

TechRadar™: Digital Intelligence, Q2 2016

Tools And Technology: The Digital Intelligence Playbook

by James McCormick

April 26, 2016

Why Read This Report

Digital intelligence technologies to track, understand, and optimize customer interactions across all digital touchpoints have evolved far beyond traditional web analytics. Vendors are constantly innovating their products and adding new solutions to their portfolio, resulting in the complex landscape of technologies for digital customer data, analysis, and optimization that exists today. This report helps customer insights (CI) professionals navigate the landscape of the 15 most important digital intelligence technologies to succeed in the age of the customer.

Key Takeaways

Digital Intelligence Technologies Are Organized Into Three Groups

To make sense of the complex digital intelligence technology landscape, Forrester has categorized the technologies as those that collect and manage customer data, those that analyze it and generate insights, and those that optimize customer interactions.

There Is Vast Technical Innovation

Digital intelligence is a constantly evolving practice with many new technologies recently entering the space. More than half of the technologies are in the Growth phase or earlier.

Digital Intelligence Is A Business Technology

Marketers and eCommerce professionals are the biggest group buying, managing, and using digital intelligence technologies. As a result, vendors are racing to make their offerings more consumable and usable for businesspeople to directly address their problems.

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Tools And Technology: The Digital Intelligence Playbook



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Forrester interviewed and surveyed 49 vendor companies and 50 end user companies.

Related Research Documents

[The Forrester Wave™: Online Testing Platforms, Q3 2015](#)

[The Forrester Wave™: Web Analytics, Q2 2014](#)

[Optimize Customer Experiences With Digital Intelligence](#)

Digital Intelligence Demands Multiple Technologies

CI professionals must build their digital intelligence technology stack by bringing together multiple customer data management, analytics, and optimization technologies.¹ No single digital intelligence technology platform today is able to serve the needs of firms seeking to understand customers as they interact with digital touchpoints and use that understanding to improve and optimize those interactions. Even mature technologies such as web analytics are hopelessly inadequate by themselves to accommodate emerging channels, sophisticated consumers, technical challenges, and the democratization of analytics within data-driven enterprises.

CI professionals and their business technology partners are struggling to build a complete digital intelligence capability that brings together disparate data, insights, and technologies.² Firms are still buying digital analytics and optimization technologies in isolation and are not considering how these technologies should support a broader digital intelligence capability. And even today their digital view of the customer is heavily focused on web analytics.³

Digital Intelligence Technologies Fuel Customer Experience

The world is being digitized.⁴ Customer relationships, products, services, business operations, and competitors are now fundamentally digital. Most firms realize that they must embrace digital transformation or risk becoming prey to those that do. Providing your customers continually optimized interactions and experiences based on your firm's freshest insights on them as they interact across digital touchpoints is key to winning customers in this new world.⁵ Forrester defines digital intelligence technology as:

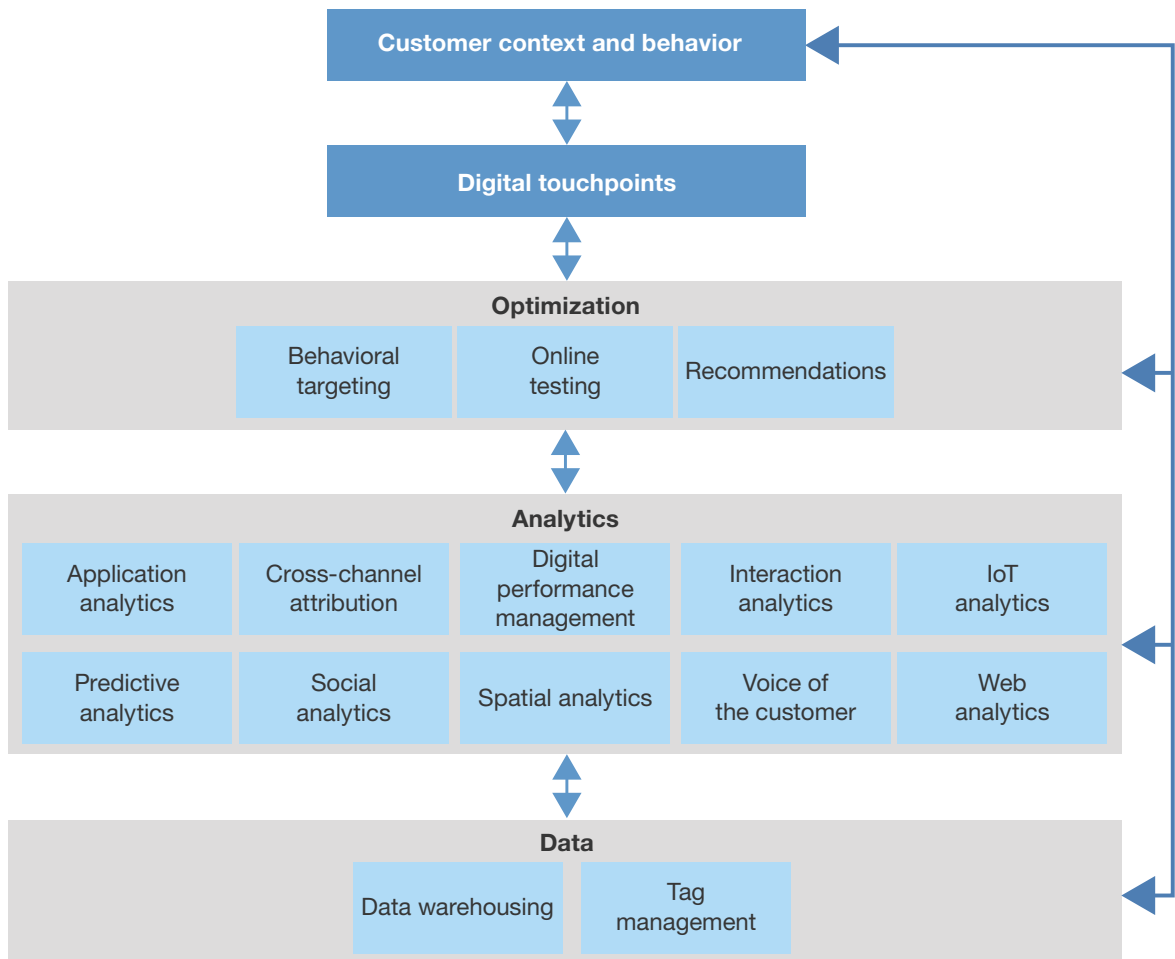
Technology that enables the capture, management, and analysis of customer data and insights to optimize digital customer interaction and experience across the customer life cycle.

Continuously optimizing customer experiences consistently and at scale requires that CI professionals and their peers integrate a large swath of different digital intelligence technologies for data management, analytics, and optimization in a three-tier architecture (see Figure 1):

- › **Data.** The available data fueling customer insights continues to grow. Digital intelligence, and the action-oriented insights it generates, is entirely dependent on managing and making sense of the growing variety and volume of customer data types. In the past, it was possible to get away with holding data in silos and using it for isolated projects and campaigns. However, the demand for customer centricity means CI professionals now need to bring this data together to form a holistic customer understanding.
- › **Analytics.** The range of digital analytics techniques broadens. As digital customer interactions have expanded from websites to mobile phones, from marketing and eCommerce to products and services, and from the online to the offline, so have the techniques for analyzing and understanding the customer within these different contexts. To support customer centricity, a single digital intelligence strategy must guide the procurement, management, and use of these technologies.

- › **Optimization.** Optimization technologies continue to be underutilized. Driving action from insights — and driving insights from action — in a closed-loop fashion to optimize how firms digitally interact with customers has always been at the heart of digital data collection and analytics initiatives. However, different techniques for testing and targeting digital customer interactions have been used in isolation for specific acquisition and conversion programs. To maximize the return on investment (ROI) of these tools, CI professionals must seek to apply each more broadly to new use cases wherever possible. For example, use online testing technologies to test the best landing pages for email acquisition campaigns as well as to optimize the mobile application experience of existing customers.

FIGURE 1 The 15 Key Digital Intelligence Technologies In A Three-Tier Architecture



Overview: TechRadar For Digital Intelligence

To help companies plan their next decade of investments in the space, Forrester investigated the current state of the 15 most important digital intelligence technologies. We examined past research, surveyed and interviewed 56 internal and external experts in the field, and reviewed demonstrations of early versions of products and services. We also conducted detailed research with 50-plus current or interested customers and users of digital intelligence technologies. We used the data thus collected to assess four factors: 1) the current state of the technology; 2) the technology's potential impact on customers' businesses; 3) the time experts think the technology will need to reach the next stage of maturity; and 4) the technology's overall trajectory — from minimal success to significant success.⁶

Why Do These 15 Technologies Appear In The TechRadar?

Each of the 15 technologies researched in this report (see Figure 2):

- › **Contributes to digital intelligence.** Each technology is or will become important to collecting and managing data on, generating insights for, and/or optimizing digital customer interactions.
- › **Is publicly available.** Whether it is a mature or an immature technology (even one in a beta phase), each technology discussed is available today from the relevant vendors.
- › **Has traction in the market.** Each technology category generates a significant volume of discussion and/or adoption among Forrester clients.

FIGURE 2 TechRadar™: Digital Intelligence, Q2 '16 Technologies Evaluated

Application analytics

Definition	Application analytics technologies track and analyze visitor behavior on applications. Due to the popularity of iOS and Android smartphones, applications are commonly associated with the mobile channel. But increasingly, applications are spreading across a wide variety of hardware, including tablets, televisions, kiosks, and even refrigerators.
Usage scenario	The use cases for application analytics are extensive and quickly evolving. They have some similarities to web analytics in that customer interactions and trends, such as screen taps, functions used, pages viewed, and responses to in-app messaging are measured and analyzed. However application analytics use cases also include capturing the daily active users (DAU) and the monthly active users (MAU) to track the DAU/MAU trend over time, and/or measuring and analyzing the length of time users interact with the application; and/or measuring the number of app downloads and/or app users' retention rates. These use cases help firms understand the success of their mobile application. More specialist use cases include measuring against KPIs that provide a clearer indication of business success such as user lifetime value and/or average revenue per user.
Vendors	Vendors include Adobe, Yahoo (Flurry), Google, Localytics, Tune (Artisan Mobile), and Webtrends.
Estimated cost to implement	Moderate. Average costs are approximately \$125,000 for enterprise-size deployments. Implementation costs are dependent on number and popularity of apps and complexity of technical environments (e.g., number of mobile operating systems supported). At the high end of the spectrum, costs are often around \$200,000.

FIGURE 2 TechRadar™: Digital Intelligence, Q2 '16 Technologies Evaluated (Cont.)

Behavioral targeting

Definition	Behavioral targeting tools allow users to deliver tailored content, promotions, and functionality to visitors using rules or predictive algorithms based on visitor behavior, characteristics, and historical interactions.
Usage scenario	Behavioral targeting technologies simplify the content discovery process for consumers. This technology appropriately identifies key traits about the visitor and categorizes that visitor based on predefined rules. Ultimately, visitors experience personalized sites, enjoy the benefit of reduced noise from irrelevant information, and see only content that meets their needs. This technology can also be used to target promotions. It allows promotions to be aligned with predicted consumer needs based on browsing history and site interactions. This has the dual benefit of increasing customer satisfaction while also yielding higher conversion rates. As interaction history is cumulative, this data informs future offer relevance for the individual customer as well as fueling product recommendations for consumers within the same segment.
Vendors	Vendors include Adobe, Get Smart Content, LivePerson, Monetate, and Oracle (Maxymiser).
Estimated cost to implement	Moderate. Average costs are around \$315,000 for enterprise size deployments with large scale deployments exceeding \$1,000,000. Implementation costs are dependent on size and extent of scope, complexity of the sites, and number of targeting campaigns implemented.

Cross-channel attribution

Definition	Cross-channel attribution tools provide measurement techniques to calculate the partial value of each interactive channel in influencing a desired outcome such as a conversion.
Usage scenario	Cross-channel attribution technologies help marketers understand how an actual channel, campaign, or marketing tactic performs, guiding them to spend more marketing budget on tactics that are working — and divesting tactics that are failing. Cross-channel attribution tools measure the relative impact of each potential interaction a brand has with a customer, and they assign the appropriate value to each marketing interaction that leads to a desired customer action. Attribution technologies measure and compare the contribution to influencing the desired customer action across individual tactics, or a combination of tactics thereby providing cross-channel insights — such as how a remarketing email impacts onsite product reviews.
Vendors	Vendors include Abakus, AOL (Convertro), Google, Marketing Evolution, Neustar (MarketShare), Rakuten (DC Storm), and Visual IQ.
Estimated cost to implement	Moderate. Average costs are around \$230,000 for enterprise size deployments and can exceed \$500,000.

FIGURE 2 TechRadar™: Digital Intelligence, Q2 '16 Technologies Evaluated (Cont.)**Data warehousing**

Definition	A data warehouse for digital intelligence is a system that stores processed digital interaction and business data for availability to digital intelligence applications.
Usage scenario	Within the context of digital intelligence, data warehousing technologies are used to bring data together within a common/standard digital customer data model and are also used to manage digital customer data profiles.
Vendors	Vendors include Adobe, Celebrus, Cloudera, IBM, MapR Technologies, Oracle, SAS, Splunk, Teradata, and Webtrends.
Estimated cost to implement	Large. Expect costs of greater than \$500,000. Costs are highly variable, depending on size and scope of implementation, and can often reach around \$2 million.

Digital performance management

Definition	Digital performance management tools track the availability and responsiveness of applications and their support infrastructure (e.g., servers, network, content delivery networks, and third-party services) and the impact on customer experience and KPIs, providing alerts and incident management in addition to analytics and reporting.
Usage scenario	Digital performance management platforms can be used to monitor the performance that an application is delivering to real users. CI professionals can then correlate performance metrics, such as page download times, to business and behavioral metrics such as abandonment or conversions. This technology is also used to continually monitor the performance of sites using scripted robots that regularly interact with the site detecting and/or preempting issues even when there are no users interacting with the site.
Vendors	Vendors include AppDynamics, BMC Software, and Dynatrace.
Estimated cost to implement	Moderate. Average costs are around \$310,000 for enterprise-size deployments. Implementation costs are dependent on size and extent of scope, as well as the complexity of the sites and apps monitored.

FIGURE 2 TechRadar™: Digital Intelligence, Q2 '16 Technologies Evaluated (Cont.)

Interaction analytics

Definition	Interaction analysis tools provide session replay functionality (i.e., the ability to visually track visitor interactions with content and functionality). Because of the detail individual interaction analysis data collects, these tools also provide aggregated thematic maps and displays — often called heat maps — of how users are interacting with pages.
Usage scenario	The main use cases for interaction analysis tools include: identifying and troubleshooting onsite errors; investigating areas on the site where customer experience can be improved; reducing the friction and abandonment on forms; finding out which content is most influential and where to place it; and watching video-style replays of real user journeys to understand in detail why digital visitors are behaving in a certain way.
Vendors	Vendors offering this technology include Clicktale, Decibel Insight, ForeSee, IBM (Tealeaf), and SessionCam.
Estimated cost to implement	Moderate. Average costs are around \$250,000 for enterprise-size deployments. Implementation costs are dependent on size and extent of scope, as well as the complexity of the sites.

IoT analytics

Definition	IoT analytics for digital intelligence analyze and generate customer-related insights from large volumes of data collected from sensors embedded within devices such as fridges, smartphones, and motor vehicles that customers interact with. Technology to ingest and analyze data from industrial components has been around for decades and is not covered in this research.
Usage scenario	Use cases tend to be centered on mobile devices. Emerging use cases include delivering insights needed to drive smart products and services. Examples include providing insights that enable customers to find and schedule a ride from a connected car service (e.g., Zipcar and Car2Go) or providing customers visibility into the status of orders and deliveries.
Vendors	Vendors include Amazon, Bsquare, GE, Glassbeam, Hitachi (Pentaho), IBM, Microsoft, Mnubo, SAP, and Tempo IQ.
Estimated cost to implement	Large. Average costs are around \$1 million but since scope and extent of implementations can vary hugely, so can costs.

FIGURE 2 TechRadar™: Digital Intelligence, Q2 '16 Technologies Evaluated (Cont.)

Online testing

Definition	Online testing technologies allow organizations to create, deploy, measure, and manage A/B, multivariate, and other statistical experimentation types that compare multiple versions of an experience to identify how they perform against each other and a control group. The objective of these techniques is to statistically determine the best treatment option for a given digital customer interaction.
Usage scenario	Online testing technologies are used to objectively inform which of an available array of experiences are optimal for: page designs; multistep processes (e.g., checkout and booking); landing pages; onsite promotions and/or offers; and general usability of the site. Online testing technologies can also be used to optimize email marketing, media buying, and segmentation. By tracking and monitoring the effect of test variants against business KPIs, online testing can boost business outcomes such as customer experience, revenue, and average cost of sale. Today, most testing is undertaken in websites, but testing can be applied to other digital touchpoints such as mobile apps and offsite/third-party locations.
Vendors	Vendors include Adobe, HPE, Oracle (Maxymiser), Monetate, Optimizely, Qubit, Sitespect, and Webtrends.
Estimated cost to implement	Moderate. Average costs are around \$190,000 for enterprise size deployments. Implementation costs are dependent on size and extent of scope, complexity of the sites, and number of tests implemented.

Predictive analytics

Definition	Predictive analytics technologies for digital intelligence use data to find models — models that can anticipate outcomes with a significant probability of accuracy. These technologies are either focused on leveraging data mining techniques to develop predictive models to estimate the future behavior of customers and adopt a forward-looking perspective; or leverage prebuilt predictive models within marketing and optimization solutions for automatic decisioning.
Usage scenario	Predictive analytics technologies use algorithms to find patterns in data that might predict outcomes in the future — which can then be used to build a predictive model. For example, a predictive model may indicate that there is an 81% chance that a customer will leave you for a competitor. So predictive technologies define models that express the probability of an outcome. Many digital marketing, eCommerce, and/or customer insights professionals use solutions driven by predictive models to predict what ad an online shopper will respond to, what offer to place in front of a customer, or when to send an email campaign to different customer segments.
Vendors	Vendors include: Adobe, Celebris, Custora, IBM, Oracle, Neustar (MarketShare), SAP, and SAS.
Estimated cost to implement	Large. Average costs are around \$500,000. Costs are highly variable dependent on size and scope and can often reach around \$2 million.

FIGURE 2 TechRadar™: Digital Intelligence, Q2 '16 Technologies Evaluated (Cont.)

Recommendations

Definition	Recommendation engines serve digital visitors, such as those to websites and mobile applications, with suggestions for related content based on rules and algorithms. Recommendations are traditionally associated with eCommerce merchandising — showing visitors complementary or similar products with the goal of encouraging cross-sell conversions. However, recommendations are commonly applied in other industries such as media and financial services and in other applications such as site search.
Usage scenario	Recommendation engines are used to connect people to products, services, information, or other people based on user profile, preferences, past online activity such as product purchases, and product/service availability. A typical usage scenario is when an online retailer recommends targeted product offers at checkout based on what a customer is about to buy or has bought in the past. Another includes those by internet media providers (e.g., Netflix and Amazon Prime) that suggest movies/videos based on what you have watched or are about to watch.
Vendors	Vendors include Baynote, Monetate, Qubit, RichRelevance, SDL, and SmartFocus.
Estimated cost to implement	Moderate. Average costs are around \$250,000 for enterprise-size deployments with large scale deployments exceeding \$500,000. Implementation costs are dependent on size and extent of scope and the complexity of the technical environment.

Social analytics

Definition	Social analytics tools and tech provide insights about spikes in volume or analysis on the sentiment of what consumers are saying and how this relates back to how they are actually behaving.
Usage scenario	Social analytics is used to help marketing and PR teams track mentions of their brands, products, and employees and to see how the public feels about them to detect events or potential crises. Legal teams use the technology to analyze online discussions for potential copyright infringement, legal threats, product knockoffs, and other regulated needs. Other use cases include comparing the extent, scope, and context of mention relative to competitor brands as well as researching market and consumer trends.
Vendors	Vendors include Brandwatch, Cision, Clarabridge, Crimson Hexagon, NetBase, Networked Insights, Oracle, Prime Research, Salesforce, Sprinklr, Synthesio, and Sysomos.
Estimated cost to implement	Moderate. Average costs are around \$190,000 for enterprise-size deployments.

FIGURE 2 TechRadar™: Digital Intelligence, Q2 '16 Technologies Evaluated (Cont.)

Spatial analytics

Definition	Spatial analytics tools and technologies collect customer location information for the purpose of analyzing for spatial insights such as distance, proximity, best route, best location, driving behavior, etc.
Usage scenario	Spatial analytics technologies are used to deliver contextual insights on customers across the entire life cycle as they shop, entertain, commute, work, or play. Typical use cases include tracking mobiles (and therefore customers) around stores, branches, outlets, etc. For instance, this can help retailers understand customers as they walk past and through their stores and calculate the percentage that are enticed into the store and how many actually purchase. Spatial analytics tech is also used to provide an understanding of customer movements within stores or branches to help optimize store layout; react when queue lengths are too long; or predict product interests and affinities using customer dwell times.
Vendors	Spatial analytics vendors vary widely in the way they collect, analyze, and apply customer spatial analytics and include companies such as Autodesk, Awarepoint, ByteLight, Esri, Google, GPSshopper, Hexagon AB, Onyx Beacon, Pitney Bowes, RetailNext, Walkbase, and WirelessWERX.
Estimated cost to implement	Small. Average costs are around \$75,000 but can vary greatly depending on scope. Rare but mature use cases can exceed \$500,000.

Tag management

Definition	Tag management systems (TMSes) ensure the efficacy of marketing and analytics efforts by consolidating individual tag execution and maintenance into a single master tag management interface. The prevalence of JavaScript and other executables as the deployment method of choice for many digital marketing and analytics tools makes effective tag management a priority for organizations.
Usage scenario	The usage scenarios vary by maturity stage of TMS adoption. The first stage of adoption starts when the technology is used to deploy and manage tag-based digital technology at scale across multiple digital properties (e.g., websites and mobile apps). The next phase starts when the TMS is used to manage and standardize the collection and distribution of digital visitor data to multiple third-party analytics and marketing technologies. A third stage starts when the technology is used to manage and control third-party customer engagement and marketing technologies. The final stage starts when tag management is used to optimize marketing campaigns and customer interactions by activating tags based on user behavior and context.
Vendors	Vendors such as Ensignen, Signal, TagCommander, and Tealium have invested a large proportion of their efforts on specializing in building tag management systems and related technologies. Vendors such as Adobe, Google, and IBM have tag management systems to support a much larger ecosystem of marketing technologies.
Estimated cost to implement	Moderate. Average costs are around \$120,000 for enterprise-size deployments. Costs are dependent on size and extent of digital properties, number of tag integrations, and use of advanced data features.

FIGURE 2 TechRadar™: Digital Intelligence, Q2 '16 Technologies Evaluated (Cont.)

Voice of the customer

Definition	Online voice-of-the-customer (VoC) for digital intelligence technologies allow online visitors to provide direct feedback to onsite questions and surveys posed by organizations. VoC analytics provides qualitative insights that provide additional context to other digital quantitative analysis techniques such as those for web and interaction analytics. Other analytics technologies for channels including social, blog, reviews, media, and mobile analytics tools are excluded from this definition for the purpose of this research. Social analytics are discussed in a separate category.
Usage scenario	VoC analytics technologies enable companies to collect the scores, comments, or requests from online VoC forms so that firms can analyze and act upon the insights generated. These technologies can also link customer opinions with customer behaviors by integrating VoC data with web analytics or session replay data.
Vendors	Vendors include Clarabridge, Answers Corporation (ForeSee), iPerceptions, OpinionLab, and PeriscopeIQ.
Estimated cost to implement	Moderate. Average costs are around \$180,000 for enterprisesize deployments. Implementation costs are dependent on size and extent of scope, as well as the complexity of the site.

Web analytics

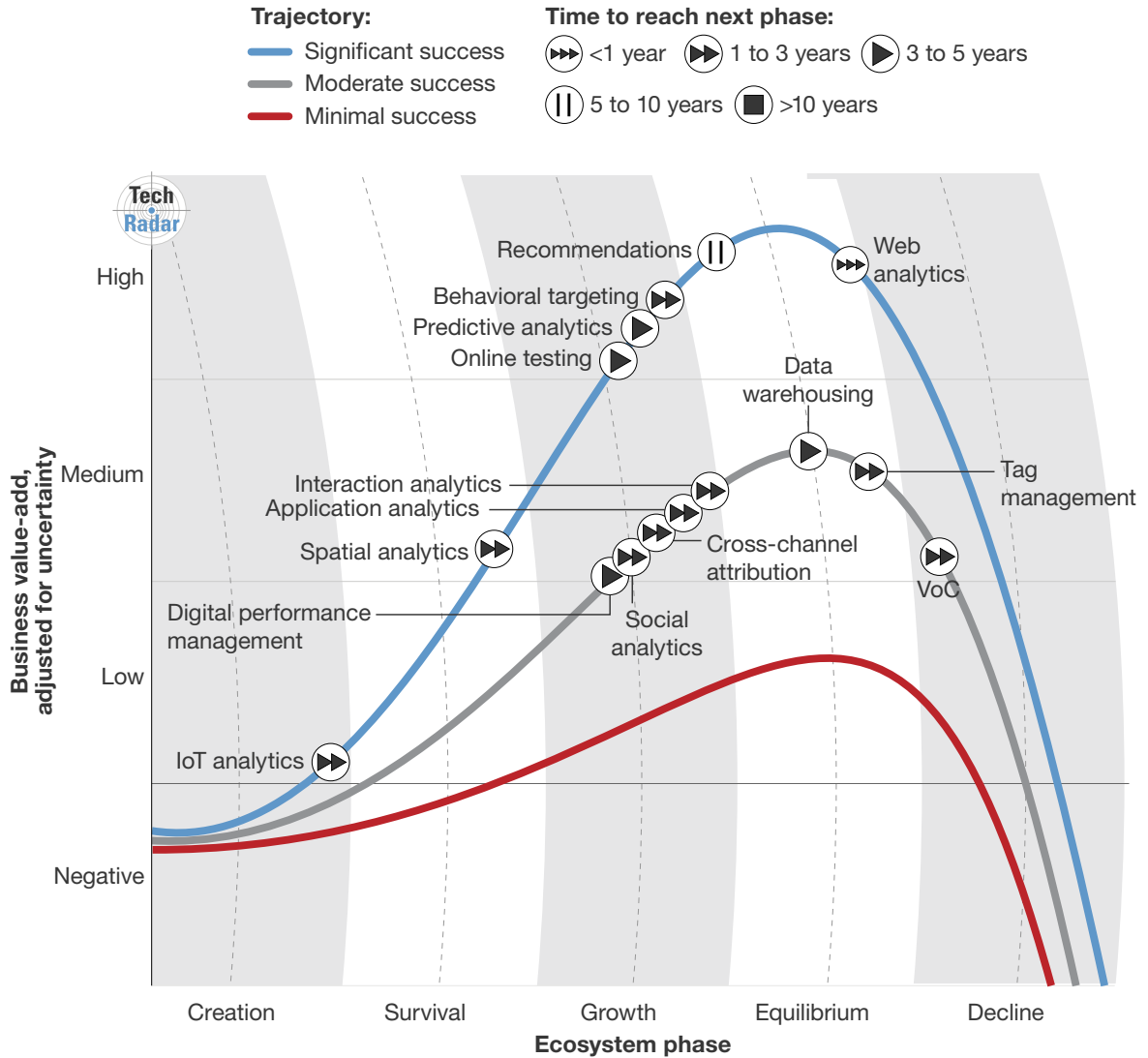
Definition	Web analytics platforms track the behavior of website visitors to help organizations understand how activity unfolds on websites, as well as to help firms understand traffic sources, track campaign effectiveness, and evaluate the customer experience.
Usage scenario	Modern web analytics technologies have come a long way in the last five years. The most important use cases now include calculating, managing, and reporting on visitor segmentation; marketing attribution; integrating visitor data with other data sets (e.g., email, mobile, and offline customer data sets); path analysis; determining the value of online content; and guiding online test initiatives such as A/B and multivariate testing.
Vendors	Vendors include Adobe, AT Internet, Google, IBM, and Webtrends.
Estimated cost to implement	Moderate. Average costs are around \$250,000 for enterprisewide deployments. Cost is dependent on number and size of digital properties, and use of advanced data features. Large implementations often exceed \$500,000. Pricing is generally based on consumption (e.g., server call or tests) or size of digital property (e.g., measured in terms of traffic volumes).

Digital Intelligence: Usability Takes Intelligence Beyond The Web

In mapping the future of digital intelligence technologies, we found that (see Figure 3):

- › **No one platform does it all.** The ever-broadening range of capabilities needed to deliver the increasing demands of digital intelligence has left vendors struggling to keep up. Even the larger vendors — with their investments in product development and acquisitions — have been unable to provide all the capabilities within one fully integrated platform. CI professionals must be prepared to integrate a number of technologies into a complete stack — or partner with a services vendor that will do it for them.
- › **Usability is key to adoption.** Business teams are the biggest technology buyers and users of digital intelligence technologies — and they also tend to manage it themselves. Sixty-eight percent of teams responsible for web analytics, the primary digital intelligence technology, are either eCommerce or marketing professionals.⁷ In order to encourage and scale its adoption across the enterprise, digital intelligence technology must be user friendly and easy to manage.
- › **Digital intelligence is still web-centric.** Almost all users of key digital intelligence technologies, such those for online testing, apply them to optimizing fixed website. Seventy-eight percent of users also apply them to mobile websites. Less than a fifth of those users are using these technologies on mobile apps.⁸ However, as customer interaction with mobile apps continues to increase and internet-of-things (IoT) channels become more mainstream, CI professionals must be prepared to more extensively apply digital intelligence technologies beyond the web.

FIGURE 3 TechRadar™: Digital Intelligence, Q2 '16



Creation: Digital Customer Interaction Growth Spawns New Intelligence Tech

As digital customer interactions and associated data continue to increase, so has the desire by CI professionals to use a greater range of analytics approaches to garner more insight.⁹ As digital intelligence practices are expanding to encompass this new scope, so too will new supporting technologies continue to enter the Creation phase. Today, Forrester places IoT analytics in the Creation phase — but expect more to come in the years ahead (see Figure 4):

- › **IoT analytics.** Early use cases for customer-focused IoT analytics have mobile as a key “thing” or device at their core. Mobile apps and associated location analytics tend to be the point where customers are finding the nearest connected taxi or tracking their connected package, for example.¹⁰ While some specific uses cases have already emerged and proven value, marketing and eCommerce use cases are still being developed and adoption is low. Once the ecosystem matures, expect this technology to become a critical and strategic asset that delivers differentiation across the entire customer life cycle.

FIGURE 4 TechRadar™: Creation Phase Technologies

IoT analytics for digital intelligence

Why the Creation phase?	IoT analytics technologies for garnering customer insights from customers interacting with IoT or connected devices are in their Creation phase. Budding use cases are highly specialized and embedded within customized applications. These use cases are project-driven, and the technology is not yet being leveraged strategically.
Business value-add, adjusted for uncertainty	Low. Adjusted for uncertainty, the business value is currently low. The trajectory toward significant success is steep, however, and adoption will grow rapidly as products and solutions mature. As more and more companies reap the benefits of maturing consumer-focused IoT use cases, the technology will become critical to maintaining a competitive business.
Time to reach next phase	1 to 3 years. A wide range of uses cases and vendor offerings for IoT analytics that deliver actionable customer insights are quickly emerging. Right now, implementations are technical, customized, and specialized. As the use cases supporting customer engagement become clearer, vendors will refine their products and services to make them more easily usable to marketing, customer experience, and customer support functions. Expect this technology to enter the Survival phase in the next one to three years.
Trajectory (known or prospective)	Significant success. As the growth and diversity of interactions that customers have with IoT devices continues, understanding the customer within this domain will become critical to business success. Businesses that leverage IoT analytics will generate significant customer insights and business value from future use cases.

Survival: Location Tracking Delivers A New Customer Dimension

The growth of mobile interactions has generated a tsunami of customer location and contextual information. Fueled by this data, spatial analytics technologies have been extended beyond traditional geographic information systems to deliver valuable insights on customers.¹¹ Spatial analytics is the only technology in the Survival phase (see Figure 5):

- › **Spatial analytics.** Technologies that analyze location data have been around for decades, but recently there has been a significant change in their relevance to digital customer interactions. What has changed? Firms have access to a constantly expanding volume of locational data, mainly

due to eCommerce on mobile phones. In addition, the emergence of cost-effective software-as-a-service (SaaS)-based vendor platforms to process the data has made spatial insights about customers more easily obtainable. The biggest challenge now facing this technology is therefore not technical — the challenge lies in striking a balance between intruding on customer privacy and preferences and providing perceived value when capturing, analyzing, and executing on spatially related insights.

FIGURE 5 TechRadar™: Survival Phase Technologies

Spatial analytics

Why the Survival phase?	A number of spatial analytics vendor platforms have emerged to drive optimized interactions and customer experiences. Some analytics capabilities are built into niche solutions (e.g., efficiently locating and managing hospital patients, staff, and assets). Other capabilities are platform-based and designed to cover a number of use cases, such as analyzing the movements of customers in a store or analyzing the proximity of customers to outlets — both owned and competitor. Many spatial analytics use cases are still in the experimental phase, and the ecosystem supporting the new generation of spatial analytics to drive customer interactions is still immature in terms of size and definition.
Business value-add, adjusted for uncertainty	Medium. The value of spatial analytics to customer interactions is currently concentrated around manual optimization cycles. For example, a customer insights professional may analyze the movement of customers around a store to detect issues and opportunities to optimize layout. The highest-value opportunities for spatial analytics exist around driving real-time optimization of customer experiences. Examples include automated triggering of promotional emails or texting a customer as she steps within a certain radius of an outlet.
Time to reach next phase	1 to 3 years. Several vendor trends will facilitate the movement of spatial analytics to the Growth phase. First, the number of vendor startups offering spatially oriented technologies will continue to increase, particularly in the mobile space. Second, existing platform technologies such as web and mobile analytics platforms, experience platforms (e.g., digital content management), and eCommerce platforms will continue to build out spatial capabilities. Third, firms that have long been providing spatial services for mapping and routing will make these capabilities more relevant to optimizing customer interactions.
Trajectory (known or prospective)	Significant success. The success of spatial analytics is well known for specialized use cases, such as letting customers know where a delivery van is or where the nearest store is. The rich technology vendor ecosystem that exists — from large incumbents with solid financials providing location services to a splintered landscape of startups focusing on mobile location — will ensure its ongoing success.

Growth: New Channels And Maturing Use Cases Boost The Growth Of Tech Adoption

Many firms are still building out and maturing their digital channels. Most enterprises have a significant investment in websites, and many are now growing their social presence and building mobile applications. As these new channels deliver more value to the business, the desire of CI professionals to measure, analyze, and optimize the customer interactions within has grown. As a result, the Growth phase of many digital intelligence technologies — which may have already reached Equilibrium if their use was restricted to the web context — has been extended (see Figure 6):

- › **Application analytics.** As firms start to mature, their mobile application capabilities need to improve. Mobile experiences and marketing have increased the importance of application analytics, though the technologies are on the whole still new and splintered. Application analytics covers a broad set of contextual metrics and objectives — such as increasing app downloads, engagement time in app, and customer proximity to store. Across organizations, mobile teams have been separated from the other digital intelligence practices, but going forward Forrester expects that mobile teams will become more embedded within an overarching digital intelligence strategy that seeks to understand the customer, however he or she engages digitally. Application mobile technologies will evolve as data integrations evolve, providing new insights and functionality to accommodate new data feeds.
- › **Behavioral targeting.** Behavioral targeting technologies sit on top of the digital analytics stack and leverage data and analytics to deliver optimized experiences to targeted audiences or segments. In mature digital intelligence practices, Optimization teams often use behavioral targeting tools in close alignment with tools for visitor segmentation and online testing (e.g., A/B/n and multivariate) to optimize key performance indicators (KPIs) such as visitor numbers, conversion rates, and revenue. Behavioral targeting technologies can be broadly split between target experiences based on business rules (e.g., “If visitor does this, then serve offer X”) and those that use mathematical algorithms to monitor customer behavior and develop predictive models to estimate the best match of content.
- › **Cross-channel attribution.** Cross-channel attribution tools are primarily used by marketers and eCommerce professionals to understand what activities drive customer action and how much influence each activity has on outcomes. This helps marketers justify expenditures and set their strategies. Attribution technologies rely on a number of techniques including last-touch, first-touch, even-spread, rules-based, and algorithmic credit allocation of customer interactions to desired outcomes. Marketers need up-to-date, modern attribution practices and technologies to ingest on- and offline data so that they can better understand the relationship of digital and non-digital customer interactions — wherever they might take place.
- › **Digital performance management.** Application performance is important to digital intelligence practices, as it has a significant impact on customer experience and the behaviors targeted by marketing, eCommerce, product management, and customer support. Despite hurdles from poor business usability, lack of analytics, and meager integration capabilities, digital performance

management technologies will remain relevant to customer-centric businesses for years to come. Leading vendors are building out next-generation platforms designed to overcome the hurdles, so expect to see adoption and value continue to grow over the next three to five years.

- › **Online testing.** Online testing is a core optimization technology for digital intelligence practices. These technologies are showing significant early success and will continue to gain more traction in the market. Functions such as marketing, eCommerce, and customer experience are the predominant users and buyers of this technology.
- › **Predictive analytics.** Predictive analytics is embedded within technologies that ingest, explore, and analyze data to generate forward-looking insights such as predictive segments and propensity scores. Some algorithmic behavioral targeting engines have predictive models baked in that direct automated decisioning and action. Regardless of form, this technology will continue its growth trend and success for the next three to five years as vendors are now focusing on democratizing advanced analytics capabilities through more user-friendly interfaces, making them more usable to different business roles. SaaS-based pricing and deployment models will also make the technology more accessible, and the growth in available digital data will make predictive models more accurate and valuable.
- › **Social analytics.** The ultimate purpose of any digital intelligence technology is to optimize experiences, influence customer behavior, and drive better business decisions. Right now, many social analytics technologies are stuck in listening and reporting mode, despite their potential to gain deeper insight. As practices mature, tools become more user-friendly and ease of integration with other analytics systems increases, expect to see growing adoption across the enterprise in parallel with increased ROI.

FIGURE 6 TechRadar™: Growth Phase Technologies

Application analytics

Why the Growth phase?	The number of technology and services vendors offering and supporting application analytics is enough to ensure the persistence of a rich ecosystem. Many analytics practices have turned to their existing web analytics tool to support mobile app analytics, but many also turn to specialist mobile analytics upstarts providing focused mobile application analytics offerings. Customer success stories now abound, and the business value that application analytics provides is increasing. Vendor consolidation has already started, and it has become increasingly difficult to enter the market with totally new offerings.
Business value-add, adjusted for uncertainty	Medium. Implementation costs are not prohibitively expensive, and the market reputation of application analytics is generally good. The criticality to business operations and potential for business transformation has yet to be proven, however.
Time to reach next phase	1 to 3 years. Forrester expects application analytics to reach the next phase in one to three years. Fewer new entrants are coming into the market and M&A activity has increased, suggesting that the ecosystem will shift toward equilibrium soon.
Trajectory (known or prospective)	Moderate success. Application analytics usage scenarios are becoming more defined but still must mature to better accommodate new contextual customer data sets (e.g., location, proximity, etc.). End users are engaged and fully aware of these benefits, and established vendors are investing heavily in this technology. However, adoption and success of application analytics is moderate due to the technology's need to support multiple operating systems (e.g., Android, iOS, Windows, and BlackBerry), which currently have limited flexibility for deploying third-party technologies.

Behavioral targeting

Why the Growth phase?	As digital analytics practices have matured, the adoption of behavioral targeting technologies — as well as the supporting ecosystem of technology vendors — has reemerged. Businesses recognize the value of these technologies and appreciate the easy implementation of new-generation platforms.
Business value-add, adjusted for uncertainty	High. Behavioral targeting technologies improve customer experiences and lift critical business KPIs such as conversions, revenues and satisfaction. Significant value is provided across the customer life cycle from boosting revenue per clicks for ad campaigns, to improving customers' experience and therefore conversions on websites.
Time to reach next phase	1 to 3 years. The rapid adoption of a new generation of behavioral targeting technologies, which are taking advantage of machine learning techniques and capabilities to analyze large volumes of disparate data sets in real-time, will move the technology into the Equilibrium phase in the next 24 to 36 months.
Trajectory (known or prospective)	Significant success. Technology vendors of all sizes continue to invest heavily in behavioral targeting technologies. Retailers in particular are investing heavily. Financial services firms, which have veered away from behavioral targeting in the past, are also starting to invest again and are seeing significant success.

FIGURE 6 TechRadar™: Growth Phase Technologies (Cont.)

Cross-channel attribution

Why the Growth phase?	Adoption and implementation of attribution technologies are widespread and continue to grow. Despite the value the marketers recognize from the technology, there is some dissatisfaction with the accuracy of the measurements produced.
Business value-add, adjusted for uncertainty	Medium. Business value for purely digital marketers is high; however, results for online to offline (and vice versa) attributions are mixed because of firms' inconsistent successes linking online and offline data. The value of cross-channel attribution is tempered by the fact that marketing is the only business operation to which the technology is critical.
Time to reach next phase	1 to 3 years. More and more end user organizations are investing in this technology, and the number of vendors in the space continues to grow. However, services vendors, distributors, and investors are not entering the market as rapidly.
Trajectory (known or prospective)	Moderate success. Cross-channel attribution technologies provide value specifically to pure-play digital marketers. This value is somewhat tempered by the level of investment required to deliver reasonable results when measuring success between online and offline channels.

FIGURE 6 TechRadar™: Growth Phase Technologies (Cont.)

Digital performance management

<p>Why the Growth phase?</p>	<p>Operation teams use digital performance management technologies to understand the impact of first- and third-party systems on application performance. While the install base has in recent years started to reach equilibrium, a new breed of use cases and a next generation of technologies are emerging and link performance management with analytics and integration capabilities to provide visibility of application performance impact on business KPIs. These technologies are finding a new lease on life as the technology's business relevance starts to grow.</p>
<p>Business value-add, adjusted for uncertainty</p>	<p>Medium. Application performance has an impact on KPIs (e.g., click-through rates, conversion, revenues, and overall customer experience). However, incumbent technologies and practices are focused more on operational metrics and struggle to readily combine performance insights with insights from other digital intelligence systems, such as web analytics and online testing.</p>
<p>Time to reach next phase</p>	<p>3 to 5 years. The bulk of existing implementations are focused on operational metrics such as page downloads, error reporting, and database performance. However, there is a growing desire to correlate performance with business KPIs. As a result, within the next two to three years, performance management technologies and practices will be subsumed into digital intelligence technologies that analyze and optimize based on customer behaviors and context. This will boost the business relevance of this technology. This transformation will prolong the growth of digital performance management adoption for another three to five years.</p>
<p>Trajectory (known or prospective)</p>	<p>Moderate success. Application performance is critical to successful customer interactions in marketing, eCommerce, product, or support functions. The disconnect between application performance and its impact on business KPIs is a drag on the success of digital performance management technologies as these business functions have failed to pervasively use these tools. Vendors are realizing this and starting to build out analytics and data integration capabilities to cross this divide. And traditional application performance management tools are evolving into more successful digital performance management systems.</p>

FIGURE 6 TechRadar™: Growth Phase Technologies (Cont.)

Interaction analytics

Why the Growth phase?	Vendors have provided interaction analytics technologies for several years. No major players have entered the enterprise market over the last two years, however.
Business value-add, adjusted for uncertainty	Medium. While still very promising, interaction analytics technologies have yet to deliver their full potential to the business. This technology has remained largely an operational tool used to resolve errors rather than optimize business interactions with customers.
Time to reach next phase	1 to 3 years. The number of users of analytics technologies continues to grow even as the number vendors offering enterprise offerings remains relatively flat. Forrester estimates that the technology will transition into the Equilibrium phase in two to three years.
Trajectory (known or prospective)	Moderate success. Significant value can be attained when integrating this technology with other digital analytics systems. For example, integrating web analytics data (that shows what users in aggregate are doing as they go from one part of the site to the next) with the interaction session replay data provides powerful insights as to why visitors are behaving in certain ways. However, these types of integrations remain the exception rather than the rule, thereby moderating the success of this technology.

Online testing

Why the Growth phase?	Many firms have difficulty defining strong business cases to garner investment in online testing technologies, but those that do use the technologies typically see significant ROI early on. The number of business professionals using online testing technologies will increase as the technologies mature.
Business value-add, adjusted for uncertainty	High. This technology delivers significant business value by optimizing personalization, marketing, and customer experience efforts. The current tactical, single-project use case approaches limit the delivery of even greater value that can be realized from strategic testing campaigns. The availability of SaaS deployment options shortens the time until initial value is recognized.
Time to reach next phase	3 to 5 years. For many early adopters, website optimization was the predominate reason for leveraging testing tools — and still is. However, the importance of the mobile channel has accelerated overall adoption of testing tools, and the maturation of the IoT will yield steeper adoption rates as firms optimize experiences across a larger ecosystem of devices. Several years remain before the adoption of testing tools shows any sign of slowing.
Trajectory (known or prospective)	Significant success. Simple A/B testing is still achieving impactful results. Businesses will need testing for optimized cross-channel customer engagement, and adoption will grow as word spreads about the value added by testing.

FIGURE 6 TechRadar™: Growth Phase Technologies (Cont.)

Predictive analytics

Why the Growth phase?	Predictive analytics has supported digital intelligence within decisioning and actions solutions for the last decade. New use cases now add value by providing advanced segmentation and predictive scoring to drive experience optimization. Vendors are making their solutions more usable and affordable (via SaaS, in concert with the level of data reaching high enough volumes to drive predictive modeling).
Business value-add, adjusted for uncertainty	High. Adjusted for uncertainty, predictive analytics technologies deliver high business value. There is a reason why — despite the effort and investment needed to bring the data together and tweak the predictive algorithms — these technologies are so widely used. There are, for example, many use cases where they significantly decrease churn, increase basket sizes, and boost conversion across the customer life cycle.
Time to reach next phase	3 to 5 years. Predictive analytics technologies will continue in the Growth phase for the next three to five years. The continued diversification of digital channels, the increasing number of digital customer interactions, and the importance of optimizing digital customer interaction will all spur firms toward more investment.
Trajectory (known or prospective)	Significant success. The investment required to make this technology work properly and its dependency on sourcing large volumes of data from different parts of the organization are significant hurdles to adoption of this technology. However, for organizations that have invested enough to overcome these hurdles, the success is evident.

Social analytics

Why the Growth phase?	Social analytics technology adoption progresses at a rapid pace, and startups are pouring into the market. Marketing cloud, CRM, and other large vendors are acquiring smaller players, though smaller vendors still largely outnumber enterprises in the market.
Business value-add, adjusted for uncertainty	Medium. The business value delivered by this technology is constrained by its primary use case of tactical isolated approaches to analyzing the social attributes of audiences. The technology provides more value to the business, for example, when linking count and sentiment analysis to specific events that are refined based on analysis. Those comprehensive uses are currently exceptions, as most practices lack coordinated approaches and resort to focusing mostly on reporting in isolation of other channels and activities. As such, these tools tend not to be used to influence customer behaviors.
Time to reach next phase	1 to 3 years. Significant growth among the user base will continue for the next few years with the increasing scale and velocity of social data. Vendors will continue to innovate by investing in advanced machine learning analytical techniques including those for detecting themes, measuring sentiment, and predicting consumer behavior.
Trajectory (known or prospective)	Moderate success. The ceiling for the potential of social analytics is somewhat low, as in many cases it is limited to reporting that may be interesting but is not immediately actionable. High-value success stories occur, for instance, when large product releases are controlled by monitoring sentiment following product announcements. Unfortunately, these examples are not as common as they should be, but as practices mature, this technology will start to deliver greater value.

Equilibrium: Continued Relevance Extends The Life Of Traditional Web Technologies

Technologies that have reached the Equilibrium phase have been adopted in parallel with the massive growth of websites over the last two decades. The longevity of these technologies has been fueled by continued investment and innovation as vendors continue to extend their capabilities and keep them core to the most mature digital intelligence practices. Expect most to remain in this phase for years to come before decline sets in. These technologies are (see Figure 7):

- › **Data warehousing.** The ability to manage, store, and analyze digital customer data is fundamental to a successful digital intelligence practice. While traditionally data warehousing was relevant to only structured data for reporting, analytics improvements have pushed this technology to become relevant for semistructured and unstructured data sources for ad hoc reporting, customer profile management, and more advanced analysis. Many digital intelligence technologies have their own data management capabilities, but large and mature analytics practices need independent data warehouses into which multiple vendor technologies can integrate in order to create a clearer picture of the customer.
- › **Interaction analytics.** Interaction analytics technologies are used by operations, customer experience, marketing, and eCommerce teams to answer questions such as “Why has traffic suddenly declined on certain pages? Why are customers dissatisfied with their experiences? Why has my marketing/eCommerce campaign failed to increase conversion?” As this technology collects and analyzes data from every interaction customers have with a digital touchpoint, individual customer sessions can be replayed or aggregated to provide heat maps that help quickly hone in on the “why.” Doing so helps marketers identify and resolve problems and make changes to further optimize customer interactions. Leading vendor technologies deliver session replay and heat map insights for websites and apps that can be integrated with those from other systems such as voice-of-the-customer (VoC) systems.
- › **Recommendations.** Recommendation technologies yield the most value when businesses have large product catalogs and content repositories and digitally engage many customers across segments. Their use cases are somewhat narrower than emerging technologies (e.g., behavioral targeting technologies), but the business value that recommendation technologies add is currently higher. eCommerce professionals are the primary users and can expect to see more marketing and product use cases as usability and innovation around content delivery and next-best action evolves.
- › **Tag management.** Used strategically, tag management is a core component of a successful digital intelligence technology stack. This technology delivers value by scaling the collection and management of high-quality customer interaction data and synchronizing the deployment of other third-party digital technologies at the time of customer interaction. When choosing a tag management technology, consider that vendors are generally split into two groups based on product strategy. One group of vendors is focused on the management of tags, data, and third-party technologies, and the other group focuses on using tag management to help their customers manage and deploy their first-party and partner data and technology stack.

- › **Web analytics.** Despite the emergence of many other digital analytics tools in recent years, web analytics still draws more investment than any other digital intelligence technology and remains front and center in most mature digital intelligence practices. Web analytics' success has persisted because the technology has evolved to ingest, analyze, report, and make actionable data and insights from digital channels other than the web. To enjoy continued success, the technology's vendors will need to evolve their web analytics tools into more usable and broader digital intelligence platforms over the next few years. Insights delivered about customers interacting with the website are still set to remain critical to the teams they serve.

FIGURE 7 TechRadar™: Equilibrium Phase Technologies

Data warehousing

Why the Equilibrium phase?	Data warehousing encompasses several subtypes, including traditional platforms, digitally born specialist analytics technologies, and newer real-time access technologies that specialize in bringing together multiple on- and offline customer data types. In one form or another, most enterprises have some of these capabilities baked into their existing digital intelligence stack, and growth of enterprise deployment to greenfield sites has slowed.
Business value-add, adjusted for uncertainty	Medium. Adjusted for uncertainty, data warehousing technology provides a medium level of business value. Its ability to support the essential task of managing customer data profiles is somewhat limited by the difficulties involved in linking multiple data sets together for ongoing analysis.
Time to reach next phase	3 to 5 years. While data warehousing technologies that support digital analytics have been around for decades, new data aggregation technologies such as Hadoop and “as-a-service” models have injected new life into this technology as vendors and users alike enter a new phase of innovation. This has the effect of prolonging the lifetime of this technology, so expect it to remain in the Equilibrium phase for the next four years at least.
Trajectory (known or prospective)	Moderate success. Data warehousing technologies are an essential tool for storing detail historical digital visitor and customer interaction data for analysis, reporting and insights discovery. Their success has been somewhat moderated by the extent of their use, which is mostly limited to ingesting and integrating data from a limited set of online (e.g., web visitor) and offline (e.g., CRM) data.

Recommendations

Why the Equilibrium phase?	eCommerce teams have used recommendation technologies for decades, and both the technology and practices governing its use are more advanced than most other digital intelligence technologies. Because the technology has already been widely adopted, its current adoption rate is relatively low.
Business value-add, adjusted for uncertainty	High. Despite implementation hurdles such as integration with product catalogs and content repositories, poor data quality, and a high level of necessary investment, the technology is proven and successful. Not only does it significantly increase business KPIs such as basket size, but it also is core to the success of entire business lines in many cases (e.g., on-demand internet streaming media firms).
Time to reach next phase	5 to 10 years. Vertical markets such as travel, leisure, media, and entertainment are still increasing their adoption of recommendation technology, and financial services and healthcare are likely to follow. Continued innovation — for example, extending capabilities beyond recommending products to include content and next-best action advanced used cases — keeps the ecosystem vibrant. The technology will stay at equilibrium for at least the next five years.
Trajectory (known or prospective)	Significant success. For many eCommerce businesses, recommendation technology delivers key differentiation. This technology provides optimized recommendations that are critical to their operations and the success of the overall business.

FIGURE 7 TechRadar™: Equilibrium Phase Technologies (Cont.)

Tag management

Why the Equilibrium phase?	This technology has entered the Equilibrium phase after a significant period of acquisition. What is left is a relatively stable landscape of vendors with very few new startups offering comparable enterprise capabilities. The number of user firms purchasing these platforms has also slowed from its peak about two years ago.
Business value-add, adjusted for uncertainty	Medium. Business value added by tag management technologies varies widely depending on use case. Firms that use the tool to deploy a common data layer and to coordinate the execution of analytics, eCommerce, and marketing technologies gain significant business benefits. For those that leverage it only for the deployment and management of tags, the benefits are limited to mostly operations and data quality. Because the less valuable use cases predominate, the average business value delivered is less than its potential.
Time to reach next phase	1 to 3 years. Marketers will need to manage websites and website tags for the foreseeable future. It is within the new digital touchpoints, such as mobile apps and those that the IoT will command, that the fate of the technology lies. Tag management has succeeded so far because of web standards, and its future success will be determined by similar types of standards that will be negotiated in the years ahead. Should such standards not be pervasively applied within the next two to three years, expect to see this technology enter its Decline phase.
Trajectory (known or prospective)	Moderate success. Tag management can deliver value far beyond simple efficiency. The technology can manage hundreds of elements such as JavaScript tags and can track pixels across multiple web properties. When deployed and used strategically, tag management can be a key strategic tool for digital intelligence, especially within websites. However, the trajectory of digital intelligence success is still somewhat moderate because the true potential of tag management has not been broadly understood by the market. Confused messaging by vendors and the very descriptive yet limiting name of tag management contribute to the tempered trajectory. Also, while the technology has succeeded in websites, it has yet to prove itself in mobile apps, which are quickly growing in importance.

FIGURE 7 TechRadar™: Equilibrium Phase Technologies (Cont.)

Web analytics

Why the Equilibrium phase?	Virtually all enterprise-scale web properties employ web analytics technology. The enterprise market for web analytics is saturated, with a few key vendors supplying most of the technology. Even the small and medium-size business market is mostly already taken up by entry-level and free-to-use tools. The ability of this technology to analyze and report on customer interaction within new and emerging touchpoints such as mobile and other IoT devices will determine future growth in this market.
Business value-add, adjusted for uncertainty	High. With the emergence of other digital analytics and intelligence tools and their associated marketing hype, the business value delivered by web analytics tools has been somewhat underappreciated. In some cases, commentators have relegated its role to one of legacy technology. But do not be fooled. Web analytics technology has delivered the highest level of industry across all current digital intelligence tools. The technology brings tremendous value to enterprises across all market verticals — it is an essential digital intelligence tool for all customer insights professionals.
Time to reach next phase	<1 year. Despite its long life and continued success, web analytics technology will enter the Decline phase in the next year. The most successful vendors will continue to invest in capabilities that make the functionality more usable, analyze and consolidate data from even more digital sources, improve cross-channel analytics, and provide better insights and actionability for channels other than the Web. At some point within this horizon, the “web” capabilities of successful tools will be diluted by these extended capabilities and will morph into genuine digital analytics or even digital intelligence platforms. Vendors that are not advancing their technology and keeping up in such innovative ways are already finding their business with enterprise users in decline.
Trajectory (known or prospective)	Significant success. Most organizations cannot imagine doing business without a web analytics technology — many have two or more tools. The phenomenal success of this technology has been driven by its critical value to marketers: As the needs of businesses have evolved, digital standards have changed and customer digital interaction has exploded, and both marketers and vendors have taken note. Mergers, acquisitions, and constant innovation within the market keeps the technology on track for significant success.

Decline: Declining Technologies Are Still Relevant But Are Being Subsumed By Other Tech

Voice of the customer is the only digital intelligence technology that has entered the Decline phase. It's in this phase not because the market is saturated or does not need it anymore, but because the capability it provides has been combined and subsumed by other technologies such as social and interaction analytics tech (see Figure 8):

- › **Voice of the customer.** Incumbent technologies for analyzing feedback directly from web customers are well into their second decade of existence, and the success of these tools to consistently deliver value has been somewhat muted. Modern digital intelligence practices understand that voice-of-the-customer technologies must collect and analyze data from all channels — not just direct-only survey/response data. Vendors know this and are building

out capabilities for combining VoC data with data and insights sources from other feedback technologies (e.g., social and voice) and with other analytics tools from other categories (e.g., interaction analytics and web analytics).

FIGURE 8 TechRadar™: Decline Phase Technologies

Voice of the customer

Why the Decline phase?	While the need for eliciting and understanding customer feedback directly has never been greater, the number of firms implementing direct feedback VoC technologies in isolation of other listening analytics tools is in decline. This technology is being overtaken and subsumed by more modern analytics platforms that are combining direct survey data from these tools with feedback from a variety of sources such as blogs, voice, chat, and call centers.
Business value-add, adjusted for uncertainty	Medium. Deployed on its own, VoC direct feedback analytics has tended to provide isolated insights that firms have struggled to convert to true business value. However, this technology generates significant business value when combined with feedback from other channels such as social, voice, and email and linked to interaction analytics to understand why site visitors are behaving a certain way.
Time to reach next phase	1 to 3 years. Vendors that have traditionally focused on this technology have either been acquired and integrated into larger technology stacks or are in the process of quickly evolving into listening platforms that ingest and analyze customer feedback from multiple sources including social, voice, and email. Newer entrants to the market are already delivering these more holistic listening capabilities.
Trajectory (known or prospective)	Moderate success. VoC analytics has not had the same pervasive adoption as many of the other digital intelligence technologies. Users have generally struggled with consistently attaining real business value and direct actionability from insights generated.

What It Means

Digital Intelligence Tech Is Now Critical To Digital Transformation

CI professionals and their firms will not only continue their annual digital intelligence budgets, they will increase them, and technology and service providers will oblige by increasing their investment in the products, platforms, and offerings to support the practices because:

- › **Existing digital channels are still not completely monitored.** Despite all the discussion and known value that digital analytics and optimization bring, many firms are still barely doing the basics. Only certain websites are measured completely, and social and mobile channel analytics have only just started. Expect to see much more investment in digital intelligence technology for existing channels in the years ahead.

- › **Emerging digital customer interaction channels will be measured.** As products and services based on IoT for customers start to become more mainstream and generate significant business value, so will the need to instrument them for digital intelligence. Expect to see exponential growth in investment in digital intelligence technology for new channels.
- › **New digital intelligence technologies will continue to emerge.** The economic and ready availability of scalable, high-powered systems for big-data management, natural language processing, real-time streaming, machine learning, and advanced analytics is providing an opportunity for the next generation of powerful optimization engines to emerge. Expect to see an increasing interest in digital intelligence technology driven by machine learning, cognitive computing, and artificial intelligence.

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Supplemental Material

Online Resource

The underlying spreadsheet that exposes all of Forrester's analysis of each of the 15 technologies in the TechRadar (Figure 3) is available online.

Data Sources Used In This TechRadar

Forrester used a combination of three data sources to analyze each technology's current ecosystem phase, business value adjusted for uncertainty, time to reach next phase, and trajectory:

- › **Expert interviews.** Forrester interviewed experts on each technology, including scientists in labs, academics, developers, and evangelists. Forrester interviewed a total of 49 experts.
- › **Product demonstrations.** As part of the research such as that for The Forrester Wave™: Online Testing Platforms, Q3 2015; The Forrester Wave™: Web Analytics, Q2 2014; and other projects, we asked vendors to conduct demonstrations of their product's functionality. We used findings from these product demonstrations to validate details of each vendor's product capabilities.
- › **Current and prospective customer and user interviews.** As part of the research such as that for The Forrester Wave™: Online Testing Platforms, Q3 2015; The Forrester Wave™: Web Analytics, Q2 2014; and other projects, Forrester interviewed and surveyed current and potential customers and users for each technology to understand current and prospective uses for the technologies and their impact on the customers' businesses and the users' work. Forrester performed a total of 50 of these detailed interviews and surveys.
- › **Analyst interviews.** Forrester consulted with 10 analysts who are the industry's subject matter experts on the technologies covered in this report. Each analyst used a combination of prior Forrester Wave evaluations and aggregate information accumulated from deep engagements (inquiry, advisory, consulting, and research interviews) within their coverage area to analyze each technology's current ecosystem phase, business value adjusted for uncertainty, time to reach next phase, and trajectory.

The Forrester TechRadar Methodology

Forrester uses the TechRadar methodology to make projections for more than a decade into the future of the use of technologies in a given category. We make these predictions based on the best information available at a given point in time. Forrester intends to update its TechRadar assessments on a regular schedule to assess the impact of future technical innovation, changing customer and end user demand, and the emergence of new complementary organizations and business models. Here's the detailed explanation of how the TechRadar works:

- › **The x axis: We divide technology ecosystem maturity into five sequential phases.** Technologies move naturally through five distinct stages: 1) creation in labs and early pilot projects; 2) survival in the market; 3) growth as adoption starts to take off; 4) equilibrium from the installed base; and 5) decline into obsolescence as other technologies take their place. Forrester placed each of the 15 digital intelligence technologies in the appropriate phase based on the level of development of its technology ecosystem, which includes customers, end users, vendors, complementary services organizations, and evangelists.¹²

- › **The y axis: We measure customer success with business value-add, adjusted for uncertainty.** Seven factors define a technology's business value-add: 1) evidence and feedback from implementations; 2) the investment required; 3) the potential to deliver business transformation; 4) criticality to business operations; 5) change management or integration problems; 6) network effects; and 7) market reputation. Forrester then discounts potential customer business value-add for uncertainty. If the technology and its ecosystem are at an early stage of development, we have to assume that its potential for damage and disruption is higher than that of a better-known technology.¹³
- › **The z axis: We predict the time the technology's ecosystem will take to reach the next phase.** Customer insights professionals need to know when a technology and its supporting constellation of investors, developers, vendors, and services firms will be ready to move to the next phase; this allows them to plan not just for the next year but for the next decade. Of course, hardware moves more slowly than software because of its physical production requirements, but all technologies will fall into one of five windows for the time to reach the next technology ecosystem phase: 1) less than one year; 2) between one and three years; 3) between three and five years; 4) between five and 10 years; and 5) more than 10 years.¹⁴
- › **The curves: We plot technologies along one of three possible trajectories.** All technologies will broadly follow one of three paths as they progress from creation in the labs through to decline: 1) significant success and a long lifespan; 2) moderate success and a medium to long lifespan; and 3) minimal success and a medium to long lifespan. We plot each of the [number] most important technologies for [category] on one of the three trajectories to help [enterprise architects] allocate their budgets and technology research time more efficiently.¹⁵ The highest point of all three of the curves occurs in the middle of the Equilibrium phase; this is the peak of business value-add for each of the trajectories — and at this point, the adjustment for uncertainty is relatively minimal because the technology is mature and well-understood.
- › **Position on curve: Where possible, we use this to fine-tune the z axis.** We represent the time a technology and its ecosystem will take to reach the next phase of ecosystem development with the five windows above. Thus, technologies with more than 10 years until they reach the next phase will appear close to the beginning of their ecosystem phase; those with less than one year will appear close to the end. However, let's say we have two technologies that will both follow the moderate success trajectory, are both in the Survival phase, and will both take between one and three years to reach the next phase. If technology A is likely to only take 1.5 years and technology B is likely to take 2.5 years, technology A will appear further along on the curve in the Survival phase. In contrast, if technologies A and B are truly at equal positions along the x, y, and z axes, we'll represent them side by side.

TechRadar™: Digital Intelligence, Q2 2016

Tools And Technology: The Digital Intelligence Playbook

Experts Interviewed For This Report

[24]7	ObservePoint
Adobe	Optimizely
Alteryx	Percolate
Analytic Partners	Prime Research
Ascribe	Qubit
AT Internet	Rakuten
Barilliance	RichRelevance
Cision	Riversand
Clarabridge	Salesforce
Clicktale	SAS
Cloudera	SDL Technologies
Confirmit	SessionCam
Decibel Insight	Sitecore
Dynatrace	SiteSpect
Ensignten	Slalom Consulting
FICO	SmarterHQ
Hewlett Packard Enterprise	Spredfast
IBM	Sprinklr
iPerceptions	Striim
Localytics	SynGro
MapR Technologies	Synthesio
NetBase	Sysomos
Networked Insights	Teradata
Neustar (MarketShare)	Webtrends
NICE	

Endnotes

- ¹ The number of channels for digital interaction, the complexity of customer interactions and their ever-increasing volume has presented a new opportunity for CI professionals to understand their customers like never before. It's for them to use that understanding to provide better and more optimized customer experiences. For more information on how to take full advantage of this opportunity under one digital intelligence approach, see the "[Optimize Customer Experiences With Digital Intelligence](#)" Forrester report.
- ² Users and vendors have not been following a universal standard model for thinking about and strategizing with their digital intelligence technologies. With a huge number of available technology options many organizations fail to develop a comprehensive solution to digital intelligence. See the "[Decipher The Digital Intelligence Technology Code](#)" Forrester report.
- ³ Despite the availability for many years of mature digital intelligence technologies such as interaction analytics 68% of firms that run a web analytics system do not have interaction analytics. Fifty-three percent don't have voice-of-the-customer (VoC) technologies either. See the "[Gauging Web Analytics Practices In The Age Of The Customer](#)" Forrester report.
- ⁴ Customers and businesses aren't what they used to be. Digital customer touchpoints and processes permeate every aspect of your customers' lives and your business. See the "[The Digital Business Imperative](#)" Forrester report.
- ⁵ Competing for digital customers means that firms must always be evolving the online experiences they provide. This must be done by adopting a continuous optimization process enabled by bringing together disparate customer data sets for analyses to continually refresh the customer understanding as she interacts digitally. This up-to-date understanding is use to continually optimize customer interactions. See the "[Transform Customer Experience With Continuous Optimization](#)" Forrester report.
- ⁶ For further details on the TechRadar methodology, see the supplemental material section of this document and our report introducing this new type of research. See the "[Introducing Forrester's TechRadar™ Research](#)" Forrester report.
- ⁷ As part of Forrester's research comparing the top web analytics vendors, end user firms were surveyed and interviewed and relevant results published. See the "[Gauging Web Analytics Practices In The Age Of The Customer](#)" Forrester report and see the "[The Forrester Wave™: Web Analytics, Q2 2014](#)" Forrester report.
- ⁸ As part of Forrester's research comparing the top online testing vendors, end user firms were surveyed and interviewed and relevant results published. See the "[Optimize Customer Experiences With Online Testing And Continuous Optimization](#)" Forrester report and see the "[The Forrester Wave™: Online Testing Platforms, Q3 2015](#)" Forrester report.
- ⁹ Forrester annually surveys business and technology decision-makers. In 2015, two-thirds of global data and analytics technology decision-makers replied that their firms had either implemented or were planning within the next year to implement text analytics. A similar percentage has done the same with location and streaming analytics. Source: Forrester's Global Business Technographics® Data And Analytics Survey, 2015.
- ¹⁰ Forrester has dedicated an entire TechRadar to the review of IoT technology including three classes of IoT data and analytics technologies: data historian, IoT advanced analytics and event management, and IoT analytics databases. See the "[TechRadar™: Internet Of Things, Q1 2016](#)" Forrester report.
- ¹¹ Forrester has dedicated an entire TechRadar to the review of spatial data and location intelligence technology. See the "[TechRadar™: Spatial Data And Location Intelligence, Q1 2016](#)" Forrester report.
- ¹² Note that the five phases are not of any prescribed length of time. For the typical technology ecosystem profiles for each of the five phases, see Figure 3 in the introductory report. See the "[Introducing Forrester's TechRadar™ Research](#)" Forrester report.

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¹³ We outline the detailed questions we ask to determine business value adjusted for uncertainty in Figure 4 of the introductory report. See the [“Introducing Forrester’s TechRadar™ Research”](#) Forrester report.

¹⁴ Forrester will include relatively few technologies that we predict will take more than 10 years to reach the next ecosystem phase. Expect to see these 10-year-plus technologies only in the Creation phase for fundamental hardware innovations and in the Equilibrium and Decline phases for hardware and software on the “significant success” trajectory. We provide details on how we predict the amount of time that a given technology will take to reach the next phase of technology ecosystem evolution in the introductory report. See the [“Introducing Forrester’s TechRadar™ Research”](#) Forrester report.

¹⁵ We provide detailed information and examples of how we predict the amount of time that a technology will take to reach the next phase of ecosystem development in the introductory report. See the [“Introducing Forrester’s TechRadar™ Research”](#) Forrester report.

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