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## 01  ARTIFICIAL INTELLIGENCE

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TECH 4 GOOD

DRISHTI – empowering the visually impaired using AI
Dhvani – real-time language assistance for the hearing or speech impaired
Ensuring the sky’s the limit for young entrepreneurs
Using blockchain to provide vital proof of identity
Applying machine learning to nature conservation
Scaling the Million Meals pilot with Akshaya Patra
Couple power with the Gates Foundation
Scaling social impact: advising social innovators

SYSTEMS AND PLATFORMS

Pioneering drug discovery with quantum computing
Fighting financial crime with the Universal Metadata Repository
Taking analytics to the edge with an oil field services company
Creating an industrial data service
Showcasing blockchain’s possibilities

APPLICATION ENGINEERING

Analyzing retail operations with intelligent application management
Testing software with intelligence and precision
Creating smart advisors for intelligent software delivery

STRATEGIC INNOVATION INITIATIVES

Industry X.0
Digital Workforce

CYBERSECURITY

Hunting down cyber-attacks with advanced automation
Securing services with blockchain
Classifying data at scale with machine learning
Security Technology Vision 2017

APPLICATION ENGINEERING

Analyzing retail operations with intelligent application management
Testing software with intelligence and precision
Creating smart advisors for intelligent software delivery
INTRODUCTION
THIS HAS BEEN ANOTHER EXCELLENT YEAR FOR ACCENTURE LABS AND FOR OUR CLIENTS.

By strengthening our technology differentiation further, and by continuing to support our clients with new and powerful technology innovations, **we helped take the Accenture business to new heights.**

What’s more, this year marked 30 years of Accenture Labs. It was the perfect moment to reflect on our track record of innovation, our **bold predictions** about technology trends, and our **cutting-edge experimentation** at the onset of every major technology wave—from the Internet and AI, to the IoT and quantum computing.

Over the course of the year we added to that already notable record. We explored the connection between the real and the virtual worlds using technologies like extended reality. We analyzed the potential of AI, as well as the responsibilities it implies. We experimented with new computing paradigms, such as quantum computing. And we did it all in support of our clients’ success.

**Some of the particular highlights from 2017 were:**

**THE DEEPENING** of our research in AI, cybersecurity, digital and immersive experiences, platforms, blockchain, and application engineering.

**THE BROADENING** of our work on Industry X.0, robotics, and regulatory technologies.

**THE CELEBRATION** of our first client successes in quantum computing.

**THE LAUNCH** of our 13 Nano Labs around the world, in locations as diverse as Riga and Monterrey.

**THE PUBLICATION** of, and strong engagement with, our Accenture Technology Vision 2017, identifying the key technology trends affecting large organizations.

**THE SIGNIFICANT** impact made by our Tech4Good initiatives around the world, driving social transformation with pro-bono projects to fight hunger, improve health, boost gender equality, and pursue environmental causes.

**THE EXTENSION** of the scope of our collaborations with 20 universities and 39 vendor partners.

This report highlights these and other achievements from our Labs teams in 2017, across all our different R&D areas and initiatives and spanning each of our seven hubs around the world. Each story represents the culmination of a huge amount of hard work, expertise, and innovation from our people. They demonstrate how we at Accenture Labs are expanding the possibilities of emerging technologies for the benefit of our business, our clients, and our communities.

Marc Carrel-Billiard
Senior Managing Director, Accenture Labs

Edy Liongosari
Chief Research Scientist, Accenture Labs
Accenture Labs incubates and prototypes new concepts through applied R&D projects that are expected to have a significant strategic impact on Accenture and its clients. Our dedicated team of technologists and researchers work with leaders across the company and business partners to invest in, incubate, and deliver breakthrough ideas and solutions that help our clients create new sources of business advantage.

Accenture Labs are located in seven key research hubs around the world: Silicon Valley, California; Arlington, Virginia; Dublin, Ireland; Sophia Antipolis, France; Bangalore, India; Beijing, China; and Herzliya, Israel. The Labs collaborate extensively with Accenture’s network of nearly 400 innovation centers, studios and centers of excellence in 92 cities and 35 countries. This collaboration delivers cutting-edge research, insights, and solutions for our clients, right in the places where they operate, work, and live.


Accenture Labs is a critical component in the Accenture Innovation Architecture that is designed specifically to scale Accenture’s ability to drive innovation. Labs’ mission is to do applied research with a focus on client challenges, leveraging new technologies available now—from the market and from our innovation ecosystem. By embodying the ‘New Applied Now’ principle, we help Accenture and our clients lead with innovation. Dive into the report for a sample of high-impact R&D projects from the last year.

For the latest news and thought leadership from Accenture Labs, please visit www.accenture.com/labs
# ACCENTURE INNOVATION ARCHITECTURE

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Artificial Intelligence
Explores new ways of addressing critical business problems by applying leading-edge AI techniques, including machine learning, natural language processing, knowledge representation and reasoning.

Digital Experiences
Develops technology concepts to increase engagement with customers and employees by pioneering emerging technologies and engagement strategies.

Cybersecurity
Develops solutions that improve our clients’ cyber-defense strategies and capabilities, such as threat-centric management, advanced detection methods, machine speed response, and effective risk management techniques.

Systems & Platforms
Creates frameworks and tools that fortify and enhance the architecture for the connected enterprise of the future, handling massive amounts of data, devices, and systems in real time.

Application Engineering
Applies intelligent automation in the software development lifecycle to significantly accelerate the software development process while increasing the quality of overall outcomes.
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01
ARTIFICIAL INTELLIGENCE
R&D GROUP
Bringing intelligence to risk management
Applying AI and machine learning to risk management means risks can be identified far earlier than through traditional methods. This kind of approach goes beyond merely scoring individual risks, and can identify risk categories, recognize their occurrence, estimate their probability, report them, and help enable mitigation steps to be taken. So, for a company like Accenture, where we manage 80,000 opportunities and 35,000 contracts every year with revenues of over $30 billion, intelligent risk management clearly holds huge potential.

This year we put the theory into practice. By applying machine learning and explainable AI techniques to 30,000 past Accenture projects, we trained a model to effectively predict project risk, identify projects needing deeper analysis, and infer the likely impact of corrective actions. The result: a set of ‘early warning’ capabilities for projects that were likely to encounter problems. Having demonstrated its capabilities on historical data, we’re all set to deploy this solution on live Accenture projects from the start of 2018.

Boosting business travel with accurate flight delay predictions
More than 300,000 flights are delayed around the world every year. That adds up to a total of something like 20 million travelling minutes lost by global passengers annually. And for business travelers especially, those delays can create huge costs and inefficiencies. Accenture already has a tool for predicting flights likely to be delayed, but it can’t predict the length of a delay—or explain why it happened. So, this year, we set about applying intelligent technologies to solve that challenge.

Working with a European airline, we used a deep neural network comprising machine learning, semantics-augmented case-based reasoning, and natural language processing (NLP), to build a robust model which can predict flight delays within minutes, and explain their causes by comparing with historical cases. This explanation is at the heart of the project—it’s ultimately set to help industry experts better understand the root causes of delayed flights.

Enabling regulatory compliance by “understanding” regulations
As the complexity of client operations grows, and as the number of regulations they must adhere to increases, their cost of regulatory compliance just keeps getting higher. That’s why Labs, together with Accenture’s financial services practice, are developing new tools to help them keep a lid on their compliance costs. Our latest approaches use NLP to break down financial services regulations into their component parts. So we can derive answers to questions like: who has an obligation? What action must they take? Which objects must that action be applied to? And what conditions are there? Even this relatively basic representation can support a range of compliance applications, such as retrieving relevant regulations, routing communications, etc. As our representations become ever more fine grained, the range of potential applications will expand.
Working with Stanford to make AI development fast, affordable, and scalable

As AI becomes ever more mainstream, we’ll be increasingly focused on developing machine learning (ML) models with and for our clients. ML largely involves training a system to classify data by providing a large number of labeled examples. This training can be extremely costly. For example, it might take an expensive expert an hour to decide whether a given loan should be approved or rejected – that is, to ‘label’ an individual data point. ML models require thousands of labeled data points, so making this process economically viable is critical in the effective commercialization of AI.

Labs have been working with Stanford University’s DeepDive research project to greatly reduce these training costs. The DeepDive project was commercialized by Professor Chris Re as Lattice, which, as of 2017, is now part of Apple. In the meantime, Labs has integrated DeepDive’s approach – and is developing related methods, to continue to make communicating knowledge to ML systems more efficient.

On our first engagement with a client we achieved a 70 percent speedup in training.

More importantly, we enabled a delivery team with this technology which has achieved a 3-5X speedup. This work is a prime example of our research into making AI delivery at scale viable.

Making smarter movie recommendations through natural conversation

This year, Labs partnered with the CMT industry innovation team to complete our development work on RHEA – the Robotic Humanoid Expert Assistant. RHEA is a proprietary virtual agent architecture which takes the form of an advisor to help users interact with Accenture Video Solutions (AVS) in a seamless way through natural conversations.

Using a patent-pending critique-based dialogue strategy and recommendation engine, RHEA can make movie suggestions based on a user’s profile, or based on a particular director, actor, or even plot. By conversing with users in a natural way, RHEA understands their preferences, their sentiments and can make effective recommendations in each context. The system has been integrated with the Android platform and Google Home devices and has been showcased at the BA Convention hosted by IIBA (International Institute of Business Analysis.)
Taking fashion designers to the forefront of retail innovation

In 2017, Labs joined forces with Fjord and the Council of Fashion Designers of America (CFDA) to help the fashion industry better integrate technology and consumer insights into its business practices. By bringing designers together with the latest technologies like artificial intelligence and mixed and virtual reality, we've been able to show how technology can create new kinds of customer engagement.

As part of this program, we help the CFDA run its retail lab in a New York store, using it as a living showcase of technology and innovation that gave designers a hands-on way to explore the new retail customer experience. We worked together with the designers to help them develop critical business skills, covering messaging, brand in physical space, retail analytics, artificial intelligence, tactile product engagement, try-ons, and storytelling. That included using fitting room RFID tags to track customer preferences, as well as the pairing of store products with online products based on designers’ recommendations. Not forgetting the hottest topic of the moment, we also ran an AI in retail workshop for CFDA members and Accenture clients.
Co-innovating a transformation to a service-driven automotive business

Labs R&D groups have been collaborating to support an Industry X.0 proof of concept with a major automotive OEM headquartered in Europe. Having first showcased an innovative virtual reality (VR) car seat with embedded sensors at the Hannover Messe industry conference, we kicked off a co-innovation effort with this client—a tier one car seat manufacturer. The pilot included a week-long hackathon event and a follow-up period of co-innovation, leveraging both the client’s assets and the full capabilities of our Innovation Architecture framework. The result was a view into the automotive cockpit of the future—a fully functional VR simulator comprising a connected car seat built using the client’s hardware and trained AI models powered by Labs’ model management.

Longer term, this work is contributing to the development of infrastructure that will support a platform of ‘living services’, covering everything from analytics, to rider authentication, to personalization, and safety. In doing so, our goal is to cement our status as a digital transformation powerhouse on behalf of our automotive and other clients.

Mastering sales predictions for new products

Accurate sales forecasting for new products is critical for marketing and supply chain planning decisions. Working in conjunction with MIT, and using advanced joint cluster assignment and regression, we helped a leading consumer goods manufacturer develop a new sales forecasting tool that’s taking their predictive abilities to a new level. Our solution used machine learning techniques, statistics, and optimization to create a sales forecasting method for new products that is highly efficient, scalable, and more accurate than the current forecasting process.

HELPING OUR CLIENTS BECOME DIGITAL BUSINESSES
Hunting down cyber-attacks with advanced automation

As cyber-attacks become ever more advanced, cyber-defenders are finding that existing security tools and techniques are quickly becoming ineffective at detecting threats. Moreover, the sheer volume of logging and NetFlow data makes it increasingly hard to spot a real attack amid all the noise. Automation is thus becoming a more and more essential part of cyber-defense.

In 2017, Labs took on the challenge of developing the next generation of threat-hunting models for IT and OT networks. Leveraging analytical methods (machine learning, time series modeling, graph analysis, streaming analysis) combined with better visualizations of cybersecurity data, we were able to better empower cyber-defenders with a significant boost to their ability to prioritize and detect genuine threats. With a large-scale proof of concept using 12 months of security/event data from a large NA enterprise complete, these new models are set to differentiate Accenture’s Security and Managed Security Services as we prove their effectiveness with other clients in both IT and OT environments over the next year.

Securing services with blockchain

Blockchain has the potential to offer much-needed security in offline or distributed operational environments, or where bandwidth is otherwise reduced. The technology can
help achieve distributed trust by enabling some of the most fundamental security services (like authorization and integrity verification) out in the field where enterprise solutions can’t follow.

To explore this potential, Labs identified the most pressing security challenges in reduced bandwidth, offline, or remote environments, and developed three proofs of concept to demonstrate what blockchain could offer. These were: multi-signature access control for confidential documents, multi-signature access control for IoT integrity, and a blockchain authenticator. These solutions are now ready for client proofs of concept in both IT and OT environments in the coming months.

Existing data classification solutions are largely text based and operate on structured data only. So this year, Labs set about applying machine learning and NLP to the challenge of classifying data at scale. We developed a solution that trains an algorithm through machine learning on a unique dataset, which can then identify other ‘like’ data across the enterprise—whether it’s unstructured or structured. With a large retail client set to pilot a proof of concept in the early part of next year, the solution will be further refined for specific industry use cases.

**Security Technology Vision 2017**

The Accenture Security Technology Vision highlights the technologies and trends that security professionals will use over the coming years to predict, detect, prevent, and remediate cyber-attacks. Our 2017 Vision set out some of the most important challenges facing businesses today, from the fact that they operate in a digital ecosystem that is ever more connected, collaborative, and complex, to the insecurity of the IoT and consumer devices that are proliferating in all domains. It also highlighted the challenge of dealing with the co-mingled data that blurring work and personal lives are creating, and the ways in which increasingly sophisticated and well-funded attackers are ‘weaponizing’ otherwise benign devices. It went on to emphasize some of the ways leading businesses are responding, whether that’s becoming a self-sustaining enterprise with an infrastructure that shifts security postures as threats and vulnerabilities emerge, using predictive analytics and cognitive modelling, or introducing greater agility through infrastructure paradigms like network functions virtualization (NFV).
Pioneering drug discovery with quantum computing

Quantum computing offers the possibility of vastly outpacing existing computational methods. And after decades of toil from scientists and engineers, the technology is finally graduating from university labs into real-world business products. Conscious that it still has some way to go to reach maturity, Labs has been assessing the science behind quantum computing, its potential through 150+ use cases in different industries, and the steps business leaders should be taking now to ensure they’re well-positioned to make the most of the technology when it does mature.

Our project with Biogen demonstrated how effective the technology can already be in the drug discovery process. Currently, pharmaceutical and materials science companies use a variety of computationally intensive methods to review molecule matches
and predict the effects of potential therapeutic approaches. Working with 1QBit and Biogen, we created a proof of concept in just two months that validated an alternative molecule comparison approach using an enterprise-ready quantum-enabled application. It uses transparent processes that generate deeper insights about shared traits, and when applied in conjunction with existing methods it offers Biogen a distinct competitive advantage through faster time to market and cost savings.

For more on our pioneering work with Biogen, see our website: www.accenture.com/quantum

**Fighting financial crime with the Universal Metadata Repository**

As much as 90 percent of enterprise data is dark data, meaning it’s not easily accessible to analytics tools. The result is that anything up to 50 percent of an enterprise analytics project is spent discovering data and making it usable. The key to making this process more efficient is indexing the metadata—both descriptive metadata (using semantic interpretation of business data) and structural metadata (technical access and format data).

Labs created a Universal Metadata Repository which uses a knowledge graph and AI techniques to automate this process of data discovery and management in today’s modern data architectures. Encompassing everything from batch and real-time pipelines to heterogeneous data stores, the platform can transform dark data into ‘data in context’. Currently in pilot with several banks, this tool, if adopted by a wider network of similar institutions, offers unprecedented potential to unlock new insights through closer working and the sharing of best practices, models, model parameters, and even cross-bank data.

**Taking analytics to the edge with an oil field services company**

For a business like an oil field services company, managing a multitude of distributed assets with a variety of owners is a major challenge. They potentially have to deal with a myriad of models servicing cross-organizational application needs, as well as the limited bandwidth and capabilities that exist at the edge of their networks. One such company was using a particularly brittle proprietary solution. The client has over a dozen business units, and each used their own approach and their own hardware to gather data at the edge and run remote analytics. Data and model updates were being physically transported ‘over the air’ via helicopter due to bandwidth limitations.

By co-innovating with the business, Labs created a solution: an edge analytics platform which helps enable all stakeholders in the organization to collect data, monitor assets, and deploy a leading intelligence to the distributed components on the network. It lets the client manage their analytics models in remote oil fields where there is minimal or no Internet connectivity, meaning they can predict equipment breakdown at remote sites and act quickly to save production time and improve equipment utilization. In doing so, this edge analytics solution provides much greater flexibility, using agile architectures leveraging containerization, micro-services,

Labs worked with Accenture Finance & Risk to use the platform to create a first-of-its-kind anti-money-laundering utility.
APIs, and open source technologies. What’s more, it’s helping them decrease CAPEX, risk, and scalability costs while sourcing edge components ‘as a service’ wherever possible.

**Creating an industrial data service**

To simplify the process of applying industrial data analytics, the Beijing Lab created a knowledge-graph-driven industrial data service. By building the industrial knowledge graph layer on top of general Big Data technologies, the team were able to create a solution which helps data scientists perform complex industrial analytics following domain constraints. It’s helping them focus on solving business problems with much greater efficiency – and that’s saving their enterprises both time and money. The solution was demoed at the Huawei Connect 2017 conference in Shanghai.

**Showcasing blockchain’s possibilities**

Labs have been engaged in numerous projects showcasing the potential of blockchain in real-world business and humanitarian scenarios. We developed a Performance Assessment Framework to benchmark, test, and evaluate Blockchain platforms, engaged with all the major blockchain and P2P players, and developed new applications and proofs of concept in digital identity, security, supply chains, and track and trace.

We teamed up with Microsoft and Avanade to build a blockchain proof of concept for ID2020, a global partnership that aims to provide digital identities for the millions of people around the world who lack adequate documentation. We worked with a major travel company to use blockchain to track luggage as it moves between airports. We ran a pilot with a logistics client to see how blockchain could improve tracking in the transportation of pharmaceutical products. We ran another pilot with a major aerospace manufacturer to explore how blockchain could prevent the counterfeiting of pilot diplomas. And we unveiled a patent-pending solution that simplifies the integration of blockchain technology with industrial-grade hardware security modules.

UNPRECEDENTED POTENTIAL TO UNLOCK NEW INSIGHTS
05
APPLICATION ENGINEERING
R&D GROUP
Analyzing retail operations with intelligent application management

Effective application management is more important than ever. Growing numbers of applications and the need for fast time to market means rapid release cycles are essential, while the huge influx of log data makes root-cause analysis ever more challenging. Automation has gone some way in improving efficiency and reducing mean time to repair (MTTR), but the numerous vendor options on the market haven’t really been able to keep up with the sheer volume and pace of new applications.

Working with a large Canadian retail chain, Labs created a first-of-its-kind intelligent application management tool. It analyzes machine-level logs and performs log forensics to address the retail-specific needs of various store operation scenarios. The architecture leverages Big Data and AI to predict application failure and offer prescriptive resolutions for performance issues. And it does all this using a virtual assistant that feels like it’s just another member of the team.

Testing software with intelligence and precision

Software testing is becoming ever more prohibitively expensive—almost as costly as writing code—and yet it’s simultaneously proving less reliable in a world of rapid deployment and vastly faster times to market. Automation is an obvious solution to this growing complexity and cost. And, while previous automation initiatives haven’t always fully delivered on their potential, the latest cutting-edge techniques change the game.

Labs developed a precision testing solution which employs a suite of efficient and modern machine learning, artificial intelligence,
The Labs Strategic Innovation Initiatives are multi-year projects designed to help enable the cross-fertilization of research activities spanning our various domains of exploration. For each initiative, we bring together experts from our R&D groups with business/functional experts and Accenture industry or practice leads. Our work uncovers the solutions that will drive the next wave of transformation by taking advantage of the combinatorial power of emerging technologies.

Industry X.0

Our Industry X.0 initiative focuses on the next wave of digital transformation in manufacturing. It’s all about products and services designed, prototyped, manufactured, assembled, distributed, and operated in ultra-automated digital lifecycles at unprecedented speed and on an unprecedented scale. It’s about workforces becoming ever more collaborative, connected, and augmented. And incorporating consumer insights and market trends early and often into manufacturing processes to ensure products and services are adaptable to market needs.

In 2017, we showcased the capabilities of crowd-powered conceptualization, immersive product engineering, and virtual prototyping. Gathering ideas from stakeholders in a traditional product conceptualization phase takes anything up to three months. Working with automotive clients, we showed how using a crowd-optimized design methodology can vastly reduce that timescale—yielding similar results in a single week. We helped designers and decision makers visualize their products in the real world by embedding assets into real-time mixed reality experiences. And we developed our automotive VR testing platform that helps clients iterate their concepts in a safe, reliable, and faster way.

Digital Workforce

One of the hottest topics in the digital work revolution right now is the agile workforce, and especially the use of digital talent platforms and the various forms of crowdsourcing operating both within the enterprise and across the enterprise boundary. Many businesses have already seen how effective
online labor markets can be at matching talent to projects on demand. This is most readily achieved for clearly defined, ‘atomized’ tasks that can be handed over to a crowdsourced resource with relative ease. But many businesses struggle to utilize agile workforce techniques in more complex areas that require teams of workers to collaborate closely.

This year, as part of our digital workforce initiative, we developed a set of innovative tools and methods to extend the scope of agile workforce platforms. We created a Crowdsourced Virtual Garage (CVG) to support distributed transient crowdsourced teams and enable them to perform collaborative innovation. CVG includes a combination of tools that allows a team of relative strangers, sourced through online talent markets, to quickly come together virtually, and produce a work product such as a prototype design. We successfully applied the CVG in numerous internal Accenture projects, from our CIO, Accenture Ventures, and HR Talent Strategy. We also conducted a client-innovation pilot to design a next-generation car seat.

We built a Crowd-Powered Delivery suite, comprising tools and methods for architecting applications in a way that makes crowdsourced development more feasible. These methods have been used in the development of the next release of the Accenture Quick Presentation Toolkit (QPT), a highly visible asset used by more than 100,000 employees across the company.

Our internal talent marketplaces broker over 35,000 hours each month, and this year one of the marketplaces was able to generate savings of over $1 million.

Our Crowd Analytics Service Suite has been designed to solve the challenges of mobilizing a crowdsourced team, from selecting the right marketplace to post jobs, sifting through candidates, negotiating pay and expectations, right through to agreeing what information should be shared. Using AI and machine learning, our new analytics suite provides guidance to both workers and project managers as they navigate the online crowdsourced talent network.

These tools are now available to any groups within Accenture that want to make differentiated crowdsourcing capabilities available for their projects—or for their clients. Indeed, we have already advised clients on liquid talent strategy and populating talent pools by implementing our platforms.
Accenture’s signature Technology Vision is a highlight of the global technology calendar, and continues to be our most broadly viewed and distributed piece of thought leadership. From the impact of the new workforce generation to the coming of age of AI, the 2017 report outlined the future technology trends that forward-thinking C-level executives are using to drive growth for their organizations. 

Specifically, it focused on five trends:

- **AI is the new UI.**
  AI is no longer just about how you do things – it’s who you are.

- **Ecosystem power plays.**
  Going beyond platforms to multidimensional value chains in a digital world.

- **Workforce marketplace.**
  The rise of the on-demand enterprise.

- **Design for humans.**
  Inspiring customer behavior by walking in step with consumers.

- **The uncharted.**
  Defining the new rules of the digital game.

The reaction to this year’s report has once again been remarkable. As well as being Accenture’s most viewed online resource – an online branded reach of 173 million generating over a million online views – the 2017 report was also the subject of over 450 media articles.


The Accenture Technology Vision 2018 will be available on February 14, 2018 and accessible at https://www.accenture.com/techvision.
The Accenture Labs Innovation Workshops program uses interactive workshops and technology demonstrations to bring our R&D to life for our clients. The program aims to foster thought-provoking discussions about what it means to operate a next-generation digital business in today’s global economy. In 2017, we sponsored nearly 700 client events across all our Labs locations for both internal audiences and a large number of high-profile clients.

Leadership teams from over half of Accenture’s diamond accounts visited the Labs this year to envision and learn about cutting-edge technologies, and to define new strategies and solutions in collaboration with Accenture scientists, technologists, and business consultants. The location of the events is flexible: they can be held onsite, offsite or virtually. Formats are customized to address the business priorities of each particular client and can include full or multi-day workshops, full or part-day educational seminars, and Labs overviews and demonstration tours.
In 2017, we launched our new Nano Labs in 13 locations around the world, from Riga to Buenos Aires to Monterrey. We’ve long known that the Accenture Labs are a fantastic way of building client relationships and creating a window to our innovative technology solutions. And now Nano Labs are bringing the Labs experience much closer to a much greater number of clients.

Each Nano Lab is hosted by a dedicated Innovation Sherpa who gives clients a sense of the R&D we do in our seven global Labs and showcases the Accenture Technology Vision. Participants are offered demonstrations illustrating key technology trends and follow-up discussions with Labs experts. With 28 Innovation Sherpas delivering more than 580 client visits in our 13 locations around the world, our new Nano Labs have more than doubled the reach of Accenture Labs.
The Labs Tech4Good program helps drive and scale technological innovation for social good. We apply cutting-edge technologies to bring something new to the way people around the world live and work. By empowering businesses, governments, and non-profits to scale social programs using technologies like AI, blockchain, and augmented and virtual reality, we’re helping social entrepreneurs turn their vision into reality—and changing lives for the better.

This year, Sanjay Podder, Managing Director of Accenture Labs Bangalore, and head of our Tech4Good program, was selected as an Eisenhower Fellow (EF) in recognition of his exceptional leadership in driving innovation for Accenture and our clients. As part of the EF program, Sanjay spent six weeks in the US researching how best to scale the impact of Tech4Good initiatives.

**DRISHTI – empowering the visually impaired using AI**

With the largest visually impaired population in the world, India is an ideal place to explore how technology solutions can help people better engage with the world around them. Labs ran a pilot with the National Association for the Blind India to create DRISHTI—a mobile application using natural language processing, optical character recognition, and the latest AI technologies to provide audio descriptions of a visually challenged person’s immediate surroundings. It even integrates with smart glasses for a seamless hands-free experience. It’s a truly innovative solution which is empowering the visually impaired and enriching their everyday lives.

**DHVANI – real-time language assistance for the hearing or speech impaired**

For workers with hearing difficulties or speech impediments, making a full contribution to the workplace can sometimes be a challenge. So Labs set out to see if we could find a better solution using AI technology. Dhvani, the multilingual solution we created, converts speech to text to offer hearing-impaired users real-time captions during Skype conversations, video training, webcasts, and even face-to-face conversations. It also uses text-to-speech technologies to similarly empower users with speech impediments. It’s making a real difference to our colleagues’ day-to-day working lives, and has already been extended to several Spanish-speaking Accenture locations with plans for global rollout.
Ensuring the sky’s the limit for young entrepreneurs

Sky’s the Limit is a program from Oakland-based non-profit Youth Business USA, which aims to match under-served young entrepreneurs with volunteer mentors who can provide the advice and support they need to build their businesses. As part of a key AI4Good collaboration, Labs developed a machine learning module to recommend optimal matches between entrepreneurs and mentors. We used a ‘warm start’ approach to allow a gradual transition to increasingly data-driven matches, which will ultimately leverage novel data like personality traits. Not only does this project bring new efficiency to the vital work of Youth Business USA, it also extends Labs’ ability to create and match worker profiles at scale.

Using blockchain to provide vital proof of identity

A major humanitarian challenge in the world today is the more than one billion people currently living without adequate proof of their identity—and who therefore struggle to access a series of vital services, from education and healthcare to housing and banking. That’s why Labs teamed up with Microsoft on ID2020—a project to prove how blockchain can provide the necessary trust and certainty in the process of connecting commercial and public record-keeping systems, enabling users to access their personal information wherever they are in the world.

Applying machine learning to nature conservation

India is home to 12 percent of the world’s known bird species. But many are increasingly threatened by unsustainable economic development and human encroachment. As part of a citizen science initiative undertaken by the Bombay Natural History Society (BNHS), Labs helped create the Internet of Birds—a first-of-its-kind platform that uses AI, computer vision, and deep learning to help amateur birders quickly identify the 180 bird species most under threat on the Indian subcontinent. Birders simply have to upload their photos to the platform and any species present in the pictures will automatically be identified. The Internet of Birds is ultimately a means of blending technology and citizen engagement to support nature conservation.

Scaling the Million Meals pilot with Akshaya Patra

The Bangalore Lab continues to support multiple projects that accelerate social transformation through technology. This year, we scaled the Million Meals pilot with Akshaya Patra, one of the world’s largest NGOs which feeds 1.5 million children every day in over 10,000 schools in 27 locations across India. Our solution uses blockchain, Industry 4.0, machine learning, and human-centric design to help Akshaya Patra scale and optimize their operations, delivering an estimated 8 million meals.
extra meals a year—an important step in helping them achieve their ambitious goal of feeding five million children a day by 2020.

This project is just one element in Labs’ ongoing efforts to help scale social impact in India.

**Couple power with the Gates Foundation**

Together with the Accenture Development Partnership team, the International Center for Research on Women, and the Child in Need Institute, Labs worked on a novel research project to combat high maternal and infant mortality in emerging economies. Called ‘Couple Power’, and funded by the Bill and Melinda Gates Foundation, the project addresses gender inequality in family planning through couple-to-couple peer coaching. Workshops are held with young couples to train them as role models and teachers who can help change gender norms and roles among their communities. A digital application collects and analyzes data to keep track of particularly vulnerable couples. Couple Power is already operational in 84 villages in the Indian state of Jharkhand—an area with one of the highest maternal and infant mortality rates in India.

**Scaling social impact: advising social innovators**

Labs serves as the exclusive technology advisor to the NASSCOM Foundation, a leading Indian non-profit organization that advocates the use of technology solutions for social ends. Since 2008 their program has supported and scaled ICT projects with the potential to address critical gaps in key social developmental areas. Labs have supported the NASSCOM Foundation in providing technology development and advisory support and mentoring to selected NGOs and social innovators.
As we move into 2018, we’ll be expanding our reach, deepening our research, and exploring new areas of enquiry, as we continue to support our clients and the Accenture business with differentiated technology innovations. We’ll build on our recent launch of 13 Nano Labs across Europe and Latin America by opening additional Nano Labs in the US and Asia, as well as a brand-new Lab in Shenzhen, focused on Industry X.0, robotics, and AI. As our reach expands across the globe, we’ll ensure all our Labs are collaborating to harness the combinatorial effect of technology innovations. So, we’ll be creating cross-location R&D initiatives on Industry X.0, robotics, and regulatory technologies. We’ll continue our focus on extended reality, cybersecurity, AI, and systems and platforms. And we’ll be introducing some exciting new research areas, such as e-textiles and printable electronics.

Industry X.0
As a cross-R&D initiative, Industry X.0 will harness R&D from Labs groups all around the world. We’ll look to accelerate combinatorial innovation, driven by emerging technologies like the Industrial IoT, robotics (see below), extended reality, crowdsourcing, smart materials, and on-demand manufacturing. And we’ll look to reorient products, services, processes, and the ecosystem toward the outcome-based economy. The question of how opportunities and data can be shared effectively across ecosystem partners, through a set of products and services, to deliver better customer outcomes, is just one of many issues that we’ll be investigating in this initiative.

Robotics
Labs are actively collaborating with clients and robotics researchers to enable the next generation of robotics usage across the enterprise. Robotics today is following the trend of consumerization, evidenced by both its acceptance and its increased economies of scale. This transformation has now reached the point where businesses can innovate with
robots as a viable solution for a broad range of tasks, in which humans and machines augment each other’s strengths to increase productivity. We’ll explore how, with a strong focus on human-robot teaming.

**Regulatory technologies**

Today’s continuous waves of technology change are bringing new risks and coming with new regulations. This has huge implications for the way enterprises design applications, govern data, and manage their business models. They must be effective and efficient in their regulatory compliance to remain competitive. And technologies like distributed ledgers, along with smart contracts and artificial intelligence, are offering fresh approaches to regulatory compliance. Our regulatory technologies initiative will explore these possibilities, including, in particular, engineering for compliance in software systems, and the use of smart advisors in risk and compliance functions.

**Tech4Good**

As always, we’ll be looking for innovative ways to apply cutting-edge technologies and improve lives all around the world. Through our various Tech4Good projects, spanning everything from accessibility and inclusion, education and health, to the environment, we’ll continue to drive social change and scale social transformation by leveraging the combinatorial power of AI, the IoT, blockchain, AR/VR, and other technologies. And we’ll expand the reach of our Tech4Good program yet further by extending it to all our Labs around the world.
ABOUT ACCENTURE LABS
Accenture Labs incubates and prototypes new concepts through applied R&D projects that are expected to have a significant strategic impact on Accenture and its clients. Our dedicated team of technologists and researchers work with leaders across the company and business partners to invest in, incubate and deliver breakthrough ideas and solutions that help our clients create new sources of business advantage.

Accenture Labs is located in seven key research hubs around the world: Silicon Valley, CA; Sophia Antipolis, France; Arlington, Virginia; Beijing, China; Bangalore, India; Herzliya, Israel; and Dublin, Ireland. The Labs collaborates extensively with Accenture’s network of nearly 400 innovation centers, studios and centers of excellence located in 92 cities and 35 countries globally to deliver cutting-edge research, insights and solutions to clients where they operate and live.

ABOUT ACCENTURE
Accenture is a leading global professional services company, providing a broad range of services and solutions in strategy, consulting, digital, technology and operations. Combining unmatched experience and specialized skills across more than 40 industries and all business functions – underpinned by the world’s largest delivery network – Accenture works at the intersection of business and technology to help clients improve their performance and create sustainable value for their stakeholders. With more than 435,000 people serving clients in more than 120 countries, Accenture drives innovation to improve the way the world works and lives. Visit us at www.accenture.com.