



LEADING
THE
CONVERSATION

2016
YEAR
IN
REVIEW

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MIT INITIATIVE ON THE DIGITAL ECONOMY



IDE Director Erik Brynjolfsson introduces the Winners at the 2016 Inclusive Innovation Challenge.

THE MIT INITIATIVE ON THE DIGITAL ECONOMY (IDE) EXPLORES HOW PEOPLE AND BUSINESSES WILL WORK, INTERACT, AND PROSPER IN AN ERA OF PROFOUND DIGITAL TRANSFORMATION.

OUR SINGULAR FOCUS IS THE DIGITAL ECONOMY

THE IDE IS INCREASING KNOWLEDGE, EXPANDING DIALOGUE, AND INVENTING SOLUTIONS.

Findings from our research are providing critical insights to our stakeholders and winning academic acclaim along the way.

Our events have gathered together thousands of practitioners, academics, and public policy experts on a level, neutral playing field to solve pressing issues that we all face, such as the future of work.

The inaugural year of the Inclusive Innovation Challenge (IIC) was an enormous success. The IDE awarded a total of \$1 million to organizations that are reinventing the future of work to ensure that a larger economic pie is shared more equitably.

We extend our appreciation to the extremely generous support of individuals, foundations, and corporations. Thanks to you, the IDE's knowledge and research is being shared around the world.

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ACHIEVEMENTS

We bring bright minds together to fuel conversation and find actionable solutions.

Inclusive Innovation Challenge

The IDE launched its first annual Inclusive Innovation Competition. The competition, which has been renamed the Inclusive Innovation Challenge (IIC), awards \$1 million to organizations that use technology to create broader economic opportunity for the many and not just the few. Through the IIC, we are advancing solutions to a grand challenge of our time: reinventing the future of work to create shared prosperity for all in the digital age. Our 2016 call for entries attracted 243 applicants from 35 countries. *Learn more about the IIC on page 10.*

More events, more attendees

In 2016, the IDE expanded the size and number of events. We added two new major events to the calendar, which nearly tripled the total number of IDE event attendees during the year. *Learn more about our events on page 8.*

Major IDE events in 2016 were standing room only.

In the news

The IDE experienced a significant increase in press coverage and global reach in 2016. We communicated our message and publicized our efforts to stakeholders and external audiences in broader ways than ever before.

The Initiative launched a redesigned web presence this past year. Our new site (ide.mit.edu) highlights the academic work of the IDE and features principals, events, and news content through

podcasts, videos, and webinars. We also unveiled our new logo and branding, which is helping the IDE stand out as a leader in our field.

The IDE also optimized the use of content and social media, including the launch of a successful IDE/IIC Medium publication that features blogs by IDE leaders such as Erik Brynjolfsson, Andrew McAfee, Sandy Pentland, Sinan Aral, Geoff Parker, and Michael Schrage. The IDE is among the top 10% of Medium publications in terms of readers and writers on the platform. Read more at medium.com/mit-initiative-on-the-digital-economy.

IDE Advisory Board

Nobel Laureate Michael Spence accepted our invitation to the IDE Advisory Board in 2016. He joins fellow Nobel Laureate Bob Solow, and thought leaders Eric Schmidt, Marc Benioff, Reid Hoffman, Carl Bass, and James Manyika. The IDE is made better by their collective intellect, perspective, insight, and guidance.

Education

In 2016, we refined and broadened our educational offerings. The Analytics Lab, for instance, provided project-based work — with most projects proposed by our stakeholders — so that master's students at MIT Sloan could tackle real-world, data-rich projects. We also launched the first of several digitally delivered executive education courses. *Platform Revolution: Making Networked Markets Work For You*, was hosted twice during the year by Sloan Executive Education, with more than 500 total participants.



Sinan Aral, IDE Social Analytics research pillar lead, presents highlights of his research at the IDE Annual Conference in Cambridge, MA.



THE IDE CONDUCTS GROUNDBREAKING RESEARCH FOCUSED ON FOUR ASPECTS OF THE DIGITAL ECONOMY.

Left:
Alex "Sandy" Pentland heads the IDE Big Data research pillar.



PRODUCTIVITY,
EMPLOYMENT +
INEQUALITY



BIG DATA
+ INFORMATION
PRIVACY



NEW DIGITAL
BUSINESS MODELS



SOCIAL ANALYTICS
+ DIGITAL
EXPERIMENTATION



Right:
Principal Investigator Renée Gosline specializes in experiments that incorporate behavioral science into human-machine interfaces.

RESEARCH

In 2016, the IDE initiated, continued, or completed more than 45 research projects. Here's a look at five from the past year.

The Co-Evolution of Income and Product Sales Distributions on eBay

Erik Brynjolfsson and Sagit Bar-Gill

eBay is the ultimate online marketplace, with annual net revenue of over \$15 billion and a population of nearly 150 million active buyers. In this project, Erik Brynjolfsson and Sagit Bar-Gill are examining eBay's long tail, or inventory of products in low demand or low sales volume, in terms of product sales and seller income distributions. The study of eBay's income distribution will provide meaningful insights on possible drivers of economy-wide trends and individual mobility within the income distribution.

Sustainable Digital Ecology

Alex "Sandy" Pentland

In the era of Big Data, the danger exists that the economic environment will be dominated by those with the biggest computers and most access to consumer personal data. This is not just an economic worry — the scandal surrounding the U.S. National Security Agency demonstrates that similar dangers exist with governments. Moreover, an ecology with such winner-take-all dynamics is likely to be unstable, with severe booms and busts. In this project, Sandy Pentland investigates alternate architectures for a digital ecology that are more sustainable, such as moving from completely open market mechanisms to cooperative exchange network mechanisms.

Productive Time Use in the Digital Age

Erina Ytsma

Has the internet decreased our productivity at work? A CareerBuilder survey in 2014 found that 21% of workers report online browsing for pleasure while at work, while 24% report spending at least one hour per day on personal calls, emails, or texts. This begs the question: should employers restrict internet access to increase productivity? Erina Ytsma is exploring the effect the

internet has on the productivity of workers and assess how limiting internet access at work impacts productivity.

The Role of Social Influence in Shaping "Healthy" Habits

Sinan Aral and Christos Nicolaides

Health-related behaviors, such as fitness and dietary habits, tend to be more prevalent among peers connected by social networks. Sinan Aral and Christos Nicolaides are using fine-grained, running-exercise data from more than one million users of a worldwide exercise platform to identify the role of social influence in fitness behavior. The project explores how a social circle affects health-related decisions and assesses the optimal set of incentives needed to change "bad" habits.

Digital Culture: Identifying Internal Mechanisms of Adaptation and Success in a Digital Environment

George Westerman

George Westerman seeks to understand the nature and prevalence of digital culture in today's enterprises. This research effort will characterize the cultures of digital-born and traditional companies in the form of artifacts, attitudes, beliefs, values, and norms. Using qualitative interviews, the project will establish measures of digital culture and quantify relationships among different constructs of interest, while providing advice and examples that help leaders of traditional companies to steer their organizations' cultures in a more digital direction.

Read about current and past research projects at ide.mit.edu.



The IIC's 3D-printed trophies await presentation at the 2016 Awards Celebration.

REINVENT THE FUTURE OF WORK



In 2016, the IDE launched the Inclusive Innovation Challenge, a program that awards over \$1 million to inclusive innovators who are reinventing the future of work and enabling more people around the world to engage in today's digital economy.

The response to our call for entries exceeded expectations. We received 243 applications from diverse organizations in 35 countries. A team of more than 70 core judges and Champion Committee members partnered with the IDE to review applicants. Ultimately, the field was narrowed to 24 winners.

Our efforts culminated with the IIC Awards Celebration, a full day of inclusive innovation programming at Boston's HUBweek, presented in conjunction with MIT Solve. The IIC finalists pitched their solutions to the audience and in the evening, received prizes in an awards ceremony at the MIT Media Lab, attended by nearly 1,000 people.



"We have a profound responsibility to broaden the bounty that technological innovation brings. The Inclusive Innovation Challenge is a perfect beacon for this, as it shines a light on 24 companies who are doing it right."

Joseph Eastin, President & CEO, ISN

2016 WINNERS

SKILLS

Coding Dojo
Digitalundivided
Duolingo
General Assembly
Year Up •

MATCHING

Bottom Line
Laboratoria •
Rural Sourcing, Inc.
Skills for Chicagoland's Future
Viridis Learning

HUMANS + MACHINES

99Degrees Custom •
Ignitia
Jana
LeadGenius
Rethink Robotics

NEW MODELS

eKutir Global
Iora Health •
Soko
StartUp Box
Coworker.org

JUDGES' CHOICE

Destácame.cl
doctHERs
SAP's Africa Code Week
uAspire



Devin Cook, IIC Executive Producer

• *denotes Grand Prize Winner*

Read profiles of the 24 winners at mitinclusiveinnovation.com.

2017 CATEGORIES

We look forward to the second year of the Inclusive Innovation Challenge, when we will continue to celebrate organizations that create economic opportunity in the digital era. This year's award categories are:



SKILLS & MATCHING

How do we enable people to succeed in and access the work opportunities of the future?



FINANCIAL INCLUSION

How do we ensure financial security and stability for more people?
How do we enable more people to access the benefits of financial services?



TECHNOLOGY ACCESS

How do we provide more people with internet and technology access, regardless of age, location, education, or ability?



INCOME GROWTH & JOB CREATION

How do we allow people to earn sufficient and growing incomes to achieve satisfactory quality of life and living standards?

Applications open: March 2017. Celebration: October 2017.
Details at ide.mit.edu/iic and mitinclusiveinnovation.com. Follow us on Twitter @MIT_IIC.

EDUCATION

We provide students, executives, and other stakeholders with online and on-campus education about transformations in the digital economy.

Learn more about the educational offerings of the IDE at ide.mit.edu.



Analytics Lab class of 2016 with faculty, course mentors, and project sponsors.

Action Learning through the Analytics Lab (A-Lab)

In the MIT Sloan Analytics Lab, or A-Lab, student teams design projects using analytics, machine learning, and digital technologies to address business questions and problems. Companies and organizations from around the world, including sponsors of the IDE, provide their data, time, and insights at the start of the semester to help student teams deliver actionable solutions and impactful findings.

In fall of 2016, students tackled 21 real-world projects across a variety of topic areas, including finance, e-commerce, medical supply chains, workplace safety, and global health. The course culminated with presentations of their findings to an audience of experts, entrepreneurs, and executives. The “winning team,” as determined by a panel of guest judges, used text analysis and sensor data to determine the quality of locomotive repairs and to predict future maintenance events.

The MIT Sloan Analytics Lab has proven to be one of the most popular courses among students pursuing careers in data science at MIT. During the past three years, A-Lab has attracted:



Digitally Delivered Executive Education

In July 2016, the IDE launched the online course, *Platform Revolution: Making Networked Markets Work For You*. Based on the book by the same title, which is co-authored by IDE Digital Fellow Geoffrey Parker, the course had more than 500 participants from across the globe in two sessions. Driven by this early success, we have several courses in development for release in mid-2017.

Left: IDE Digital Fellow Geoffrey Parker provided insights, frameworks, and knowledge for building platform capability and for thriving within platform ecosystems.

LOOKING AHEAD

WE ARE ON THE CUSP OF EVEN MORE PROFOUND AND RAPID CHANGE. THE IDE WILL NOT ONLY KEEP PACE — WE WILL HELP SHAPE THE FUTURE.

Inclusive Innovation Challenge

In 2017, the IDE will launch the second annual Inclusive Innovation Challenge. Building upon the success of our first event, we will host a bigger and more impact-focused IIC Awards Celebration event in October, which will convene leaders and stakeholders from the inclusive innovation ecosystem. We will continue to celebrate the organizations that are creating economic opportunity in the digital age, while inspiring the next generation of inclusive innovators to use technology as a tool to build shared prosperity.

The MIT Disruption Timeline Conference Series

In March 2017, the IDE will host the first MIT Disruption Timeline Conference. This conference series will bring together leaders from industry, academia, and public policy to explore and debate the impact and trajectory of technological innovation, each year featuring a specific technology. The inaugural event will focus on the latest advancements and applications in the realm of artificial intelligence and machine learning. Participants will discuss the impact that AI and machine learning are having on business, labor, and the economy, and will examine the policy recommendations sparked by these developments.

Executive Education

The IDE is excited to launch two new courses in the summer of 2017. An ensemble cast of faculty, including the IDE's George Westerman, will lead the first course, *Digital Transformation Through the Internet of Things*. In the second course, IDE Director Erik Brynjolfsson and Co-Director Andrew McAfee will join forces to lead *Harnessing the Digital Revolution: Machine, Platform, Crowd*.

New book from Erik Brynjolfsson and Andrew McAfee

The highly anticipated book, *Machine, Platform, Crowd: Harnessing the Digital Revolution*, will hit bookstore shelves in late June. In the book, co-authors Erik Brynjolfsson and Andrew McAfee point to the new capabilities required for any organization to be successful in the Second Machine Age. Pre-orders are now available through amazon.com.

Receive updates about events, research projects, research briefs, and the Inclusive Innovation Challenge. Subscribe to the IDE monthly newsletter at ide.mit.edu.



IDE Co-Director Andrew McAfee examines emerging digital business models.

TEAM

• denotes new faces to the IDE team

RESEARCH PILLAR HEADS



Erik Brynjolfsson
Director, IDE
Professor,
MIT Sloan School of Management



Andrew McAfee
Co-Director, IDE
Principal Research Scientist



Alex "Sandy" Pentland
Professor,
MIT Media Lab



Sinan Aral
Professor,
MIT Sloan School of Management

RESEARCHERS



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George Westerman
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Renée Gosline
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Management

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IDE team members at the 2016 Annual Conference.

DIGITAL FELLOWS

Tim Aepfel
Reporter, Reuters

Thomas Davenport
Professor, Babson College

Alan Davidson
Digital Economy Director, U.S. Department of Commerce

Joshua Gans
Professor, University of Toronto,
Rotman School of Management

Shane Greenstein
Professor, Harvard Business School

Lorin Hitt
Professor, University of Pennsylvania, Wharton School

Jeffrey Hu •
Professor, Georgia Tech

Tod Loofbourrow
CEO, ViralGains

Kristina McElheran
Assistant Professor, University of Toronto

Geoffrey Parker
Professor, Dartmouth College, Thayer School

Michael Schrage
Imperial College Department of Innovation and
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Sonny Tambe
Associate Professor, NYU Stern School of Business

Irving Wladawsky-Berger
Professor, MIT Engineering Systems

Lynn Wu
Assistant Professor, University of Pennsylvania

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Capgemini Consulting
Tetsuhiro Amma
Suruga Bank

PhDs and POST-DOCTORAL FELLOWS

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Paramveer Dhillon •
Andrey Fradkin
Avi Gannamaneni •
Shan Huang
Xiang Hui •
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Google.org

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Rockefeller Foundation

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Joël Andre Ornstein

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Jeff & Leisl Wilke

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Merck

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“2016 WAS A TREMENDOUS YEAR OF GROWTH FOR THE IDE. WITH VERY GENEROUS SUPPORT FROM ALL OF OUR STAKEHOLDERS, WE ARE MAKING A DIFFERENCE AND DRIVING THE DISCUSSION ON THE DIGITAL ECONOMY.”

David Verrill
Executive Director

Learn more about us at ide.mit.edu

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