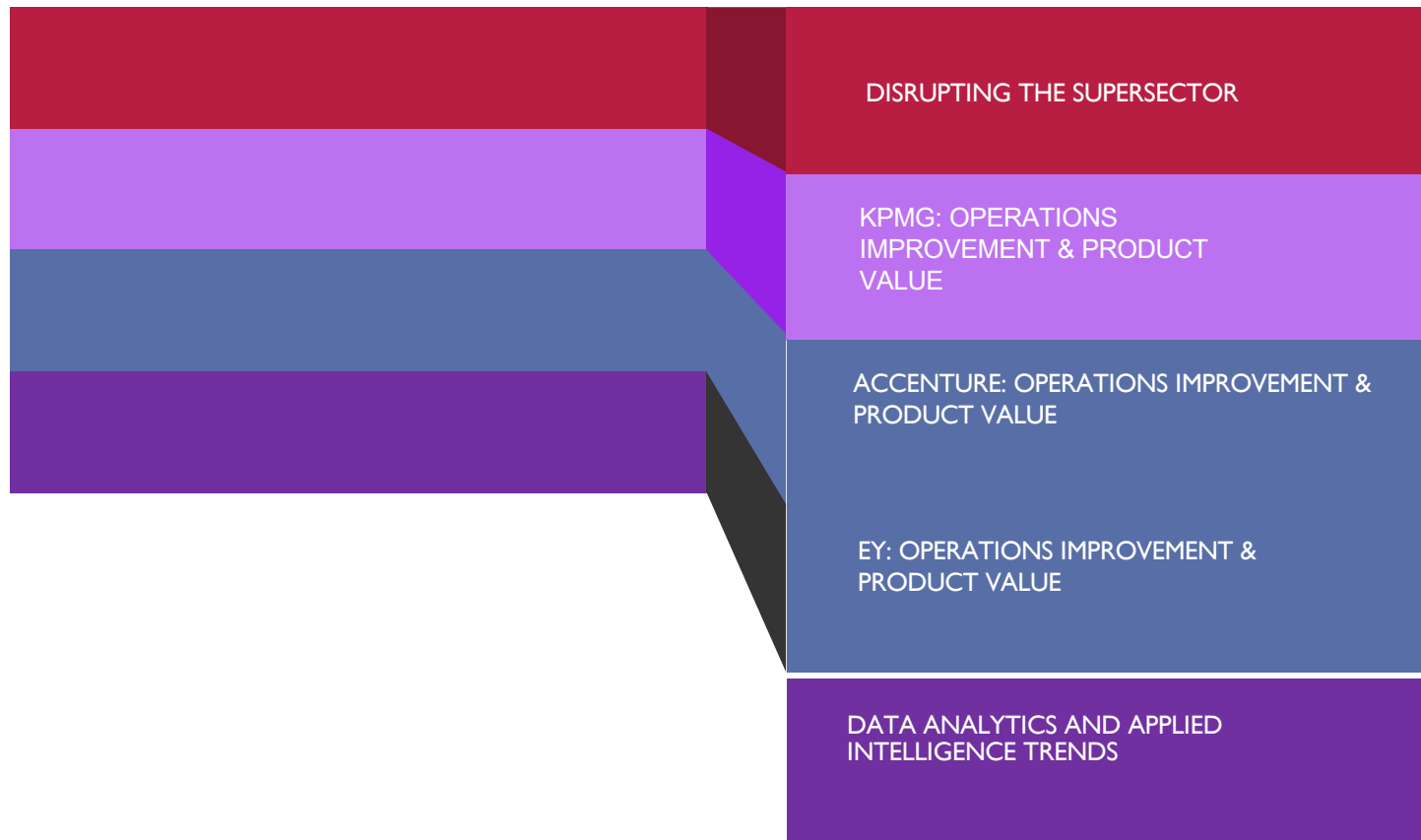


CONSULTING INDUSTRY MARKET STRUCTURE KEY TRENDS AND DISRUPTIONS





Fast Track Insights



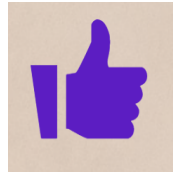
Disrupting the Supersector

The consulting sector is traditionally associated with large revenues and a relatively stable operating environment. Until recently, experience and a good reputation were the keys to success.

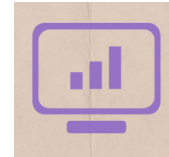
However, the changing market conditions introduced new challenges:



New entrants challenge conventional fields of expertise through the provision of niche services



Clients have more sophisticated expectations: omni-channel, agile services are increasingly becoming the norm, whereas cost-efficiency is a priority



Technologies disrupt traditional businesses, drive new demands, and present new skill challenges

Disruption in business theory, occurs when a new market emerges and the value network this market creates eventually displaces established market-leading firms, products, and alliances.

Digital transformation is the integration of digital technology into all areas of a business, fundamentally changing how companies operate and deliver value to customers. It's also a cultural change that requires organizations to continually challenge the status quo, experiment, and get comfortable with failure¹. The need to be digitally transformed, however, is a matter of survival, too. In this wavelength, if firms neglect or delay the adoption of digital tools, disruptions can emerge and challenge their position in the market².

There are multiple aspects in the relationship between technology and the consulting supersector:



Digitization as a Consulting Service: Researchers, clients and consultants see the field of digitization on top of the agenda. Clients increasingly take the leap of faith towards digital transformation and seek consultants to ask for help and guidance. To this end, firms have started building departments that address specifically these needs: Accenture Digital and Digital/McKinsey, for instance, help clients design their digital transition and assist them in embedding the changes in the organization's culture.



Digitization to Boost Internal Efficiency: Web-conferences, knowledge management systems, and ERP software can all dramatically improve a firm's performance. At the same time, big data and analytics can indicate patterns, predict trends, and minimize risks. AI tools can speed up processes and they allow consultants to dedicate their time on relationship building. Ultimately, internal digital transformation can lead to a complete automation of the consulting services, with activities being both fully digitized (i.e. electronically performed and delivered with the help of Internet technologies) and automated (i.e. the transfer of tasks previously performed by humans onto artificial systems)³.

² Nissen, V. (2018). Digital Transformation of the Consulting Industry: Extending the Traditional Delivery Model. Cham: Springer International Publishing.

³ i-Scoop (2019). Digital transformation: Online guide to digital transformation. (n.d.). Retrieved from <https://www.i-scoop.eu/digital-transformation/>

Disrupting the Supersector

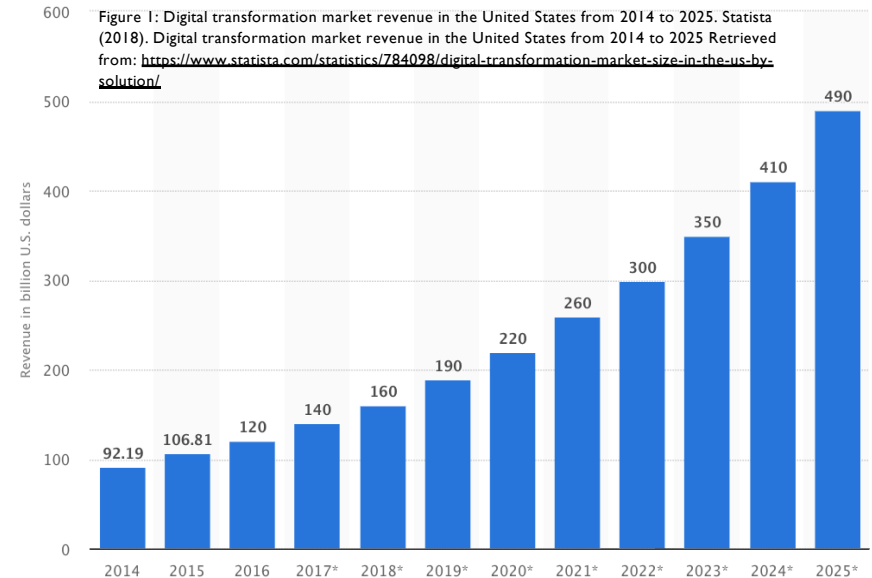
In the last 18 months, the worldwide digital transformation industry has nearly doubled, with sales increasing over three years by more than \$20 billion. Although the sector's digital transformation services remain a fairly new entry, attempts to incorporate innovative, creative technologies into business operations have become so crucial for the sustainability of companies that technology integration has come to be the ultimate buzzword. The global digital transformation industry was found last year to represent £ 2.26 billion, or £ 7.31 billion, in the United Kingdom's advisory market. The pattern has been repeating worldwide, with digital transformation consulting disrupting dramatically the US business landscape.

The trend offers the biggest consulting companies a remarkable chance for growth and expansion. Certain firms, such as the Big Four--PwC, Deloitte, KPMG, and EY--host talents of all shapes and sizes, as well as the diverse teams necessary to oversee a digitalization process successfully from start to finish. Since digital transformation projects require multidisciplinary expert pools that can transform internal operations and processes, larger companies are the first ones to benefit, as their capacity allows them to initiate projects and set up suitable teams. Strategy Consulting companies also profit greatly from digital transformation, as they are well positioned to help clients anticipate the potential pitfalls and shortcomings of projects, while building innovative technology into a business plan, rather than digitizing for digitization's sake. Top strategy firms McKinsey & Company, Bain & Company and BCG (known collectively as the MBB) have each invested heavily in their digital lines in anticipation of this.

According to a recent poll by Source Global Research among consulting industry clients, however, the trend does not freeze out smaller players either. Businesses tend to speak very positively about mid-sized strategy firms' digital transformation capabilities. According to the study, mid-market competitors are not being left out of the action either, with the likes of L.E.K. and A.T. Kearney sitting alongside much bigger firms when it comes to the quality of their digital transformation work, despite their breadth of digital services rarely being as wide as the biggest firms. The flexibility and nimbleness of mid-sized strategy players compared with their larger peers was considered a major selling-point by clients polled.

This is to some extent because of changing client behaviour, driven by cost-pressures. In the past, mega IT projects were engaged as bigger was often assumed to be better. Now, firms are keen to seek more cost-effective, agile strategies amid an uncertain economic environment in the UK and US particularly, prompting clients to focus on value for money. While digital transformation is indeed big, some clients want to attack it in smaller chunks. Pilots, proof of concepts, and rapid prototyping in small engagements is increasingly popular – in part because some clients are also unwilling to place responsibility for such a key business aspect in the hands of one firm – with companies moving toward larger overall aspirations of a digital transformation via small, quick steps, handing smaller, more agile consultancies an inherent advantage⁴.

⁴ Consultancy.uk (n.d.). Digital Transformation Consulting Market Accelerates to \$44 Billion. , www.consultancy.uk/news/17223/digital-transformation-consulting-market-accelerates-to-44-billion.



Disrupting the Supersector

When it comes to the internal operations of consultancies, however, the cobbler's children wear no shoes:

Although digital solutions are high on customer demands, the firms themselves haven't taken decisive steps towards embedding digital tools in their internal processes and operating model.

Harness Data to transform and tailor its outreach to target consumers, and hiring specialized staff⁵.

What is certain is that adoption of digital tools can, in the long run, affect the culture of an organization-which is critical to its digital maturity. By focusing on creating a fun, rewarding, and engaging environment for staff, an organization stands to boost happiness and as a result, raise overall productivity by around 12%.

The firms that do address the challenge, have either created separate digital transformation units or they have acquired new companies with expertise on the field; however, most consultancies have given a stronger focus on how to best serve their clients externally than how to embrace a digital culture internally.

Deloitte was the first one to create a separate digital unit called Deloitte Digital, followed by Accenture Digital in 2013, and BCG Digital Ventures in 2014.

Other firms have instead established digital teams that work across units, so that digital expertise can be transferred across sectors and get easily applied to any project and task in a flexible way⁶.

According to McKinsey Global Institute (2016) most companies are capturing only a fraction of the potential value from data and analytics⁷

5. DMI Blog (2019). "Digital Transformation: 5 Examples of Organizations That Excel." Digital Marketing Institute, Retrieved from: digitalmarketinginstitute.com/en-eu/blog/01-11-17-digital-transformation-5-examples-of-organizations-that-excel.

6 Henke N., et. al. (2016). "The age of analytics: competing in a data-driven world". Retrieved from <https://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/the-age-of-analytics-competing-in-a-data-driven-world>

Figure 2: To what extent are digital engrained in your company culture? Henke N., et. al. (2016). The age of analytics: competing in a data-driven world. Retrieved from <https://www.mckinsey.com/~media/mckinsey/business%20functions/mckinsey%20analytics/our%20insights/the%20age%20of%20analytics%20competing%20in%20a%20data%20driven%20world/mg-the-age-of-analytics-full-report.ashx>

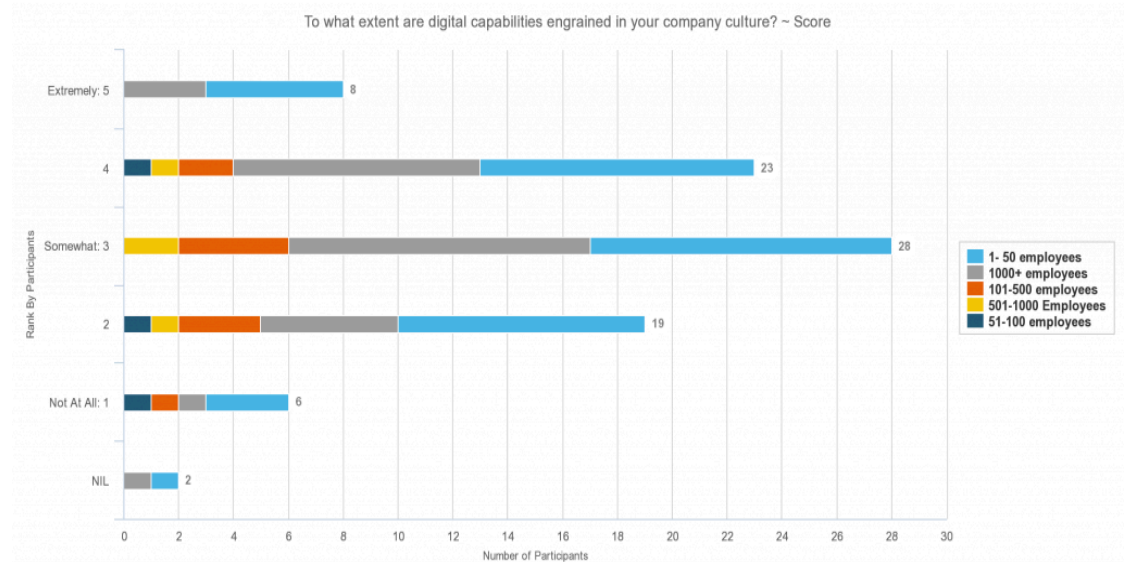
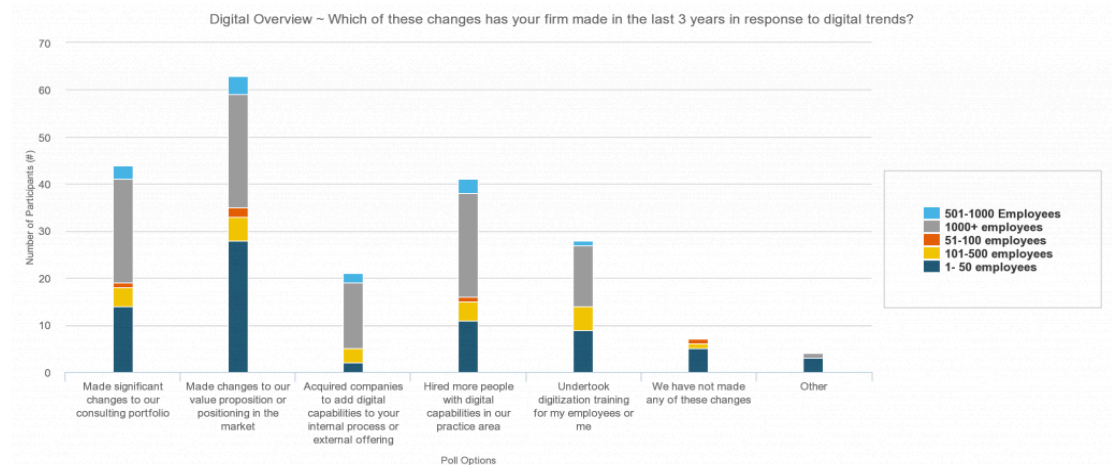


Figure 3 Which of these changes has your firm made in the last 3 years in response to digital trends? Henke N., et. al. (2016). "The age of analytics: competing in a data-driven world". Retrieved from <https://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/the-age-of-analytics-competing-in-a-data-driven-world>



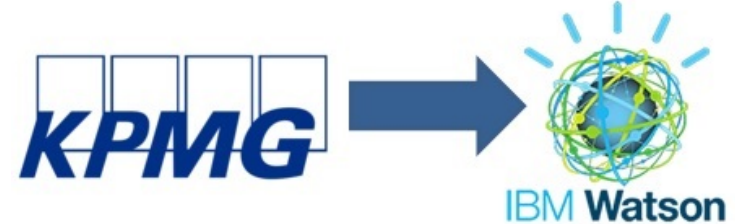
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Digital Case Studies

- ✓ KPMG/Watson
- ✓ Accenture - Applied Intelligence Platform

Digital Case Studies: KPMG/Watson

KPMG's Alliance with IBM



KPMG's network of firms has investigated opportunities for deploying intelligent automation technologies to drive operational efficiency and create a platform for innovation using intelligent automation technologies.

- **Reporting and data:** Adopting a new digital operating model will become an enabler for data quality programs, performance dashboards, and centralized real-time information to enable better management information.
- **People and change:** Refining the employee value proposition across the organization will become increasingly important. The new operational environment means you will need to upskill resources, provide alternative career paths and reinvigorate existing roles, such as continuous improvement specialists and process owners.
- **Governance model:** The new environment will give you better control of changes or decisions that could affect operations. An environment with clearly defined roles and responsibilities will have potential impact across your current and target operating model.
- **Technology ecosystem:** Intelligent automation can make it easier to deploy resources across different virtual environments. This can make operations more resilient, accelerate integration across systems and buy you time to address more structural and costly systemic changes.
- **Process design:** Intelligent automation provides an opportunity to design thorough processes and realize the associated benefits. This will make operations more consistent, reduce process fragmentation, and make ways of working more transparent.
- **Organizational impact analysis:** Automation will shift the organization's focus from a departmental view to a process view. New roles will be created to control the digital operation, handle exceptions, and maintain and change bots. All of this will enable better integration across functions and geographies.
- **Risk and compliance:** Deploying digital labor will give you measurable SLAs and auditable processes. Overall adherence to processes, policies and data disclosure across the organization will be significantly enhanced.¹⁶

KPMG has allied with IBM to create a source of competitive advantage in the market and to successfully address its clients complex enquiries in an era of technological disruption. From helping organizations make the most of their ERP implementations to developing joint solutions that capture the power of IBM's software with the specialization of KPMG's advisory services, the alliance continues to bring innovative answers through the use of IBM's Watson technology that enables KPMG's Audit, Tax and Advisory practices to harness the power of cognitive computing¹⁷.

¹⁶ Accelerating automation. (n.d.). Retrieved from <https://advisory.kpmg.us/articles/2018/accelerating-automation-faster-smoother-journey.html>

¹⁷ KPMG and IBM. (n.d.). Retrieved from <https://home.kpmg/us/en/home/services/strategic-alliances/kpmg-and-ibm.html>

KPMG & IBM-WATSON For Tax And Audit Services

By incorporating AI and cognitive technologies, and by re-engineering workflows, KPMG is taking a path where its partners' and employees' work is enriched by having powerful insights from relevant structured and unstructured data. Especially in the complex areas of audit, tax, and advisory, KPMG is seeking to implement innovative tools and technology solutions to turn work products into valuable contributions. KPMG's cognitive lab has opened in order to help the firm integrate new technologies like IBM Watson into both KPMG's internal operations and accelerate growth for clients. The lab brings the firm's domain expertise to life in new formats, and creates powerful solutions and services around cloud, data, and AI that enhance and scale expertise. The Cognitive Lab is focused on shortening cycles of training and teaching these smart machines to assist and augment human decision-making. By creating new methods and approaches that combine domain knowledge, data sets, and technology to achieve this, KPMG is accelerating innovation and introduces disruptive offerings¹⁸.

WATSON, IBM's software is the first commercially available cognitive computing system; it can analyse data and information more like a human than an actual computer, as it understands natural language, generates hypotheses, and learns as it goes. As such, Watson can generate responses based on insight elicited by large amounts of data and can help to dramatically minimize risks and spot opportunities.

In a nutshell, WATSON can:

- Analyze large volumes of structured and unstructured data at rapid speeds, using natural language processing to better understand M&E expenditures and research and development credit eligible activities;
- Ingest and accumulate high volumes of data and insight continuously from every interaction;
- Understand complex questions and evaluate many possible meanings to determine what is being asked;
- Form hypotheses, make considered arguments, and prioritize recommendations to help tax professionals make better decisions;
- Present answers and solutions based on supporting evidence and quality of information found¹⁹.

WATSON'S FUCTIONS

The tool is currently used in KPMG's Tax and Accounting Unit as it has the capacity to help advisors examine massive amounts of information, like loan assets and nuanced tax interpretations, to offer clients richer recommendation. At the same time, the system is able to recommend the correct tax treatment to be followed, with a marginal error of three out of four times. The empowered workforce utilizing Watson, now available, include the KPMG Contract Abstraction Tool for IFRS 16 lease accounting compliance and KPMG Research Tax Credit Services with Watson²⁰.

¹⁸ KPMG (2019). Three lessons KPMG put to use with their Cognitive Lab. (2019). Retrieved July 31, 2019, from <https://www.ibm.com/blogs/watson/2018/03/three-lessons-kpmg-put-to-use-with-their-cognitive-lab/>

¹⁹ KPMG (2019). IBM Watson Tax Meals <https://home.kpmg/us/en/home/insights/2019/05/ibm-watson-tax-meals-entertainment.html>

²⁰ Samuel J., (2018) KPMG unveils cognitive business solutions <https://home.kpmg/xx/en/home/media/press-releases/2018/03/kpmg-unveils-cognitive-business-solutions-to-address-digital-transformation-challenges-under-alliance-with-ibm.html>

Figure 6: Impacts of a cognitive technology enabled audit. Macaulay M., (2017). **How Cognitive Tech Is Revolutionizing the Audit.** Retrieved from <https://www.financialexecutives.org/Topics/Strategy/How-Cognitive-Tech-Is-Revolutionizing-the-Audit.aspx>

Impacts of a cognitive technology enabled audit.

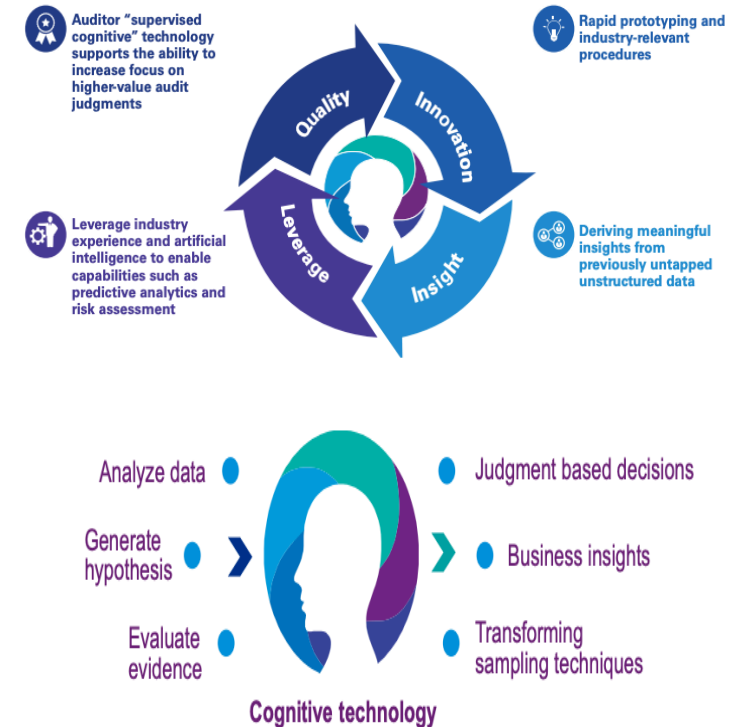


Figure 7: Cognitive Technology. **How Cognitive Tech Is Revolutionizing the Audit.** Retrieved from <https://www.financialexecutives.org/Topics/Strategy/How-Cognitive-Tech-Is-Revolutionizing-the-Audit.aspx>

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Digital Case Study: Accenture

Industry X.0

- From a technology standpoint, a set of digital technologies are settling down to form the foundation of digital transformations resulting in:
- **Autonomous robots** – which are enabling smart, connected, and intelligent machines to collaborate alongside humans in transforming business processes.
- **Horizontal and vertical integration** – of the enterprise and business ecosystems (think of partners and suppliers) to develop real-time integrated views of data and networks across the value chain.
- **AR/VR** – that is reimagining assisted diagnostics, support and maintenance.
- **Additive manufacturing** – where technologies like 3D (and most recently 4D) printing are used for production of small batches of highly customized and programmable products.
- **Cloud** – that has helped in commoditizing the compute, storage and network consumption among other well-known advantages of scale and the sharing economy.
- **Simulation** – providing the ability to digitally simulate entire production assembly lines for rapid prototyping and innovation before even the physical construction has started. Think digital twins!
- **Big Data & Analytics** – that is truly enabling massive scale data processing and insight generation targeted at timely decision making across the key business processes.
- **IIoT** – i.e. the Industrial Internet of Things that is enabling the infusion of intelligence into products, processes, and services that communicate with each other and humans over a global network.
- **Cybersecurity** – ensuring that the enterprise assets, both physical and IT infrastructure, are truly secured from the cyber threat vectors that are continuously on the rise as more systems gets interconnected²⁶.

²⁶ Mitra, T. (2018). How Accenture is reinventing digital transformation through Industry X.0. Retrieved from <https://www.manufacturingglobal.com/company/how-accenture-reinventing-digital-transformation-through-industry-x0>

WHAT IS INDUSTRY X.0?

Industry X.0 is the digital reinvention of industry.

Industry X.0 businesses embrace constant technological change—and profit from it. They move beyond experimenting with IT bundles or SMAC (social, mobile, analytics, cloud) stacks, combining digital technologies to drive both top-line and bottom-line growth. Industry X.0 businesses incorporate Industry 4.0's core operational efficiencies, but also leverage combinations of advanced digital technologies to continuously create new, hyper-personalized experiences in both a business-to-consumer and business-to-business context.

They also boast four distinct value characteristics. Industry X.0 businesses are:

Smart:

Every product and production process is self-monitoring, data-generating, and aware of its ever-evolving business context.

Living:

There is an enterprise-wide cultural capability to act with speed, focus, and agility, to meet needs and seize opportunities.

Connected:

Communications are end-to-end and multi directional, while data-sharing among people, products, systems, assets and machines happens in real time.

Learning:

Adaptive interactions help create increasingly relevant and valuable user experiences over time.

Industry X.0

Accenture is changing the digital landscape with Industry X.0; a framework that underpins the digital reinvention of industry, through which organizations leverage advanced digital technologies to transform their core business operations.

Accenture's end-to-end framework and cross-functional breadth of research and resources allows you to operationalize digital innovation across your business at every stage of product and service development. Using new technologies like IIoT, analytics, AI, robotics, 3D printing and digital twin, you'll unlock new revenue and work with customers, employees, and partners on a whole new level. At Accenture, Industry X.0 is defined as such a framework that underpins the digital reinvention of the industries, through which organizations leverage advanced digital technologies to transform their core business operations in order to reimagine human-centered worker and end-user experiences, and ultimately to drive innovation and growth. New levels of operational efficiencies are harnessed – in the core business operations of research and development (R&D), engineering, product design and manufacturing, by leveraging advanced sensors and networks, and by embedding software-enabled intelligence into integrated products and services. Workers and customer experiences are reimaged and redesigned through immersive and AR/VR technologies. Innovation and growth is accelerated – new business models are formulated and revenue streams generated by unlocking and harnessing the value trapped inside the ecosystem that is developed through connectedness.

One of the fundamental philosophies of Industry X.0 is to transform the core business systems and processes. By introducing modern architecture patterns and principles, legacy systems can be modularized and modernized which, then, opens opportunities to introduce digital technologies into legacy systems. The digital technologies (e.g. microservices, analytics, and immersive user experiences) introduce layers of utilities that unlock the trapped value from such systems and processes. The value realization and operational efficiency gains naturally lead to more viable cost economics. The savings obtained can be subsequently apportioned to invest in rotating the business strategy and innovation to the 'new' – an absolute imperative to sustain and thrive amidst the systematic digital transformation of everything. To consolidate, there are six foundational capabilities that should underpin the digital business strategy to systematically rotate to a new digital business:

- **Transform the core** – invest in digitization along with horizontal and vertical integration of enterprise systems in core business operations around R&D, product engineering & design, and manufacturing operations.
- **Focus on experiences and outcomes** – shift the business strategy, innovation focus, and core competency away from product centricity and into a needs-first true experiential platform.
- **Rearchitect the ecosystem** – to identify, assemble, and liaise with the right ecosystem partners to drive innovation and differentiated capabilities.
- **Innovate new business models** – by offering consumer experiences, leveraging industrial consumerism patterns to disintermediate and reach the end consumers, while innovating new revenue streams and models.
- **Build the workforce** – in a commensurate capacity by new skilling, re-skilling, and upskilling the next generation talent.
- **Manage the wise pivot** – balance the investment, workforce, and funds allocation between *transforming the core* and *rotating to the new*.

Innovation in Industry X.0 broadly touches the disciplines of Connected Products, Connected Operations, Connected Worker, and the Connected Enterprise. Across all the disciplines there is a resonating shift in business strategy from building products to delivering outcomes through digital services and human-centered experiences around the physical product or an ecosystem of products – there is a palpable shift in strategic innovation away from product centricity to building true experiential platforms. Connected Products has a pathway that typically follows the progression from *Products*, to *Products & Services*, to *Products & Differentiated Services*, and ultimately to *Products As A Service*. The benefits and value realization follow a similar, but potentially more exponential, uptake path. While the first wave of maturity of connected products enhances products and the spare parts sales, the second wave of *Products & Services* introduces value through offering customized after-sales plans and hence increased customer touchpoints and engagements. *Products & Differentiated Services* opens channels for upselling more premium services fostered by increased maturity and sophistication of the product and its overall performance. *Products As A Service* opens entirely new opportunities for different economic models like risk-and-reward based revenue sharing, 'pay for what you consume', as well as other innovative consumption-based payment models. The value progression not only increases the number of touchpoints along the consumer's interaction with the product but also increases the addressable customer base. It is the layers of utility that are innovatively engineered into the connected product that fosters the exponential uptake; a few of which go on to disrupt the market²⁷.

²⁷ Mitra, T. (2018). How Accenture is reinventing digital transformation through Industry X.0. Retrieved from <https://www.manufacturingglobal.com/company/how-accenture-reinventing-digital-transformation-through-industry-x0>



Industry X.0

Accenture helps its clients move past Industry 4.0 and become an Industry X.0 businesses, by offering an integrated framework that allows them to draw from an extended range of internal and partner capabilities.

Industry X.0's offerings include the Digital Service Factory, Cybersecurity capabilities, an Innovation Network, and Customer Engagement tools and services that help transform the sector in a holistic, all-encompassing way.

The Digital Service Factory

The Digital Service Factory helps businesses go beyond their capabilities, by accelerating digital transformation and breaking down internal barriers; it enables businesses to bring new digital services to market faster and accelerate the digitization of production and operations. Ultimately, improving efficiencies and connecting employees with information to enable data-driven decision making, all with a modular approach tailored to the way each specific organization operates.

Cybersecurity

Digital Identity:

- Identity and access management;
- Focus on the future to enable organizations to fast-track their identity and access management capabilities at reduced cost;
- Reduced risk of cybersecurity threats by protecting access to the most valuable resources;
- Blockchain and biometrics guidance;
- Help to clients in mapping physical IDs to digital IDs, enabling organizations to pursue new market opportunities that are part of a broader ecosystem.

Cyber Defense

- Security engineering;
- Implement prevention, detection and response solutions across the entire environment (networks, cloud, endpoints, mobile, IoT, IIoT and ICS);
- Digital forensics, incident response and threat hunting;
- Detect, Respond and Recover from threat actors and breaches impacting your business operations;
- Cyber threat intelligence;
- Support decisions with actionable and relevant threat intelligence to improve security maturity.

28 Wellers, D. (2017). Securing Your Digital Future: Cyber Trust As Competitive Advantage. Retrieved from <https://www.forbes.com/sites/sap/2017/05/17/securing-your-digital-future-cyber-trust-as-competitive-advantage/#4aaf9f4e6ccd>

Reasons to invest in cybersecurity as a service:

- 4.2 billion records were exposed in more than 4,000 known data breaches in 2016, according to [Risk Based Security](#).
- Cyber insurance premiums could increase tenfold to [\\$20 billion annually](#) by 2025, according to Marsh & McLellan.
- The cost of data breaches will reach \$2.1 trillion globally by 2019—nearly four times the estimated cost of breaches in 2015, [according to Juniper Research](#).
- Cyber attacks could cost the world up to \$90 trillion in net economic benefit by 2030 if cyber security doesn't keep pace with growing interconnectedness, according to a study published by the Atlantic Council and the Zurich Insurance Group.
- Cyber risk is expanding beyond the virtual world to the physical one. Hackers used highly destructive malware to bring down three [Ukrainian power distribution companies](#) in 2016, for example, cutting power to 80,000 people.
- The expanding universe of Internet of Things devices is particularly vulnerable to exploitation as companies may not update them after installation and many devices are not able to receive security update patches, [according to AIG](#). In fact, an [IoT hack](#) took down Amazon, Twitter, Netflix, and other major sites in October 2016.
- Connected devices pose particular concern in healthcare, an industry that already faces 340 percent more cyberattacks than the average industry and that fails to monitor 75 percent of hospital network traffic, according to [a report from Raytheon and WebSense Security Labs](#).
- Cyberattacks are one of [the top ten global risks of highest concern](#) for the next decade, right alongside such threats as water and food crises, natural catastrophes, social instability, and national governance failures, according to the World Economic Forum.28

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Digital Case Study: Ernst And Young

Ernst And Young Drones For Audit

Auditors are employing new technologies to improve the efficiency and effectiveness of audits. For example, audit firms are now using data and analytics technologies to automate substantive audit testing, and are using robotic process automation software (i.e., bots) to reduce the number of hours that auditors dedicate to repetitive and mundane tasks. In recent years, the Federal Aviation Administration relaxed regulations governing the commercial use of unmanned aircraft systems, commonly referred to as “drones”. This has prompted audit firms and audit regulators to explore the capabilities of drones in audit and advisory services. As described by PCAOB board member Steven Harris, “[accounting] firms are exploring the use of drones to conduct inventory observation,...[but] the extent to which the actual quality of the audit can be enhanced by the increased use of technology tools is still unclear”. Thus, whether using drones as an auditing tool can add value to the audit process is an empirical question that can best be answered by employing the technology in an auditing context. To this end, we employ drones and automated counting software in two audits of commodity assets. We compare this technology-supplemented audit approach with more traditional audit approaches on three dimensions of audit quality—efficiency, effectiveness, and quality of audit documentation. We supplement our empirical results with interviews with national-level audit firm partners and audit regulators to gain insight on the need for regulatory guidance in this emerging area. Understanding how drones and automated counting software could impact audits of inventory is important for several reasons. First, inventory is an important asset in companies, especially in agriculture and mining companies.

PwC’s Aura auditing system is a good example. Aura is used by every auditor in PwC’s network to capture and integrate audit activities. It provides a single source of information for each of our audits and ensures that everyone works to the same methodology. It facilitates central monitoring of progress and quality in real time, driving improvements in audit quality. Detailed transaction testing is another area where automation has been a game-changer. In the past, to audit the millions of entries on the purchase ledger of a large company, an auditor would start by choosing a statistically valid sample (let’s say that’s 60). For each of those 60 transactions, they’d have to check whether that purchase was properly authorized, whether the cash actually went out of the bank account (so that’s 60 copies of bank statements to find), and check that whatever was bought actually arrived – so they’d also be looking for 60 different goods received notes. That’d have been two weeks’ work, minimum, to examine a tiny slice of the transactions on the ledger. Our big data analysis tool, Halo, allows us to move away from a sample testing approach to an evaluation of an entire population of transactions. Halo can check the characteristics of millions of entries in an instant, immediately flagging any exceptions. It, then, lets us visualize the data in lots of different ways – by supplier, by transaction date, by amount for example – increasing the chance that the auditor will spot unusual items or trends. All of that takes a fraction of the time spent previously – much more assurance, much less human effort. The use of drones in the audit is also bringing efficiencies. We’re exploring the use of drones in stock counts of capital assets to save our auditors having to physically travel to locations. But, this is only the beginning. Drones can be applied to a number of industries, such as mining. Open-cast mines can cover several square kilometres, and auditors may need to assess the physical state of the mines. In a similar fashion to how they check stock counts, drones can be used to quickly map the area, make reports, monitor work progress and so on. And all without having to travel into the mine, saving time and avoiding safety hazards.

DRONE TECHNOLOGY, INTERNET OF THINGS AND SENSOR TECHNOLOGIES

Unmanned drones are used in a variety of commercial projects, such as power line inspection, and the Big Four accountancy firms have spotted the potential for their use in inventory inspection, particularly where physical scale or distribution is an issue. For example, PwC recently announced its first stock count audit – of an open cast mine – using drone technology (PwC 2019). Drones are the aerial component of the Internet of Things, the constantly growing number of devices and sensors connected via IP (internet protocol). An example of a sector that is ripe for the adoption of such technologies in audit and assurance is agriculture.

Ernst And Young Drones For Audit

EY scaling the use of drones in the audit process :

- EY to use pioneering industry software to improve inventory counts;
- Artificial Intelligence (AI) to be built into the drones to extend capability;
- Information to feed directly into EY Canvas, the EY Assurance global audit digital platform EY has launched a global proof of concept (POC) to expand the use of drones in inventory observations, as part of its digital audit capabilities. In order to enhance audit quality, this extensive pilot project will use pioneering industry technology to improve the accuracy and frequency of inventory count data collection.

The cloud-based asset tracking platform, powered by an Internet of Things (IoT) sensor network, will analyze inventory quantities in real-time by reading Quick Response (QR)/barcode/rack labels and feeding this information directly into EY Canvas — the EY Assurance global audit digital platform that seamlessly connects more than 80,000 auditors. The POC will initially be used in both the manufacturing and retail sectors. Audits for automotive manufacturers, for example, will use the drones to conduct an automated count of vehicles at manufacturing plants. In retail sector audits, for a warehouse stock count, the drones will work autonomously while using variable image and object recognition tools such as optical character recognition and QR/barcode/rack labels to collect inventory information, especially during off-hours to minimize audit stakeholder risk and improve efficiency. Hermann Sidhu, EY Global Assurance Digital Leader, says: “We have been testing the use of drones in the audit process for several months and the findings have been compelling. It’s now time to scale our testing globally across multiple sectors, as we know that many audits can benefit from the use of this innovative technology. It’s just one of many ways that we are working to embed the very latest technologies into our audit processes to further improve audit quality.” The use of drones in the inventory count allows for more data to be captured, and for audit teams to focus on identifying areas of risk, rather than manually capturing stock counts⁴¹.

⁴¹ EY (2019).EY scaling the use of drones in the audit process. Retrieved from <https://www.ey.com/ro/en/home/press-release-ey-scaling-the-use-of-drones-in-the-audit-process>

- ▶ Car plant based audit by autonomous drones: automated count of vehicles enriched by image recognition technologies (e.g. for type, colour)
- ▶ Warehouse based audit with autonomous drone using image and object recognition tools like OCR, QR-/Barcode to collect stock information
- ▶ Potentials public sector case
- ▶ Pilots show
- ▶ Time reduction by 50–60% on site and 80–90% in back office
- ▶ Cost reduction up to 80%



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