr>
<tr>
<td>IBM</td>
<td>USAA</td>
</tr>
<tr>
<td>Infosys</td>
<td>Warner Bros. Entertainment</td>
</tr>
</tbody>
</table>
ENDNOTES

1. Forrester defines big data as the practices and technologies that close the gap between available data and firm's ability to turn that data into business insight. Big data therefore plays a part in turning data into insights, but it does not create action, which is necessary for the benefits firms expect.

2. ClickFox, a visualization-savvy vendor focusing on using customer journeys as a way to turn data into insight, brings this example of a customer challenged to turn data into insight.


4. Forrester defines big data as the practices and technology that close the gap between the data available and the ability to turn that data into business insight. This definition implies this linkage between technology, people, and process. However, most firms and vendors still equate big data only with technology and technology practices. We believe that elevating the discussion to “systems of insight” will help trigger the investments and alignment firms need to accomplish the original goal of big data and go further to systematically turn data into action, not just insights.


7. Software is the crucial element of business success in the age of the customer. It captures the essence of a company’s value and brand promise and provides the means of engagement for customers. There are three classes of modern software, which are putting systems of engagement in the center of an applications troika that also includes systems of record and systems of automation. Working together, these three types of software are the foundation of business success. See the “Brief: Systems Of Engagement Take Center Stage” Forrester report.

8. The vast majority of the information workforce directly supports customers or helps their organizations understand customers' behavior. Customer experience professionals need to be at the forefront of changing the governance models and culture around client data. To learn more about shaping this business conversation, see the “Four Questions That Free Employees To Accesses Customer Data” Forrester report.

9. Measuring social marketing is hard, and tracking engagement data doesn't make that task any easier. In fact, even Facebook itself now admits that engagement doesn't prove success. Marketing leaders must instead gauge the performance of their Facebook pages and Twitter accounts by tracking customer loyalty and lifetime value. To learn how to break an addiction to meaningless engagement metrics and which tools can help measure the business outcomes of social programs, see the “Brief: Stop Measuring Social Engagement” Forrester report.

Forrester surveys find that only a small percentage of organizations’ data is actually converted to useful information in time to leverage it for better insight and decisions. At both strategic and tactical levels, much of this quagmire can be explained by the fundamental disconnect in goals, objectives, priorities, and methods between technology management professionals and the business users they should ideally serve. See the “It’s Time For A User-Driven BI Strategy” Forrester report.

11 Campaigns are far less effective at winning and retaining customers than they once were. To achieve sustainable competitive advantage now, customer insights pros must deliver self-perpetuating cycles of real-time, two-way, insight-driven interactions with individual customers. To learn more about contextual marketing engines, which create sticky, highly engaging environments for customer interaction and yield property data that cannot be replicated by traditional marketing methods or third-party data sources, see the “The Power Of Customer Context” Forrester report.

12 As the hub of our offline and online experiences, mobile interactions are a powerful catalyst for contextual marketing. The untapped opportunity in mobile for marketers will be to get an extremely granular understanding of their customers, anticipate customers’ expectations, and develop unique insights to power better marketing across all channels, not just mobile. To learn how to mine the unprecedented wealth of customer data and adopt the best practices of savvy marketing leaders who are straddling the realms of mobile and big data, see the “Mobile's Untapped Value Is In Contextual Data” Forrester report.


16 Improving customer experience is now the No. 1 priority of business executives. Firms must overcome experience gaps in performance, convenience, personalization, and trust by adopting a new experience architecture and philosophy. See the “Closing The Experience Gaps” Forrester report.

17 Forrester’s Information Fabric reference architecture provides a basis for building the insights fabric. We deliberately use the term insights services fabric in the report instead of information fabric because we believe over time, the true fabric value is not just exposing the data, but providing the context necessary to help translate the raw data into business insight. See the “Information Fabric 3.0” Forrester report.

18 Virtualization technologies provide a comprehensive workbench for two-way data federation that includes connectors, discovery services, metadata definition services, integration design studios, and query optimizers. These tools can drastically simplify bringing diverse data sets together. However, they are not cheap, costing a minimum of $200,000 for an enterprise deployment. Federated query technologies do not provide such sophistication but can be substantially less complex and may come with existing technologies.
For example, Teradata’s QueryGrid technology provides adaptors that let firms query across Hadoop and Aster using the Hive SQL-like query language. Source: “Teradata Querygrid,” Teradata (http://www.teradata.com/Teradata-QueryGrid/#tabbable=0&tab1=0&tab2=0).

As technology leaders look at how to deliver a trusted, real-time, integrated, and secure data platform to support applications, they look at data virtualization. Forrester evaluated nine vendors — Cisco System, Denodo Technologies, IBM, Informatica, Microsoft, Oracle, Red Hat, SAP, and SAS — on 60 criteria. To learn how each vendor fared, see the “The Forrester Wave™: Enterprise Data Virtualization, Q1 2015” Forrester report.

Yet another resource negotiator (YARN) is part of the Apache Hadoop 2.0 distribution. It is commonly referred to as YARN, so we did not spell out in the body of the report. Apache Mesos is another resource management technologies geared toward over all data center management, not distributed analytic workload management like YARN. The complementary and similar nature of these two projects has been noticed by the vendor community, and early efforts have begun to potentially create a unified approach.

Source: Cognitive Scale (http://cognitivescale.com/products/).


Underlying any investment is the ever-present question of “what am I going to get for my money?” To answer this question, Forrester developed the Total Economic Impact™ (TEI) methodology. TEI provides a rigorous cost and benefit analysis framework that explicitly incorporates an evaluation of future technology and business flexibility and associated risk. As technology platforms increasingly influence the ways in which companies do business, often providing strategic direction and differentiation, it becomes more important than ever to utilize a consistent, repeatable evaluation process to make the best decisions to achieve the desired results. See the “The Total Economic Impact™ Methodology: A Foundational Framework For Investment Decisions” Forrester report.

Today IBM and Microsoft are fighting to reclaim market share from Amazon Web Services and Google which both went from cloud non-players to cloud contenders at blinding speed.
About Forrester

A global research and advisory firm, Forrester inspires leaders, informs better decisions, and helps the world's top companies turn the complexity of change into business advantage. Our research-based insight and objective advice enable IT professionals to lead more successfully within IT and extend their impact beyond the traditional IT organization. Tailored to your individual role, our resources allow you to focus on important business issues — margin, speed, growth — first, technology second.

FOR MORE INFORMATION
To find out how Forrester Research can help you be successful every day, please contact the office nearest you, or visit us at www.forrester.com. For a complete list of worldwide locations, visit www.forrester.com/about.

CLIENT SUPPORT
For information on hard-copy or electronic reprints, please contact Client Support at +1 866.367.7378, +1 617.613.5730, or clientsupport@forrester.com. We offer quantity discounts and special pricing for academic and nonprofit institutions.

Forrester Focuses On CIOs

As a leader, you are responsible for managing today's competing demands on IT while setting strategy with business peers and transforming your organizations to drive business innovation. Forrester's subject-matter expertise and deep understanding of your role will help you create forward-thinking strategies; weigh opportunity against risk; justify decisions; and optimize your individual, team, and corporate performance.