



Information Industry Outlook 2017

All Data, Nothing But Data

October 5, 2016





All Data, Nothing But Data

Every day, Outsell researches, analyzes, and forecasts the trends and developments that affect you and your business. In its 17th edition, the Information Industry Outlook 2017 is a labor of love from the entire Outsell staff, crafted to serve you and your teams with the best industry intelligence you need to support your mission-critical decisions.

At Outsell, we believe the combination of people, media, information, and technology fuels the planet, supports education, delivers better healthcare, improves products, helps the environment, and creates progress for humankind. That's why we continue to invest in our own data and platform this year, upgrading our intelligence to ensure we have the best and most accurate metrics and analysis available in the industry so that you can make optimal decisions about your business plans for the coming year.

Our 2017 theme, **All Data, Nothing But Data**, focuses on how industry leaders are harnessing the power of data to drive their businesses by offering new data-driven solutions or optimizing their performance. It offers a deep look at the possibilities and consequences of a data-driven world and the companies making it happen.

As always, we're here to serve you through your toughest challenges. Please feel free to reach out whenever we can be of service.

Our very best wishes,



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As Chief Analyst and an early member of the Outsell team, Leigh Watson Healy has co-created and led all aspects of Outsell's activities in producing research, advisory, and consulting services for the information and publishing industry. She relies on her extensive experience in market and opportunity assessment, strategic and business planning, and product planning to serve as an executive-level advisor to a broad range of Outsell clients. As a primary spokesperson for Outsell, Leigh writes and speaks frequently about key trends and issues in the information industry. Today, she leads developing Outsell's long-term strategic relationships with industry leaders and drives delivery of trusted, value-add programs that meet clients' needs. Leigh co-chairs Outsell's Leadership Councils, an exclusive member-service for CEOs and senior executives of media publishing and information provider firms.

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Why This Topic

Since 1998, it is Outsell's tradition to deliver our annual Outlook about the trends and predictions that will shape the year ahead, as well as provide guidance and essential actions for information industry leaders. We also name our annual **Companies to Watch** — those that exemplify the coming year's key theme.

Our **Sensored World, Sensible Choices** theme for 2015 reflected upon life on our data-driven planet, a place where algorithms and smart machines sensor, track, quantify, and analyze everything we do. In 2016, we experienced unprecedented political, social, and economic volatility, and our industry faced unprecedented technological change in this larger context. We named last year's theme **Tipping Point** because old models started toppling and irreversible change took hold. M&A reshaped the landscape. Enterprises entered the industry in a more significant way. As smart machines get smarter, the future of work and the role of people at work are in question. The Brexit referendum bombshell and the US presidential election are changing the political, legal, and regulatory landscape. Extreme uncertainty is stalling decision-making — Stop? Go? Hire? Fire? Invest? Divest?

As leaders strive for success and growth beyond the tipping point, this report provides our outlook and predictions for 2017 and the market trends, forces, and companies to watch. Our meta trend for this year's outlook is **All Data, Nothing But Data**, building on our 2000 meta-theme of **All Net, Nothing But Net**.

Then it was all about the internet, its vast power, and the changes it was unleashing. Today, in a networked, social, mobile world, convergence has taken place. As we enter the third age of computing, it's all about data and harnessing it to run businesses, optimize performance, make money, and save money. Data-driven, data-savvy, data-rich — many companies are realizing there's

increased alchemy in connectedness of data, smart machines, and human creativity that can turn data into gold for the organizations that harness its power.

We publish this piece so leaders and their teams can use this as a backdrop to assess their 2017 plans and get a sense of the overall dynamics shaping a landscape in never-ending flux. In times of such great uncertainty, bold and informed decision-making and seizing opportunities will set successful firms apart from the rest of the pack. We provide a backdrop of industry statistics and then focus on the key trends and essential actions behind this year's meta trend.

Get Data, Get Set, Go.

Methodology

Each year, Outsell invests millions of dollars analyzing all sectors of the industry. We continue to expand our coverage of sectors and players that are driving growth and convergence of content, software, services, and platforms in our increasingly data-driven world, including healthcare IT, education technology, marketing services, marketing automation, and CRM. We track and analyze 27 segments and over 9,000 firms (increasing every day) within these segments, and we provide coverage of major announcements, revenue and business model mix, and growth.

We couple this supply-side analysis with a demand-side perspective, conducting original research among marketers and advertisers, enterprise information buyers, and end-users (as professionals and consumers) to follow the money and track and forecast spending trends. We then take this fact-based underpinning and combine it with our daily dialogue with decision-makers and our 18+ years of tracking and analyzing the industry. Finally, our analytic team convenes to discuss and debate the forecasts, trends, and leading firms to watch.

This year, Outsell's Signature Event co-producer, JEGI, collaborated to identify top 10 trends, as did members of Outsell's Leadership Councils. Out of that lively discourse, we distilled and created this year's Outlook report.

Industry Growth & Performance

Now
\$1.5 Trillion

Our industry of information, media, and technology is a blend of fast-growing software, services, tech companies, moderate-growth traditional content publishers, and media. Hot spots continue to be data-intensive businesses and platform solutions providers for fully integrated content, software, services, and workflows on any device, anywhere around the world. Convergence is now behind us as we enter the third wave of computing.

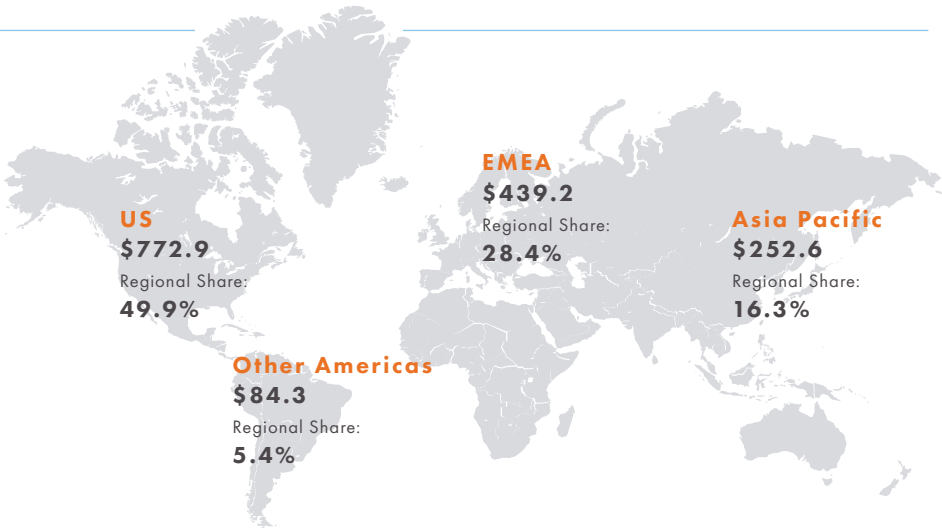
Adtech, martech, and CRM solutions are the segment growth frontrunners, and we predict double-digit

growth through the forecast period on the strength of demand for sales and marketing analytics to drive pipelines. Health Information & IT remains a hot spot for growth, along with HR Services & Solutions, with talent management an ongoing challenge that’s driving demand. These segments will grow well above the industry average growth of 5.2% CAGR over the forecast period.

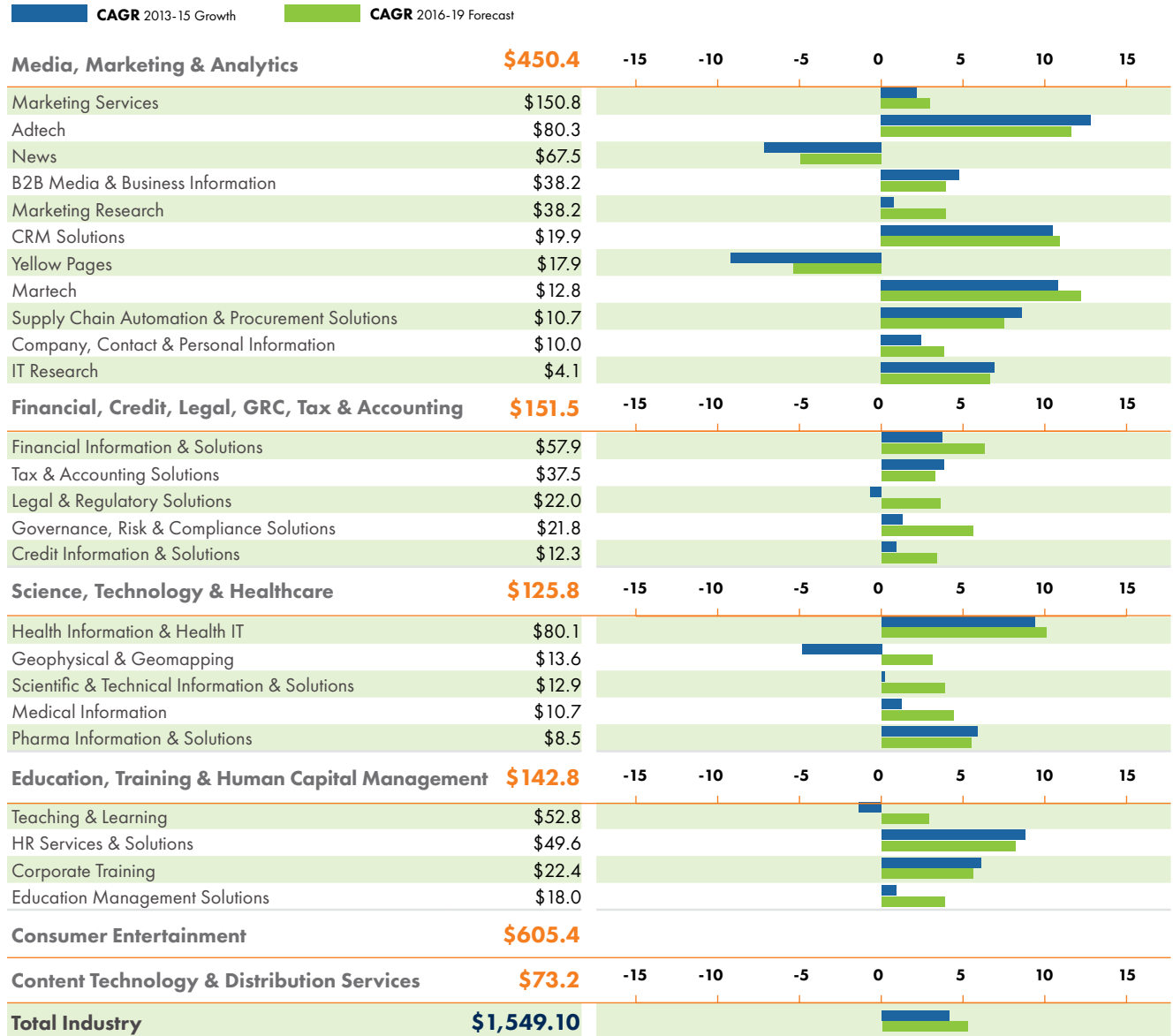
Unsurprisingly, News and Yellow Pages continue to lag industry performance with the core categories continuing to grow between 3% and 5% with the regular cadence that increases with largely subscription-driven businesses and recurring revenue streams. Steady is as steady goes — something that makes this industry a continued favorite among investors.

Geographic Distribution

2015 Estimated Global Revenue
(USD Billions)



Industry Ecosystem and Segments, 2015 Revenue and Growth (USD Billions)



Source: Outsell, Inc. Research & Analysis

Outsell's 2017 Meta-Trend

All Data, Nothing But Data

As we've said, transformative change has been the norm for so long that it almost has a numbing effect. This year, the planet and our industry are at a tipping point, with forces in play that are fundamentally changing the nature of knowledge work. And this is happening against a backdrop of political and economic uncertainty on the world's stage. Yet, success will come to companies that seize the moment, leverage the data, and recognize how to extract value from these uncertain times.

At Outsell, we've always said that information services are bought and sold or marketing and advertising services are funded when they help someone make money, save money, or mitigate risk. With data, it's the same — and it's happening faster because of the computing power and possibilities that are now in and around our everyday industry.

Data is exploding and rapidly changing the information industry landscape. Data is the enabler. Smart applications/analytics are the disruptors. Successful organizations are leveraging data throughout all areas of the enterprise. Savvy-ness in developing applications/analytics capabilities that take advantage of data is a differentiator among peers, and a leading indicator for overall business performance. Forward-thinking CEOs and COOs — and the rising role of the Chief Data Officer (CDO) and its morphing into the Chief Analytics Officer (CAO) role — recognize that this vast expansion of data within their own enterprises creates opportunities, defined by:

- **The rise of the platform model:** This reflects the transition from a product-oriented strategy toward a platform strategy and providing choices to industry providers, be it a platform or a ride on someone else's platform.
- **New roles:** Chief Data Officers are becoming Chief Analytics Officers, migrating from the back office of "risk management" in financial services and other regulated industries to mainstream offensive positions in many verticals. They are expanding beyond defensive governance and management roles toward roles focused on new business and product development. This is happening as we watch our industry's customers become partners, competitors, and participants in the commercial information ecosystem.
- **Democratization:** As barriers to entry continue to radically change and services like AWS make it easier for enterprises to focus on new product development, this movement is also further eliminating moats that may have once surrounded their franchises.

Data is now a foundational element of product strategy. Core data assets and competencies inform all stages of the product-development lifecycle. As AI continues to advance, the proliferation of data and economies grow around it. Data is a growing currency. The power of analytics and tools now being pushed into the hands of end-users creates opportunities for new use cases and applications suddenly borne of collaboration between machines and humans, or by machines alone. We are seeing the evolution of the API business model with companies now starting to realize the benefits of having others linking through their APIs, building access, and then creating revenue models from it.

In the information industry, companies have long made money on solutions that support key application areas, including marketing and customer acquisition, risk and compliance, legal solutions, financial services, education, training and human capital management, and other areas.

Today, however, we are seeing enterprises, under their CDO meets CAO, do these same things. They are using data to support operational performance in areas such as digital marketing, risk and compliance, human capital management, supply-chain optimization, and so forth. Increasingly, enterprises such as General Electric, Boeing, Ford, or FedEx recognize they can use data to predict performance to help them become better stewards of shareholder value.

Some, like [MasterCard](#), [IBM](#), or [Oracle](#), are building new commercial solutions by acquiring data assets, building new information solutions, or mashing up their data assets alongside those of others. Either that or they are licensing their data exhaust. Think [Ecova](#) with data assets stemming from the exhaust of their managed services. Just about any major enterprise has data they can commercialize by licensing it or by mashing it up with other data to create new solutions. This means there are more competitors and partners evolving in our industry.

In information industry firms, we are also seeing data become even more fixed as a core ingredient to what companies are monetizing or selling, or to how they run their business to serve customers. [Hanley Wood](#), [Northstar](#), [ALM](#), and [IDG](#) have all continued to put data at the center of their operations and offerings. Today, everyone is in the data business, adding to the rich tapestry of complexity and possibility in our industry.

What does data-driven, data-savvy success look like? Where is the action? Who will succeed? To answer these questions, Outsell identified the trends and companies most likely to drive industry change, disruption, and success in the years ahead. The winners are focused on seizing these opportunities now and are paying attention to, responding to, or, more importantly, proactively developing strategies and plans that address our 10 data-driven trends that matter.

10

TRENDS THAT MATTER

1. Geopolitical and Economic Uncertainty
2. Talent Shortfalls
3. Data-Driven Enterprises
4. Connectedness, AI, IoT, and Robotics Retooling Verticals
5. The Rise of Platforms
6. De-Siloing Data to Meet Innovation Demands
7. Mobile Payments and the Future of Money
8. Advertising Gets Smart to Survive
9. Virtual Realities — The Next UI Is No UI
10. Cyber-Security

10 Trends That Matter

1. Geopolitical and Economic Uncertainty

The Brexit referendum bombshell will continue to shape Britain and Europe as other parts of the world and all parts of the information industry deal with the repercussions. With Brexit comes some uncertainty,

particularly surrounding how the UK government will follow up on the referendum, and how it will impact the UK's future relationship with the EU. On the economic front, sterling appears to have settled near its record low against

the dollar, and while many factors influence currency markets, an extended period of weakness for the pound seems probable. There are still significant concerns about a slowdown in growth both in the UK and Europe, raising the likelihood of sustained low interest rates. The US election and changing political landscape add to an atmosphere of extreme uncertainty. Around the world, terrorism impacts regional safety, creating the need for improvisation in trade shows, events, and other sectors our industry serves.



What This Means: Companies must plan for a range of scenarios and be prepared to act. The biggest danger during these times is the potential for delayed decision-making, resulting in missed opportunities. An ability to make decisions quickly in response to unforeseen events is indispensable. Leaders must walk the tightrope between scenario planning and active decision-making at the same time they recalibrate, at a moment's notice, as external events dictate. Agility must be a core competency.

2. Talent Shortfalls

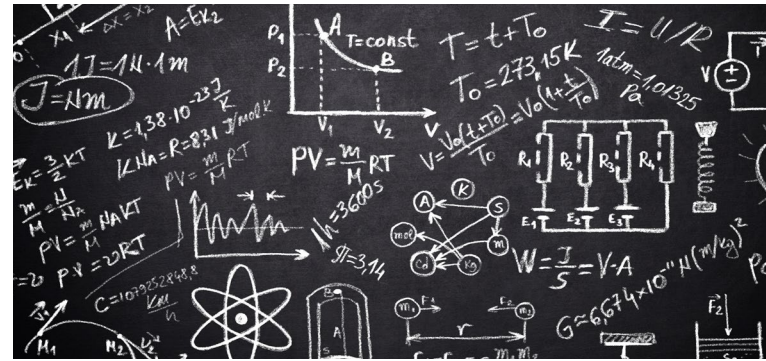
The talent gap is widening. One of industry executives' top woes is the struggle to find and keep top talent. The millennial workforce now outnumbers boomers, and they have different priorities. Although money is important, it is not the end game. They want meaningful work, and frequent job movement is the norm. As they become leaders in managerial ranks, they will bring indelible change. Meanwhile, savvy CEOs and their leadership recognize the old motivations don't work and that the entire team is responsible for talent management. HR functions of yesteryear go by the wayside as analytics, transparency, and the gig economy give rise to new methods of finding, hiring, and retaining talent. At the same time, the future of work will change for humans. Driverless Uber, AI, analytics, and robotics — blue collar, white collar, home health, financial analysts — all are

replaceable and being replaced. The freelancer economy is on the rise as workers choose to remain independent and in control of their own destiny. *The Inevitable* by Kevin Kelly points to 12 technology forces that will shape our future. A must read for all CEOs, it provides a hopeful look at how humans and machines will work together in new ways, bringing the best of our talents to bear on the problems our worlds needs to solve.

What This Means: Companies that can't recruit and retain top talent will struggle to grow. Independent contractors will find the socialization and infrastructure they need to succeed in co-working spaces, affiliate networks of independent consultants and experts, and online talent recruitment/temp worker platforms, and they will be able to seamlessly move from gig to gig. HR and talent management solutions are set to grow by healthy double digits and be a hot M&A market over the coming years.

3. Data-Driven Enterprises

Data comes from both inside and outside organizations. Businesses are extracting gold from the data exhaust — output from platforms such as CRM and marketing automation tools; external data from website browsing and e-commerce; and contributions from sensors, users, and machines. The data-driven enterprise either runs a data business, explicitly monetizing information in the form of data, platform, and data-driven services, or may leverage data to optimize their own performance, save money, or mitigate risk. In any case, the data-driven enterprise sees data as an enabler, a differentiator, and a leading indicator for overall business performance.



What This Means: Data is a foundational element of product strategy for enterprises contemplating new or evaluating existing lines of business. Core data assets and competencies inform all stages of the product development lifecycle. Information services firms must now think platform enterprise architecture rather than product IT. Platform also means providing a mechanism for converging internal and external data to provide applications solutions and offer an ecosystem for others to do business with their customers.

4. Connectedness, AI, IoT, and Robotics Retooling Verticals

Information assets that organizations collect, process, and store during their regular business activities, but are not leveraged for other purposes such as competitive intelligence, product development, or analytics, are "dark data." Unstructured, untagged, and untapped, this is data that has not been analyzed or processed. Typically, storing and securing such vast swathes of data is more expensive than the monetary value extracted from it.

Companies usually retain it for regulatory compliance or record-keeping reasons. Valuable insight can become irrelevant and perish because it is not processed quickly enough.

Recent and rapid development in data analytics and cognitive computing is turning the spotlight on dark data. Organizations are starting to find areas that can be valuably mined. Much of the data generated in scientific research, for example, has until relatively recently, been dark. Data discoverability tools, improved data curation tools, and the rapidly expanding open data movement are shedding light on the dark data generated by the scholarly and scientific research process in ways that improve the ability to validate, reproduce, and measure the impact of scientific research.



As an example, in the world of Big Agriculture, farm data is estimated to be a \$20 billion to \$25 billion revenue opportunity. Precision agriculture has seen the collection of huge datasets, and the presence of big enterprise organizations such as Monsanto and their strategic partnerships with the likes of John Deere highlights the extent to which they see the opportunity to generate profit and value from farm data that may otherwise have become dark (in 2015, the companies signed an agreement that saw near real-time data

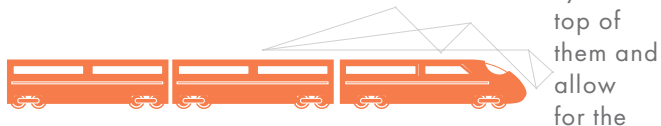
connectivity between certain John Deere equipment and Monsanto's Climate FieldView platform).

What This Means: Thanks to data analytics, the food industry is hot, with enhanced productivity from precision agriculture (aka satellite farming), tech inroads in dicing and slicing, virtual nutritionists, sanitizing and palletizing, allergy prevention apps, gluten detectors ... not to mention robot waiters and dishwashers. With everyone collecting and making better use of data, we see a host of startups in Food & Ag IT. The collecting and normalizing of messy and missing data can be difficult and rewarding, requiring increasing connectedness in the Food and Ag Internet of Things. There is great potential for firms to roll up a powerful tool set and put a big footprint in this space. [Other verticals ripe for retrofitting](#): construction, real estate, insurance, or the evolving cannabis industry.

5. The Rise of Platforms

Successful data-driven businesses have shifted their mindset from a product-oriented strategy toward a platform strategy. At their core, platforms are data collection mechanisms: strong upfront designs that attract desired participants, enable core/desired interactions, and, most importantly, encourage ever-more-powerful network effects. It's all about platform, whether a company has enough scale to BE the platform and let others connect via API and put their content there, or whether a company operates on a platform developed and run by others. Increasingly, with the forces of focused scale having unfolded over the years, companies like [Bloomberg](#), [SF.com](#), [Thomson Reuters](#), [Pearson](#), [UBM](#), or even little ones like [CSRHub](#) or [MyCase](#) have

the power to be a platform in their ecosystem. They collect, aggregate, curate, and distribute content and software-enabled solutions that have a service layer on



top of them and allow for the integration of internal and external data as well as third-party originated content. On these platforms comes the ability for customers to run their businesses and the APIs that go out and in to support doing so. IT strategies in media and information strategies now revolve around enterprise architecture vs. product architecture — enterprise technology vs. product technology. Savvy information firms are thinking enterprise first and how data integrates to support customers, their customers, or to optimize business performance or both.

What This Means: New thinking about what is a platform and what it takes to own and be the platform, or be on another's platform requires new thinking too about openness, integration, convergence, and service. Top players like Thomson Reuters have long been thinking platform and workflows, while at the same time intensely *focusing portfolios to ensure scale and dominance in a market, effectively becoming pure plays.*

6. De-Siloing Data to Meet Innovation Demands

Research and invention demand comprehensive access to all market data, which can only be achieved by breaking down the walls between proprietary data and everything else. The value is in the knitting together of all searchable data — and making dark data accessible

— with new service models, new opportunities, and new challenges emerging.

The challenge of big data lies in its size, and in the almost limitless usage possibilities. To build successful business solutions, vendors must be able to use the attributes of data in very specific ways to answer very specific problems, by using big data to spawn small data. For example, in education some vendors have built predictive analytics solutions that create a holistic view of a student through tasks such as tracking library usage or eating habits (as recorded on an institutional payment and access card) as well as academic activities such as grades, completed assignments, or lecture attendance (taken from the LMS/SIS). All of these data elements can be combined to give a picture of a student's well-being by comparing this profile to those of thousands of other students, and examining which behaviors are displayed by successful students and which by those who are in danger of dropping out.

In retail, small data may be used in a system that tracks inventory and sends alerts when stock is low. Of course, as in the education example above, this information could form part of a big data solution if it were combined with other data streams about marketing, customer preferences, and social media sentiments. This provides a holistic view of the buyer in much the same way as big data in education provides a holistic view of the student.

Another example is the use of smart labels on medicine bottles. Small data can be used to answer specific questions around a topic such as spoilage, including where the medicine is located, its remaining shelf life, if the seal of the bottle has been broken, and the current temperature conditions. Data analytics can be used to

look at this information over time to examine the cause of why drugs may be expiring or spoiling, whether due to a certain shipping company, retailer, or a recurring pattern that points to problems in the supply chain.

What This Means: In all the furor about big data, small data has been overlooked, but it is critical to help answer very specific questions at a specific point in time. Understanding the small elements that go into making up that big picture is often just as critical, particularly when it comes to creating specific solutions to specific problems. Access to all data about a problem — big, small, dark — is essential to fully understand how to extract new and valuable insights. Content providers will have to move into a more service-oriented paradigm that will require significant adjustments to operations and business models.

7. Mobile Payments and the Future of Money

Mobile is becoming the foundation for everything digital. “Mobile first” strategies, which treat mobile as a medium and separate marketing channel, are being replaced by digital strategies where mobile becomes a way to connect to media. [Google](#) and [Facebook](#) now account for two-thirds of mobile advertising spending, and their dominance continues. Consumer adoption of mobile is skyrocketing, creating demand for ubiquitous connectivity — mobile is like oxygen — and as a result, solutions must be seamless, pain free with easy enablement of transactions and payments. While our research shows that end-users still largely use desktop devices for workflow in the enterprise, a generational shift is occurring where millennials’ most

preferred sources are all those that belie a mobile-first orientation and will continue to shift. Mobile and money will be intertwined. With it we’ll continue to see new forms of transactional activity taking place via the blockchain distributed ledger, trade settlement, and payment (cryptocurrency) capabilities that have enabled financial services to move to a whole new level of data encryption and security. Technologies for fast, seamless, secure payments, together with smartphones, will conquer online transactions. Look for this in any transaction environment over time. From marriage licenses, to court settlements, to auto registration, the future of money is evolving and blockchain will have an unparalleled impact as it morphs to broader use including copyright and royalty payments closer to home.

What This Means: Mobile payments are the future of money and blockchain is the future of transactions. Blockchain will revolutionize credit evaluations by enabling real-time assessments of behavioral spending and debt management with unprecedented accuracy. Once blockchain proves it is superior to traditional methods of storing and sharing data among (relatively) trusted parties, traditional transaction processing — such as the super-fast, optimized, and highly reliable kind practiced today on Wall Street, in credit card companies, and airlines — will look old-fashioned.

But blockchain is bigger than just financial and operational transactions. Although blockchain was born in financial



services, it is cross-functional by design, so its applications in other industries became realized quickly. As technology companies with trusted brands and core strengths like IBM bet on blockchain, high-profile and disruptive implementations will develop at scale. Blockchain is a good fit for processes that require record-keeping, security, and multiple parties, like the supply chain, procurement, ERP, and anywhere the payment is the settlement. Blockchain has the potential to transform and enable transactions related to:

- Digital Identities
- Passports
- E-Residency
- Birth Certificates
- Wedding Certificates
- IDs
- Online Account Logins
- Money — Cryptocurrency
- Proof of Ownership, Real Estate/Automotive
- Deed/Title Management
- Connected Vehicles
- Smart Appliances
- Supply Chain Sensors
- Publishing, Music, and Entertainment
- Copyright/Ownership Rights and Transfers/
Digital Rights Management
- Royalty Distribution
- Smart Contracts

Information providers, particularly public record suppliers and databases, need to take heed as to how blockchain will generate and share its own record of

data, and where there is the potential for third-party data to become obsolete. Creation of historical and archived transactions must leverage existing records — thus, potential collaborative opportunities.

8. Advertising Gets Smart to Survive

Outsell's Chuck Richard has long noted that with push marketing run totally amok, it is high time for advertisers to begin restoring trust and trusted environments for professionals and consumers. With ad blocker wars — pull consumers in and then block them when they block you — the advertising death spiral seems certain.

The growth in behavioral targeting means advertisers collect more information about their consumers than ever before. This data coupled with smart technologies like emotive AI and facial recognition has potential to make advertising and marketing actually relevant and of interest to potential buyers in the moment of intention. In media, advertising, and marketing, mobile is now a driving force and a rich two-way data pipe. Verification companies now ensure that the data streams coming back from ad impressions are real people on the other end. DMPs and data onboarders now have become key partners for both advertisers and publishers helping them both make sense of a constantly flowing data pipe or first-, second-, and third-party data.

At the same time we await a service that lets people put in exact specifications, allowing others to bid on providing the solution. Ultimately, the era of push marketing gives way to the era of to pull marketing, as marketing and advertising becomes user centric instead of focusing on manipulating and driving behaviors.

What This Means: Beyond today's tools, IoT, AR, and messaging bots offer the potential for new streams of bi-directional data to those tools, while also spawning new and advanced user interfaces. Data-driven experiences might save advertising. User pull and relevance are key. Smart advertising might actually survive.

9. Virtual Realities — The Next UI is No UI

In just its first week, Pokémon Go had 7.5 million downloads, and it's had well more than 100 million downloads to date, capturing the attention of millennials, business owners, and mainstream media. Averaging 20 million daily active users, it's bigger than [Twitter](#). Pokémon Go gets people off the couch and outside, sparking conversations between total strangers on public transportation, and bringing new customers into local businesses. Pokémon Go not only caught on with millennials, but it is also captivating parents nostalgic for the days when they played Pokémon in their youth.

Barack Obama became the first sitting president to use virtual reality, projecting himself in a full depiction of Yosemite as he talked about the national parks. In a blend of old world and new world, National Geographic joined Facebook's Oculus studies along with VR specialists. At Google, the head of enterprise is now working as a key decision-maker in their VR team. Outsell believes first-wave developments will occur in augmented and virtual reality, making strides via implementations like Pokémon Go and the President's visit to Yosemite.

What This Means: For advertisers, once the pieces get built, the ability is there to aggregate AR location data, feed it into a DMP, create unique audience segments, and then send it to a DSP to schedule targeted ad buys, meaning AR applications will join messaging bots as the new advertising and media vehicles. AR will become more visible not only among consumers, but in professional applications too. Pokémon Go grabbed the world's attention and thousands of people learned overnight that AR is here and ripe for application across verticals — engineering, medicine, teaching and learning, everywhere that guidance or advisory can overlay.



With AR, the brand experience is more immersive. AR in engineering means that aircraft mechanics might soon point a mobile device over the name plate of a component part they are inspecting and get immediate access to its service history. In education, students might point their smartphones inside a classroom and immediately download the week's assignment with detailed instructions into their calendars and to-do lists. In medicine, phlebotomists might use a handheld scanner to project veins over a patient's skin to make sure they don't miss on the first stick. Mechanics repairing parts and other key applications in B2B are sure to open up.

AR has gone mainstream, thanks to Pokémon Go, and people have gotten comfortable with the UI virtually overnight, representing a tipping point for the technology. With data and AI, IoT, chipped humans (Fitbit), augmented reality and VR, and voice recognition (Siri and Alexa), this future UI is rapidly emerging, and humans will be increasingly freed from screens by predictive, listening, and assistive technologies.

10. Cyber-Security

Edward Snowden sparked outrage across the world when he revealed mass US surveillance practices and created considerable mistrust of big US technology companies. Europe in particular was infuriated about the revelations. A lawsuit by Austrian student Max Schrems against Facebook resulted in the EU-US Privacy Shield, which began allowing companies to self-certify their compliance from 1 August 2016. However, the future of Privacy Shield is uncertain, as EU privacy regulators will only allow the transatlantic trade agreement to run for a year as a trial before deciding whether to bring any legal challenges.

The advancement in data analytics has propelled the information industry into a new era: A time where data quality is pertinent, and data quantity is crucial. Data collected about people, companies, and entities are growing exponentially by the day. This data includes demographic information (age, gender, phone number, address, etc.), web-browsing activities, credit and financial transactions, social media interactions, and other personal habits, all increasing the likelihood of identity theft. Although privacy acts are in place to safeguard consumer data, companies continue to dance

the fine line between privacy invasion and customer-value creation while the halo of security remains thin. Personal data aggregators like the people search engine Nuwber will continue to proliferate and pop up as fast as humans can opt out and demand removal of their data.

What This Means: The business and security needs for companies and governments to obtain and process personal data to support services that are increasingly essential to our society and economy, is increasingly at odds with people's legitimate legal rights for privacy. Data privacy and security is not just a compliance issue, but it is also a branding issue. Ultimately, providers that make data security compliance part of their brand's DNA will gain customers' long-term trust and business.

Cyber-security is becoming a super-hot M&A sector, as solution providers work on technologies that enhance data encryption, identity management, and fraud detection. Emerging solution disruptors like [ShoCard](#) and [Filament](#) offer next-generation, blockchain-based identity management systems designed to be difficult to hack, and challenge traditional ways of electronic transactions and data storage.

It's important to understand these trends in the context of the main stakeholder groups that fund the information industry, control the purse strings, and influence the money flows that fuel industry growth — marketers and advertisers who decide the spending allocation for their marketing mix; enterprise data and information managers who budget for paid content; and the end-users who buy and consume content directly for themselves or their departments.

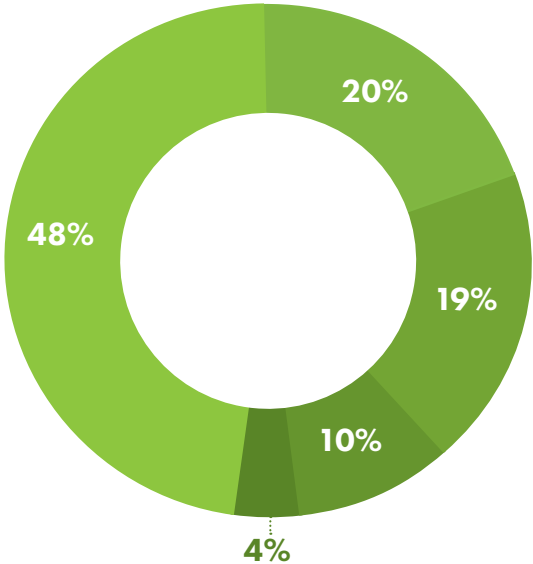
Marketers & Advertisers

\$473 Billion

4.7% Total Growth Expected Over 2015

- Digital: **48%**
- Print: **20%**
- TV, Radio, and Cinema: **19%**
- In-Person Events: **10%**
- Out of Home, PR, and Other: **4%**

*Numbers rounded to nearest percent



2012-16 Total

Spending (USD Billions)



Top Five Barriers and Problems

Marketers' top problems and barriers represent a challenge and opportunity for martech, adtech, and marketing services vendors, and agencies. Partners who demonstrate data-first approaches and a commitment to understanding first-party customer data stand to be more deeply integrated into the marketing stacks of B2B and consumer-facing brands.

1. Media companies and vendors not solutions-oriented
2. Agencies not solutions-oriented
3. Difficult to apply analytics
4. Evaluating ad spend effectiveness
5. Analytical expertise of staff

Trends That Matter

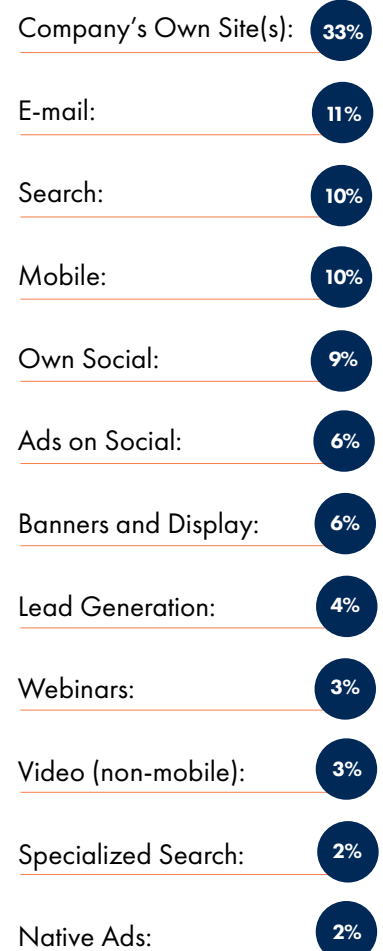
Digital Accelerates, Print Falls, Social Climbs

Spending on digital marketing and advertising efforts continues to accelerate thanks to the huge audience shift toward mobile, video, and social. Spending on print continues to fall, as the growing millennial and Gen Z audiences are simply not there. Social spending increases, as it becomes a critical distribution channel for content, services, and advertising to reach these audiences.

Mobile's Importance Can't Be Denied

Mobile becomes the digital channel preference to reach audiences with content and advertising. Consumer-facing brands and younger marketers will help drive higher adoption of mobile content, mobile video, and mobile advertising. Mobile programmatic accelerates now that buyers within digital marketing teams at brands and agencies have mastered digital programmatic ad buying.

Digital Spending



Source: Outsell, Inc. Research & Analysis

Information Management & Libraries

\$28.9 Billion

Forecast for 2016: \$29.2 Billion

Trends That Matter

Industry Consolidation

- Pressure on library budgets continues, leading to steady consolidation in information and library services.
- Companies are growing via acquisition. Notable examples: *Follett's* purchase of *Baker & Taylor*, *ProQuest* bought *SIPX*, *Ex Libris*, *Alexander Street Press*, and others. *EBSCO* bought *YBP* and *Plum Analytics*. Thomson divested IP & Science to streamline its portfolio.
- Strategic moves are likely to continue and in many ways promise more integrated, end-to-end solutions to meet libraries, researcher, and student needs.
- Ramifications of consolidation result in less choice for end-users and the likelihood of higher prices.

Future of the Library

- Continued focus on the evolution of libraries and the role of information managers, with technology as the driving force. New applications leveraging ever more powerful analytics, artificial intelligence, natural language processing, content, and data capabilities drive user demands and the response of research libraries to meet their needs.

- In the corporate sector, service providers are moving beyond the library to directly address the end-user, a trend that has been happening for some time. In the academic sector, recent Outsell research found that the overwhelming reason students use the library is for a quiet place to study. Public libraries are transforming themselves as community centers, offering classes, training, or computer support.
- Information managers position their tools, platforms, services, and resources to further the discovery, use, production, and organization of ideas, not just analog or digital information.
- ROI justifies continued corporate library support. Effectively demonstrating value to executive management in quantitative and qualitative enterprise benefit is imperative for survival.

The Rise of Data

- Data assets within the enterprise are increasingly leveraged for monetization. Methodologies for how to do this represents skills/knowledge gap in many organizations.
- External data sourcing adds value by augmenting and enhancing internal data. Information managers can add value in this process by identifying and acquiring these external data sets.
- Digitization, online resource management, web archiving, and text and data mining all create new types of data that libraries can gather, analyze, and leverage to create enterprise-specific solutions.

Formats: Digital vs. Print

Digital: 77% (2015, average)

Print: 23% (2015, average)



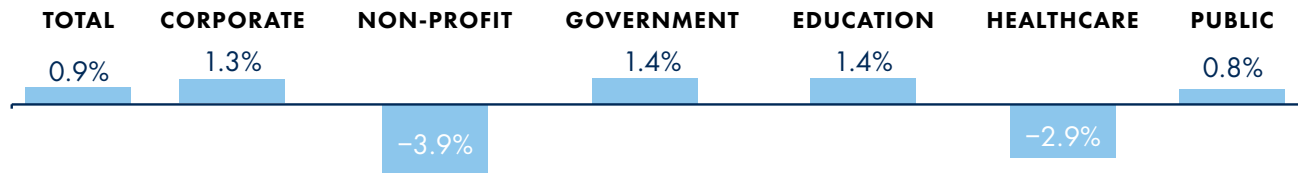
Top Areas of Investment, 2016

E-Books	24%
Online Databases	18%
Analytics and Data	17%
E-Journals	17%

(In what key areas will you be increasing investment in 2016?)

Library Budgets

Anemic growth across the board, with a surprising drop in corporate after several years of 4% increases. When factoring in 3% to 5% content price increases, libraries are fast losing ground.



Top Content Spend by Category, 2015

Scientific & Technical Information	35%
Consumer & Entertainment	12%
Medical Information	11%
Legal, Tax & Regulatory Information	7%
General Purpose Business Information & News Aggregation	7%
Company Information	4%

(Percentage of content budget the library spends on specific category)

Top Content Spend by Format, 2015

E-Journals	22%
Print Books & Reference Materials	19%
Online Databases of Content From Single Provider (e.g., Gartner, IDC, Elsevier, etc.)	16%
Online Databases of Aggregated Content from Multiple Providers (e.g., Dow Jones Factiva, ProQuest)	15%
E-Books	6%

(Percentage of content budget the library spends on specific format)

Source: Outsell, Inc. Research & Analysis

Knowledge Workers

Knowledge management is making a comeback. Collaboration tools are proliferating, and users feel that tacit knowledge is not as productive as actively shared knowledge. With that in mind, there are a host of issues to consider. Ease of access to content is critical. Millennials tell us they want a single access point, meaning an integrated front door may be a point of differentiation for vendors. Meanwhile, passive sharing of licensed content (posting it in collaborative work spaces or social media) is increasing the likelihood of copyright violation. How are people consuming content? Outsell's survey data shows that end-users like to access e-mail and some data via smartphones or tablets, but the overwhelming percentage prefer desktops and/or laptops. Surprisingly, print still has a high presence among millennials, knowledge workers, and engineers.

Trends That Matter

Corporate Knowledge Workers

- Knowledge workers consider roughly seven publications as critical to their work. Just 3% (down from 13% in 2013) felt that no publications were critical for their job.
- Small and medium-sized organizations have a higher number of critical publications than those in large organizations.
- Print is the third most-important category after databases and digital journals or publications, but it is the only information category to decline in importance between 2013 and 2016.

3%
Percentage who felt that no publications were critical for their job, down from 13% in 2013.

Students and Faculty

- Time and budget provide the biggest challenges to faculty members looking for information resources. While time is an issue, it fell in importance from 66% in 2011 to 54% in 2016. Budget was perceived as a problem by far fewer faculty, down from 42% in 2013 to just over a quarter in 2016.
- More than half of both students and faculty expect to purchase more digital resources, and 44% of faculty and 34% of students foresee declines in spending on print resources.
- Students and faculty overwhelmingly prefer text to either audio or video. Outsell expects this figure for video to increase over the next few years as more compelling video-based solutions enter the market, and as faculty recommend more video-based resources to their students.
- One-third of faculty don't evaluate their spending on information solutions. Outsell expects this figure to fall due to direct budget pressures or as a way to accommodate students unable to afford course materials.
- More than 50% of both faculty and students still do not use OER materials, with around a quarter replacing proprietary content with OERs and a quarter deliberately using a mix of OERs and proprietary content.
- Students in higher ed still use the library routinely and value it as an important place to go.

Time suck: Engineers spend 9 hours per week gathering and analyzing external information.

Engineers

- Outsell studies indicate that, on average, engineers are spending roughly nine hours each week gathering and analyzing external information, with 62% of that time spent on the analysis phase.
- Engineers find knowing what information is available to them difficult, do not have enough time to deal with information, and find getting desired results challenging.

Legal Professionals

- Legal professionals rely heavily on desktops and laptops for their information access, with demand for print information (by 37% of respondents) far lower than digital resources (93%). Smartphones and tablets were rarely used.
- Sharing information is vital in the legal space, with email the most common vehicle (used by 90% of respondents), followed by in-person conversations (87%). Internal closed document sharing environments are used around a third of the time.
- Online searches were the most trusted way of finding information (73%), followed by aggregator databases

- (40%), colleagues (27%), and print sources (20%).
- As with other knowledge workers, budget is a key inhibitor to accessing information (cited by 50% of respondents), followed by lack of time (30%).

Millennials

- Facebook, YouTube, Instagram, Pinterest, and Snapchat are the top five social media sites. This could indicate a generational trend toward pictorial and away from text-heavy sites, which has implications for website and product design.
- What used to be our industry's most authoritative sources — company information, market research, and the like — have dropped to fifth on the list of go-to information solutions. Search engines like Google, a company's own websites, their own portal, and peers respectively round out the top five.

Millennials' Go-to Sources

1. Google
2. Company Website
3. Portal
4. Peers
5. Market Research

% OF MILLENNIALS WHO SAID

that content purchased by their company or organization could be shared with others inside or outside the organization.

49%

Agreed or
strongly agreed

26%

Percentage with
no opinion

25%

Percentage
who disagreed

Source: Outsell, Inc. Research & Analysis



Analysts' Views on 2017 and Beyond

Our analysts weighed in on the critical trends going forward and what our meta-trend means to the information industry, its sectors, and players. We take a look at each in the following pages.

Media, Marketing & Analytics

Media, Marketing & Analytics covers the spectrum of media types, supported by a range of marketing services and research with an increasing emphasis on marketing automation and analytics, and adtech and martech as underlying drivers.

Trends and Hot Spots

Breaking the Google and Facebook Duopoly

Facebook's convergence into news aggregation and distribution now drives even more ad volume through it. Google's AMP initiative and new content and ad tools also solidify its position. With over half of all ad revenue flowing through the two digital giants, Verizon buys [Yahoo!](#) to combine it with [AOL](#) in an attempt to become a stronger content and ad player and stand out among others fighting for Facebook's and Google's scraps.

VC Pullback Creates Desperation and Opportunity

The free money is over. With adtech overinvested in, VCs pull back and tighten the screws, and many startups look to get bought in order to survive. VCs and PE firms get more interested in "data first" companies who value first-party data over third. Their lens shifts toward martech startups because they lie much closer to customer data and are helping to build the new data-driven experience for marketers.

IoT, AR, and Bots Drive New UIs

Large investments in IoT, Pokémon Go's emergence as a killer app for AR, and commerce and content companies' rush into Facebook's Messenger bot

program all signal a user interface inflection point ahead. Smart machines and sensors will soon drive new data pipes to marketers' dashboards, enhancing the knowledge gleaned from customer touchpoints. New approaches to news, entertainment, interactive content, and advertising emerge to embrace the new UIs.

Mobile and Video Dominate Content Delivery and Advertising

Media companies and brand marketers push mobile as the primary channel for people to connect to their content. Emphasis switches away from long-form storytelling to bite-sized video chunks. Even social shifts from text-based communications to heavy use of image and video, requiring new tools to track sentiment and virality.

Companies to Watch

Established Leaders

WPP: \$18.7B, -1.6% YoY Growth

Salesforce: \$5.2B, 20.9% YoY Growth

Criteo: \$1.3B, 33.9% YoY Growth

Disruptors

Sailthru: \$20.0M Est. Revenue

Krux: \$20.0M Est. Revenue

Shine: \$2.0M Est. Revenue

Market Ecosystem and Segments

2015 Estimated Global Revenue (USD Billions)

Marketing Services

\$150.8B 1.3% YoY Growth

Segment Leaders

- Omnicom
- WPP

Marketing Research

\$38.2B -3.5% YoY Growth

Segment Leaders

- Nielsen
- Kantar

Yellow Pages

\$17.9B -9.7% YoY Growth

Segment Leaders

- YP
- hibu

Company, Contact & Personal Information

\$10.0B 1.0% YoY Growth

Segment Leaders

- D&B
- LinkedIn

Adtech

\$80.3B 11.8% YoY Growth

Segment Leaders

- Google
- Criteo

B2B Media & Business Information

\$38.2B 5.1% YoY Growth

Segment Leaders

- Reed Elsevier
- IDG

Martech

\$12.8B 11.1% YoY Growth

Segment Leaders

- Adobe
- Salesforce

IT Research

\$4.1B 6.1% YoY Growth

Segment Leaders

- Gartner
- IDC

News

\$67.5B -9.3% YoY Growth

Segment Leaders

- News Corporation
- Asahi Shimbun

CRM Solutions

\$19.9B 11.0% YoY Growth

Segment Leaders

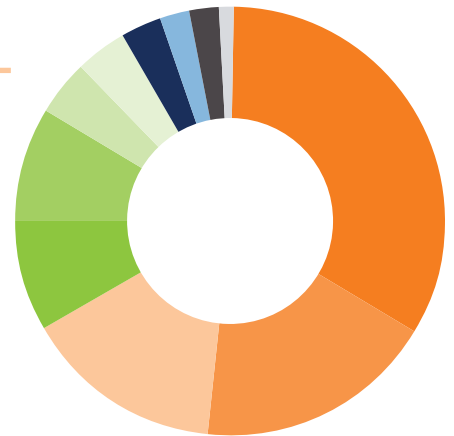
- Salesforce
- SAP

Supply Chain Automation & Procurement Solutions

\$10.7B 8.7 % YoY Growth

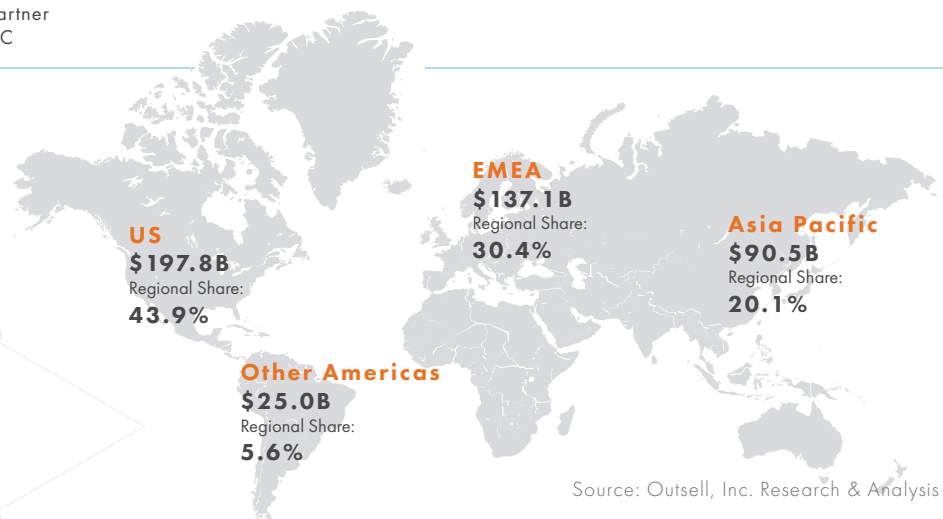
Segment Leaders

- SAP
- Oracle



Geographic Distribution

2015 Estimated Revenue (USD Billions)



Source: Outsell, Inc. Research & Analysis

B2B Media, Business & Company Information

B2B Media, Business & Company Information includes companies collecting and supplying information and services designed to bring buyers and sellers together. This includes companies serving business professionals with targeted vertical media, events, and market information; and it includes serving advertisers and exhibitors with targeted B2B audiences. Company Information includes data and related services used primarily to identify and target sales and marketing prospects. It also includes rich company profiles and data management services.

Trends and Hot Spots

Convergence Among Events, Media, and Business Information

This convergence fuels a unified lifetime audience membership view. B2B businesses use audience data to build lifetime relationships with multiple touch points in multiple media.

Marketing Converges with Sales

Account-based marketers will use data to focus on pipeline, engagement, and sales. This will increase demand for access to key contacts, but decrease demand for raw leads. Marketing may become part of sales. Increased demand for quality engagement increases events' importance in the marketing mix.

CRM Software Goes Deep

As Microsoft Dynamics integrates CRM, Business Intelligence, ERP, and LinkedIn, CRM is accelerating in the SME market. Company, contact, and personal information providers face increased competition as CRMs transition to become sources of information. SMEs get smarter about marketing, prospecting, and sales. Account-based marketing adds value to CRM.

Machine Learning Adds Value to Data

Widespread investment and the emergence of machine learning as a service accelerates prescriptive analytics and propriety metrics among information companies and their customers.

IoT Disrupts Data Markets

Internet of Things seeds information businesses where widespread use of sensors is practical and downstream data demand is strong. Expect major shifts in agriculture, transportation, and the supply chain. Buyers and distributors may force adoption of IoT technologies faster than suppliers would prefer, and suppliers will seek to monetize their digital exhaust.

Everything-as-a-Service

Everything-as-a-Service subscription revenue will become critical. Media with vertical reach and strong audience relationships introduce subscription services, paid data, online community, paid access, and high-value content. Each market's needs will likely yield a unique revenue mix.

Companies to Watch

Established Leaders in B2B Media & Business Information

RELX: \$2,342M, 12.4% YoY Growth

International Data Group:
\$1,520M, 2.3% YoY Growth

UBM: \$1,176M, 25.4.0% YoY Growth

Established Leaders in Company, Contact & Personal Information

Dun & Bradstreet: \$622M,
5.3% YoY Growth

Microsoft/LinkedIn: \$1,676M,
12.3% YoY Growth

Infogroup: \$295M, 5.4% YoY
Growth

Disruptors

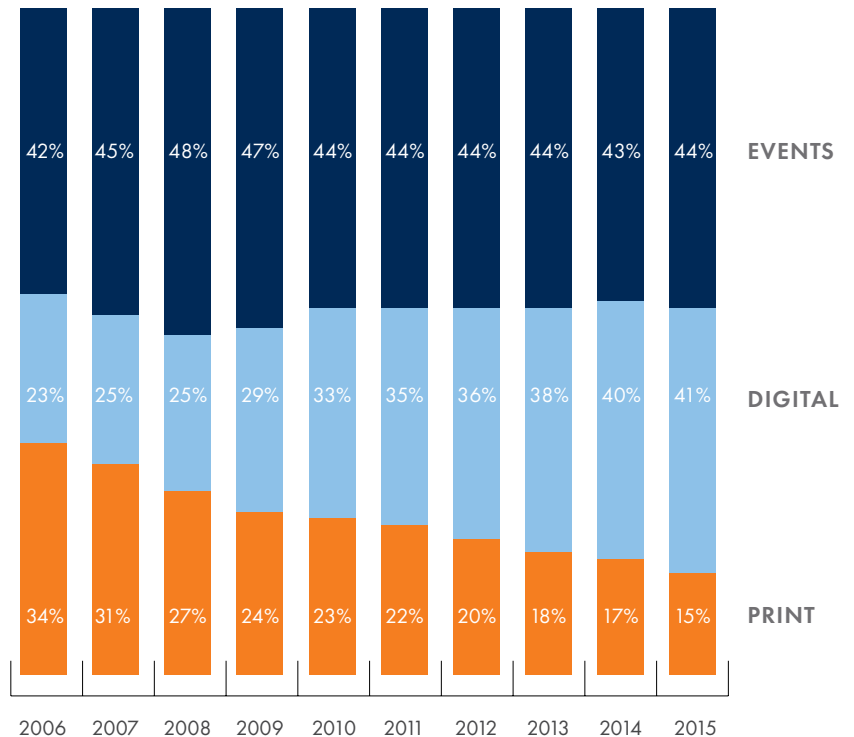
CrowdFlower: \$25M Est. Revenue

Demandbase: \$35M Est. Revenue

Mattermark: \$2.4M Est. Revenue

Digital and Events Drive B2B Revenue

B2B Media Revenue Share by Source



Events Spending Split Between Exhibitions, Company Events, and Conferences

Larger firms favor exhibitions, smaller firms prefer conferences, but the differences are small.

	Share of Event Spending	Growth	
Exhibitions	33%	6.3%	
Companies' Own Events	30%	3.0%	
Conferences	29%	3.8%	Source: Outsell, Inc. Research & Analysis

Education, Training & Human Capital Management

Outsell's coverage of this space includes educational content resources as well as solutions used for administrative purposes, edtech offerings, and services that support human capital management and recruitment.

Trends and Hot Spots

Teaching & Learning Solutions

- Data-driven adaptive solutions and predictive analytics drive product development and portfolio expansion.
- Successful digital solutions address specific market pain points and come to dominate in that one area.
- Educators and students have high expectations of an integrated print/digital experience.

Education Management Solutions

- Data delivers new insights, but privacy issues and concerns demand transparency in data usage.
- Educators are key gatekeepers. Vendors must understand their needs and support use of complex solutions.
- Digital solutions are a given, and must be accessible across a range of platforms, including mobile.

HR Services & Solutions

- HR teams must now be agile, data-driven, and skilled in attracting, retaining, and developing talent.
- Data is important here: Enterprises want actionable analytics, connecting HR metrics to strategic goals.
- Solutions must serve the growing millennial workforce in collaborating and sharing information.

Companies to Watch

Established Leaders

Pearson: \$8.9B Revenue, -4.8% YoY Growth

Benesse Corp.: \$3.1B Revenue, -12.8% YoY Growth

LinkedIn: \$1.8B Revenue, 33.3% YoY Growth

Disruptors

busuu: busuu PRO launch shows that language learning edtech startups can move into corporate markets.

Entelo: Data-driven solutions for recruiters to identify, qualify, and engage with talent.

Third Space Learning: 1:1 online maths tutoring. Ambition is to create an AI module to infer best teaching practices.

Corporate Training

- Training is critical for boosting skills, improving leadership pipelines, and enhancing engagement and retention.
- Competency-based education makes its mark. Data links competencies with performance.
- Connectivity between MOOCs and enterprise is driving the creation of valuable courses directly applicable to specific organizations.

Market Ecosystem and Segments

2015 Estimated Global Revenue (USD Billions)

Human Capital Management

\$49.6B

8.8% YoY Growth

Segment Leaders

- LinkedIn Corp.
- Pearson Education
- CareerBuilder
- Monster Worldwide
- Towers Watson

Education Management Solutions

\$17.9B

-1.6% YoY Growth

Segment Leaders

- Microsoft
- Pearson
- IBM
- K12, Inc.
- Ellucian

Teaching & Learning Solutions

\$52.8B

-5.6% YoY Growth

Segment Leaders

- Pearson Education
- Benesse Corp.
- McGraw-Hill Education
- New Oriental Education and Technology Group
- Cengage Learning

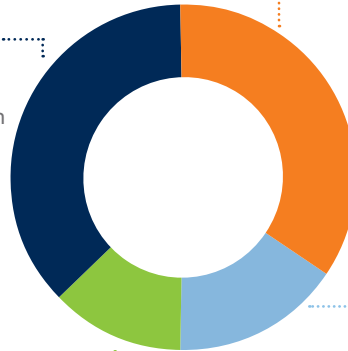
Corporate Training

\$22.4B

6.0% YoY Growth

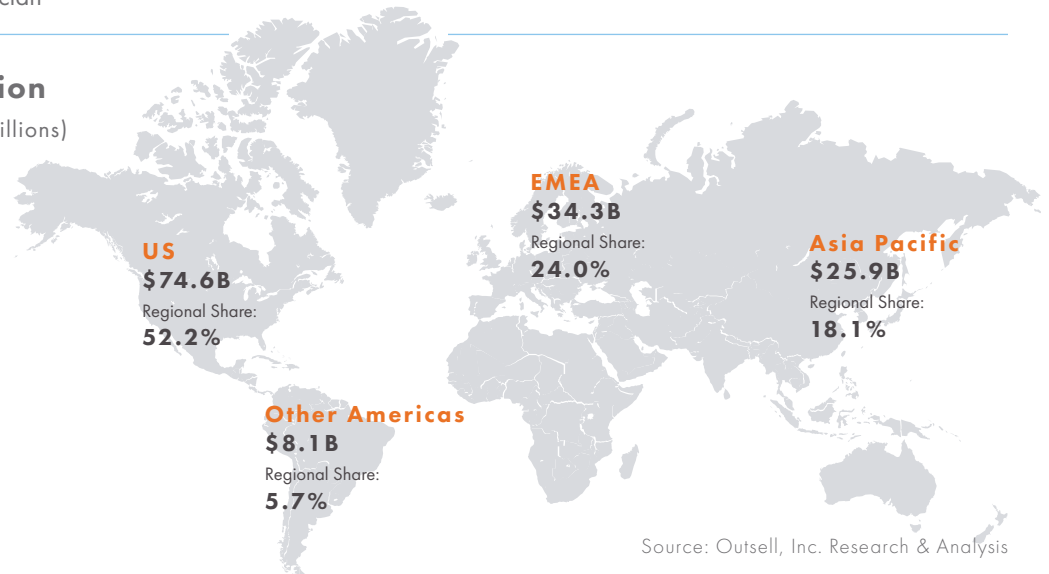
Segment Leaders

- Benesse Corp.
- Global Knowledge Training
- GP Strategies
- Wiley
- Arrow Education



Geographic Distribution

2015 Estimated Revenue (USD Billions)



Source: Outsell, Inc. Research & Analysis

Financial, Credit, GRC, Tax & Accounting

This area of coverage includes Financial Information & Solutions, Credit Information & Solutions, Governance, Risk & Compliance Solutions, and Tax & Accounting Solutions.

Trends and Hot Spots

Prescriptive Analytics

Prescriptive analytics has paved way for robo financial advisement. Investors now have the option to utilize technology over in-person wealth managers for financial planning.

Trended Data

Lenders are becoming more receptive to using trended data — data that exhibits dynamic spending and debt-management behavior of companies and individuals — over traditional snapshots of financial records to assess creditworthiness.

Blockchain and Security

The blockchain distributed ledger, trade settlement, and payment (cryptocurrency) capabilities have enabled financial services to move to a whole new level of data encryption and security. Despite new evidence of potential vulnerability in the blockchain protocol, its level of security remains unsurpassed by traditional transaction protocols. Players like Elliptic and Numisight have introduced blockchain forensics technology, which makes detection and mitigation of blockchain fraud easier.

Increase of Cross-Border Activities

A steady increase of transfer pricing studies for US-based multinational companies (particularly across international borders and in Europe), research and development (R&D) credit assessments, global mergers and acquisitions (M&A) support, and initial-public-offering (IPO) preparations are driving growth in the tax and accounting space. The area of sales and use tax management in the US continues to face increases in government audits, thus audit support/defense in the indirect tax arena will maintain its growth.

Tight Control of Costs

Expectations on the quality of externally sourced information have grown significantly, while budgets for such information have not. This means that financial institutions are expecting a greater amount of content versatility in support of their global businesses. Market data in support of hot areas like algorithmic and forex trading, including that of virtual currencies, and of new asset classes/derivatives are available from niche players. Thus, price-sensitive firms may choose to source such data directly from these players, rather than through expensive financial desktops that include data they do not need.

Market Ecosystem and Segments

2015 Estimated Global Revenue (USD Billions)

Tax & Accounting Solutions

\$37.5B

2.7% YoY Growth

Segment Leaders

- PwC
- EY

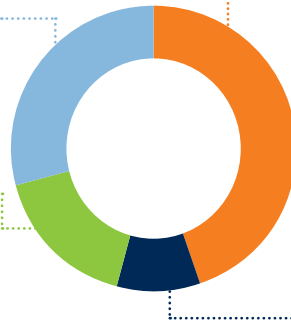
Governance, Risk & Compliance Solutions

\$21.8B

-2.1% YoY Growth

Segment Leaders

- Verisk Analytics
- LexisNexis Risk Solutions



Financial Information & Solutions

\$57.9B

2.7% YoY Growth

Segment Leaders

- Bloomberg L.P.
- Thomson Reuters Financial & Risk

Credit Information & Solutions

\$12.3B

-3.4% YoY Growth

Segment Leaders

- Experian
- Equifax

Companies to Watch

Established Leaders

Bloomberg: \$8.5B, 3.9% YoY Growth

Experian: \$3.1B, -7.0% YoY Growth

Verisk Analytics: \$1.8B, 6.3% YoY Growth

PwC: \$8.9B, 2.0% YoY Growth

Disruptors

Wealthfront: \$12M Est. Revenue, 28.7% YoY Growth

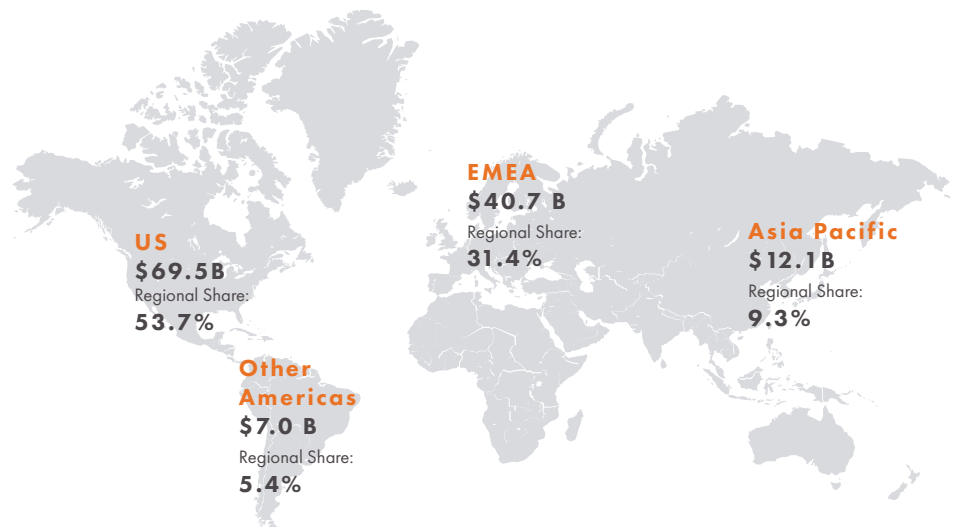
TransUnion: \$1.5B Est. Revenue, 15.5% YoY Growth

LexisNexis Risk Solutions: \$1.6B Est. Revenue, 3.3% YoY Growth

Vertex: \$142.5M Est. Revenue, 9.3% YoY Growth

Geographic Distribution

2015 Estimated Revenue (USD Billions)



Source: Outsell, Inc. Research & Analysis

Legal & Regulatory

The legal and regulatory solutions market is made up of B2B and B2C legal information, technology, and, increasingly, information-as-a-legal-service providers. They offer legal information and software used by the legal services industry, corporations, government bodies, and consumers prepared to conduct their own legal affairs.

Trends and Hot Spots

Convergence of Risk Management

Legal and regulatory risk management is converging with other types of risk management. Legal enterprise solution provider [Mitrastech](#) recently acquired two UK companies to help them serve the Governance, Risk & Compliance (GRC), and Environment, Health & Safety markets. Last year, [Wolters Kluwer](#) announced a divisional organization, which saw legal enterprise solutions moved to a new GRC division.

Legal Consumers as Growth Drivers

Legal consumers are more self-sufficient than ever, which is driving growth in the legal information for consumers segment. Only 30% of people with legal issues obtain legal services, and consequently opportunities remain to create the next generation of low-cost information solutions to support self-sufficient consumers.

AI Goes Mainstream

Law firms are adding value by incorporating AI into legal services. Clifford Chance partnered with AI provider [Kira Systems](#), which followed deals that Kira entered with DLA Piper, and [Deloitte](#), while Linklaters partnered with AI provider RAVN. Mainstream adoption of AI paves the way for technology in other areas such

as alternative dispute resolution, corporate legal spend control, and case management software.

L&R Opportunities in Wake of Brexit

Brexit presents opportunities for solution providers, including launching large events, investing in automated contract review technology, developing Brexit-specific products for in-house and private practice lawyers, and taking advantage of weak sterling to acquire UK companies.

Developing Countries

Several developing countries are professionalizing legal services sectors with improved regulation, training, and government initiatives to increase legal certainty and drive out corruption. A growing middle class is driving growth in areas such as financial services, telecommunications, and commercial property, while increased education standards is making people more legally aware.

Great Power in Hands of a Few

Legal marketplace websites are driving fees down in legal services, and a handful of providers are increasing their control of the market. This will place great power in the hands of a few, and there is a risk they may exploit this, just as price-comparison websites did in industries such as car insurance.

Companies to Watch

Established Leaders

Thomson Reuters: \$3.4B,
-0.7% YoY Growth

RELX (Reed Elsevier legal):
\$2.2B, -4.2% YoY Growth

Wolters Kluwer: \$1.1B,
-17.5% YoY Growth

Disruptors

eBrevia's AI extracts data from contracts. It will be in high demand as corporations review agreements for clauses reliant on the UK's membership of the EU.

Kira Systems uses AI to analyze text in contracts, and it can be trained to learn from a law firm's expertise for tailored services.

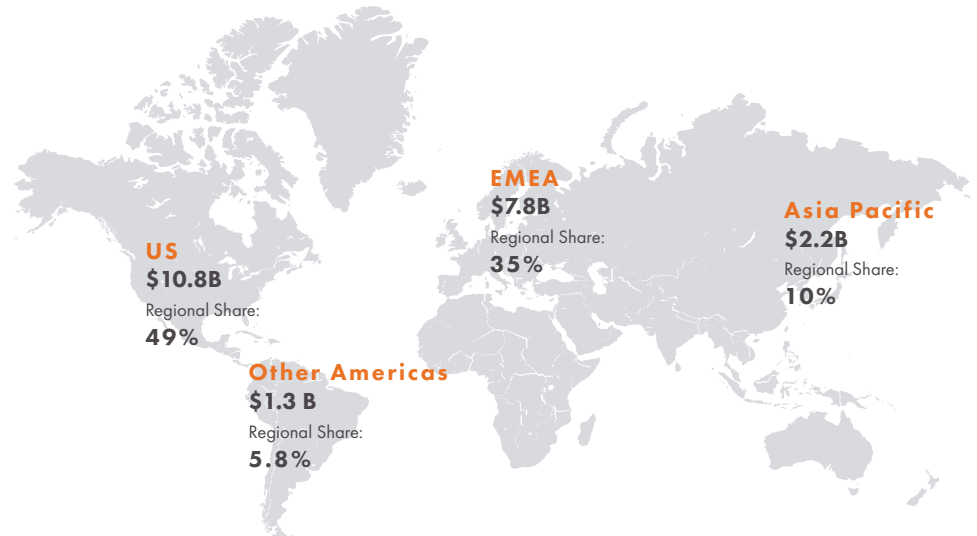
Mitratech has acquired five companies in 12 months, enabling its expansion into GRC and Health & Safety markets to create a "total risk management solution."

Neota Logic provides platforms on which law firms can build automated legal services by providing the building blocks to design a product without knowing the coding behind it.

Ravel Law partnered with the Harvard Law School Library to digitize its collection of US case law. The materials will be **searchable** through Ravel.

Geographic Distribution

2015 Estimated Revenue (USD Billions)



By the Numbers

- \$22B** Size of the total Legal & Regulatory global solutions market in 2015.
- 5.0%** Decline of Legal & Regulatory global solutions market in 2015.
- 39.8%** Combined market share of the 10 largest international legal information solution providers.
- \$8.8B** Combined revenue of the 10 largest legal and regulatory global solution providers in 2015.
- 2.1%** Outsell's CAGR forecast for the legal and regulatory solutions market from 2013-19.

Source: Outsell, Inc. Research & Analysis

Science, Technology & Healthcare

This segment covers the Scientific & Technical Information and Solutions, Geophysical & Geomapping, Medical Information, Health Information & Health IT and Pharma Information and Solutions markets.

Trends and Hot Spots

Scientific & Technical Information & Solutions

- The storage, accessibility, discoverability, and interoperability of data, the expansion of the Open movement, and increasing use of predictive and prescriptive analytics to monetize opportunities.
- Continued focus on the individual researcher/professional and services supporting their workflows.
- SciHub forcing the conversation around copyright, and access and usability of scientific research.

Geophysical & Geomapping

- Severe cost-cutting measures due to the energy sector crisis and oil process slump, including portfolio rebalancing, asset stacking, and headcount reductions.
- Renewed focus on high added-value business and multi-client services to protect revenues and underline value to clients.
- Continued expansion into new and adjacent segments to drive growth.

Medical Information

- National and Governmental policies (such as the US Precision Medicine Initiative) driving new research, reference, data, and training solutions.
- Information solutions designed for mobile devices

continue to proliferate as physicians use them to access work-related content as a means to save time, lower costs, and improve quality of care.

- Significant investments in adaptive learning, community-based services, and video-based content use.

Health Information & Health IT

- An abysmal year of data breaches ensures security remains top of mind for many.
- Telemedicine solutions supporting the goal of anytime/anywhere care via two-way video feeds. Equally, offerings focused on the continuum and coordination of care continue to trend.
- Patient engagement as a high-impact issue.

Pharma Information & Solutions

- A shifting landscape as the technology, information, and consulting markets overlap and morph.
- Data sources such as Real World Evidence and self-reported data are part of the mix as technological innovation and advanced analytical capabilities offer ways to track and leverage higher data volumes.
- Data quality, trust, and security are crucial given the digitization of life sciences and expansion in EHRs, the Cloud, mobile applications, and networked medical devices.

Market Ecosystem and Segments

2015 Estimated Global Revenue (USD Billions)

Health Information & Health IT

\$80.1B Revenue
10.2% YoY Growth

Segment Leaders

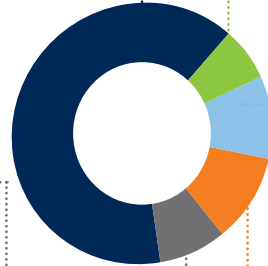
- Optum Insight
- Cerner Corporation
- Cognizant Technology Solutions
- McKesson Corp.
- Xerox

Medical Information

\$10.7B Revenue
-1.9% YoY Growth

Segment Leaders

- Elsevier
- Wolters Kluwer
- WebMD
- Holtzbrinck
- John Wiley & Sons



Pharma Information & Solutions

\$8.5B Revenue
6.0% YoY Growth

Segment Leaders

- Quintiles
- LabCorp
- InVentiv Health
- PAREXEL International Corporation
- INC Research

Scientific & Technical Information and Solutions

\$12.9B Revenue
-3.4% YoY Growth

Segment Leaders

- Elsevier
- IHS, Inc.
- Springer
- John Wiley & Sons
- BSI Group

Geophysical & Geomapping

\$13.6B Revenue
-11.0% YoY Growth

Segment Leaders

- CGG
- Fugro N.V.
- Petroleum Geo-Services
- DigitalGlobe, Inc
- TGS-NOPEC

Companies to Watch

Established Leaders

Elsevier (S&T + Medical): \$2.9B Revenue, -4.1% YoY Growth

CGG (Geo): \$1.7B Revenue, -29.4% YoY Growth

Optum Insight (Health): \$6.2B Revenue, 18.5% YoY Growth

Quintiles (Pharma): \$1.3B Revenue, 3.0% YoY Growth

Disruptors

S&T: SciHub, Digital Science, Kudos

GEO: GAFM, the non-sector Enterprise

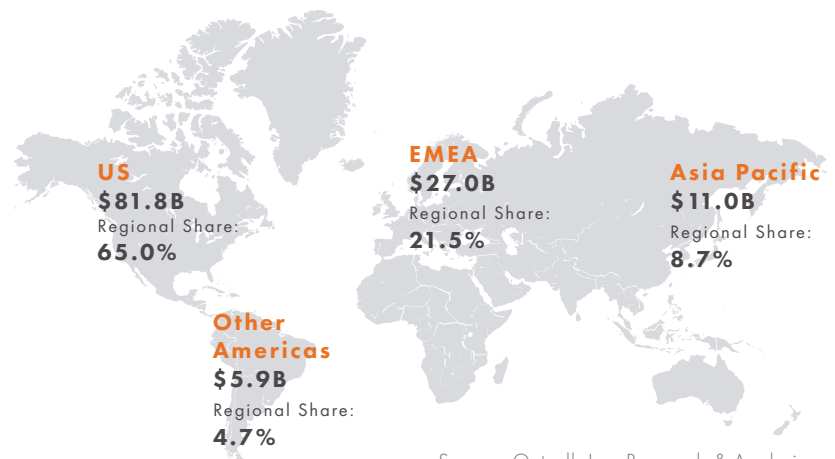
Medical: WK Health, Future Science Group, Doximity, NIH

Health: Salesforce Health Cloud, RES Software, Signet Accel, eClinical Works, IBM Watson Health

Pharma: Shyft Analytics, Truven Health Analytics, TriNetX, Zephyr Health

Geographic Distribution

2015 Estimated Revenue (USD Billions)



Source: Outsell, Inc. Research & Analysis

Companies to Watch



Affectiva: Spun out of MIT's Media Lab, [Affectiva](#) has emerged as a leader in emotive AI and facial recognition.

Originally focused on studying autism,

Affectiva found more demand and revenue from advertisers than it did from studying health issues. It measures people's emotions in real time as they watch videos, applying AI techniques, and analyzing and delivering the results via a SaaS-based platform. Projects run significantly faster and cheaper than traditional tests such as focus groups. With 4 million faces scanned so far and an exclusive relationship with WPP and their Millward Brown research arm, Affectiva looks to use its recent funding round on investing in tech more and pursuing HealthTech and FinTech next.



Authorea: Founded by two grad students in 2012 to write and collaborate on technical documents, the

platform supports scholars or researchers with math annotation or in data-driven fields such as physics or computer science, as well as sciences such as computational biology. Users are young professors, early stage postdocs, Ph.D.s, and graduate students. Users can drag and drop images and data to construct a paper, and they can share data behind a scientific or technical figure, and then deposit papers into an open repository. Customers are institutions, but unaffiliated individual users can use the tool at no cost, paying a monthly premium only for collaborating privately. [Authorea](#) positions itself as part of the open

science movement and believes the future is all about reproducible science.



BDS Analytics: Tracks the emerging cannabis industry with transaction data from dispensary point-of-sale system.

Founded by former McKinsey and NPD Group employees, [BDS Analytics](#)

provides information and insights to dispensaries, brands, and growers. The company has received \$1.5 million in investment and has about 10 employees.



Blendle: Reinvigorated the dream of micropayments in 2016. [Blendle](#) has been working with some of the biggest brands in news, including *The New York Times*, *Wall Street Journal*, *The Economist*, and *New York* magazine. They have an epic struggle ahead if they're going to make micropayments work, but they're the leading candidate to own this business. If they succeed, they'll be in a strong position to influence what people read.



BlockTech: Supports various blockchain transactions, possessing insight on the many transactions surrounding individuals or organizations — new metrics that could support credit assessments. Its novel business model for cryptocurrency consists of two approaches: mining and utility. Mining covers [BlockTech](#)'s operational costs and offers

network security for new blockchains, enabling profits for users and investors. Utility draws more users to use cryptocurrency in hopes of maintaining a steady increase in its demand and volume, and an increase in coin prices.



Busuu: A language-learning online community with 55 million registered users, growing by 30,000 to 50,000 users each day. The company announced a funding round from McGraw-Hill Education in 2015 and has since launched a B2B corporate language learning venture sold exclusively by McGraw-Hill. Startups like [busuu](#) are getting to a size where they are fundamentally changing the market landscape of the sectors in which they play.



Civic Science: Emerging out of Pittsburgh's Carnegie Mellon University, [Civic Science](#) produces a syndicated "poll of the day" that runs across multiple publisher sites. They then stitch together the data and provide demographics and psychographics on respondents. Civic Science offers the results back to media companies and publishers for free, while charging brands for this capability and for custom, exclusive questions. Its question-stitching approach addresses issues found in traditional surveys, mainly professional survey takers, and fraud from bots and low complete rates.



Co/Counsel: A new crowdsourcing legal research platform that is also pursuing the legal research market using better graphic interfaces to serve both lawyers and laypeople. It aims to visually map the

logic of law by organizing cases, statutes, and articles into interactive flowcharts with similar legal principles grouped into factors and sub-factors. In the law school market, professors are using [Co/Counsel](#)'s visual mapping platform to allow students to build out the logic of the law and provide a visual and interactive component to legal education. It caters for digital natives currently going through law school that approach legal research in more visual ways instead of methods that are rooted in a print paradigm.



CrowdFlower: A data crowd-sourcing company that has received \$10 million from investors, including Microsoft, to combine training data, machine learning, and humans in a single platform. The company combines human-labeled training data, machine learning models, and human-in-the-loop capabilities to help companies extract information from unstructured data. [CrowdFlower](#) has received \$38 million in investment and has roughly 250 employees.



DataFox: Automates the collection and integration of public information to build a company and person database. Their software uses machine learning to identify new prospects and actionable sales triggers from thousands of data sources. [DataFox](#) has 75 employees and has received \$6.8 million in investment.



Digital Asset Holdings: A star on Wall Street positioned to be the leader in offering financial infrastructure and APIs

via blockchain. It constructs encrypted, distributed straight-through processing (STP) tools for the financial community, with the objective of enhancing security, efficiency, compliance, and settlement speed. Investors of [Digital Asset Holdings](#) are not just venture capital or private equity firms, but the major banks (the users), themselves, demonstrating the demand and urgency for the platform to be on the market.



eBrevia: Uses artificial intelligence, including machine learning and natural language processing technology, to extract data from contracts, bringing increased accuracy and speed to contract analysis, due diligence, and lease abstraction. In 2015, the company launched eBrevia Bespoke, enabling their customers to identify and extract specific contractual terms unique to their industry, domain, or project. This makes the software highly adaptable, and it places [eBrevia](#) in a good position, in light of Brexit, as every contract that a company has entered will potentially need review to find clauses that are reliant on the UK's membership in the EU.



Elliptic: Uncovers illegitimate activities on bitcoin blockchain and offers its services to law enforcement agencies and financial firms. Its birth stems from the public perception that bitcoin is the global criminal's currency of choice and that such payments are anonymous and untraceable. [Elliptic](#) forensic technology proves this is not the case. The method Elliptic uses to identify the source of transaction fraud in cryptocurrency has made the solution provider a key player in the blockchain space (and the financial crime arena).



Entelo: [Entelo](#) provides enterprise software for data-driven recruiting and serves more than 425 companies, including 15% of the Fortune 500. The platform combines machine learning, predictive analytics, behavioral listening, and social signals to help recruiting organizations identify, qualify, and engage with talent. This combination of data resources provides a compelling 360-view of an individual, supporting corporate talent development goals.



Immerse Learning: A 3D virtual platform for learning, training, and knowledge sharing. Immerse Learning is well placed to thrive in the increasingly digital world of professional training, where demands such as improved user engagement, auditability, and demonstrably better learning outcomes speak strongly to the values that the [Immerse](#) platform can deliver.



Kensho Technologies: A top unstructured data analytics provider in financial services that combines statistical computing with machine learning and natural language to enable next-generation investment-decision support. It is backed by Goldman Sachs, In-Q-Tel (the venture capital arm of the CIA), and Google Ventures, which means a creditability "sign-off" by the government, Wall Street, and Silicon Valley, respectively. Moreover, [Kensho](#) drew its talent from the best unstructured analytics talent pool: Google, Apple, Facebook, and top academic institutions.



Kira Systems: A software provider that, using artificial intelligence, searches

and analyzes text in contracts, delivering improved levels of speed, efficiency, and quality to previously manual processes. [Kira](#) works “out of the box” with little setup time, and it can be “trained” by law firms to learn from the firm’s specialist expertise, which allows for delivering on specific requirements for the firm’s clients. Leading law firm Clifford Chance partnered with Kira in July 2016, enabling the law firm to leverage AI for tasks such as document review in M&A due diligence. It follows deals that Kira has entered with DLA Piper and Deloitte earlier in the year. As with eBrevia, this AI document review providers will be in even greater demand after Brexit.



Kudos: With its strong growth in terms of both individual researchers and publisher partnerships and initiatives, Kudos continues to impress with its drive to advance the researcher reputation management space. Now with evidence-based support for the positive correlation between promotional activities and the broadening of access to research, [Kudos](#) has strengthened still further its embodiment of key industry trends such as renewed focus on the needs of the individual researcher, the move to a broader range of workflow-related tools and solutions, the rise of altmetrics, and improving both the discoverability and reach of research.



Mattermark: Gathers and makes sense of company information for marketers, investors, and researchers. [Mattermark](#) pulls information from websites, regulatory filings, news, social media and databases, and applies machine learning to profile companies and people. It has received \$17 million in investment and has roughly 75 employees.

MITRATECH

Mitratech: A provider of enterprise legal management solutions, it competes against Wolters Kluwer’s ELM solutions and Thomson Reuters’ Legal Tracker. [Mitratech](#) has made five strategic acquisitions in the past 12 months, including Hitec Laboratories, a provider of GRC enterprise software, and CMO Software, a solution provider in the Environment, Health & Safety (EHS) and GRC markets. The acquisitions enable Mitratech to extend its market to become a “total risk management solution,” offering end-to-end legal, compliance, and operational risk offerings. It underlines the importance of all-inclusive platforms in extending markets by adding additional tools, content, software, and data sources.

NUMISIGHT

Numisight: Provides proprietary data, algorithms, reporting, and interactive visualization to help identify anomalies in a blockchain. More specifically, [Numisight](#) can reveal how blockchain transactions are connected and depict such relationships on a visual graph. Users of bitcoin (as well as investigators) can now view when, where, and how blockchain-enabled transactions are conducted, helping the community identify any sources of potential problems.



PluralSight: An enterprise technology learning platform that provides members with on-demand access to a digital ecosystem of learning tools, including adaptive skill tests, directed learning paths, expert-authored courses, interactive labs, and live mentoring. [PluralSight](#) has made eight acquisitions in the last three years, and it is making the most of e-learning capabilities to challenge more traditional players in the corporate training market.



PushSpring: Unlike traditional DMPs and marketing analytics providers, mobile DMP [PushSpring](#) has device IDs gathered directly from the devices of over 170 million people. This also includes detailed data on the full spectrum of apps used as well as the media and content consumed, in real time. Marketers can then use its tools to create personas and unique audience segments that can be exported to DMPs to make targeted mobile ad buys.



QPID: Clinical Decision Support tool [QPID](#) (Queriable Patient Interface Dossier) formed in 2005. QPID can take a patient's schedule for procedures such as colorectal cancer screenings and correlate that with potentially heightened risk factors using data in the HER. Using that data and evidence-based content to review a patient's circumstances can surface important new information. Using a specific patient's information is, furthermore, true decision support. In addition, QPID is a small, ambitious, and relatively young company with nice growth potential. Although mom-and-pop shops manually providing what QPID does electronically will soon realize they need to take the approach, QPID is taking to their processes — and barriers to entry are low. QPID has first-mover advantage and a strong leadership team.

realeyes **Realeyes:** The other provider in the emerging emotive AI space, this London-based firm launched out of Oxford University. It compares test results to a growing database of normative comparisons that can tell marketers how their video-based ad scored in comparison to similar content tested. With a partnership with Ipsos and the

ability to predict earned media impact of video, [Realeyes](#) is looking at other predictive metrics such as heart rate monitoring via webcam and eying additional vertical segments beyond consumer advertising.



RES Software: Addressing security problems in regulated industries, healthcare is its largest vertical. Risk resides in roaming clinicians, USB drives, and mobile devices. In each situation, [RES](#) prevents access to patient information in public places and locks down flash drives where appropriate. It has grown by 103% in the Americas in healthcare (compared to 30% growth in all segments), and it has a 90% renewal rate, of which more than 50% is attributable to healthcare.



ROSS Intelligence: An early stage Canadian startup that provides artificial legal intelligence built on Watson, IBM's cognitive computer system. NextLaw Labs, a subsidiary of global law firm Dentons, provided [ROSS Intelligence](#) with venture funding and could lead to increased deployment of artificial legal in the legal services market. Its customers also include Latham & Watkins, the world's highest-grossing law firm. ROSS understands the legal questions users pose in natural sentences, and it provides answers sourced from a variety of content sources, including legal guides, statutes, and cases. Law firms can train ROSS in legal research, and provide their clients with a unique automated legal assistant tailored to their specific requirements.



Sailthru: Originally focused on marketing-based personalization tools,

[Sailthru](#) has expanded with a host of services for both brands and publishers. It now offers a Prediction Manager that plays across web, mobile web, and mobile app environments, offering 13 predictive scores out of the box. Sailthru helps marketers determine where to spend their ad dollars and how to get the most out of all their cross-channel digital efforts.



SciHub: The pirate site [SciHub](#) for scholarly literature is acting as a lightning rod for discussions around fundamental issues such as copyright, pricing, open access, and the accessibility and usability of data.

The debate seems set to continue for some time, too — Alexandra Elbakyan is driven, passionate, and able to evade attempts being made to shut her down.



SmartNews: [SmartNews](#) has reached monetizable scale in its home market of Japan. It received another \$38 million on a valuation of over \$500 million. The company has been operating in the US since October 2014. They're the biggest and strongest pure news aggregator.



Third Space Learning: Online, 1:1 maths tutoring using a team of tutors based in Asia. One of the company's long-term

ambitions is to create an artificial intelligence module to infer best teaching practices, shifting [Third Space Learning](#) from being a service business to a solutions business.



TransUnion: As a key player in the consumer credit information space,

[TransUnion](#) is evaluating various unstructured data analytics, combined with trended data, to yield a new perspective in assessing creditworthiness. Unlike traditional credit information that takes a snapshot of an individual's financial record to assess creditworthiness (only taking into account of the person's ability to pay on time and at least the minimum monthly payment amount), trended data offers a detailed account of a consumer's financial transaction history (taking into consideration how the individual maintains balances/debts over a period of time). As such, the level of analysis feasible on trended data is more telling of a person's debt management and spending behavior.



XpressBuy: Focused on bringing mobile advertising, marketing, inventory data, and mobile payment capabilities

closer together, [XpressBuy](#) focuses on delivering better ecommerce solutions. Its offerings let brands connect to retailers and execute seamless shopping and buying experiences between social and the mobile web. Its first step was to create a seamless shopping and buying experience within Instagram, whereby goods can be viewed, customized, and paid for, all without leaving the social platform. It looks to provide similar capabilities on other social platforms soon.

zenreach Zenreach: [Zenreach](#) takes a Wi-Fi router and adds smart CRM, marketing analytics, dashboards, email marketing, and customized mobile gateway tools on top. It lets retailers offer free Wi-Fi to shoppers in exchange for their email address, enabling retailers a jump on first-party data, rather than relying on in-store beacons that try to match device ID data with other data sets, which is still not an exact science.

Essential Actions

With the accelerating pace of change, new players driving growth, and the opportunities and threats that **All Data, Nothing But Data** brings, we end with our essential actions and steps necessary to thrive and grow.

✓ Determine a Platform Strategy

Today, firms must know which markets they will target directly and which they will serve indirectly. Being a platform requires scale, even in a niche environment. That requires resources and, most of all, the talent to go after and own the space as a No. 1, 2, or 3 market-share leader. Being midsize is a challenge. Being small and nimble can be fruitful. It's essential to be clear about what markets one can own and which are required to run through someone else's ecosystem. This includes having platform technology architecture and being prepared to run data through the entire fabric of the enterprise in and through commercialized solutions — from metrics on operations to analytics on marketing and internal talent. It's all data, all the time.

✓ Take the Data Business Leap

Take stock of data assets and market opportunities, and jump in, making sure to understand market pain points, competitive holes in the market, and adjacencies from core service offerings that fill niche gaps. Know the audience and address recurring workflow needs. Calibrate content breadth, depth, and analysis based on well-established use cases. Determine a data sourcing strategy to fill the gaps and execute a business development function that brings in data essential to the platform strategy or license out non-vital data to the direct markets, making sure to fill gaps left by others. This is new revenue opportunity for the data exhaust a company possesses. Growth to scale takes time, and successful entry into a data business often requires M&A, including the acquisition of talent with deep data experience.

✓ Get the Business Model Right

Like data, business models can be multidimensional. Find the combination of fee and free that maximizes conversion and retention. Regardless of internal complexities, business models and pricing are ideally easy for the market to understand.

✓ **Get the Defense-Offense Balance Right**

Part of the talent mix is a Chief Content Officer or, in some cases, a Chief Data or Chief Analytics Officer who is responsible for the use of data in the enterprise, including the data in offerings and the quality and integrity of it. The charter must embody a balanced portfolio of defensive and offensive responsibilities. Both are critical for the enterprise. Look across the entire business lifecycle, from the demand side all the way through to delivery. Bringing all key enterprise stakeholders together around the common theme of data as a strategic asset is where the CDO/CAO/CCO will add value.

✓ **Hire the Right Skill Set**

It's often the case that new leaders inherit IT or data teams with skill sets that are not optimal for a data-first charter. While it's important to retain deep subject matter expertise, which includes both industry knowledge and an understanding of all of the moving parts within a business, new skills are invariably required to advance business objectives in a data-driven era. This includes product management, data scientists, and UI/UX that understands use cases and how best to display or make data usable in new and innovative ways. As data becomes an indispensable part of the enterprise, organizations must have a common awareness of the impact it will have on their business. The successful CEO must build a proactive culture for leveraging data in all aspects of the business.

✓ **Benchmark and Beat Industry Norms**

As always, we advise leaders to compare company performance — and theirs as leaders — with that of similar companies. Commitment to understanding norms and to achieving/exceeding benchmarks is critical to competitiveness, innovation, and healthy growth. We remain here to serve these needs through our array of syndicated services, memberships, and custom research programs.

Meet the Team

Outsell has assembled a global team of executive-level analysts, most with more than two decades of experience developing, marketing, selling, buying, deploying, and using information and content technology. We're all here to serve, and any person you call is the right person.



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Data Analytics

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