Physical, meet digital
From factories to physician’s offices, high tech is revolutionizing routines

Bringing dormant data to life
There’s evidence that an ochre-based paint factory may have existed in an African cave 100,000 years ago. By the 12th century, Venetian ships were produced on an assembly line. Steam and hydraulics advanced manufacturing in the late 1700s, as did electricity a century later, and computers a century after that.

What hasn’t changed much until recently, though, is the supply chain, which traditionally is linear in nature—design, plan, source, make and deliver. But, advances in technology and innovation allow previously unconnected sensors, processes, systems, and information across the supply chain to be easily connected in real time. The result is a vastly different digital supply network, and it’s powering the rise of smart factories.

“The smart factory has a fully connected and flexible system—one that can integrate data from systemwide physical, operational and human assets to drive manufacturing, maintenance, inventory tracking, and many other types of activities across the entire manufacturing network,” explains Doug Gish, Deloitte Consulting LLP principal and US supply chain leader. “Those who embrace that approach and are willing to make the investment stand to potentially increase market share, efficiency, product quality and customer satisfaction.”

Deloitte Consulting LLP (US) is helping a client—a global machinery manufacturer—connect its digital and physical channels by digitizing end-to-end factory operations from the point of manufacture through inspection. In the process, production steps that were not visible in the past are lighting up.

Deloitte’s cross-functional team created a “live factory” using Internet of Things (IoT) technology by attaching sensors to machinery. Movement, location, time spent per station and quality events were tracked and recorded in real time using GPS and RFID sensors.

“This ecosystem of business equipment and sensors provided data that helped the team develop apps and dashboards, effectively bringing a ‘hidden factory’ of dormant data and insights to life,” says Andy Daecher, Deloitte Consulting LLP (US) principal and Deloitte Digital IoT practice lead. “This is helping improve product quality, reduce production time, allocate resources more efficiently and decrease their finished-goods inventory.”
New dashboards fed with real-time information show the priority of machines in need of service, as well as the amount of rework required. With this knowledge, employees should spend less time locating machines, the flow of production can be improved, and nonconformance would be easier to manage and track—which can expedite root-cause analysis and corrective action. These improvements alone could improve the client’s return on investment 20 percent to 30 percent. Better inventory, scrap, and labor management also should lower costs.

Now that the client sees tangible benefits from integrating IoT with its physical assets, it can explore expanding and incrementally connecting other lines and factories. “Not only would that further improve its analytics capabilities, workflow transparency and overall efficiency,” says Doug Bade, principal, Deloitte Services LP (US), “but it also would help improve their interactions with their customers, enabling them to meet and exceed the expectations that digital technology is driving.”

**Connecting with patients**

The merging of the physical and digital worlds seems to also be helping health care providers, caregivers, pharmaceutical companies, payers and other care team members understand their patients better so they can provide tailored support that delivers healthier outcomes. Deloitte Consulting LLP’s (US) ConvergeHEALTH Patient Connect™ platform provides life sciences companies with tools and insights to help build effective relationships between patients and their extended care teams.

“Patient Connect is designed to improve human interaction and enable more-personalized service using a variety of digital channels and an advanced and flexible cloud software platform,” explains Chris Zant, principal, Deloitte Consulting LLP (US). “Patients want to be informed and engaged, and pharmaceutical companies want closer connections to their patients. Our platform can do both while hopefully improving the coordination of, and adherence to, care programs and other patient-support initiatives.” Data collected by Patient Connect across a wide patient population—information that remains secure and private—also feeds research and development efforts, creating opportunities for innovation and improved outcomes.

In addition to new processes that improve specialty pharmacy referrals, patient intake, document management, data sharing and more, Patient Connect continues to integrate prepackaged solutions from its ecosystem associates. One gives caregivers and patients the ability to sign documents electronically, which can speed up the processes of getting consent, verifying benefits and submitting prescriptions. Another uses powerful telephony and cloud contact center capabilities so that when a patient calls, care team members and customer service agents have all relevant historical information at their fingertips. Patient Connect was also approved to be delivered exclusively through Salesforce AppExchange, making it easier to implement than many competitors’ patient-engagement solutions.

“These enhancements have significantly improved the patient experience and streamlined processes for providers,” Zant says. “There's less physical paperwork, less hassle and less time wasted—which should lead to less frustration for patients, lower costs for providers and more-personalized care.”

**Integrating AI into hospital care**

Operational processes within hospitals are also undergoing fundamental change. A suite of solutions introduced by Deloitte Australia is helping drive that change, covering “classic pinch points” from admissions and outpatient scheduling to intensive-care unit utilization, and the discharge process.

One of those solutions is D.Assist, a lean, enhanced patient-to-nurse communication system that augments the existing call-bell system in place in most hospitals and aged-care facilities. “Through the innovative use of leading technology, D.Assist improves the patient experience, releases nursing time to care for patients, and provides a rich source of data for hospital administrators to act on to optimize patient care outcomes,” says Nick White, Consulting principal and Robotics and Cognitive Automation team leader for Deloitte Australia. “It also provides nurses and the medical team critical information needed to effectively respond to patients.”

D.Assist captures a spoken request for assistance in the patient’s room, which is understood by the system and converted to text. The message is then assessed using artificial intelligence services and processed to identify the patient’s request and how best to respond.
In many cases, D-Assist is able to respond to the patient from a database of frequently asked questions, relieving workload from nurses. The solution can even be combined with intelligent room automation to enable smart controls of the patient environment.

“Deloitte is working with a number of hospitals around the world to implement this and a range of complementary solutions across the patient pathway,” White says. “By providing these cognitive solutions to the market, we are transforming Deloitte’s role in the health care industry globally.”

Building a digital insurer
Economical Insurance was founded in 1871 by a group of Canadian citizens who pooled their resources to protect one another. It was a simple concept for a simpler time. Through its Sonnet Insurance subsidiary, Economical—with Deloitte Canada’s help—is making insurance uncomplicated again.

“The management team had a vision to build a direct-to-consumer, digital insurance company that could give people an accurate quote if they answered just three questions,” says Alice Keung, Economical Insurance chief transformation officer. “That was a stretch goal, but we successfully created a site where customers could easily buy insurance for their cars or homes in five minutes.”

The secret to Sonnet’s speed is the way Deloitte Canada integrated real-time analytics, a sophisticated IT infrastructure and third-party software to simplify the purchase experience and help Sonnet’s customers make informed decisions. “At the outset, we conducted ethnographic research—which shows how people actually behave versus how they say they behave—to build this company from the ground up,” says Daniel Shum, Deloitte Canada lead engagement partner for Sonnet Insurance. “Based on what we learned, together, we came up with a customer experience that is simple, easy to understand and gives customers confidence Sonnet will be there for them. This is backed with fast and reliable technology that drastically streamlines the quoting, sales, servicing and renewal processes.”

Sonnet is currently the only solution in Canada that allows customers to fully purchase and service their insurance policies directly online.

Smart transactions
In the past few years, blockchain has evolved from a word that often required definition to a common component of client solutions across Deloitte’s businesses. One such tool is TradeChain, a system developed by Deloitte Tax LLP (US) that brings consensus, consistency and accuracy to intercompany agreements.

Transactions between different units of multinational companies can be challenging from a compliance standpoint. There also are many administrative lags and manual processes typically needed to implement pricing agreements between related parties. TradeChain is designed to address these issues by using a private blockchain and smart contract-like automation that enables the execution of transfer-pricing agreements.

“Most intercompany agreements are hard to formulate, difficult to regulate and tough to execute because the parties often are working with incomplete information spread across many systems,” explains Rob Massey, partner, Deloitte Tax LLP (US). “So, transactions often end up with errors, deadlines get missed and risk increases.”

With TradeChain, technology-enabled contracts are triggered by both internal and external business activities, interfacing in real time with people in tax, treasury, legal and accounting. The blockchain validates transactions. Future versions are expected to use cognitive technologies to drive advanced predictive analytics and decision making.

Sam Kaprelian, Deloitte Global Tax & Legal chief technology officer, says, “Soon after TradeChain was introduced and clients began seeing it, it didn’t take long to see how its cognitive and advanced analytics technologies can systematically improve quality, decision making and outcomes.”
The art of the possible
Transforming our capabilities so that clients can revolutionize theirs

Elevating the audit
History is littered with innovations that withered from neglect because they cost too much or because few understood their practical uses—evidence that few institutional skills are more valuable than being able to grasp the art of the possible.

“Helping clients visualize the benefits of investing in exponential technologies—and then working with them to make those visions reality—drives business progress and advances society,” says Andrew Vaz, Deloitte Global chief innovation officer. “That’s why we also continually advance our own capabilities and reinvent ourselves in the context of what is possible.”

In the audit and assurance world, possibility is fast becoming reality. Substantial portions of public and private company audits—already enhanced by automation and analytics—will be increasingly augmented by cognitive technologies. “Deloitte’s investments in transforming the audit are enriching the experience and relationship between the auditor, clients, capital markets and broader ecosystem—elevating the audit from an obligation to an opportunity,” says Panos Kakoullis, Deloitte Global Audit & Assurance managing principal. “In the process, these investments are elevating audit quality and consistency.”

Deloitte has begun using cognitive technology in audits to review contract terms, leases, electronic documents and more. “The rapid reviews enabled by cognitive technology allow auditors to review and assess larger samples, or even review 100 percent of the contracts,” explains Jon Raphael, partner and chief innovation officer, Deloitte & Touche LLP (US). “The reviews can also incorporate segmentation of documents, such as separating contracts that include escalation clauses from those that do not. We can then add visualization capabilities to easily show, as an example, which documents differ from what is expected.”

Cognitive applications are just part of Deloitte’s next-gen audit technology platform, which will be cloud-based and data-driven. “We have a number of separate tools today—capabilities that already are differentiating us,” says Mike Schmidt, Deloitte Global Audit & Assurance chief technology officer. “Our focus now is on seamlessly integrating all data, tools, analytics, methodologies and project management functionalities into a single platform to perform consistent audits around the globe.”

Schmidt points to Deloitte Connect—a secure, online collaboration site that facilitates two-way dialogue between audit teams and client teams—as just one example of how Deloitte is setting itself apart in the marketplace. “A lot of people are talking about holistic
strategies and building for the future, but we’re actually doing it,” he says. “Instead of dipping a toe in the water, we dove in the deep end and are putting innovative solutions in the hands of our professionals around the world.” Schmidt adds that Audit & Assurance also is experimenting with Web-based robotic process automation (RPA) tools that expedite preparation and review of standard audit processes and tasks.

Solutions in development include a suite of big-data tools that can create customized audit procedures using predictive analytics and regression analysis. These tools enable auditors to deliver more value, enhance risk identification, and identify patterns and trends that can lead to accounting, operational and control insights. Deloitte also has introduced collaboration tools that provide transparency across multiple stakeholders in processes used for confirming balances and counting inventories.

In addition, Deloitte is using new diagnostics capabilities to monitor live audit engagements. “We can create reports based on more than 160,000 live audit engagements that give us new, strategic perspectives into the Audit & Assurance practice and are allowing us to transform the way audit quality is monitored,” explains Cal Buss, Deloitte Global Audit & Assurance quality leader. “These capabilities provide an unprecedented level of insight and transparency for our leaders so they can better address what is meaningful for our stakeholders.”

**Launching an internal startup**

An example of Deloitte’s dedication to transformational innovation is Auvenir, a first-of-its-kind startup venture established to radically change the financial audit space. “Deloitte brought together entrepreneurs with varied backgrounds and challenged them to disrupt the audit business,” explains Chris Thatcher, Deloitte Global Audit & Assurance innovation leader. “They were given as much leeway as possible while providing access to Deloitte’s capabilities.”

Auvenir’s autonomous structure enables it to quickly develop and test products based on real-time market feedback. This flexible solution applies the latest technologies—including cloud-based storage, machine learning and artificial intelligence—to streamline and improve the quality of the workflow between auditors and their clients.

“The Auvenir business model is very different because—while the technology platform is specifically designed to address the unmet needs of smaller engagements—it is focused on building tools that can be used by all accounting firms, big and small, and not just for internal Deloitte use,” explains Auvenir CEO Pete Myers. “As the tools are used more and data flowing through the platform increases, our underlying machine learning technology kicks in and enables the platform to become smarter over time. By opening the platform so broadly, we can strengthen the entire industry.”

Auvenir will soon emerge from beta testing conducted with several small audit firms in Canada. “We selected firms who can nimbly test new technologies to provide feedback that drives rapid development,” Myers says. “This approach allows Auvenir to work collaboratively with auditors on tools that automate much of the audit, which will free them up to build stronger relationships with their clients and provide deeper business insights.”

**Investing in exponentials**

Deloitte is also aggressively integrating transformational technologies and data analytics into its nonaudit solutions and services.

Our Financial Advisory business, for example, is adopting multiple platforms to support clients with new levels of insight and experience to help them solve complex business problems. Among them:

- A sophisticated forensic digital platform that builds on Deloitte’s pioneering use of analytics and technology to help clients identify inefficiencies, anomalies and issues in their systems—and provide proactive solutions to address them. The platform enhances our professionals’ ability to quickly and effectively respond to a critical financial crime event, give a deeper and more complete understanding of the issues leading to that event, and provide strategies to prevent future problems.
• ValueD and iDeal are analytics platforms that allow Deloitte's Mergers and Acquisitions practitioners in many countries to quickly understand their clients’ complex situations. In addition to visualizing data in real time, these platforms provide advanced insights on multiple levels, including industry benchmarks.

Deloitte Cyber Intelligence Centers around the world provide fully customizable solutions to help organizations proactively detect, respond and recover from security events—making them more secure, vigilant and resilient. These Cyber Intelligence Centers operate around the clock, providing advanced security event monitoring, threat analytics, cyber threat management and incident response to help organizations strengthen their cybersecurity posture. For a closer look into Deloitte Cyber Intelligence Centers, during FY2017, Global Risk Advisory has launched the use of virtual reality "tours" to provide clients with an immersive experience and a behind-the-scenes view of Cyber Intelligence Centers in action.

Tax & Legal expanded its ecosystem in FY2017 through six alliances with automation, cognitive and blockchain companies. Additionally, our Business Process Solutions (BPS) and Tax practices have formed five strategic agreements with robotic process automation (RPA) vendors and created an RPA center of excellence. Deloitte Tax & Legal practices also enhanced client connectivity by introducing innovative technology-enabled solutions across all service areas through a new digital relationship platform.

Among the many tech-enabled initiatives that will impact Deloitte Consulting practices around the globe is the Center for the Long View, which specializes in long-range scenario planning. The Monitor Deloitte unit, located in Germany, has developed artificial intelligence and online collaboration tools that dramatically increase the quality of scenarios while reducing project costs. It ultimately could serve as a prototype for the comprehensive digitalization of Deloitte’s consultancy services around the world.