

Accenture Labs

IF IT AIN'T BROKE, BREAK IT

We question everything, find new forms and break the rules of the game to bring incredible innovations to clients.



[#LabsInnovationReport](#)

Welcome to the Accenture Labs Innovation Report

The breakneck pace of today's technology developments can sometimes feel relentless. It creates new challenges for businesses, who must confront fresh and fast-moving competitors. It calls for employees, and consumers too, to adapt to new technological possibilities. And that's equally true for those, like us at Accenture Labs, who explore new concepts and ideas at the cutting-edge of technology R&D.

But this accelerated pace of change makes it doubly important to find time to take stock of what we've achieved and where we're going next. That's the purpose of this Accenture Labs Innovation Report. By showcasing our work at the technology coalface over the course of 2018, we aim to celebrate some of the extraordinary innovations that the latest technologies are now enabling for our clients.

From innovative applications of artificial intelligence that radically enhance anti-money-laundering (AML) compliance and streamline production lines to the immersive virtual reality tools that are transforming remote collaboration, and from the publication of our signature Technology Vision to more than 200 groundbreaking patents we've filed, this report highlights just a selection of our achievements over the past year.

It also reflects the great work of our Tech4Good program, which aims to scale technological innovation for social good. With a series of awards and recognitions for its social responsibility work in 2018, the program continues to go from strength to strength as it looks to benefit some of the most disadvantaged communities around the world.

Indeed, spanning all our R&D areas and each of our global Labs locations, the depth and reach of the innovations presented in this year's report demonstrates the value that Accenture Labs are bringing to the Accenture business, to our clients and to communities all over the globe.

But innovation never sleeps. And our exciting program of research for 2019 is already underway. Over the next year we'll be exploring cutting-edge fields like biocomputing and smart materials, as well as reaching out further through our "Shaping the Future" program. We'll also be celebrating the launch of a new Lab in Shenzhen, China. Specializing in artificial intelligence, Industry X.O and robotics, this newest member of the Labs family will be driving innovation in collaboration with an ecosystem of local technology companies, startups, academic institutions and other organizations.

Here's to another fantastic year of innovation in 2019.

Marc Carrel-Billiard
Senior Managing Director, Accenture Labs

Edy Liongosari
Chief Research Scientist, Accenture Labs

THE IMPOSSIBLE EVERYDAY

We're rethinking what goes in and what flows out. Read on to discover the stories that are reshaping the future.

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01

OUR MISSION

Through applied R&D projects, Accenture Labs incubate and prototype the new ideas and concepts that are expected to have a significant near-term impact on our clients' businesses. Our dedicated team of technologists and researchers work with leaders across the company and with our business partners to invest in, develop and deliver breakthrough ideas and solutions that help clients create new sources of business advantage.

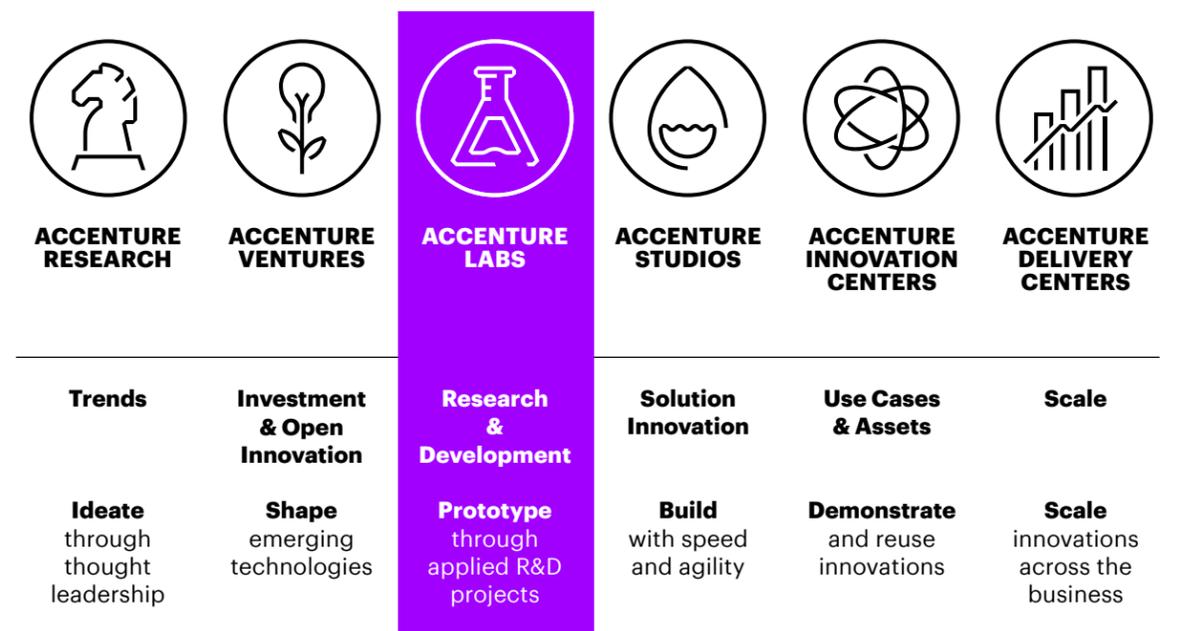
Accenture Labs are located in seven key research hubs around the world: San Francisco, California; Washington D.C.; Dublin, Ireland; Sophia Antipolis, France; Bangalore, India; Tel Aviv, Israel; and soon Shenzhen, China (opening in 2019). These Labs are complemented by 25 Nano Labs that extend our reach to numerous locations in Asia, Europe and the Americas – and we plan to add even more Nano Labs in 2019. Labs also collaborate extensively with Accenture's network of nearly 400 innovation centers, studios and centers of excellence in 92 cities and 35 countries. This collaboration is key in delivering highly scalable cutting-edge research, insights, and solutions for our clients, right in the places where they operate, work and live.



New. Applied. Now.

Accenture Labs are a critical component in the Accenture Innovation Architecture. Specifically designed to scale Accenture's ability to drive innovation, they have a mission to undertake applied research focusing on client challenges and leveraging new technologies available now – both from the market and from our own innovation ecosystem. By embodying the 'New Applied Now' principle, Labs help Accenture and our clients lead with innovation.

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



Accenture Innovation Architecture

Accenture Labs R&D groups

Each of the seven Accenture Labs specializes in one or more research and development groups:

Artificial Intelligence

This group explores new ways of addressing critical business problems by applying leading-edge AI techniques, including machine learning, natural language processing, explainable AI, knowledge representation and reasoning.

Digital Experiences

This group develops technology concepts to increase engagement with customers and employees by pioneering emerging technologies and engagement strategies, such as adaptive product redesign, human-machine teaming and immersive experiences.

Systems & Platforms

This group develops frameworks and tools that enhance architectures for the connected data-driven enterprises of the future, ensuring they can orchestrate and adapt to massive amounts of data, devices and systems in real time.

Cybersecurity

This group creates solutions that improve our clients' cyber-defense strategies and capabilities, such as threat-centric management, advanced detection methods, data protection at scale and effective risk management techniques.

Application Engineering

This group applies intelligent automation in the software development lifecycle to significantly accelerate the application development process while increasing the quality of overall outcomes.

Accenture Labs by R&D Group

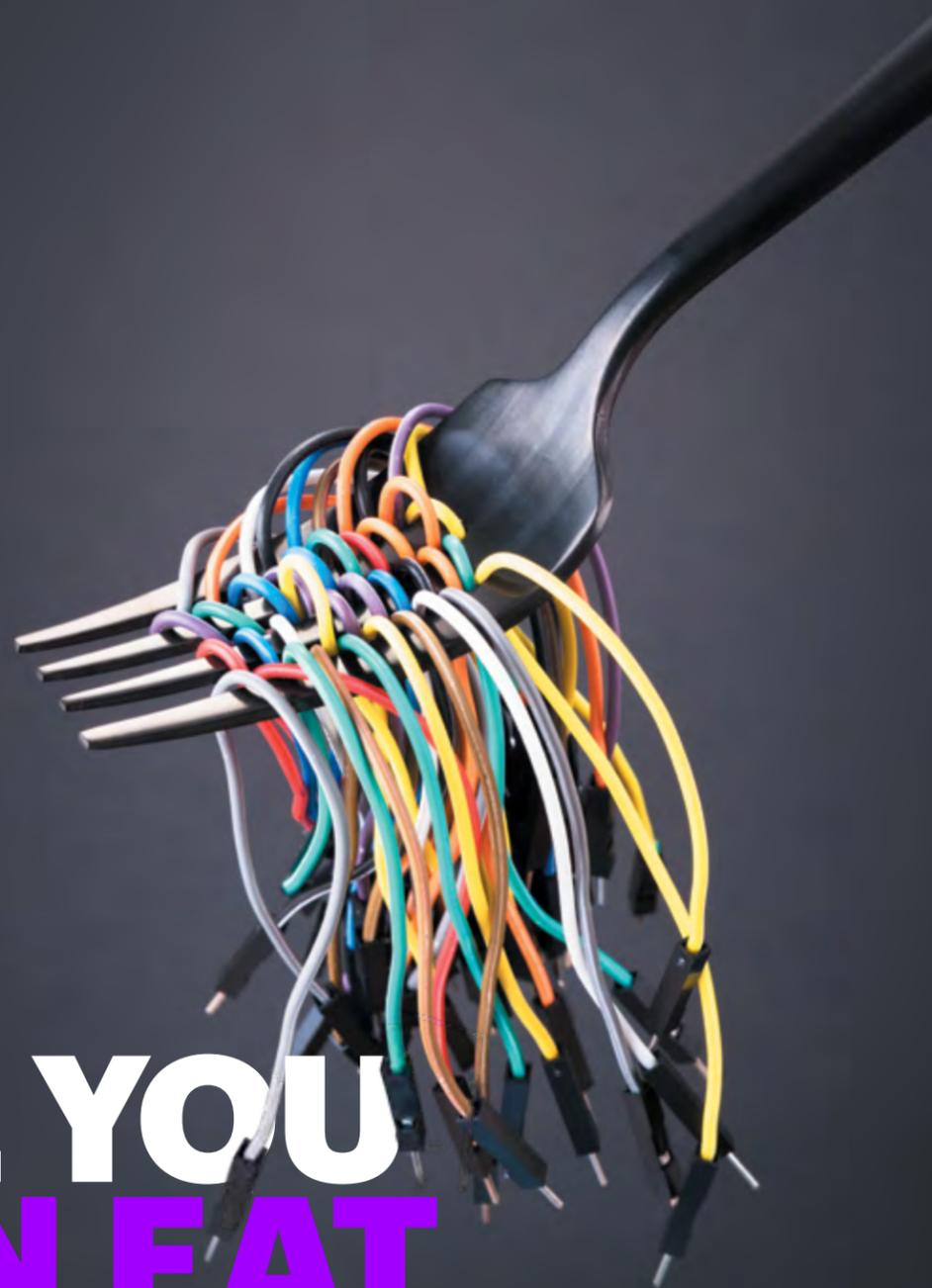
	San Francisco Lab	Washington DC Lab	Dublin Lab	Sophia Antipolis Lab	Tel Aviv Lab	Bangalore Lab	Shenzhen Lab
Artificial Intelligence R&D	●		●	●		●	●
Digital Experiences R&D	●					●	●
Systems & Platforms R&D	●			●			●
Cybersecurity R&D		●			●		
Application Engineering R&D						●	



Bangalore Lab



Sophia Antipolis Lab



ALL YOU CAN EAT

We've curated more diverse innovations than ever before, to satisfy your hunger for the new.

02

SUCCESS STORIES

Artificial Intelligence

A winning solution for AI-powered insurance claim processing

This year, Labs helped an insurance major prove the value of AI in speeding up its claims processing. The company challenged several organizations to a “blind” competition to test whether they could automatically extract information from first notification of loss (FNOL) forms. Far more complex than simple optical character recognition, the challenge required the Labs solution to use computer vision and multi-label classification to intelligently “understand” the relationships between the information provided in the various fields on each FNOL form—associating, for instance, the “city” field with both a person and their address, but not, say, their car model. The result? A convincing win for the Labs solution—and a flexible tool with a range of applications in business processes.

Staying in shape with the help of AI

Keeping in shape can be a challenge whatever your level of fitness, especially for busy professionals with hectic work days. Success can often depend on finding the training plan that works for each individual. So this year, working with the Accenture Fit team, the Dublin Lab used clustering and an embedded knowledge graph to develop a model capable of recommending a personalized training plan for any employee. The solution is set to be integrated in the Accenture Foundation Platform for Oracle and was showcased at the Oracle Summit 2018.

Reducing false positives in AML compliance

Money laundering remains a major challenge all around the world. But even as AML regulations get tougher, today's mostly manual, rules-based detection processes are still highly inefficient, producing vast numbers of false positives. That's why the Dublin Lab has been developing proofs of concept that address a range of challenges from entity resolution (understanding that two parties are actually the same) to link analysis (establishing relationships between parties). The team also proved the value of their solutions by exploring hidden entities and relationships within the Panama Papers and Paradise Papers. The sheer scale of these leaked datasets on offshore investments means they're virtually impossible for human analysts to handle (the Paradise Papers alone amount to 1.4 terabytes of data), making them an ideal testing ground for Labs' capabilities.

Accelerating the production line with computer vision

To ensure only the highest-quality goods leave the production line, manufacturers have stringent quality controls. But these often comprise laborious, time-consuming and costly activities. So the Dublin Lab has been exploring how computer vision technologies can help ensure quality at speed and scale. Working with Faurecia, a leading automotive supplier, they've created a system that uses deep learning to detect missing accessories and the extent of wrinkles on newly assembled car seats to determine whether rework is required. In doing so, the Lab overcame a range of machine vision challenges in dealing with irregular shapes, subtle texture variations, varying seat models and different colors. The solution is now set to be scaled up to a wide number of potential industrial applications.

Managing growing compliance obligations with NLP and machine learning

Every year, around 75,000 pages of new regulations are issued in the US alone – and Accenture's clients spend billions staying up-to-date and compliant. To help streamline what are often manual processes, Labs have been creating solutions to manage a range of compliance challenges, such as automatically extracting the specific "actionable obligations" placed on each entity by regulations. More recently, Labs have been developing a "regulatory radar" to monitor news sources and identify stories that are relevant to both regulators and the companies they regulate. It's helping them stay abreast of key developments and repercussions in the compliance space—and spot potential issues in time to respond effectively.

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Digital Experiences

Reinventing in-car experiences with Faurecia

Accenture Labs have joined forces with leading automotive supplier Faurecia, co-investing to develop new services for connected and autonomous vehicle cockpits. Combining the innovation expertise of both organizations, the partnership will focus its initial work on reinventing the in-car experience. Organized within a "digital services factory", the teams will explore the use of artificial intelligence, advanced analytics, cloud, edge computing, augmented and virtual reality and blockchain to develop services aimed at enhancing the wellness and comfort of both drivers and passengers. These services will be developed on Faurecia's Cockpit Intelligence Platform—a hardware and software platform that integrates key cockpit functions such as driver information, infotainment, safety, comfort, temperature and sound management.

Exploring Human + machine fashion advice with the CFDA

Building on the partnership established in 2017, the San Francisco Lab has been working with the Council of Fashion Designers of America (CFDA) and other parts of the Accenture business to explore innovative ideas like the "smart retail store" and how artificial intelligence can augment fashion advice for customers. In just one month, the team created a tool that could capture a senior fashion stylist's unique design perspective and then reflect it in guidance given to less experienced employees, offering a retailer the prospect of spreading key insights much more widely across its business. It's just one of the innovations delivered through the partnership with the CFDA, which continues to fuel new ideas, capabilities and concepts for the Accenture retail practice.



Reimagining the future of entertainment with Disney

Accenture has joined the Walt Disney Studios StudioLAB as a key Innovation Partner. The StudioLab is a unique space dedicated to reimagining, designing and prototyping the entertainment experiences and production capabilities of the future using innovative technologies. The San Francisco Lab brought experienced team augmentation to the program, helping StudioLAB execute on some of its wide range of exciting emerging technology projects within the Walt Disney Studios. Early projects have explored the use of the IoT to support ground-breaking experiences and how next-generation technologies like artificial intelligence can accelerate and streamline movie production.

Enhanced human-robot teaming for the smart factory

To showcase new ways that robots and humans can work together in an industrial setting, the San Francisco Lab took the Human Robot Teaming System (HRTS) originally developed for a café retail scenario, and extended it with Industry X.0 digital twin technology. The result was a first-of-its-kind human-robot teaming system for the smart factory, which the Lab demoed at the 2018 Hannover Messe conference. With integrated IoT sensors providing enhanced situational awareness, the demonstration showed how robots can perform multi-modal interactions in more complex scenarios with their human teammates.

Virtual teleportation takes remote collaboration to a new level

Partnering with a leading digital experiences agency, the Sophia Antipolis Lab developed a “teleportation” application to support collaborative working from disparate locations. Using virtual reality, the application enables users to connect from any location and be immersed in a dedicated meeting room complete with advanced collaboration functionality. As well as interacting via digital avatars, participants can share documents, invite live presenters into the environment and be connected to virtual Accenture Labs showcases, or tour remote Labs in 3D.

Cybersecurity

Securing a new securities lending platform with blockchain

In a collaborative project with Intel and the Tel Aviv Stock Exchange (TASE), Accenture Labs helped develop a blockchain-based proof of concept for securities lending. Leveraging the ability of Intel’s Sawtooth Lake blockchain platform to integrate ‘smart contracts’, the project aims to create a new kind of marketplace for securities lending. Labs have been instrumental in ensuring Security by Design principles were embedded in the project from the outset, accelerating development without sacrificing security.

Categorizing security breaches with advanced analytics

This year, the Washington D.C. Cyber Lab developed a new analytics tool capable of labeling security alerts based on the phase of the cyber-attack “kill chain” that the intruder has reached (that is, reconnaissance, weaponization, delivery, exploitation, installation, command and control, or actions on objective). The Lab has built an ICS research testbed and tested a proof of concept which can accurately identify the right kill chain phase and network architectural layer, giving cyber-defenders a fast way to move to the most critical alerts. The team have also developed in-house machine learning algorithms and used Splunk ML capabilities to enhance the labeling mechanism.

Reducing security risk by “de-bloating” Docker containers

Docker containers can often include numerous unused or unnecessary packages, creating a much larger “attack surface” for malicious actors to exploit. This year, the Washington D.C. Lab have developed a prototype DeBloat tool. It introduces the idea of a “bare minimum container” (BMC) that includes only those components that are essential for an application to work in a Docker container. Through a dynamic analysis, the DeBloat Profiler creates a tailored profile for the container and the DeBloat Reducer then strips out unnecessary code. Results to date show the smaller footprint that results reduces the vulnerability of the container by up to 100 percent.

Enhancing data protection at scale

Labs have developed a comprehensive machine learning solution for identifying and classifying sensitive information at scale. Able to find business-critical intellectual property, as well as personally identifiable information (PII) and personal health information (PHI) in large datasets, the tool helps organizations ensure their data protection safeguards are sufficient and compliant with regulatory requirements. Running on ASPIRE, Accenture’s enterprise search tool, the new solution can also tag relevant documents and support risk analyses. The Washington D.C. Lab is currently running pilots with key clients and assessing the feasibility of integrating the tool with third-party data protection services.

Bringing new agility to security decisions with AgiSec

To help enterprises move beyond mere compliance and leverage the true value of their cybersecurity capabilities, the Tel Aviv Lab is developing a new “AgiSec” security methodology which employs automated predictive analytics to identify business risk and recommend suitable security actions. The tool helps a business analyze the vulnerability of their assets, assess the value of those assets to the bottom line, and determine the probability of a security breach. By combining these insights, the AgiSec methodology delivers measurable results, enabling a business to prioritize security actions in an agile way, using automation where appropriate, based on a continuously updated risk assessment.

Security Technology Vision 2018

The Accenture Security Technology Vision highlights the trends and technologies that security professionals are using to predict, detect, prevent and remediate cyber-attacks. Our 2018 Vision set out some of the most important challenges facing businesses today and in the years ahead—from the looming risk that quantum computing will nullify existing cryptography to the vivid reminders that hardware vulnerabilities can dramatically expose new attack surfaces. It makes the case that intelligent enterprises now rely on trust-based partnerships for growth—and that security executives must not delay in rethinking the risks and challenges those partnerships create. Learn more at www.accenture.com/securityvision.

Systems and Platforms

Pushing quantum computing to the next level

Accenture has just been granted its first quantum computing patent for a “multi-state quantum optimization engine” that can help organizations optimize business decision making with unprecedented efficiency and effectiveness. The patent is the latest in Accenture’s global IP portfolio and builds on years of quantum investments, partnerships and R&D efforts.

Over the past year, Accenture Labs have been working closely with Accenture Digital to build out quantum-related business offerings. Our new quantum computing center in Detroit will give clients a host of exciting ways to experiment with this new technology. A partnership with IBM Research has given us access to leading-edge hardware for conducting experiments, and testing has already yielded promising techniques for advancing machine learning in the years ahead. Working with 1QBit and Fujitsu, we’ve also validated a nearer-term technology, the Digital Annealer, Fujitsu’s pioneering quantum-inspired technology offering which focuses on solving combinatorial optimization problems.

To learn more about our quantum computing work, please visit www.accenture.com/quantum.



Building a pipeline of enterprise intelligence for an oil and gas major

In 2018, Labs partnered with a global oil and gas major to develop a “well advisor” tool using a knowledge graph. Similar to the way Google searches resolve queries and assemble information, the idea is to present data in context rather than simply a list of search results. By leveraging artificial intelligence techniques, the team showed it could process the company’s documentation, harvest relevant information and map it to a domain-specific knowledge graph. The result is a tool that gives the workforce quick and easy access to a wealth of relevant data to support well planning and operational decision making.

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Creating “genius” data discovery in natural language

The Silicon Valley Lab has developed a “Genius” tool to enhance data discovery on behalf of a multinational banking group. The unique capability of Genius is that it handles queries in natural language, so business teams can access the data they need without having to understand the complex data model that underlies it. So, for example, Genius can take a query like “Show clients in Barcelona who have a valid phone registered” and, using a knowledge graph, map each element to a SQL query (“Barcelona” to a city or region, “registered phone” to a customer table column, and so on). It opens up a far simpler means for enterprise-wide data discovery.

Exploring the future of enterprise robotics

With the emergence of commercially viable robotic applications that can handle ever greater levels of variability, the next phase of robotic automation is now here. In 2018, we've been exploring practical use cases in a host of different industry verticals.

For energy companies, we showcased how robotics can be used to test smart meter firmware updates. By replacing the role of a human tester with a robotic gantry system, we created a proof of concept able to automate all physical interaction with metering devices. It not only freed the workforce from a laborious and monotonous activity, but also produced a dramatic improvement in testing efficiency.

Working with a major global technology company, we've also been developing a use case and roadmap for the deployment of robots in a data center. The goal: to improve efficiency, safety and security—and reduce operating costs. The eight-week strategy project will consider how robotics could be applied throughout the whole lifespan of the data center—from construction through to decommissioning, and all activities in between.

Application Engineering

Focusing on liquid and intelligent engineering

Accenture Labs have developed a first-of-its-kind application testing prototype using extended reality. Enabling an engineer to “walk into” a virtual three-dimensional representation of an application, it's opening up new possibilities for spotting otherwise hard-to-find patterns and insights in white box testing. The approach weaves together static aspects of an application and its structure with live data about its dynamic behavior and usage to create interactive mixed-reality visualizations. The prototype was showcased at the Accenture Technology Symposiums at Orlando and Berlin and received highly positive feedback from clients and colleagues alike. Labs are now developing a banking-specific prototype and exploring how the concept could be used in software engineering activities like knowledge transition.

Making learning personal with AI

The Bangalore Lab has been exploring how artificial intelligence and knowledge graphs can help employees upskill through personalized and adaptive “microlearning”. Trained on data from 5,000 learner records across 50,000 course units, the resulting prototype is able to match a learner's profile against a set of recommended learning paths. With a successful pilot completed, and a publication at the prestigious Educational Data Mining 2018 conference well-received, the tool is demonstrating how smart technologies can make a real difference to employee learning.

Developing new ways to verify machine learning applications

With recent practical applications of machine learning showing accelerated performance, the expectation is that most business applications will soon include some form of artificial intelligence. However, testing these applications with today's methodologies is extremely challenging and expensive. That's why Labs have been developing a new “Metamorphic Testing” approach to identify implementation bugs in machine learning based image classifiers. Leveraging Support Vector Machine and a deep learning application, our approach has shown it can catch 71 percent of implementation bugs in these applications, and is now integrated into Accenture's Teach & Test methodology.

Prioritizing test scripts with Markov and Bayesian methods

By prioritizing the test scripts that are most likely to fail, developers can accelerate the identification and fixing of bugs and get their products to market faster. Most existing prioritization techniques, however, require access to the code, as well as data on code churn, code quality, and who developed it. In practice, this information is difficult and expensive to gather and maintain, especially if testing is carried out by an independent organization. To solve this challenge Labs have been exploring a tool to prioritize test scripts based purely on the execution history of those scripts. Using a Bayesian technique and a Markov chain technique (similar in principle to natural language processing), our approach has shown very encouraging results in practical testing scenarios.





GREAT MINDS

Engaging our collective brain power activates big thinking and mind-blowing transformation.

03

CROSS-GROUP INITIATIVES

In addition to their domain-specific R&D activities, the seven Accenture Labs around the world conduct special multi-year projects designed to spark innovation through the cross-fertilization of new ideas and cutting-edge concepts. For each of these projects, the Labs R&D groups come together with business and functional experts and Accenture industry or practice leads. Their work helps uncover the solutions that will drive the next wave of business transformation by taking advantage of the combinatorial power of emerging technologies.

Industry X.0

The Labs Industry X.0 initiative focuses on the next wave of digital transformation in manufacturing. This year, the Labs have been developing an Engineering Data Digitization tool, using artificial intelligence to automate the process of digitizing engineering documents and integrating their insights into a knowledge graph. By releasing valuable data trapped in images and hard copy, the knowledge-capturing tool ensures IoT solutions can make sense of the context of asset data. As such, it's set to be a vital foundation for future Digital Twin implementations.

Labs also developed a new Intelligent Trend Detection tool to help clients transform product development by spotting upcoming trends in their industry, even if they don't know precisely what to look for. It uses heuristics to provide a meaningful way of exploring variations on a concept that might otherwise be missed. So, for instance, "hospital" might produce a list of variants like "small clinic", "specialty hospital", or "smart hospital". As each new variation is identified, it is explored further via web searches to determine whether it's on an upward or downward trend.

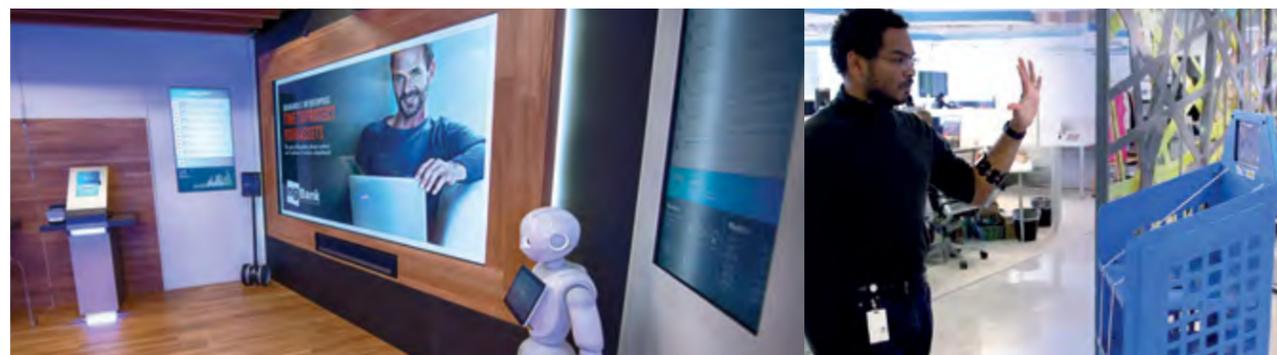
RegTech

The Labs regulatory technologies initiative (“RegTech”) is exploring how technology-led innovation can streamline the regulatory environment—for both businesses and regulators themselves.

This year, we instigated a co-innovation program with the Accenture Technology Centers India Financial Services innovation team to develop a prototype “smart risk advisor” to help Accenture’s clients build competitive differentiation around their regulatory constraints. By helping risk managers spot emerging risks instantly and, crucially, recommending mitigating actions, the advisor has the potential to make a significant difference to regulatory compliance. The smart risk-reducing tool has been trialed with several leading banking clients, and its potential was recognized by the judges at the GTIC 18 Awards.

We also developed a proof of concept to showcase how blockchain could streamline banks’ compliance with evolving laws and regulations. Using Hyperledger Fabric blockchain technology, the prototype stores bank branches’ daily deposit reports in a secure distributed system (rather than consolidating and reporting them quarterly to the regulator). Scaled up, the solution would enable the regulator to access every report instantly, perform history checks and make faster and more accurate predictions about banks at risk of failure.

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**DRIVE THE NEXT
WAVE OF BUSINESS
TRANSFORMATION**

REAL EYE OPENERS

These technologies, trends and breakthroughs provide valuable insights for intelligent enterprises.



04

ACCENTURE TECHNOLOGY VISION 2018

Accenture's annual Technology Vision continues to be our most widely viewed and distributed piece of thought leadership. In 2018, we pinpointed the technology trends which are allowing companies to tap into the powerful potential of the intelligent enterprise.

Reflecting the indisputable fact that business today is getting ever more personal, this year's Vision calls on leaders to shift mindsets and business models toward developing strong and trusted relationships with partners, customers, employees and governments. Specifically, it explored five key trends that are transforming society and creating the foundation for future enterprise growth:



Citizen AI. Used responsibly, AI will be a powerful addition to a collaborative workforce.



Frictionless business. Companies need to re-architect to power partnership-driven growth.



Extended reality. Immersive experiences are changing how people and information connect.



Internet of Thinking. "Intelligence everywhere" calls for an overhaul of enterprise infrastructure.



Data veracity. Inaccurate, manipulated and biased data is now a serious vulnerability.

This year's report outperformed even last year's incredible success. In just three months after launch, the 2018 Vision had received over 350,000 online visits—more than half as much again as the 2017 report. It had also been the subject of over 2 million branded social media engagements—five times the number achieved in 2017.

For more about Accenture's Technology Vision, please visit www.accenture.com/techvision.

05

LABS INNOVATION WORKSHOPS

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 2018, we broke records by sponsoring over 1,000 events across all our Labs locations for both internal audiences and valued clients.

Client teams visit the workshops to learn about and envision 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 client and can include full or multi-day workshops, full or part-day educational seminars, and Labs overviews and demonstration tours.



06

NANO LABS

Spanning the world, from Riga to Buenos Aires and from Bratislava to Monterrey, our 25 Nano Labs have a mission to inspire and guide clients with breakthrough technology innovations. Able to connect with researchers from any Lab location, even via virtual reality, participants can immerse themselves in emerging technologies and understand how new trends will impact their future business operations.

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-on discussions with Labs experts.

Last year, we launched our first North American Nano Lab in Boston, co-located with a Liquid Studio in a new Innovation Hub. The Labs showroom was built at record speed, and we trained and certified the new leadership in just a single month. Already, the Boston Nano Lab has hosted over 60 events, with many more to come.

In fact, with more than 800 client visits delivered around the world in 2018, and five new locations in the pipeline in Asia Pacific, our Nano Labs are more than doubling the reach of Accenture Labs.

Our 25 Nano Labs have a mission to inspire and guide clients with breakthrough technology innovations.

SHARING INNOVATION GLOBALLY

Our Tech4Good projects bring innovation where it's needed most.



07

TECH4GOOD

Accenture Labs apply cutting-edge technologies in innovative ways to help build a more inclusive and sustainable world. Through our various Tech4Good projects, we're driving societal change and helping scale positive social transformation by leveraging technologies like AI, the IoT, blockchain and augmented and virtual reality.



The Tech4Good program has been honored to receive several awards and recognitions for its social responsibility work:

- ★ **India Mobile Congress and Aegis Graham Bell 2018 award:** Bringing fortune at the bottom of the pyramid (for project Grameen).
- ★ **mBillionth South Asia 2018, Inclusion & Empowerment Diversity Award** (for project Drishti).
- ★ **Sabera award for social enterprise.**
- ★ **Glomo Award** finalist 2018.

Promoting financial inclusion and education with the Grameen Foundation

In partnership with the Grameen Foundation India, the Bangalore Lab developed two innovations to help women and low-income citizens overcome barriers to accessing financial services. EASE (Emotion Analytics for Social Enterprises) is a mobile and web app that uses AI to glean key insights into the emotional and cognitive state of an individual. This helps microfinance advisers spot if any undue pressure is being placed on female loan applicants and also helps organizations identify the right talent for recruitment and career progression. Grameen Guru is a tool that uses augmented reality, image recognition, and a multilingual chatbot to help smartphone users with limited literacy understand available financial products and services. By holding their phone camera over a product brochure or icon, users get instant access to the Guru chatbot, who can explain their options in clear and simple language.

Empowering job applicants with EASE

The Labs-developed EASE tool is also being used to help job seekers build confidence and refine their interview technique. By embedding the AI in a virtual agent, Valesa, the Lab created a solution which could be used by career coaches and interviewees to assess performance in mock interviews. In India, it was piloted with Her Second Innings to improve the coaching HSI offers to job applicants who have previously taken time out from their careers. In the UK, Valesa is helping the East London Business Alliance build the confidence of underprivileged young job seekers.

Helping the hard-of-hearing feel the beat with BleeTech

Learning to dance can be challenging at the best of times. And for hard-of-hearing dance students at the Red Cross Society’s School for the Deaf, Pune, distinguishing and responding to the subtle rhythms in a piece of music make it even more so. That’s why BleeTech created the BleeWatch which lets wearers feel the beat through haptic feedback. However, they were having to manually extract and program the rhythmic patterns for each song, limiting the range of music available. So the Bangalore Lab used state-of-the-art music analysis to help BleeTech automatically extract the beat pattern and tempo of any piece of music. They also ensured multiple BleeWatches could be synchronized to the same beat for group lessons.

Applying AI to lifelong learning with Project Plato

Career guidance often involves sharing career stories. And this was the inspiration for the Dublin Lab in working with Fjord to understand how leveraging analytical models of career stories might help people make better career decisions. As continuous reskilling and lifelong learning become the new normal in the workplace, the need for clear guidance on career development, skills, training and future roles becomes ever more important. It’s an area in which artificial intelligence has a potentially significant role in helping employees navigate shifting career landscapes.

Making blood donation easier and more secure with Save a Life

Using the emerging W3C and DIF standards for decentralized identity and the evolution of multimodal biometrics (iris and facial recognition), the Sophia Antipolis Lab has been developing a new Save a Life application to streamline and secure the process of donating blood. Using a distributed computing platform and clever biometric technologies that can identify a donor by their unique facial or iris features, it’s creating a secure and trusted system of self-controlled decentralized identity. That means everyone involved—donors, governments, healthcare providers, donation centers—can exchange and use sensitive personal information with far greater trust and security.

Fighting human trafficking with artificial intelligence

Based on a collaboration with Stanford University, the San Francisco Lab is using knowledge-based machine learning techniques to help law enforcement authorities uncover possible human trafficking. By working together on a tool that

can process the huge numbers of advertisements for escort services and recognize the features that law enforcement experts deem the most relevant (such as unusual pricing or location), the partners have created a solution which will ultimately be used to focus enforcement resources on cases most likely to involve trafficking victims.

Building future skills with an innovative VR “game”

Taking a human-centric approach to discover, describe, create, test, and iterate new ways to help young people understand and enhance their transferable skills, Labs have developed a virtual reality “Future Skills Builder” experience. Designed to fit seamlessly into the school day, and using the new Oculus Go headset, the Future Skills Builder is a framework able to offer short goal-based minigames to develop users’ “create and solve” skills. Both fun and serious at the same time, it’s an innovative initiative for encouraging high school students to explore the STEM skills that will be vital in the future economy.



08 LABS FY18 R&D IN NUMBERS

1,000+ innovation workshops and events hosted

770+ client visits to Nano Labs

220+ patents granted

150+ patent applications filed

136 business and research reports published

92 proofs of concept developed

34 client pilots

3 awards for social impact.



A TASTE OF THINGS TO COME

09

WHAT'S NEXT?

Over the coming year, we'll continue to deepen our research and explore new avenues of enquiry as we support our clients and the Accenture business with differentiated technology innovations.

We'll be launching our latest Accenture Lab in Shenzhen, China, which will specialize in driving the next Industrial Revolution by applying R&D in artificial intelligence and robotics, as well as playing a leading role in our cross-Labs Industry X.0 initiative. The new Lab will have a mission to identify and develop the latest innovations in China, and more broadly in Asia Pacific, by collaborating with an ecosystem of technology companies, emerging startups, academic institutions and other local and regional organizations.

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 human-robot teaming, Industry X.0, and artificial general intelligence. We'll also continue our focus on technology vision, digital experiences, cybersecurity, AI, application engineering, and systems and platforms, as well as introducing some exciting new research areas like biocomputing and smart materials.

Biocomputing

With Moore's Law hitting its plateau, computing infrastructure appears ever more heterogeneous. Whether it's Nvidia with its Turing platform, Google with its Tensor processors, or Microsoft with Brainwave, the future of computing seems to be one of divergence. A key element of this trend is biocomputing – using biological materials like proteins and DNA to perform computation with extremely high levels of energy efficiency. In addition to the quantum computing R&D we started two years ago, we'll be exploring how biocomputing can help solve some of today's most challenging computing and data storage problems—and create new possibilities for our clients.

Smart materials

The science of smart materials—materials which can dynamically change state in response to external stimuli—has huge implications for both business and our daily lives. Sitting at the intersection of material science and information technology—two fields that are currently going through breakneck development—smart materials potentially change everything about what we consider a “product” to be. Imagine a pair of running shoes which morph and dynamically adapt to your particular anatomy and running style, as well as the day’s weather conditions, and which continuously collect data to feed back into the design process. Or what about industrial materials that “remember” their shape and can reform after being damaged? This is obviously a field with high potential for Accenture and our clients, and we’ll be working with our partners to dig deep into the possibilities. The starting point: the latest smart textiles that are already out of the laboratories and moving toward commercial use.

Shaping the Future program

Accenture Labs are kicking off an innovative new program—Shaping the Future—in which we’ll be working with select clients and partners to jointly define and shape the future of their businesses and industries, looking ahead to 2030 and beyond. This program will examine bold, provocative, speculative, combinatorial technologies and various societal factors to understand what the future holds—and what the various possibilities imply—and ultimately pick the preferred outcome to define and shape together.

Our first focus area? The transformation of physical products into services and the creation of the outcome-based economy. Watch this space for more...



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: San Francisco, CA; Washington, D.C.; Dublin, Ireland; Sophia Antipolis, France; Herzliya, Israel; Bangalore, India; and Shenzhen, China; and 25 Nano Labs. 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. For more information, please visit www.accenture.com/labs.

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 469,000 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.