



2010 – 2020
CELEBRATE
INNOVATION

COPYRIGHT © EIT DIGITAL 2020. ALL RIGHTS RESERVED

Design: Studio Eyal & Myrthe

ISBN/EAN: 978-90-9033712-8

CELEBRATE INNOVATION

EIT Digital
2010–2020



EIT Digital ivzw

www.eitdigital.eu

Digital

Rue Guimard 7 | 1040 Brussels, Belgium

Preface

This book tells the story of how EIT Digital over the past decade became the largest digital innovation ecosystem in Europe, delivering on digital entrepreneurship, innovations, talents and skills.

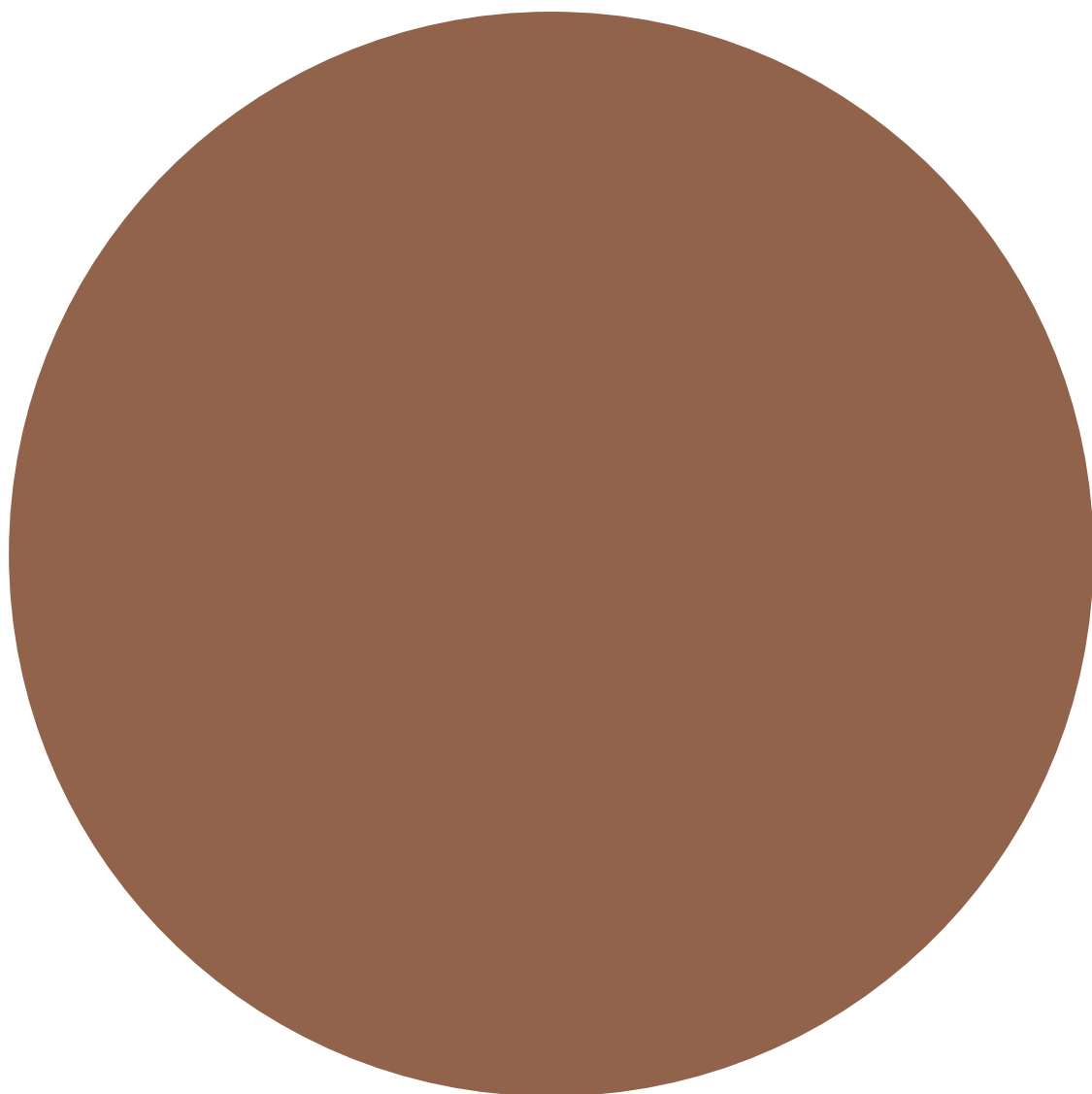
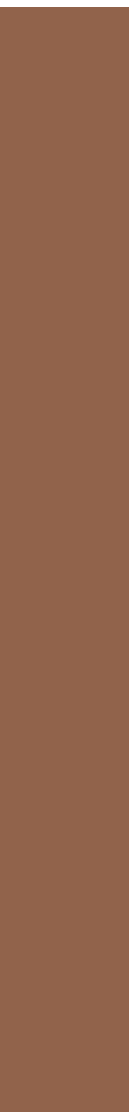
Launched in 2010 as one of the first wave EIT KICs (Knowledge and Innovation Communities), the community set out on a journey of growth. Growth in terms of the community itself, growth in terms of delivery on innovation, entrepreneurship, and talent, and finally growth in terms of impact through its thought leadership.

EIT Digital matured against the background of a fast-accelerating digital world and a growing focus on entrepreneurship in Europe. Complementing the strong European research base, this entrepreneurial mindset will strengthen Europe's position in a digital world driven by data, platforms, and the network economy. Creating a Strong Digital Europe will safeguard European values by being inclusive, fair, and sustainable.

The book consists of three parts. Starting with describing the trends of the first decade of this century that preceded the creation of EIT Digital. It follows describing the journey of EIT Digital in the second decade against the background of the fast-developing digital world. The final part is an outlook to the third decade, identifying the main trends and outlining the envisaged further development of EIT Digital.

SECTION	PAGE
2000–2010: THE AGE OF NETWORKS	6
2010–2020: THE AGE OF PLATFORMS	32
BEYOND 2020: THE AGE OF MINIATURISATION	84

2000–2010



The road to EIT Digital

The origin of EIT Digital finds its roots in Harvard professor Clayton Christensen's theory of innovation. Christensen passed away on the 23rd January 2020, leaving behind an indelible legacy as the grandfather of disruption. It scarcely seems relevant that Christensen's original treatise on disruption originated in the steel industry, where large, integrated steel mills ceded ground to smaller competitors at the low end of the market, before these minimills used this foothold to gradually drive efficiencies and utilize their flexibility to capture the market.

As the years passed from the publication of *The Innovator's Dilemma* in 1997, the notion of 'disruptive innovation' came to be captured by the growing wave of technology startups emanating from Silicon Valley. It is an era pithily captured by Jill Lepore, in the *New Yorker*. "Ever since *The Innovator's Dilemma*, everyone is either disrupting or being disrupted," she writes. "There are disruption consultants, disruption conferences, and disruption seminars..."

The age of networks

INTO THE BUBBLE

The dotcom bubble of the late 1990s was a euphoric time, with unbridled enthusiasm for the changes a new wave of technologies were bringing to society. While the financial valuations, and indeed the business models, of many of these pioneering companies were ultimately unsustainable, the evolution technology made during this period helped propel us to where we are today.

The early years of the Internet were characterized by not only ill-founded attempts to commercialise this new medium, but a rapidly unfolding exploration of just what it all meant.

Many early adopters made the fundamental mistake of assuming it would be a natural extension of the bricks-and-mortar world they knew so well, with early websites little more than digital versions of the brochures retailers would typically mail out to customers' homes.

Just as there was considerable experimentation in the millions of websites that flooded the burgeoning world wide web, so too did the demographics of web users gradually shift. In 1995, it was estimated that the average web user was a 31-year old male professional, but growth

was faster than anything seen before, such that by the height of the dotcom bubble in 1999, Internet usage had become mainstream.

It was a journey that began in 1989 (although the French Minitel service had launched several years earlier, allowing users to make online purchases, check stock prices, chat and have a mailbox), when the NASDAQ stock market rang in the year at 378 and the World Wide Web was in its earliest stages at CERN. The purpose of the ENQUIRE project, within which the web sat, was to create a system of interlinked documents so that the scientists at CERN could more easily find the documents they needed for their work. It was a year that also saw the launch of the AOL Messenger service.

In a clear nod to the future, 1989 also saw the launch of the first Block-II GPS satellite, but while the technology would power technologies in fields ranging from farming to telecoms, financial services to aviation, one of its earliest applications was in the first Gulf War, which was fought between 1990-1991, with the

U.S. Army deploying it to reduce instances of friendly fire, which were a major source of casualties in Operation Desert Storm.

The technological expansion of space continued the following year with the launch of the Hubble Space telescope, but back on earth, developments were no less rapid, with the launch of Adobe Photoshop coinciding with the first website going live. It also saw the launch of the first search engine, with the Archie search engine, developed by McGill University, to enable this burgeoning ecosystem to be indexed, sorted and searched.

By 1990, telecom companies were beginning to offer virtual private networks to enable businesses to send and receive data across shared or public networks as if their computers were directly connected to the private network. It would be another seven years before the term 'cloud computing' would be proposed by Emory University's Ramnath Chellappa, and another sixteen years until Amazon Web Services was released.



Despite Christensen's theory of disruption being diluted over the years, it is undisputed that the world has changed beyond recognition since his masterpiece was published, and it is important to recognise this transformation, as the bursting of the dotcom bubble can prompt us to overlook what were halcyon days for technology and innovation.

These transformations were not confined to the technological sphere, with the fall of the Berlin Wall signalling the start of the unification of Germany and the integration of central and eastern European states into the European Union that would be formalised in 2004 with the accession of Poland, Czechia, Hungary, Slovenia, Slovakia, Lithuania and Estonia to the European Union.



Release of the Linux operation system 1991

1991 saw the first release of the Linux operating system, which not only provided a direct rival to the dominant Windows operating system of the time, but also showcased a new way of organising human endeavour that would help to popularise crowdsourcing, open innovation and distributed ways of working that have been widely adopted by organisations such as Basecamp.

The early days of the web were an experimental domain, but you could already order pizza online, and Yahoo! had been created, albeit originally as the much less catchy “Jerry and David’s Guide to the World Wide Web.”

A COMPLEX WEB

By 1993 the mobile landscape was also beginning to take shape. The first cell phone, which was small enough to fit into a pocket, had been launched in 1987, albeit with a prohibitive price tag of around £2,500, with the first, 2G, commercial digital cellular network

launched in 1991 to challenge the incumbent analogue 1G network providers, and by 1993 IBM had launched a prototype smartphone, called 'Simon'. This was an extension of the personal digital assistant released by Psion in 1984, with the Psion Series 3 and Apple Newton extending the capabilities, before the Simon device merged personal organiser functionality with that of a mobile telephone. The burgeoning marketplace was bolstered with the 1996 release of market ready devices from Nokia, with their 9000 Communicator, and the Palm Pilot.

These early forays into the mobile world provided a clear indication that demand for data, especially to access the burgeoning internet, would grow considerably, and the industry soon realised that the 2G technology would need to be significantly upgraded to support this demand.

1993 also saw the release of the Pentium processor by chip giant Intel, complete with 3.1 million transistors. It marked the latest progress in the exponential growth in processing capability first proposed by Intel co-founder Gordon Moore

in 1965. The general doubling of capacity every 18 months proposed by Moore had seen the 1.2 million transistors found in the 486 processor in 1989 nearly treble by 1993, and it had grown to 5.5 million transistors in 1995's Pentium Pro range, and 42 million transistors in the Pentium 4, released in 2001. By the time of the Intel Core range of processors, an incredible 1.3 billion processors were crammed onto each chip.

This growth would power many of the technological developments in the coming decades, providing the computational power for everything from artificial intelligence to driverless cars, smartphones to genomic sequencing. Indeed, it is said that if an Android phone today was built using microprocessor technology from 1971, the processor alone would be the size of a family car.

There were also clear moves to make the burgeoning Internet secure by this point. Viruses have been a feature of the web for almost as long as it has existed, with the Morris worm widely believed to be the first when it hit the web in 1988. By 1993, the first firewall had been developed by



INNOVATION DISRUPTED

The overwhelming success of Silicon Valley has prompted many regions to try and replicate the Californian approach to innovation in the hope that they too can produce an armada of startups ready to reshape the world. There are nearly 500 startup ecosystems emerging around the world, with many supporting businesses that have eclipsed their Silicon Valley peers. Chinese ride-sharing startup DiDi has several times as many active users as Uber, for instance, while Indian payment startup Paytm dwarfs PayPal.

Despite this, the innovation community is often beholden to Silicon Valley's principles for building a startup. Entrepreneurs look to California for guidance on how to build and scale their businesses, while policy makers and politicians make regular pilgrimages to the Valley to try and find the secret sauce they can replicate in their homeland.

Just as the world moved on from looking to Detroit for answers in the automobile industry, so too is the wave of innovation around the world encouraging a broadening of horizons about how startups can best support growth around the world.



Check Point Software Technologies to offer protection to corporate networks. The technology ushered in an entire market of tools to protect the integrity of data as it flowed between trusted and untrusted networks.

It was also a period when the potential of Internet-based telephony became clearer, with the invention of Voice over IP (VoIP) by Israeli computer scientists Alon Cohen and Lior Haramaty in 1994 leading the way to the formation of Skype and other web-based telephony companies.

NEW FOUNDATIONS

By 1995, there were already clear signs of the changes that were coming. Pagers were in widespread use, with Motorola releasing the Memo Express as a way to keep in touch with people on the go (the UK's National Health Service has remained fiercely loyal to the technology, and were believed to own 10% of the world's stock by the time Health Secretary Matt Hancock pledged to phase them out in 2019).

It was a year in which the classified ads industry would be targeted by the launch of Craigslist, the dating industry by the launch of Match.com, and auctions by a burgeoning startup called eBay. It also saw Microsoft venture onto the web with the launch of MSN, and Amazon.com opened its doors to offer the world an online bookstore.

It was also a year that heralded the launch of the browser wars, after Netscape completed a successful initial public offering, with its stock closing the day over twice what it began it at. Microsoft's own browser, Internet Explorer, was also launched that year, and began to be packaged with the newly released Windows 95 operating system.

The Java programming language was also developed in 1995 by Sun Microsystems. The platform independent language has proven hugely influential in the development of the technology landscape since then and is estimated to be in use on over 1 billion computers and 3 billion mobile phones around the world.

By 1996 the convergence of biology and computing that would later be popularised by futurist Ray Kurzweil was further emphasised by the cloning of Dolly the sheep by scientists in Scotland. With the sequencing of the human genome later in the decade and the development of the CRISPR gene editing technology, which was patented by the University of California, Berkeley's Jennifer Doudna and Jillian Banfield in 2005, the potential of genetic modification was becoming all too evident.

By now froth was certainly beginning to appear in the market, with NASDAQ passing the 1,000 mark and infamous dotcom blowouts such as eToys.com and Pets.com launching. It was also the time at which Amazon took to the stock markets with their initial public offering. The \$18 flotation price would have been a tidy investment given that they are now worth over \$2,000 per share, which is nearly twenty times their price at the height of the bubble.

There were also signs that the decades long 'AI winter' might be thawing as IBM's Deep Blue managed to beat the world chess champion

STRENGTHENING EUROPE'S ABILITY TO INNOVATE – THE EIT

Through the creation of the European Institute of Technology and Innovation (EIT) in 2008, the European Union set out to support innovation and entrepreneurship in a distinctly European way.

“The EIT will make this possible: it will allow a new generation of Europeans to come together,” then president of the European Commission José Manuel Barroso said. “Shared strategies will harness different creative approaches to face up to challenges of shared European concern, creating added value and a competitive advantage at the European level. A culture of openness can itself foster innovation. In this way, the EIT will make a significant contribution to the renewed Lisbon Strategy for Growth and Jobs, and boost Europe's position among its international competitors.”

This is manifesting itself in a digital strategy that aims to benefit all people, not just a few. It aspires to a world in which citizens have the opportunity to flourish and engage in society whilst feeling safe online. It strives to provide businesses with a framework within which they can innovate and compete with larger rivals in a fair and equitable way.



EU Commission President José Manuel Barroso visits EIT headquarters in Budapest, 2014

Garry Kasparov in a highly publicised match up. Kasparov fought back in their initial five-match series, before finally being defeated the following year. It would set in wave a chain of highly publicised game-based contests that would see IBM return to conquer Jeopardy in 2011 and Google's DeepMind tackle the World Go champion Lee Sedol in 2016.

It remains questionable how valuable such stunts are in the wider development and deployment of AI, and indeed, Kasparov himself is scathing in his commentary of the Deep Blue matchup, but the AI domain has experienced several hype cycles that have all been followed by disappointment and criticism, before renewed enthusiasm emerges after a period of calm.

Marvin Minsky, for many the godfather of modern AI, warned that enthusiasm for AI had spiralled out of control in the 1980s, and that a period of disillusionment would inevitably follow. With the sector shedding billions of dollars in value in the early 90s, the success of Deep Blue is nonetheless an important sign of AI being cool again.

All of this had taken place before Google was launched in 1998, alongside altogether less successful firms, such as Webvan and Flooz. The year was also remarkable as a foretaste of things to come, with the iMac launch playing a significant role in the rebirth of Apple. It also saw the flotation of theGlobe.com, who were arguably the pioneer of social networking, for an extravagant valuation of \$842 million.

The year was also notable for the release of a new operating system for mobile phones, called Symbian. The platform was used by many of the major brands of the day, including Sony Ericsson, Samsung, Motorola, and Nokia. This pioneering product remained the most popular smartphone operating system until 2010, when Apple's iOS and Google's Android overtook it. By this time, Europe had come to dominate the mobile space, with Ericsson alone estimated to hold 40% of the global mobile phone market, with approximately 54 million subscribers.

The International Telecommunication Union had also laid the ground for the next generation

3G service, with Ericsson already testing services based upon the GSM standard by 1996. By 1997, Japanese operator NTT DoCoMo had signed deals with both Ericsson and Nokia to support the WCDMA standard that was based upon GSM. The company was subsequently the first to provide a 3G service to customers, albeit not until 2001.

These developments in mobile were also typified by the launch of the Blackberry mobile device in 1999. The hugely popular device, which was so addictive it was nicknamed the 'crackberry', was the first phone to be able to receive email from the Microsoft Exchange Server, thus rendering it hugely popular among business users. The Blackberry continued its development, and began to include features such as a camera, and remained hugely popular until the iPhone began to eat into its market share in 2007.

The 802.11 technology behind WiFi had its origins in 1985, but it wasn't until the Wi-Fi Alliance trademarked the technology in 1999 that it truly began to take off, with Apple adopting it for their iBook laptops in the

INNOVATION: THE EUROPEAN WAY

The concept of a European institute to bring together education, research, and innovation was first mooted in the 1980s, but the concept began to gather pace in 2005 as part of the mid-term review of the Lisbon Strategy for Growth and Jobs, driven in part by the growing appreciation for the benefits of the kind of open innovation first popularised by Berkeley Haas academic Henry Chesbrough in 2003.

A recent review of innovation across Europe found that open innovation is being practised in most companies today, and what's more, that it is helping many of them launch new and innovative products, but at the time, it was a largely novel concept. It was, however, fundamental to the very vision for the EIT.

“We need to generate knowledge, we need to disseminate that knowledge widely, and we need to prepare citizens in the society to absorb that knowledge,” Chesbrough says in his latest book *Open Innovation Results*.

After receiving over 700 contributions from across the EU member states, the mission, structure, and priorities of the EIT began to take root. The concept of a pan-European organisation that could bring together the best teams from business, education and research to work collaboratively on issues of strategic importance to Europe began to form.

“Excellence needs flagships: that's why Europe must have a strong European Institute of Technology, bringing together the best brains and companies and disseminating the results throughout Europe,” Barroso said in 2006. “The EIT will be a light and flexible organisation. It will teach graduates and doctoral candidates, carry out research and be active in innovation, both in some strategic thematic areas and in the field of science and innovation management”.

same year. The mobile nature of the Internet was also encapsulated by the first use of the ‘Internet of Things’ by MIT’s Kevin Ashton the same year, which was closely followed by the release of a ‘smart fridge’ by LG. The device, which had its origins in an Internet controlled toaster that was prototyped by John Romkey in 1990, but was considered far too expensive for commercial success.

As befitting the period, there was considerable hype surrounding the potential for the mobile internet, and this resulted in operators spending huge fortunes bidding for 3G licenses, with many overextending themselves and proving unable to afford the new networks required to use the spectrum they had acquired. This resulted in job losses across the industry, and sparked the beginning of the decline of Ericsson and Nokia, with the mobile arm of Ericsson spun off into a joint-venture with Sony, and Nokia struggling on until it was eventually sold to Microsoft in 2013.

THE POWER OF TECHNOLOGY

As the millennium drew to a close, there were also widespread concerns that the so-called ‘year 2000 problem’, or Y2K, would cause widespread disruption, as computer systems were designed to represent years using the final two digits, thus rendering the year 2000 as indistinguishable from 1900.

“I have no proof that the sun is about to rise on the apocalyptic millennium of which chapter 20 of the Book of Revelation speaks. Yet, it is becoming apparent to all of us that a once seemingly innocuous computer glitch relating to how computers recognize dates could wreak worldwide havoc,” said New York senator Daniel Patrick Moynihan.

It is doubtful that concerns about the ‘millennium bug’ contributed a great deal to the looming stock market crash, but by the end of the 1990s, the froth was clearly evident, with high profile flotations of Priceline.com, eToys.com, Pets.com and Webvan achieving huge valua-

tions despite haemorrhaging huge amounts of cash. The NASDAQ had peaked at 5132, a rise of around 390% over the last four years, and Pets.com didn’t manage to see the year out before shutting its doors.

The nadir of the dotcom bubble was reached in 2001 with the mega-merger of AOL and Time Warner, which represented one of the worst mergers in the history of Wall Street. The year also saw previous dotcom darlings such as eToys, Webvan, Flooz and theGlobe.com close operations, with Flooz having burned through an estimated \$450 million in venture capital.

The commercial challenges of the web were encapsulated by the launch of Wikipedia that year, which saw the commercial decline of highly popular products, such as Encarta and the Encyclopedia Britannica. The distributed, and volunteer led, encyclopedia project transformed how complex projects were conducted, and provided further support for the virtues of crowd-based endeavours.

By the end of 2007, a political agreement had been reached to create a body complete with a budget of €309 million for the 2008–2013 period and an aim to contribute to sustainable growth and competitiveness across Europe. The EIT was tasked with promoting and integrating higher education, research and innovation – the knowledge triangle – to help achieve this.

As the University of Michigan’s Jason Owen Smith argues in his latest book *Research Universities and the Public Good*, high quality universities offer three unique components to any innovation community:

- They are *sources* of knowledge and talent who converge in great diversity and scale on every university campus.
- They are *community anchors* who act as contributing institutional citizens for a region, with the longevity and stability of universities highly valuable.
- They are *connect hubs* who funnel people and ideas from the local community back into the wider world.

Despite the long and often illustrious track record of European academia, however, it was clear that this alone was not sufficient to drive innovation across the EU. More needed to be done to bring the three points of the knowledge triangle together to create a robust pipeline from lab to market.



The iPod was a further sign of the disruptive forces of the Internet, with Apple attempting to provide a more respectable face to the transformative forces behind the Napster file-sharing service, which had been launched in 1999 and rapidly attracted legal attention from the music industry. The release of the iPod, and the accompanying iTunes platform, changed the face of the music industry.

The first half of 2001 also saw 3G licenses auctioned across the world, with European companies alone paying more than \$100 billion for licenses. It was part of an ongoing development in the sector that saw the 4G technology that plays such a central role in the mobile Internet launched in 2009, and the 5G networks that will power sectors such as the Industrial Internet of Things and autonomous transportation in the coming years.

The Y2K situation highlighted the challenges posed by the increased connectivity of the modern world, and the risks posed by cybercrime were underlined by the Convention on Cybercrime, which was signed in Budapest that year.

A CHANGED WORLD

By the time the World Trade Center was attacked on September 11th, it was clear that the world had changed, and the exuberance of the dotcom era had given way to a more sobering reality of what the technologies of that era were capable of. Those that survived came out the other side with renewed strength, with Priceline perhaps the best example, as they went through various rebrands as they were buffeted both by the global slowdown in travel after 9/11 and the bursting of the dotcom bubble to eventually be a global travel brand worth over \$85 billion.

The immediate aftermath of the 9/11 attacks also highlighted the darker elements of technology, with the first drone strikes achieving their first 'kill' in Kandahar in autumn 2001, and underlining the growing role autonomous technology has played in warfare since the first Gulf War.

The early years of the new millennium also saw the introduction of the Euro in January 2002, with

the EU's ePrivacy Directive coming into force later that year. This was followed by the Data Retention Directive in 2006, which obliged EU member states to store citizens' telecommunications data for a maximum of 2 years. This was subsequently deemed a breach of the EU Charter of Fundamental Rights, which led to the General Data Protection Regulation (GDPR) that would shape privacy discussions around the world after its implementation in 2018.

The survivors of the dot com recession were unmistakably the fittest of the bunch, however, with Amazon doing the unthinkable and reporting an annual profit in 2003, the same year that Skype, Myspace and LinkedIn were founded. Despite this Darwinian tale of survival, however, those that did survive retained the wide-eyed enthusiasm that the web, and the technologies surrounding it, would be an untrammelled force for good. All that needed to be resolved were the business models of companies to ensure the web was sustainable.





The following year saw Facebook emerge out of Harvard to offer users a more refined interface than the free-for-all that had come to typify Myspace. This period has come to typify the growing appreciation for user-generated content that has come to define the web. The period arguably began in 1999 when Blogger launched to provide people with a way of publishing content online without requiring any technical skills.

This early period was overwhelmingly experimental, however, with the early videos published on YouTube in 2005 typically involving cats in some way. Despite the release of Napster four years earlier, there was no real indication that the platform would become the predominant means of consuming music-related content some 15 years later, or indeed that it would inspire Spotify, which was launched the following year.

There were also a number of smaller, regionally successful platforms that had pockets of popularity around the world. XING, for instance, was launched in 2003 in Germany and

achieved significant popularity there, while Bebo achieved significant popularity in the United Kingdom after it was founded in 2005.

With the benefits of hindsight, however, the signs were evident that this post-recession period would shape the tech landscape for years to come. Technologies such as Skype emerged from the rubble of the recession and showcased how web technologies could transform how we communicate.

American research agency DARPA also launched the first of their Grand Challenge competitions to encourage an autonomous vehicle to successfully navigate a 150 km track in the Mojave Desert. None of the initial entrants managed to complete the route, and indeed, the most successful team managed to complete just 11.78 km before encountering a rock. From that inauspicious beginning, however, the origins of the driverless boom we are seeing today were born.

The growing importance of operating in a more sustainable way was underlined by the signing of the

Kyoto Protocol in 2005, under which the European Union committed itself to reducing greenhouse gas emissions by 8% by 2012.

DOT-COM MK II

The transformation of the Internet into the domain we know today continued with the creation of Twitter in 2006. The launch of the micro-blogging platform, alongside that of YouTube and Blogger and WordPress, highlighted the increasingly user-generated nature of the web. Equally important was the shift towards commercialising the considerable traffic generated by these websites.

Google launched its AdWords platform in 2000, providing contextual adverts alongside its search results. Three years later, they expanded the platform via Google AdSense, to allow publishers from across the web to have contextual adverts on their properties.

THE GENESIS OF EIT DIGITAL

Even before the EIT issued its initial call for proposals in 2009, various consortia all over Europe started to form and work on collaboration concepts and structures. Many wanted to be prepared and ready by the time the detailed specifications for the Call were to be published.

In April 2009, the EIT published a Call for Proposals for the selection and designation of the first Knowledge and Innovation Communities (KICs), which are industry and thematic clusters, complete with an innovation chain that aims to deliver measurable societal, economic and entrepreneurial impact.

The EIT KICs have a number of key roles, but central among them is to explore some of the key, long-term challenges facing European society. They aim to do this by ensuring a smooth and well-stocked pipeline of research and innovation from higher education through to market, whether via startup activity or partnerships with both small and large firms.

There is also a key role to play in ensuring the human capital across Europe is as strong as it can be, both in terms of technical skills but also the entrepreneurial capabilities to capitalise on the strong research base within Europe, while also ensuring ample financial support to ensure these capabilities are fully utilised.

KICs must involve at least 3 independent partner organisations, with those partners from at least 3 different EU Member States. The partners must include at least one higher education institution and one private company. Originally, each KIC was supposed to contain between four and six physical places, called colocation centres, where stakeholders can collaborate in a face-to-face environment. These facilities are the hubs from which a large network of partners interact with the KIC.

Revenues in the early years were minimal and represented just \$70 million in 2001. This rapidly grew however, such that when Google bought YouTube in 2006, they were generating over \$6 billion per year from advertising. It was a model that quickly scaled not only onto YouTube, but also across other major web platforms of the time.

The era was not without hiccups, however, as the purchase of Myspace by News Corporation in 2005 illustrates. By 2006 Myspace had become the most visited website in the United States, but its subsequent failure heralded lessons for the next generation of social networks.

Arguably the foremost lesson was the transition to mobile that was portended by the launch of the iPhone in 2007. It was a year in which Finnish mobile phone giant Nokia had approximately 50% of the market share for mobile phones, but the transition to the smartphone era was a wave that the company failed to capitalise on, with their market share plummeting to just 3% by 2013, with rivals such as Apple and Samsung coming to dominate the market.

Google were also major players in the smartphone market, albeit via software rather than hardware. They had already tested the water with the 2008 release of the Chrome browser, and by 2009 their Android mobile operating system was entering the mainstream. By 2019, Android was powering nearly 75% of all smartphones, with Apple powering most of the remainder.

DISRUPTION FATIGUE

The dotcom bubble was a clear example of over-exuberance about the potential of the Internet to transform society. With the benefit of hindsight, one could argue that this excitement was warranted, and the huge sums of money pouring into Internet companies at the time was justified, but at the time there were widespread concerns that the hype cycle had run wild.

A number of clear warning signs were evident throughout this period. Investors can often suffer from the ‘fear of missing out’, which

was aptly chronicled by recent research from the Rotterdam School of Management. They highlight how startups in new and emerging fields often attract considerable hype, driven in part by a lack of understanding of the technical and commercial aspects of a burgeoning field, but also by a distinct fear of letting your head rule your heart and missing out on something that goes on to be hugely successful.

This results in investors backing the most adventurous startups, but hedging their bets across a number of risky ventures to try and spread the risk somewhat. The study found that most entrepreneurs in such high-risk ventures would pitch their enterprise almost exclusively in terms of what they will become, with this emphasis seeming to boost investments by 22%, albeit with smaller sums invested each time.

This was clearly evident during the dot-com bubble, with 457 IPOs in 1999 alone. They attracted considerable hype, with around 25% of these stocks doubling in price on their first day of trading. The fundamentals of investing had



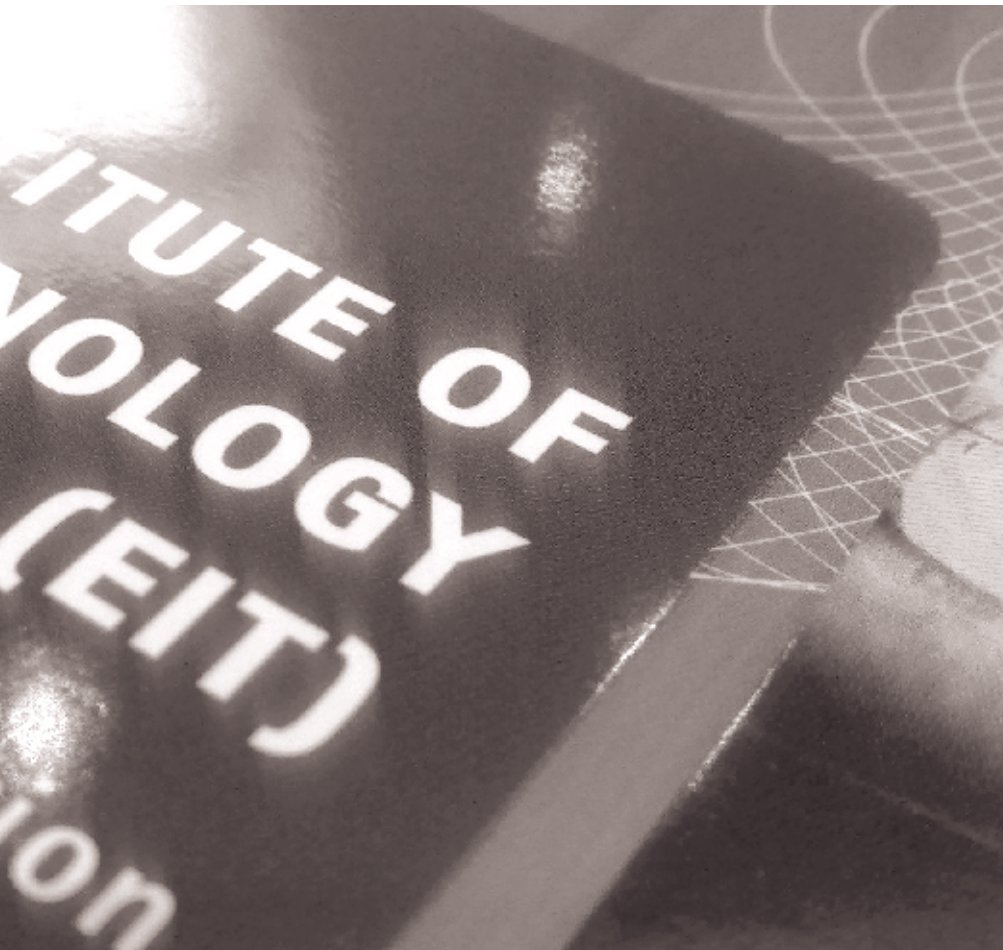
© Juha Haataja



The cap on the number of colocation centres fell, however, in subsequent years, allowing KICs such as EIT Digital to grow and expand.

The initial priorities for the EIT focused upon three core, strategic areas:

- Climate change mitigation and adaptation
- Sustainable energy
- Future information and communication society



gone out of the window, until the stocks were so absurdly valued that the fundamentals could no longer be ignored, and startups whose primary attribute seemed to be their ability to burn through cash crashed down to earth again.

Companies that were desperate for cash faced a drought as investors pulled out with the same speed and enthusiasm as they had previously piled in. The NASDAQ index took nearly 15 years to recover the heights scaled during the boom.

CHANGING TIDE

The general euphoria that accompanied the dot-com boom had largely endured even in the wake of the crash, with the Arab Spring in 2010 a standard bearer for the positive impact the new social media platforms could have on the world. As the major players began to mature, however, and so with them society's understanding of the technology, concerns began to materialise.

In the wake of the Great Recession, concerns were emerging around the impact technology might be having on employment. This mounting public alarm prompted researchers to explore the possible negative impact of these new technologies on society, reaching a nadir in 2013 with the hugely influential study from Oxford University's Carl Benedikt Frey and Michael Osborne, which painted a dystopian picture of mass technological unemployment in the coming years.

It is perhaps no surprise, therefore, that the Pew Research Center found the majority of people were highly concerned about the impact technology will have on their livelihoods. It is a sentiment echoed by doyens of the tech world, such as Elon Musk and Bill Gates, who have voiced concern about the role technology will play in society in the coming years.

These concerns seem to have their roots in the very nature of disruption that has come to define the startups emerging out of Silicon Valley. Conferences such as TechCrunch Disrupt have created

an almost cult-like aura around the need to disrupt, but there is a sense that what is being disrupted is the fabric of society itself.

There is a fear that while Silicon Valley is producing a new photo-sharing app, they remain oblivious to the sixty million Americans that are financially underbanked, or the 500,000 who are homeless, or the unimaginably immense scale of student debt, which currently sits at over \$1.5 trillion. Real problems facing the majority of people are not being tackled, and in some instances, may be made worse, which is prompting the public, governments, and regulators to hold companies to a much higher standard than was previously the case.

“To prosper over time, every company must not only deliver financial performance, but also show how it makes a positive contribution to society... Without a sense of purpose, no company, either public or private, can achieve its full potential. It will ultimately lose the license to operate from key stakeholders,” BlackRock CEO Larry Fink wrote in a recent letter to the CEOs of public companies.

EIT ICT LABS – A WINNING CONCEPT

Following a comprehensive evaluation and selection process, the EIT announced on 19 December 2009 the winning bids: Climate-KIC, Inno-Energy KIC, and the EIT ICT Labs KIC (which became EIT Digital in 2015).

“This is the starting point of a new approach to innovation and knowledge-sharing,” said Martin Schuurmans, at the time chair of the EIT’s governing board, during the announcement. “The KICs will be our test beds for an entirely new type of collaboration.”

EIT ICT Labs was the winning bid for the information and communication technology KIC. From the beginning, the new KIC had a clear goal – to transform ICT technologies, research and ideas into products, services and businesses that will boost Europe’s competitiveness in all sectors of society.

To achieve this, EIT ICT Labs planned “to build a world-class network of innovation hotspots” starting with an initial set of five co-location centres in Berlin, Eindhoven, Helsinki, Paris and Stockholm.



LEARNING THE LESSONS

The initial dot com bubble provided numerous lessons for what was to come. For instance, Webvan was valued at over \$4 billion when it floated on the stock market, before going bust a few years later. They aimed to utilize local distribution centres that would allow them to bypass supermarkets, thus achieving the kind of cost savings that would allow them to continue charging customers low prices.

They rapidly learned that building such a value chain was easier said than done, and would require a huge investment in logistics and distribution facilities. They weren’t able to develop the kind of scale to support such an investment, and crashed and burned with supermarkets barely noticing their arrival.

In the *Disruption Dilemma*, the University of Toronto’s Joshua Gan suggests that the choices of startups typically fall into four categories: technology, customer organisation, and competition.

If one is to disrupt, then it usually requires a focus on one of these four categories.

Arguably the flaw of many of the startups of that era was that they swallowed the disruption kool aid and sought to bypass incumbent players entirely in the hope that they would scale sufficiently quickly to make it work. It formed part of a Silicon Valley rule book for innovation that has delivered success, in that some 40% of publicly traded US companies listed after 1979 were once startups, and entrepreneurship has been responsible for all net new jobs created in the past decade.

It is been responsible for the creation of the iPhone and the commercialisation of drones and autonomous vehicles. Indeed, the economic value of startups has doubled as a percentage of global GDP since 1992, and is predicted to double again in the next 15 years. This has helped to propel the Silicon Valley economy to be worth \$750 billion, with three of the largest five companies in the world calling it home, alongside

some 40,000 other startups, approximately 1,000 venture capital firms and over 320,000 people working in the technology industry. It has also fostered concerns that the model might be broken, however.

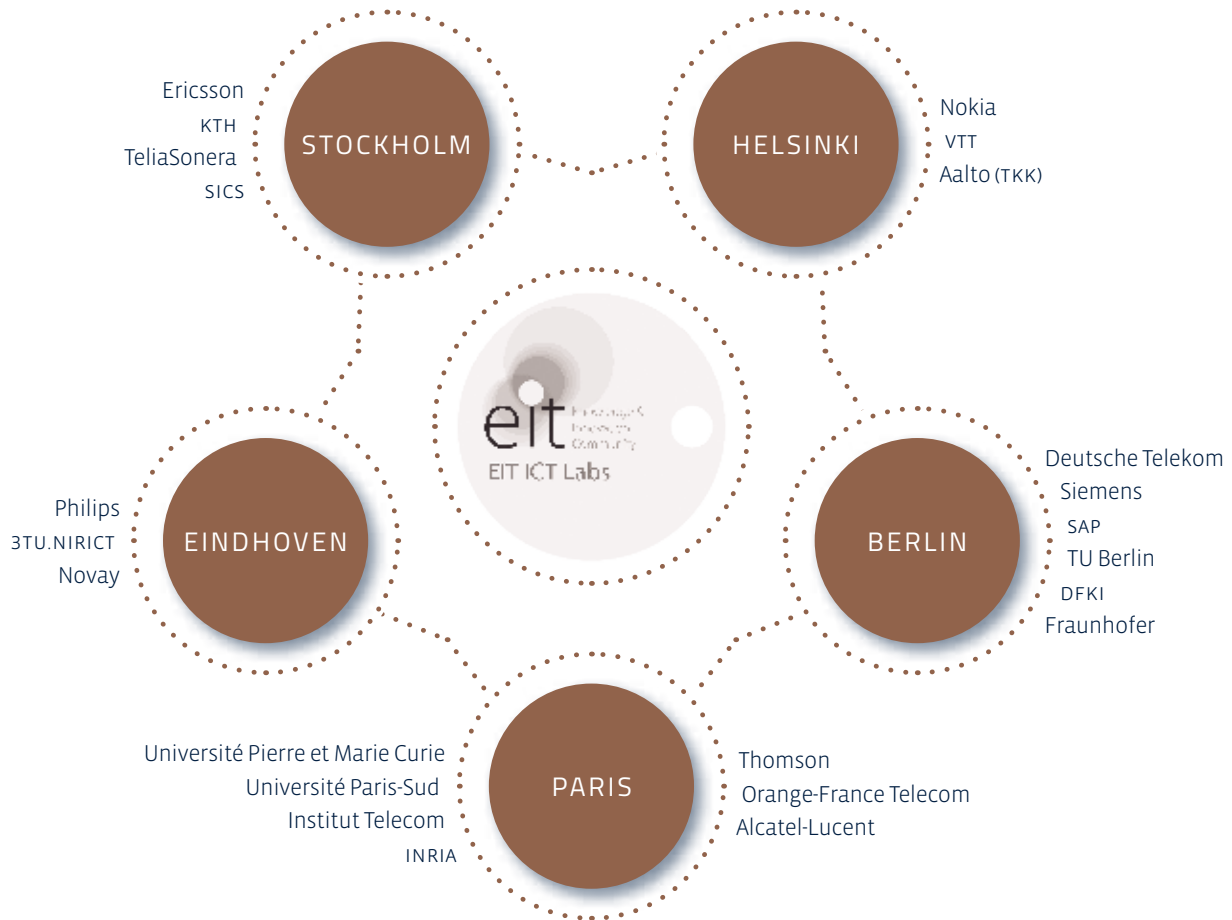
TECHNOLOGY FOR GOOD?

Nowhere have these concerns coalesced so viscerally as in the burgeoning 'gig economy'. Uber, and their brash former co-founder Travis Kalanick, are in many ways the epitome of the Silicon Valley model of innovation. Their approach is to grow into new territories and once a consumer base has been built, force local regulators to do something about them (or not).

One could argue that the 75 million consumers the company has around the world can't be wrong, and yet there is growing concern that their approach is not a good one. There are worries that the fundamental business model is an exploitative one, as gig economy platforms typically have lower barriers to entry,

In Berlin, the initial partners were Deutsche Telekom, Siemens, SAP, Fraunhofer Gesellschaft, DFKI and TU Berlin. In Eindhoven, it was Philips, 3TU.NIRICT and TNO. In the Finnish capital Helsinki, the group was made up of Nokia Research Center, VTT Technical Research Center of Finland and Aalto University. Members in Paris were Alcatel-Lucent, France Télécom-Orange, Thomson, INRIA, Université Paris 6, Université Paris-Sud 11 and Institut Télécom. And finally, in Stockholm, the founding partners were Ericsson, TeliaSonera, SICS and KTH.

with intense competition between workers helping to keep costs (and income) down. Court battles have raged across the world not only around whether Uber is legally allowed to operate in a territory, but whether workers should be classified as employees or not.



The rise of platforms as a crucial part of the digital ecosystem is unmistakable, but it is vital that they serve all stakeholders, and do so in a fair, transparent and equitable manner that ensures the benefits are widely distributed across society. It is a desire aptly described by Andrus Ansip, then European Commission Vice-President for the Digital Single Market.

“Millions of mostly small traders in the EU now depend on online platforms to reach their customers across the Digital Single Market. These new online marketplaces drive growth and innovation in the EU, but we need a set of clear and basic rules to ensure a sustainable and predictable business environment. Today’s proposal brings more transparency to the online economy, gives businesses the predictability they need, and will ultimately benefit European consumers,” he said.

Similar concerns have raged around the level of taxation charged to platform companies such as Airbnb, with localities raising concerns that rental properties are not only dis-

rupting the local property market but fundamentally changing the character of the region. These are an extension of ongoing concerns around the level of taxation digital giants pay that saw the European Commission propose reforms to corporate tax rules so that profits are registered and taxed where businesses interact with users rather than where they are domiciled.

“The digital economy is a major opportunity for Europe and Europe is a huge source of revenues for digital firms. But this win-win situation raises legal and fiscal concerns. Our pre-Internet rules do not allow our Member States to tax digital companies operating in Europe when they have little or no physical presence here. This represents an ever-bigger black hole for Member States, because the tax base is being eroded. That’s why we’re bringing forward a new legal standard as well an interim tax for digital activities,” former European Commissioner for Economic and Financial Affairs, Taxation and Customs, Pierre Moscovici said at the launch of the proposals.

“A central part of the consortium is to transform research into business concepts, entrepreneurship and growth,” said Gunnar Landgren, then vice president at KTH Royal Institute of Technology Stockholm and coordinator for EIT ICT Labs. “The creation of a positive view of entrepreneurship during the education itself will be of importance for the provision of skills for Europe’s future.”

From the very beginning, education played a central role at EIT ICT Labs. The new KIC aimed at developing an entrepreneurship culture in the next generation of students and extending the mobility of young people and teachers across borders. In addition, EIT ICT Labs had a clear vision to promote world-class research in ICT science and enable the design of future internet platforms that could impact society at the individual, business and public levels. The young KIC’s aims for innovation included boosting ICT as the primary innovation driver in all industry sectors, generating new innovation and business models, and supporting the emergence of strong SMEs that could capitalise on research results.

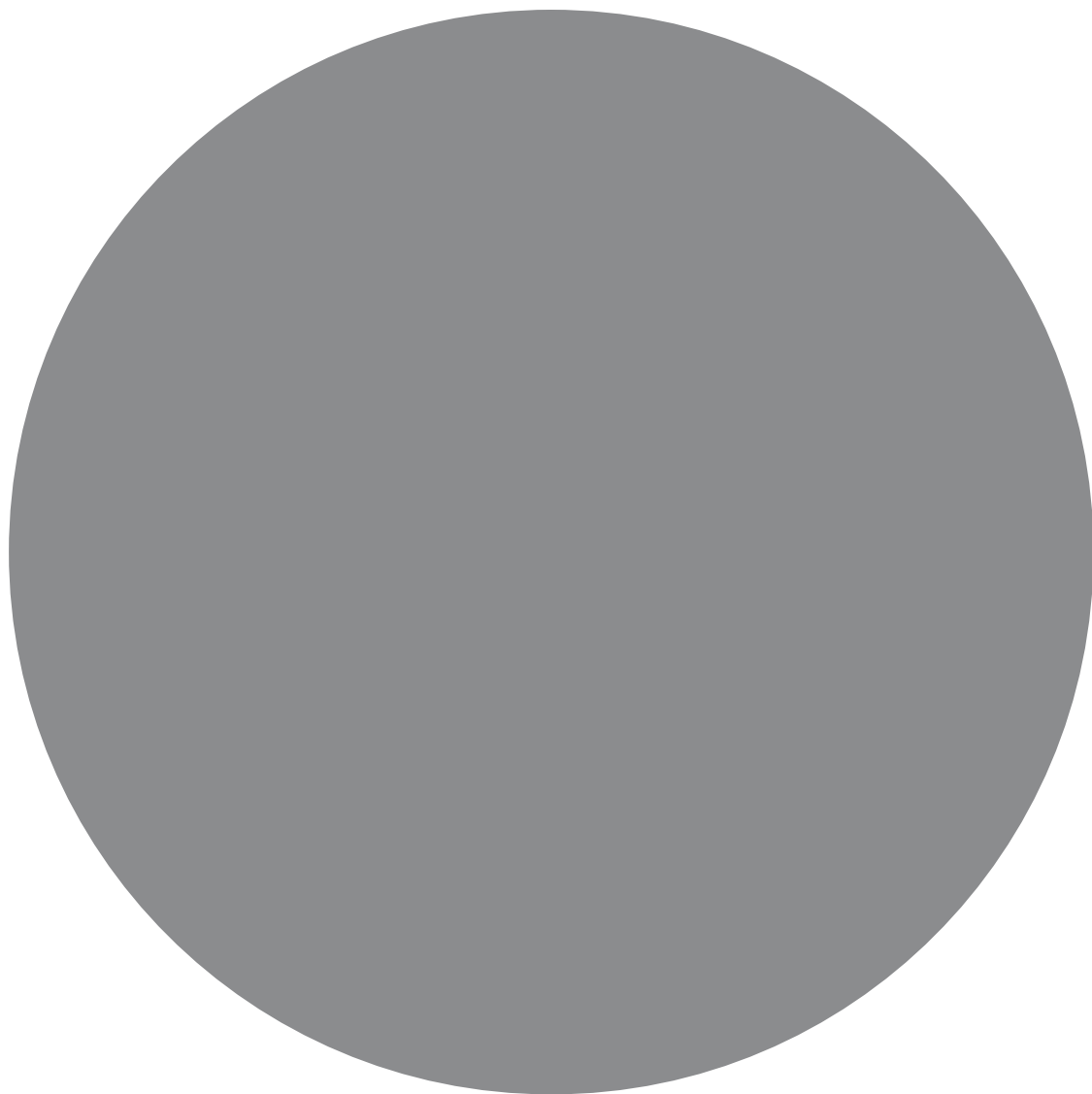
“Becoming a KIC is a tremendous opportunity for us to make Europe the global leader in ICT Innovation” said Magnus Madfors, representative of Ericsson in the winning bid. “We have the team, the experience, and we are ready to start building a world class innovation ecosystem, turning the potential of the Future Information Society into benefits for the citizens of Europe and the world.”

Even the hugely popular social networks, such as Facebook and Twitter, have come in for intense criticism for their role in propagating fake news and misinformation on a wide variety of topics, from climate change to politics. Their role as distorters of public dialogue is a rapid fall from grace from the optimism that surrounded their role in the Arab Spring. Far from providing a platform for people to participate in democracy like never before, they are instead contributing to what the University of Cambridge’s new Centre for the Future of Democracy calls the state of malaise in democracy.



EIT ICT Labs bid presenters, Budapest 2009

2010–2020



EIT Digital 2010–2020

2010–2012 The setup



EIT ICT Labs CEO Willem Jonker, Acting EIT Director Dr. Ronald de Bruin, and European Commission representative Jordi Curell sign initial 7-year partnership between EIT and EIT ICT Labs at the EIT Headquarters in Budapest

EIT Digital began life as EIT ICT Labs, and had an ambitious mission to turn Europe into a global leader in digital technologies. The journey began in 2010 with the establishment of five full nodes with colocation centres in Berlin, Eindhoven, Helsinki, Paris and Stockholm, with associate partnerships in Budapest, London, and Trento, and an office in Brussels.

Despite ongoing negotiations on the KIC's legal structure, and more importantly, delayed approval of the KIC's EIT grant, operations were in full swing. In December 2010, EIT ICT-Labs finally signed a seven-year framework partnership with the European Institute of Innovation & Technology (EIT), followed by the first annual grant agreement signed in May 2011.



The age of platforms

The financial crisis that spread throughout the world in 2008 had a profound effect on the technology landscape, as both the technology sector itself and the society that had grown to depend on it got to grips with the changes wrought by the contraction in credit that came to define the period.

As Sun Microsystem's Tim Bray wisely predicted, it would be a period where discretionary spending among both individuals and organisations would be pared back, but investments in scalable technologies, such as the cloud, would

be boosted. It is a transition that had a revolutionary impact on companies such as Microsoft, whose CEO Steve Ballmer was still largely wedded to a Windows-based strategy. Despite the apparent wake up call, it would be several years until Microsoft began to successfully pivot towards a cloud-based strategy, under new CEO Satya Nadella.

Despite the financial challenges present at the time, however, R&D spending remained strong, with investment in the fourth quarter of 2008 comparable to that in the same period of 2007. The tech com-

The organisation’s initial strategy derived from the so-called innovation paradox that saw Europe lag behind other regions in turning exceptional research into industrial outcomes.

It therefore began life with the aim of turning Europe into a global leader of digital innovation that was capable of creating added value and high-quality jobs for Europeans.

It is a mission that was shared with many other European and national initiatives, but where EIT ICT Labs stood out was in traversing the knowledge triangle of education, research, and business to create an integrated and mutually reinforcing whole that enabled it to tackle the challenges and opportunities of the digital society.



Stockholm Node Director Gunnar Landgren, KTH, with board members Ulf Wahlberg, VP Industry and Research Relations at Ericsson, and Christer Norström, CEO at RISE SICS



EIT ICT Labs Action Line Leaders 2010

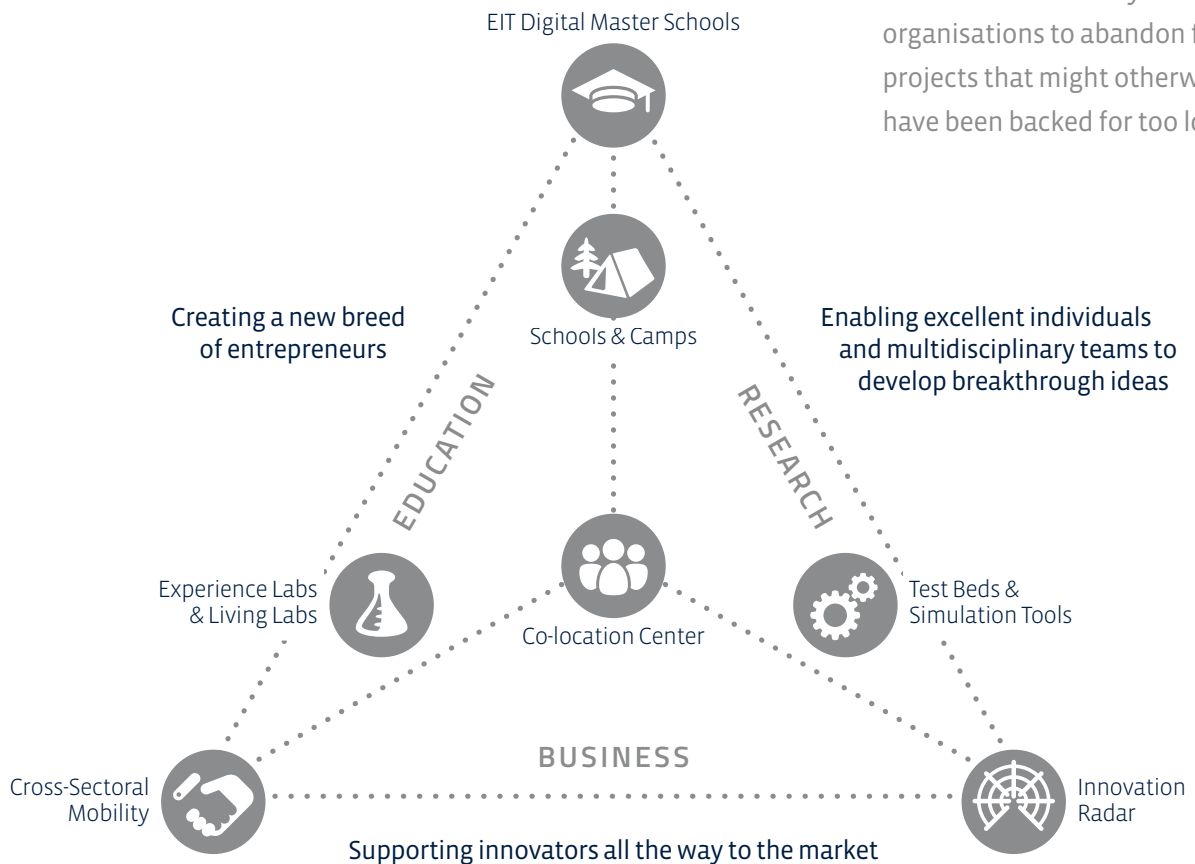


2011: GETTING ORGANISED – GETTING RECOGNISED

The first fully operational year was primarily concerned with establishing the groundwork for the success that was to come, with the motto being to “get organised, and get recognised”. This manifested itself in a management agenda that focused on six key areas: Nodes and co-location centres, Innovation Catalysts, Action Lines, Processes, Marketing & Communications and Relationships.

panies, many of whom remained from the bursting of the dot-com bubble, believed that investing through tough times was the key to successfully competing when the economy improves.

Even if companies were not so well endowed financially, it was a time that Clayton Christensen believed was ripe for innovation, with financial scarcity forcing organisations to abandon failing projects that might otherwise have been backed for too long.



“So, if you give people a lot of money, it gives them the privilege of pursuing the wrong strategy for a very long time” he told the MIT Sloan Management Review. “And in an environment where you’ve got to push innovations out the door fast and keep the cost of innovation low, the probability that you’ll be successful is actually much higher”

The University of Toronto’s Joshua Gans argued that while necessity can indeed be the mother of all invention, the financial crisis did nonetheless pull out funds that might otherwise have been used to help startups grow and innovations develop.



Valérie Pécresse, French Minister of Higher Education & Research, at the inauguration of LINCS, the Laboratory of Information, Network and Communication Sciences, supported by EIT ICT Labs’ Paris Node

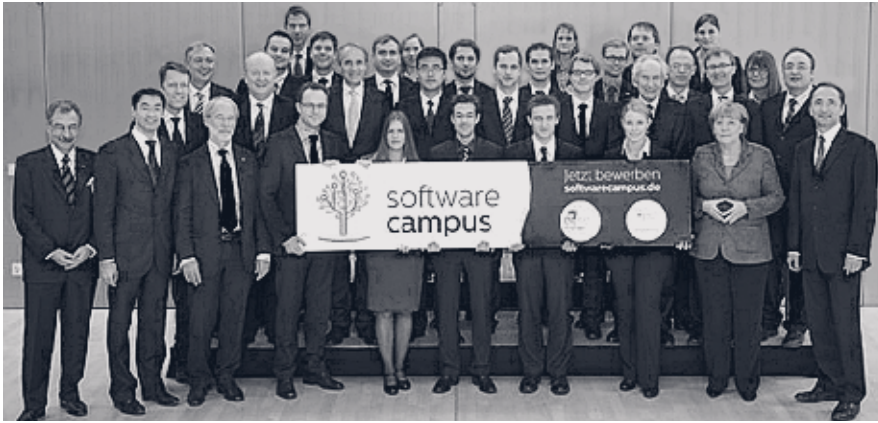
Despite a lot of work being done to establish the infrastructure required, a number of early results were nonetheless achieved, not least of which was the creation of the ICT Labs Master School, which engaged with nearly 20 universities across Europe. EIT ICT Labs also developed the entrepreneur support system that was in operation across all nodes, with initial support for four startups.

Complementing the initial organisational setup, a final tranche of partners, known as associates, were recruited. Associate partners, who included University College London, Imperial College of Science, and Budapest University of Technology and Economics, don’t provide support to specific nodes, due in part to their geographical location, but nonetheless aim to support educational and entrepreneurial activities across the network.

The work of EIT ICT Labs in this inaugural year was focused on a number of action lines, each of which blended education, research and business activities. Each action line, which included areas such as smart spaces, intelligent mobility and smart energy systems, was composed of topically linked valued added activities that followed the so-called Catalyst-Carrier model, where EIT funded activities (Catalysts) work on non-EIT funded activities (Carriers) in the domains of education, research, and business.

In its essence, this model was continued, but later on renamed into nowadays ‘KIC added value activities’ (KAVA) and ‘KIC Complementary Activities’ (KCA).

Two of the earliest projects supported by EIT ICT Labs were Stress@Work and Stress@Home, both of which sat under the Healthy Life theme of work. The projects resulted in the development of new services in the area of stress monitoring and analysis, together with the organisation of a summer school on health and wellbeing.



Launch of Software Campus Berlin with Chancellor Angela Merkel

The year also saw an exciting testbed developed for the Future Internet of Things. The project brought together partners from academia and industry across several of the EIT ICT Labs colocation centres. The project aimed to allow network researchers to develop and experiment next generation services and applications.

One of the early startup success stories was Finnish company Innorange, who partnered with Nokia to develop solutions that allow service providers to observe and manage the flow of people in public spaces. The startup received support from the EIT ICT Labs Entrepreneurship Support System to bring their solution to market. In total, this support system helped 21 different startups across each of the nodes.

In addition to Innorange, startups including German defence company Trifense, smartphone company Blaast, and smart signage startup Smartsigns were also supported by EIT ICT Labs during its inaugural year.

It is perhaps out of this fallow investment landscape that the crowdfunding pioneer Kickstarter was born in 2009, hot on the heels of rival platform IndieGoGo, which had launched in 2008.

These platforms typically offered innovators a way of raising finance from the very people who would eventually be their customers, with platforms typically adopting either a rewards-based approach or an equity-based approach.



EIT Director José Manuel Leceta and EIT Governing Board member Dr. Daria Tataj visit the EIT ICT Labs Helsinki Co-location Centre

It was a model that by 2015 had seen over \$34 billion raised for thousands of ventures, with Kickstarter alone claiming to have supported 445,000 different projects.

The period was also notable for the ground-breaking release of the App Store by Apple in 2008 to coincide with the iPhone 3G release. Whereas traditionally software companies had done much of their application development in house, the App Store signalled a fundamental rupture of that model, with the store featuring some 2.2 million third party applications by 2017.

2012: INVESTING FOR IMPACT

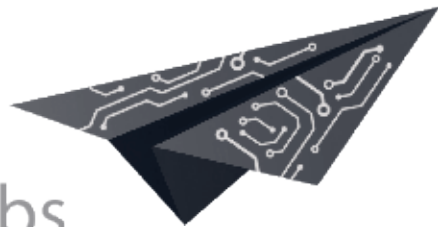
By the start of 2012, Italy had joined the EIT ICT Labs network via a colocation centre in Trento, which was an important milestone in the development of a truly pan-European network for digital innovation.

It was a year that saw growth in terms of the quantity, quality, and impact of work conducted across the network, not least in the first group of 94 master's students and the launch of the doctoral programme in four of the colocation centres, with 40 participants enrolled in Budapest, Helsinki, Rennes, and Trento.

The year also saw the partnership network grow to over 80, with London making progress towards joining the network as a full node, and the Budapest associate partner group acting as an early bridgehead into the eastern European digital ecosystem.



EU Commissioners Neelie Kroes and Androulla Vassiliou at signing ceremony for the Memorandum of Collaboration between EIT ICT Labs and the EU's Future Internet PPP on 21 June 2012



EIT ICT Labs
IDEA CHALLENGE
8 topics. 8 cities. One challenge.



The group was active at a number of major industry events throughout the year, most notably the CeBIT conference in Hannover, which at the time was the largest digital event in Europe. The annual partner event also took place at the new co-location centre in Helsinki.

The EIT ICT Labs Business Development Accelerator was launched in 2012, with the aim of integrating the various business catalysts and providing an end-to-end service to startups at all stages of the innovation value chain. This included the successful Idea Challenge competition, which received entries from 130 teams from all over Europe, with the finalists receiving personal mentoring from leading European entrepreneurs.

The diversity of startups supported by EIT ICT Labs grew rapidly throughout the year. For instance, French startup Ubcast provided storage and streaming services for live presentations, such as conferences and live events, whereas Italian startup RSens developed sensors to detect radioactive radon gas.

It was an approach that was echoed by the Android operating system that Google had developed in 2008. Unlike the proprietary operating system deployed on Apple devices, the Android OS was based upon the Linux open source platform, and was designed specifically for touchscreen mobile devices. Where the two approaches converged was in the app-based marketplaces both supported, with the Google Play marketplace growing to approximately 3.5 million applications by 2017. Android has since become the most popular operating system on both smartphone and tablet devices.



The first Idea Challenge winners, German startup Tinnitracks



360city platform, allowing visitors to optimise their sightseeing experience

TACTILE INNOVATION

The touchscreen revolution that had reached critical mass with the launch of the iPhone in 2007 continued as Apple released the iPad tablet computer in 2010. The product sparked a wave of innovation in the tablet sector, although the iPad remained the most popular device on the market, with several hundred million sold around the world.



*Marc Habbema, sowiso, and
EU Commissioner Vassiliou*



*EU Commissioner Maire Geoghegan-Quinn
at the conference "Destination Europe" in
Cambridge, Massachusetts, January 2012*

One of the most successful startups backed by EIT ICT Labs was Dutch firm sowiso, who was spun out of the Technical University of Eindhoven. The company, which is based in Amsterdam, works with large educational institutions, and received help from EIT ICT Labs in determining the best business model to reach this traditional market.

The partnership also worked to open doors for the company, with many of the universities in the EIT ICT Labs network collaborating with the company to bring the technology to market.

Also successful were French startup Ubcast, who worked with EIT ICT Labs to grow out of their native market and offer their EasyCast solution across Europe. The company is now a market leader in the smart lecture capture system market.

The connectivity afforded by EIT ICT Labs membership was underlined by German startup TestObject, who explain that it can be tempting for German startups to focus purely on both the domestic market and the German speaking markets of Austria and Switzerland. Support from EIT ICT Labs helped them to expand these horizons across the continent.

“One of the outstanding features of EIT ICT Labs is the close contact we in Berlin have with colleagues from other Nodes and with the industry cooperating with those Nodes,” Mrs Corina Weber, business developer at the Technische Universität Berlin, who backed TestObject, says. “Not only start-ups and other companies, but we ourselves as well learn and benefit from it.”

FROM LAB TO INDUSTRY

EIT ICT Labs also worked to encourage technology transfer across the continent, and successfully supported 16 technologies in their path towards commercialisation. During 2012, EIT ICT Labs was able to integrate the work of more than 300 researchers into a range of commercial projects and activities. There was also considerable success with disseminating science across multiple top-level publications, with significant contributions also made to standards generation in key digital areas.

There were particular successes in a number of key action line areas. For instance, in the Internet technologies and architecture group, key work was undertaken on the future internet of things (FITTING) project, which brought together partners from a number of colocation centres to contribute to an open-federated and evolving experimental platform. This contributed to the EU's Future Internet Public Private Partnership.

The privacy, security & trust action line also made strong progress in the various privacy aspects of geo-located systems, such as mobile phones and vehicular communication systems. Particular efforts were made to develop an updated version of a toolkit for the curation of data in a secure way, with the toolkit released as open source to allow others to build on the work.



The Fit to Perform solution, making professional driving safer

Social media innovations also continued, with the release of Instagram typifying not only the desire for image sharing, but also the changes in the digital economy, with the company having just 13 employees when Facebook bought it for \$1 billion in 2012. This was typical of the new breed of digital startups, who were able to use online technology to reach a mass market despite having very small workforces.

It is also symbolic of the difficulty many digital startups had in avoiding the 'tractor beam' of the increasingly powerful digital giants, with many companies bought before they had gained any kind of scale in the market. WhatsApp, which was launched in 2009, is another startup that was bought, also by Facebook, for an eye watering \$19 billion, despite having no real revenue to speak of.

This concentration of market power has come to symbolise the age, with many of the European social networks mentioned earlier falling by the wayside as Facebook, Google, Apple and Netflix have come to dominate the online world in the west.

THE MAGIC KINGDOM

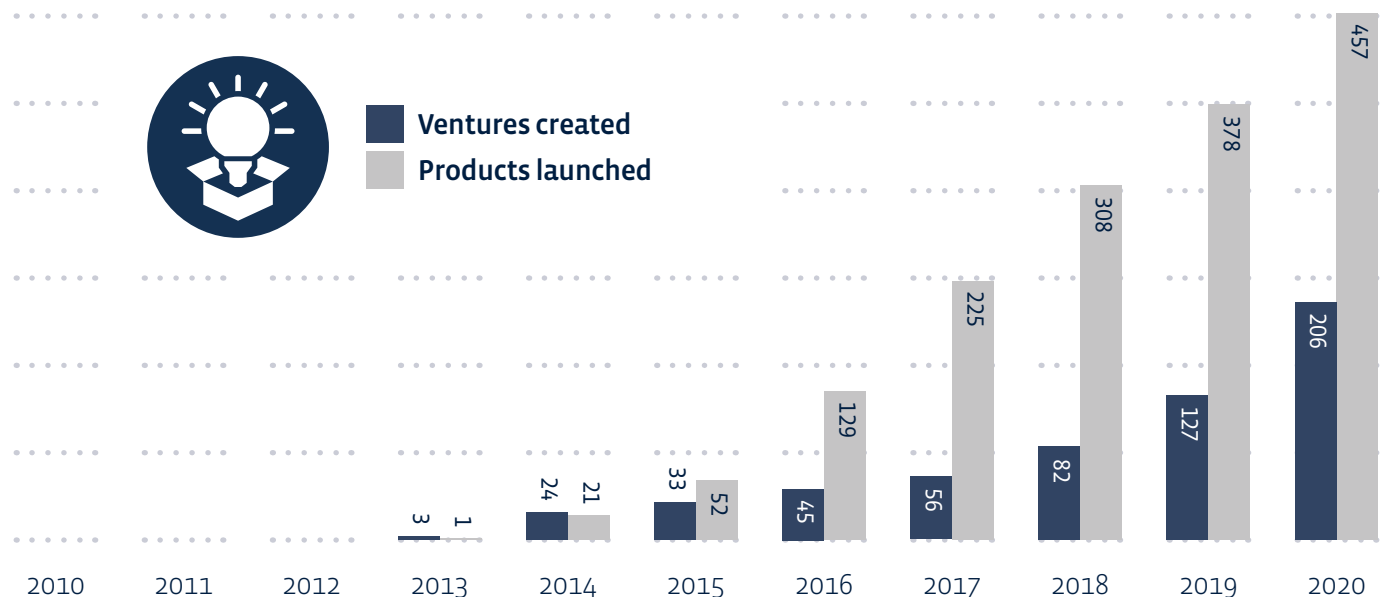
This was also a period of profound growth in Chinese tech platforms, with their growth synonymous with a new way of approaching platform development. B2B marketplace Alibaba was the pioneer, having been founded in 1999 to help Chinese SMEs export globally. Just as American rival eBay had spawned PayPal, so too Alibaba spawned an array of spin-offs, including payment platform Alipay, which was subsequently rebranded as Ant Financial Services, and consumer to consumer marketplace Taobao.

BROAD COLLABORATION

The computing and cloud project saw the inauguration of the EUROPA project, which was a collaborative effort among the EIT ICT Labs network to support data-intensive processing based on the Stratosphere cloud computing framework.

There was also considerable progress in integrating the work done by EIT ICT Labs with that of other national and European level organisations and initiatives, including the European Investment Fund, the Trust in Digital Life project, and the Future Internet Public Private Partnership. Initial results also began to emerge from the Information Technology for European Advancement (ITEA) initiative.

EIT ICT Labs also launched the Innovation Radar project to scan the horizon for emerging technologies in a wide range of fields. Foresight reports were published in a number of disciplines, including smart energy systems, digital cities, and future media, along with two Trend Lab books and an annual trends report.



THE NEXT GENERATION OF ENTREPRENEURS

With the launch of the Master School across Europe, EIT ICT Labs was able to offer cutting edge learning opportunities via 19 university partners from across the continent. The popularity of the offering saw five times as many applicants as there were places.

The summer of 2012 also saw the Summer School Programme launched, which was a mandatory element of the innovation and entrepreneurship education provided by the Master School. Four doctoral training centres were also launched in the colocation centres, with 40 students enrolled for 2012, and this number expected to double by 2013.



LINUX creator Linus Torvalds at the EIT ICT Labs Colocation Centre Helsinki

Chinese search giant Baidu was founded in 2000, and currently enjoys over 75% of the Chinese search engine market. It became the first Chinese company to list on the NASDAQ index in 2007, and like its American counterpart Google, has diversified in a wide range of areas, from autonomous cars to translation devices.

Arguably the most interesting of the triumvirate of Chinese tech giants is Tencent, however. The company, which was launched in 1998, has three core elements to its business: the WeChat messaging app; the largest mobile gaming network in the world; and an ecosystem of around 1 billion users. This allows the company to offer the largest video streaming service in China, Tencent Music, and significant stakes in western firms ranging from Snapchat to Tesla. Not for nothing is the company the first Chinese firm to surpass \$500 billion in value.

DRIVERLESS
TRANSPORTATION

The investment made by Baidu into driverless cars is part of the incredible interest in this technology across the world. The early entrants into the DARPA Grand Challenge in 2004 were largely comical affairs, with none of the robot vehicles coming close to completing the 240 km test track. By 2009, however, progress was such that Google's driverless ambitions were begun by Sebastian Thrun's team, who were the winners of the Grand Challenge in 2005.

Early testing was also being initiated by mining giant Rio Tinto Alcan to release the world's first commercial autonomous mining haulage system in the Pilbara iron ore mine in Western Australia. It was not long before all major automotive manufacturers began work on their own driverless car systems.

Considerable work was also underway in making existing vehicles more environmentally friendly. Buoyed by the considerable success of the hybrid Prius developed by

2013-2016 Growth & Delivery

2013: TARGET AND FOCUS

The first two full years of operation had given EIT ICT Labs a great many lessons into what was working, what wasn't, and how the entrepreneurial ecosystem across Europe could be better cultivated and supported. After building up the organisational capacity of the group, and developing clearly defined education and innovation methodologies, the third year focused on growing activities to achieve critical mass.

It was a year that saw Spain represented, with an associate partnership operating out of Madrid, whilst greater engagement with all 28 EU nations was delivered via the X-Europe outreach programme. There were also initial attempts to broker connections with the global innovation ecosystem, with an initial link up with Silicon Valley.



First graduation of ICT Labs Master School students in Paris

The education arm of EIT ICT Labs continued to grow, with the launch of the Catalyst Disruptive Education initiative striving to improve the relevance and quality of educational outcomes delivered by the programme. In practice, this meant not only growing the student body, but also ensuring they have the T-shaped skill set required to be truly disruptive entrepreneurs.

The student body at both the Master School and Doctoral School continued to grow, with 185 new master's students and 70 students participating in the doctoral programme. This was a reflection of the strong brand the two schools had developed, not only across the EU but further afield, with over 1,000 applicants to the Master School from outside the EU.

There were also burgeoning efforts to improve collaboration between industry and academia via the Doctoral Training Centres, which aims to link doctoral studies with key industrial challenges. To begin with, six centres were developed, in Budapest, Helsinki, Paris, Rennes, Stockholm, and Trento, with Madrid tipped to become the seventh centre in 2014. What's more, summer schools were organised for each of the key action lines to further integrate innovation and education.



Prince Constantijn of the Netherlands at the official opening of the new EIT ICT Labs Eindhoven Colocation Centre.

Japanese company Toyota, Tesla released the completely electric Roadster vehicle in 2008, with the vehicle capable of completing 394 km on a single charge, which was unprecedented range at the time.

URBAN MOBILITY AND SMART CITIES

The success of autonomous and connected vehicles is likely to rest in large part on developments in telecommunications.

The continuing development of telecommunication infrastructure saw the rollout of 4G from 2011, with this and the burgeoning internet of things fuelling much of the growth in smart city projects.

These projects cover a huge range of use cases, from waste management to crime detection, but arguably the most progress has been made in urban mobility.

Significant changes have also emerged in how people travel inside and between towns and cities. Bicycle sharing systems had emerged on a small scale in the 1990s, but truly began to take off towards the end of the 2000s, with popular schemes emerging in Copenhagen, Barcelona, London and Paris. The success of these schemes has encouraged a wider range of shared mobility solutions, with scooter sharing the most common.

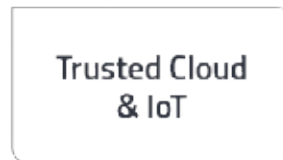
As mobile technology advanced, public transportation systems began to capitalise. Transport for London became the first mass transit system to accept contactless payment for journeys in 2014, with Finland's Kutsuplus trying (and failing) to use mobile apps to provide flexible micro-transit using minibuses.

FOCUSING ACTIVITIES

The research activities of EIT ICT Labs were also consolidated to provide renewed focus on key societal challenges, especially around areas such as mobility, digital cities, smart energy and health and wellbeing. There were also initiatives aimed at technology-driven innovations, including cybersecurity, cloud computing and cyber-physical systems.

These activities led to greater integration of researchers into the activities of the colocation centres, which helped to ensure a more efficient and effective dissemination of research from the lab to the marketplace.

This level of focus also extended to the support offered to the entrepreneurial ecosystem, with emphasis given to startups operating in areas such as cloud computing, cybersecurity, mobility and smart manufacturing. These themes were supported via the launch of the EIT ICT Labs Business Development Accelerator (BDA), which created a deal flow of technologies, ideas, talents, and investments.



Empowering users to share information between IoT and the Cloud



EU Commissioner Neelie Kroes and SAP Co-CEO Jim Hagemann Snabe launch the EIT ICT Labs-supported Academy Cube

In its first year in operation, the accelerator scouted 261 ventures and 78 technologies, with over 90 of these receiving dedicated coaching to help them get to market and start making an impact on society. One example of this knowledge flow was the support offered to image processing startup Inca Technology, which emerged out of the Fraunhofer Institute. The company was one of the first technologies to be integrated into the BDA funnel, with initial connections made with Thales for a joint-venture project using the technology in a surveillance capacity.

The BDA also facilitated the cooperation between French company Santech and Finnish firm Medixine to develop a co-created solution for the French marketplace to provide a unified communication platform for healthcare professionals to engage with patients.

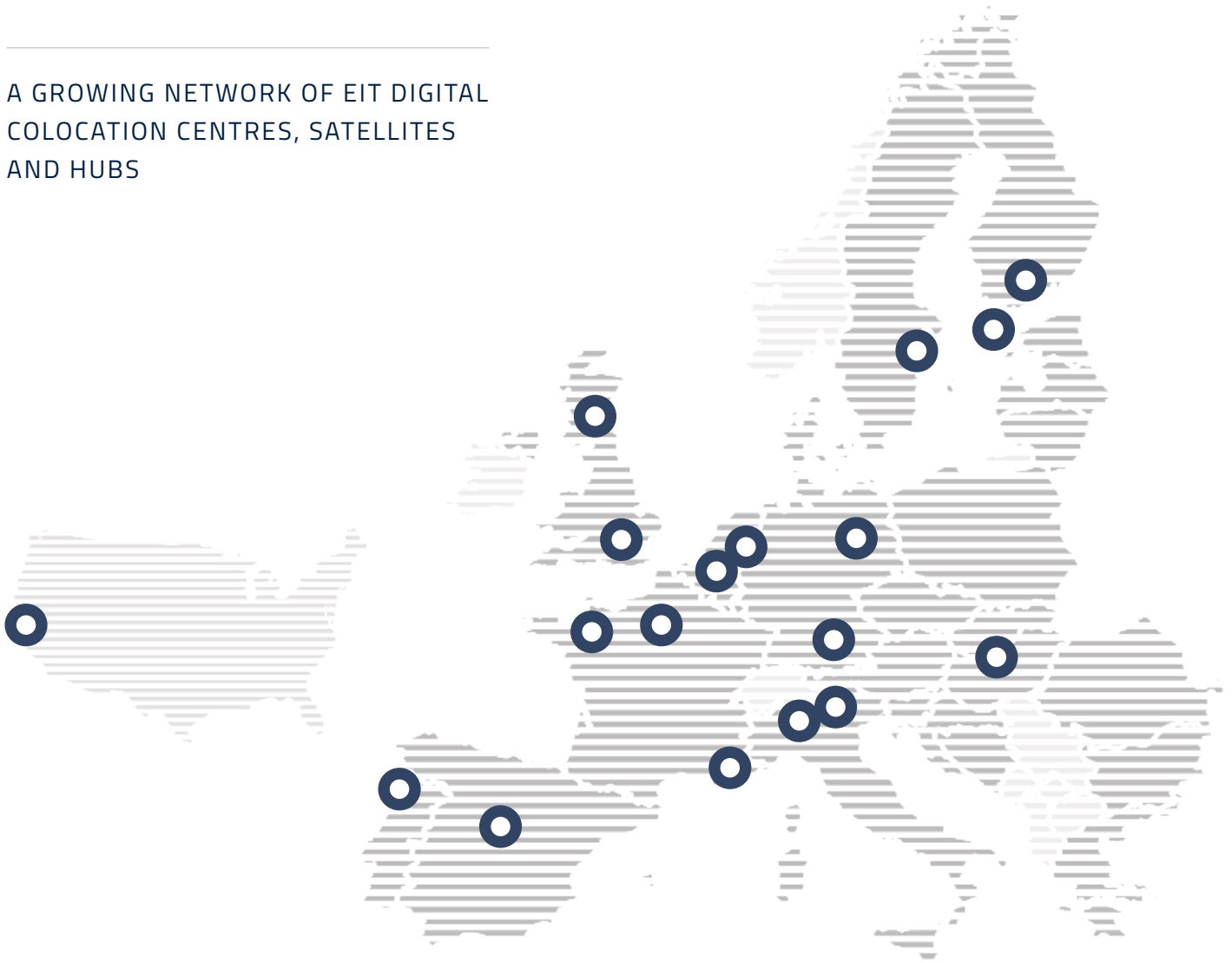
The BDA also provided expert coaching to startups, with Nokia spinoff Quuppa a particular beneficiary as they looked to develop their indoor positioning platform. The company was helped to secure three deals across both Italy and Germany, over a dozen introductions made to corporate buyers throughout the year.

The most transformative shift in mobility emerged in 2009, however, with the launch of Uber. The ride-sharing boom was built upon GPS navigation devices to determine the driver's route, smartphones to allow travellers to request a ride, and social networks to establish trust and accountability between drivers and passengers. Whilst ridesharing services have proven hugely popular amongst passengers, they have been controversial, with existing taxi services lobbying hard to prohibit their impact on city centre travel.



Visit of MEPs Sabine Verheyen, Joachim Zeller, Pilar del Castillo, and Lambert van Nistelrooij to the Berlin Colocation Centre

A GROWING NETWORK OF EIT DIGITAL
COLOCATION CENTRES, SATELLITES
AND HUBS





2,000+ ALUMNI DISTRIBUTED
ACROSS THE GLOBE



RISE OF THE PLATFORM ECONOMY

Uber is also one of the poster children of the platform economy, which has transcended the pre-financial crisis digital business models, and come to define the age. In mobile, the platforms created by Apple and Google rapidly usurped Blackberry and Nokia; in films and entertainment, Netflix led to the demise of Blockbuster; and, of course, Airbnb has had a profound impact on the hotel industry.

The platform-based model has been based upon the lowering of transaction costs between the multiple actors in any interaction, and its impact has been wide reaching. Arguably the biggest societal impact of the rise of platforms has been the emergence of the gig economy, whereby individuals bid for particular pieces of work. By 2018, it was estimated that work conducted via platforms such as Upwork and PeoplePerHour was worth \$204 billion, with this expected to double by 2023.

FINANCIAL SUPPORT

EIT ICT Labs was also able to successfully position itself as a valued partner of the European venture community in 2013. This helped to support the launch of initiatives such as the EIT ICT Labs Investors' Dinner. One startup that benefited from this programme was Dutch company Abellife Adventures, whose market leading mobile app for hikers and cyclists received €1 million towards the growth of the company after participating in an Investors' Dinner in Berlin. Another company to receive investment support was German health-tech startup Matchfit, whose fitness marketplace for corporate users was rolled out with support received via the Investors' Dinner, with eventual investment from both Dutch and German venture capital firms.

Lastly, 2013 also saw the germination of the EIT ICT Labs Idea Challenges, which was born out of successful experiences with focused idea challenges in the preceding years. The concept was identified as a clear channel for delivering successful outcomes across the action lines, and the preparation was made for the challenges to be scaled up in 2014. "EIT ICT Labs has further matured in terms of ecosystem, entrepreneurial ICT education and disruptive ICT innovation, resulting in more impactful results such as a growing number of students, increased value of technology transfers, and higher number of supported start-ups and SMEs in their European expansion," chairman of the EIT ICT Labs Executive Steering Board Henning Kagermann said.



The EIT ICT Labs Management Committee 2013

2014: CREATING FOR VALUE

The year 2014 began with an intensification of the geographic footprint of EIT ICT Labs, with not only heightened activity across the existing network, but a new node being launched in London and continued activity via the associate centre in Madrid. The hub that was opened last autumn in San Francisco was also continuing its development to allow truly transatlantic cooperation.

This expansion saw the number of partners grow to 123, featuring some of the biggest corporate names in Europe, with a partner event hosted in Berlin, which featured 400 participants around the core theme for the year of “Creating for Value”. Continued attempts to influence the entire European ecosystem resulted in five startups from Czech Republic, Lithuania, Poland and Hungary being awarded €20,000 each to develop their app-based products for the Windows platform.

“Getting this prize was one of the key milestones for us as it helped us to move the company to higher level,” one of the awardees said. “We were able to hire more people and speed up the development process.”

EIT Digital spin-off Capiche, a smart language assistant for refugees



On some of these platforms, the individual worker was largely free to operate as they pleased, but on others, such as the various ride sharing platforms, they were allocated work by the algorithms that power the platforms.

This has led to ongoing legal battles around whether the control placed upon workers renders them employees rather than independent contractors. Legalities aside, the ability of the platforms to perform this form of algorithmic management underlines the progress made in AI in this time.

Androulla Vassiliou, EU Commissioner for Education, Culture, Multilingualism and Youth, and EIT ICT Labs Master School students



EMERGING FROM
THE WINTER

The defeat of chess Grandmaster Garry Kasparov by IBM’s Deep Blue in 1997 had failed to result in a wide scale AI-driven transformation, and indeed Kasparov’s experience competing against Deep Blue saw him codify his thinking on the best way to utilise the technology of the time, when he described that a weak human player using a computer and with strong process would be infinitely better than any computer playing alone.

SCALING UP

The Idea Challenge initiative continued to grow, with 790 submissions received from all 28 EU countries. Among the winners were German startup Konux, whose technology to revolutionize the mechanical sensor market has seen them achieve tremendous growth. The company, which was founded in 2014, has since gone on to raise over \$50 million and was selected by the World Economic Forum as one of the 30 most innovative startups around the world.

“We want to thank EIT ICT Labs for this awesome prize. We will accelerate our product development with the prize money, and we are looking forward to creating new possibilities and a great future together with the EIT ICT Labs network and offices,” Andreas Kunze of Konux said.



Master School kick-off in Budapest



As well as receiving \$40,000 for winning the Idea Challenge, the company also received considerable mentoring and coaching via the Business Development Accelerator, which helped the company establish ties with Siemens. The company also received additional funding from Idea Challenge jury member Michael Baum, as well as introductions into the American market via the new Silicon Valley Hub.

Another startup receiving significant support from the Business Development Accelerator was Finnish cloud technology startup Nordcloud. The company, which was founded in 2012, received considerable support from EIT ICT Labs to expand internationally during 2014, with Dr Jussi Autere, the Manager of the EIT ICT Labs Helsinki Doctoral Training Centre, chairman of the company's board. The company raised €3 million during 2014 to support this expansion, with the company going from strength to strength, and raising over \$25 million in total in the intervening years.

By 2010, the brute force tactics deployed by Deep Blue had been transformed, with IBM returning to the field with their language-based system Watson, and London-based startup DeepMind, taking the field of AI in completely new directions. Whereas Watson was largely built upon the rapid growth in both data and processing power to crunch that data, DeepMind's technology is based upon deep reinforcement learning, which allows systems to train itself. The approach was famously demonstrated when defeating



EIT ICT Labs first partner event in Berlin

the world Go champion Lee Sedol in 2016, with their unique approach prompting Google to buy the firm in 2014. Whilst DeepMind has failed to generate real breakthroughs in the market, their successes have nonetheless showcased the progress being made in AI in recent years.

As the capabilities of AI have grown, so too has concern around the ability of bad actors to utilise the technology for ill ends. Bot farms have become a multi-million-dollar industry, as they seek to manipulate discourse on social media on issues ranging from climate change to public health. Deep fakes have also become increasingly lifelike, raising the prospect of fake videos propagating popular social networks and further muddying public discourse.

The Future Cloud action line that Nordcloud were part of was one of the flagship initiatives of 2014. Part of the initiative was a project to create a platform that would give companies the ability to offer their customers trusted cloud products and services. The project worked with core partners, including BT, Ericsson, and Telecom Italia.

ENTREPRENEURIAL EDUCATION

Summer School activity continued to expand, with schools run across each of the eight action lines during 2014. Participation in the schools is mandatory for master's students, with half of their time spent on developing a business plan, and the other half on a range of company visits, thematic presentations, and social activities.

During 2014, the summer schools were open to master's students who were not part of EIT ICT Labs programmes, with 290 students participating from across Europe, and further strengthening the integration of education and innovation across the group.

2014 also saw EIT ICT Labs join the e-learning revolution with the launch of MOOCs via the market leading Coursera platform, with work underway between EIT ICT Labs and both InnoEnergy and the Climate KIC to explore the development of a pan-European MOOC platform.

EIT Digital Accelerator team at the Slush conference in Helsinki



2015: SUSTAINING THE VISION

2015 began with a very visible change, with EIT ICT Labs becoming EIT Digital. The name change represented the mission of increased societal and economic impact via the digital transformation of Europe. The year saw 10 new industry partners added, bringing the pan-European ecosystem to over 130 leading corporations, SMEs, startups, universities, and research institutes.

It was also the year where the Silicon Valley Hub began to take shape and support the two-way mobility of talent, provision of opportunities for collaboration on research and innovation initiatives, and support for growth of businesses across both the United States and Europe.

Central to this was the ability to connect the various European scientific and trade missions to the United States into a uniform “Europe as One”, whereby national efforts complement one another. Nowhere was this more emphasised than in the Startup Europe comes to Silicon Valley event, through which policy makers, startups and corporations met with crucial stakeholders across Silicon Valley.

The Hub also developed a number of research-to-innovation initiatives, such as the Software Defined Networking testbed, which involved industry partners such as Telecom Italia and Deutsche Telekom.

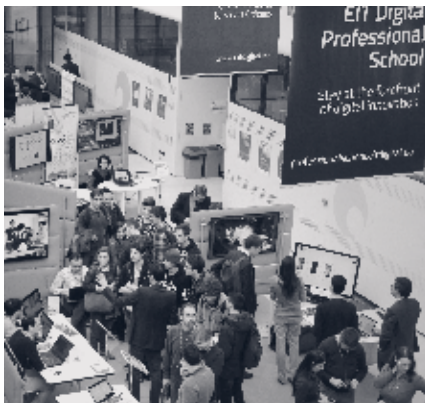
There have also been growing concerns around the misuse of the data that is the fuel for so many digital products today. The Cambridge Analytica scandal in 2018 underlined both the amount of data being shared on social media, but especially how this data can be used to manipulate democratic events.

The scandal coincided with the EU’s General Data Protection Regulation (GDPR), which aims to shift the balance back in favour of citizens in terms of the protection of their data and privacy. With the growing concern around security of data, GDPR marks the first of what is likely to be a wide range of policies and regulations designed to ensure data is secure and citizens have greater control over it.



BREAKING THE CHAIN

The privacy concerns surrounding data played a major role in the development of new approaches to securing our information. While work on cryptographically secured chains of blocks began in the 1990s, the first blockchain was conceptualised by Satoshi Nakamoto in 2008, with the design subsequently being used as the core component of the bitcoin cryptocurrency that was released in 2009. The growth in popularity of the new currency saw the ledger grow to 200GB in size by 2020.



Innovation Day at the Colocation Centre in Trento

REGIONAL INNOVATION

Back in Europe, efforts were made via the Regional Innovation Scheme to further the geographic spread of EIT Digital’s work across Europe. This has resulted in partnerships with six innovation centres across the region, including in Slovenia, Portugal, Greece, and Austria. The six centres helped to drive innovation in their respective countries and were rapidly connected into the partner ecosystem of corporates, investors, universities, and policy makers.

“The selected Innovation Centres have strong success stories and local ecosystems. We are excited to start working together and contribute to making their territories and the whole Europe THE place for digital innovation,” explained Fabio Pianesi, then Research Director of EIT Digital.

The project helped to bring over 90 startups into the Business Development Accelerator funnel, with eight of them invited to pitch to the BDA and Access to Finance teams, and five ultimately selected to receive support from EIT Digital.

GROWING THE DIGITAL INFRASTRUCTURE

The Future Cloud initiative continued to deliver strong results, with 18 deals conducted to help startups scale across Europe involving partners such as British Telecom and F-Secure. EIT Digital also worked hard to accelerate the development of Apache Flink, with almost 200 contributors from across industry and academia.

Swedish startup Severalnines was one of the most successful startups supported by EIT Digital during 2015. The company, which won the Best Cloud Startup Europe award at Eurocloud, developed a strong client list,

including Cisco, Technicolor and British Telecom, with ongoing support from the Business Development Accelerator.

The Cyber-Physical Systems action line also began to bear the fruits of the work begun in 2014, with clear startup activity emerging in the space and progress being made towards the development of the Industry 4.0 concept, which connected embedded system production technologies and smart production processes.

These “enabling technologies” are instrumental to a wide range of innovative applications and processes as the boundaries between the real and virtual worlds begin to disappear. One of the startups backed by this initiative was French startup Sentryo, which provides cybersecurity solutions in the industrial network space. The company, which successfully raised €2 million to expand internationally continued to grow from this promising start, and was acquired by Cisco in 2019.

PROFESSIONAL EDUCATION

The educational portfolio continued to grow with the launch of the EIT Digital Professional School, which aimed to create a learning ecosystem via courses specifically designed to provide critical digital knowledge, insights, and skills to working professionals.

The initiative resulted in blended education courses that were able to successfully match the needs of industry, and of the workforce, with the supply of material from some of the finest schools in Europe, including Imperial College London and the Fraunhofer Institute. In total, 14 courses were created across all EIT Digital action lines.



EIT Digital-supported startup Furhat Robotics at the Stockholm Innovation Day

Despite widespread media attention, mainstream adoption of blockchain has remained limited, with Gartner revealing in 2018 that just 1% of CIOs were adopting the technology, and just 8% believing they would do in the short-term. The technology has raised the bar in terms of what is possible with fintech innovations, however.

The launch of M-Pesa in 2007 has arguably been more transformative than blockchain, with the mobile payment system bringing accessible financing to the developing world. With Apple Pay launching in 2014 and Samsung Pay in 2015,

the concept of mobile payments is reaching the mainstream, with estimates that 92% of people in major Chinese cities use mobile payments as their primary form of paying for goods and services.

Mobile and contactless payments have become more popular during the coronavirus pandemic, and society is likely to deepen adoption as it adapts to the post-Covid landscape across a wide range of industries.

The partnership with Coursera also continued to develop, with a blended Master Programme in Embedded Systems created.

“These courses provide students with the cutting-edge knowledge on Internet of Things and Embedded Systems,” Martijn Klabbers, Online Education Activity Lead at EIT Digital, explains. “If you can complete these courses you have the capacity to become a master in Embedded Systems. Generally, such a master’s degree gives you access to world-renowned companies like ASML, NXP, Philips, Siemens, Nokia, etc.”

The summer school also continued to progress, with 366 participants from 43 countries enrolling throughout 2015. That 40% of these students were from outside the EIT ecosystem highlights the growing reach of the EIT Digital brand.



EIT Director Martin Kern with first wave KIC CEOs Bertrand van Ee, Diego Pavia and Willem Jonker



Master School Graduation 2015, Budapest

2016: SUSTAINED IMPACT

2016 began with the signing of a new seven-year Framework Partnership Agreement with EIT to underpin the work EIT Digital had been doing and provide structure for the sustained impact the group hoped to achieve between 2016 and 2022.

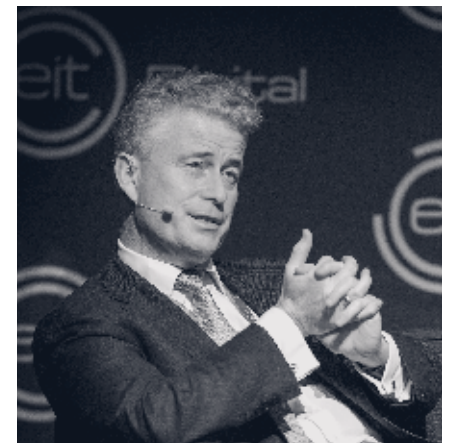
“The digital transformation is happening globally, and it is our role to ensure Europe is at the forefront, so we have a competitive economy and an improved quality of life across our continent. For that, we need to mobilise our innovation strengths to create and transform industries, to develop our cities, and to refocus our healthcare system. In addition, we need to invest in people through education in digital skills to ensure we have a workforce ready to drive this digital transformation,” Willem Jonker, CEO EIT Digital, told the Driving Europe’s Digital Transformation conference.



Konux CEO Andreas Kunze with EIT Digital CEO Willem Jonker

ROSSUM’S UNIVERSAL ROBOTS

The post-Covid world is also likely to see a resurgence in the use of robotic technology as organisations strive to maintain output and social distancing at the same time. It is nearly a century since Karel Capek’s ground-breaking science fiction novel *R.U.R.* popularised the notion of robots, and the last ten years has seen considerable progress in adoption of the technology across industries.



Commission Director General Robert Madelin at the 2016 EIT Digital conference in Brussels

Automation has long been a key component of manufacturing and industrial facilities, but the automation of a wider array of tasks began to grow with the launch of Massachusetts-based startup, Kiva in 2003. The company developed two core robotic systems that were capable of performing a range of fulfilment-based tasks, and was eventually bought by Amazon in 2012 for \$777 million. It is estimated that the company now deploys over 200,000 Kiva robots in their fulfilment centres.

It marks the beginning of a renewed effort to drive sustained impact through the continuous delivery of entrepreneurial graduates; through the increased market uptake of innovative ideas; and through the sustained growth of novel startups into mass market products and services.

The partner network expanded to 26 to help meet these ambitious goals, with developments underway throughout the year to transform the associate groups in Budapest and Madrid into full Nodes by the start of 2017. Expansion also continued in countries without a node presence, with the ARISE initiative providing robust support to innovation in the countries of the EIT Regional Innovation Scheme (EIT RIS).

ARISE was designed for EU Member States and Horizon 2020 Associated Countries in Europe who are modest and moderate innovators, and where EIT Digital has few or no partners. Strategically, the scheme is an additional offer to these countries to facilitate their engagement with our Innovation Community. Initially, ARISE entailed Estonia, Poland, Czech Republic, Slovenia, Portugal, and Greece. The expansion in 2016 into Poland and the Czech Republic alone allowed a network of 130 partners to enter the EIT Digital ecosystem.



Farewell to EIT Digital's first chairman, Henning Kagermann



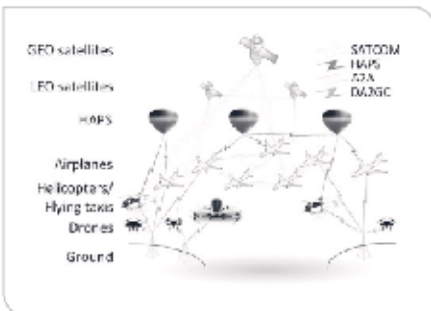
Martine Reicherts, EU Director-General for Education, Youth, Sport and Culture, and MEP Michał Boni receive the EIT Digital Strategic Innovation Agenda 2017–2019

DIGITAL CHALLENGE

This pan-European outreach was reflected in the EIT Digital Challenge, which aims to support startups in their expansion overseas. The competition had entrants from 234 startups from 25 EU countries, with 16 countries represented among the finalists. Dominik Krabbe, then Lead of the EIT Digital Challenge, said: “With these companies, we have identified some of Europe’s most innovative digital technology scaleups. They show proven product market fits and a high potential to succeed in world markets. Now we aim to accelerate their growth and create new European success stories.”

2014 EIT Digital Challenge winner Konux continued to grow from strength to strength raising \$7.5 million and entering a partnership with Deutsche Bahn to provide real-time insights into the health of their rail network. French autonomous vehicle startup NAVYA also continued to progress, helped by a fundraising round of €41 million that was secured after the company entered the EIT Digital Accelerator.

British supermarket Ocado has perhaps taken this approach the furthest with its largely automated warehouses powering its online grocery operations. Their warehouse contains over a thousand robots that collectively process several million items per week. These facilities increasingly combine robotics, the internet of things, and artificial intelligence to optimise operations. There is also a growing use of 3D printing in facilities around the world. The first 3D printer was built in 1992, with an increasingly broad array of applications emerging since then, including the first 3D printed blood vessel in 2010 and the first 3D printed car in 2014.



ICARO provides a robust direct air-to-ground connectivity for aircraft, flying cars and drones

EDUCATIONAL OUTREACH



*EIT Digital Chairman Raymond Freymann,
EIT Governing Board Chairman Peter Olesen,
EIT Interim Director Martin Kern
and EIT Digital CEO Willem Jonker sign
the 2016–2022 Framework Programme
Agreement*

The educational footprint of EIT Digital also continued its rapid expansion in 2016, helped in large part by the tremendous growth in both courses and student numbers on modules launched on the Coursera platform. The year saw new courses on the Internet of Things and Embedded Systems helping to attract over 30,000 active learners in the second half of 2016 alone.

“These courses provide students with the cutting-edge knowledge on Internet of Things and Embedded Systems. If you can complete these courses, you have the capacity to become a Master in Embedded Systems. Generally, such a master’s degree gives you access to world-renowned companies like ASML, NXP, Philips, Siemens, Nokia, etc,” said Martijn Klabbers, at the time Online Education Activity Lead at EIT Digital and Project Developer and Manager at Eindhoven University of Technology.

EIT Digital also entered a partnership with the Haas School of Business at the University of California Berkeley to develop two courses for the Coursera platform on innovation and entrepreneurship. The partnership follows an earlier partnership with Swedish university KTH on the Impact of Technology and Marketing Strategies for Entrepreneurs.



UC Berkeley’s Henry Chesbrough at European Innovation Days, co-organised by EIT Digital



2017–2020

Impact & Influence

2017: DELIVERING TRANSFORMATION

2017 began with a mission to deliver transformation, both of the wider digital ecosystem across Europe, but also of EIT Digital itself into a sustainable, impactful, future-proof organisation. It was a year that saw two new nodes established in Budapest and Madrid, with several legal entities created in other countries to help to truly appreciate the diversity of talent and entrepreneurship across Europe.



DLD conference Munich with EU Commissioner Viviane Reding and Amazon CTO Werner Vogels

THE GROWTH OF HYPERAUTOMATION

The slightly inappropriately named robotic process automation (RPA) has also emerged as a major trend of the last decade. The sector was popularised by Romanian startup UiPath, which was launched in 2005. Such RPA applications typically interface with other enterprise applications, and thus provide organisations with mature, resilient, scalable, and reliable applications.

Many RPA applications are cloud based, and the availability of on-demand computing, both in terms of data storage and computing power, has transformed the way computing resources are accessed by organisations.



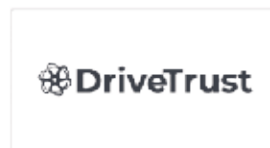
Commission Director General Roberto Viola at EIT Digital Conference in Brussels

The concept allows organisations to tap into complex technologies without needing either the hardware, software, or even expertise, to develop and manage them in-house. The technology has been enabled by virtualisation software, such as that pioneered by VMware, that allow multiple virtual machines to run on the same physical server.

It is a market that all of the major technology vendors have entered with gusto, with Microsoft launching Azure in 2010, IBM SmartCloud in 2011 and Google it is Compute Engine in 2013. Google followed up the release of the Compute Engine with the launch of Kubernetes in 2014 to provide an open source means of automating application development. By 2020, the market for cloud computing is expected to top \$241 billion.

It was a year in which the support ecosystem for entrepreneurs grew to 156, with a presence in 15 European countries, plus the Silicon Valley Hub in the United States. This support for Europe’s entrepreneurs was reflected in the news that five EIT Digital entrepreneurs had been listed in Forbes’ 30 under 30 list, with another 11 entrepreneurs celebrated from across the EIT network, with the EIT Digital Accelerator also named as one of the leading global accelerators by Gust.

A key part of the expansion of this network is the work of the ARISE Europe programme, which delivered key results throughout 2017. For instance, EIT Digital co-organised the market leading Startup Nation Summit in Tallinn, with Estonian scaleup DigiFlak also joining the EIT Digital Accelerator in a bid to boost the global expansion of their cybersecurity technology.



DriveTrust – a connected AI dash camera for driver evaluation



GLOBAL ORIENTATION

The 2017 Annual Conference in Brussels provided an opportunity to reaffirm the importance of adopting a global outlook to help drive Europe's digital transformation. With 60 new scaleups admitted into the EIT Digital Accelerator during the year, it is crucial that they start their commercial lives with a global outlook. EIT has always been supportive of expansion across Europe, but it is crucial that no market is left unturned in the search for growth opportunities.

A good example of this in action was the delegation that attended the RSA Conference in San Francisco. EIT Digital officials were accompanied by three cybersecurity scaleups to help them explore opportunities for growth in the North American market.

“Our Accelerator supports fast-growing European startups to scale up their business in Europe and beyond,” Chahab Nastar, EIT Digital's Chief Research and Innovation Officer said. “We accelerate their growth by helping them secure target customers and raise capital. When it comes to cybersecurity, it is one of EIT Digital's core innovation areas, and one of Europe's strengths.”

The year also saw EIT Digital and Mind the Bridge co-organise Startup Europe comes to Silicon Valley to help future European startup unicorns engage with key industry players in the United States. The event brought together 15 of the fastest growing scaleups in Europe, EU policy makers, and Silicon Valley stakeholders during a week of presentations and meetings.

Carlos Moedas, European Commissioner for Research, Science and Innovation, awards Kristina Tsvetanova of EIT Digital-supported BLITAB Technology with the EU 'Rising Innovator' Prize

ENGINES OF CREATION

Data from the World Bank highlights the growing ease with which entrepreneurs have been able to create a startup as the decade has progressed. Improvements have been made in numerous areas, with the European Index of Digital Entrepreneurship Systems (EIDES) highlighting the four pillars of Culture and Informal Institutions, Formal Institutions, Regulation, and Taxation, Market Conditions and Physical Infrastructure as especially crucial to the ease of creating a startup, and indeed of growing one into a successful business.



Many of the factors examined in the report are also central to the Global Innovation Index that is produced each year by INSEAD. It measures things such as the quality of educational institutions, the regulatory environment, access to finance, intellectual property regimes, and availability of talent as key ingredients of the most innovative societies. The report frequently places European nations at the top of the league table, with Switzerland, Sweden, the Netherlands and the United Kingdom regularly featuring in the top ten.

FUTURE ENTREPRENEURS

The development of the next generation of entrepreneurs continued to grow at pace, with 215 and 17 graduates respectively from the EIT Digital Master and Doctoral Schools. These students were not only gaining excellent tuition, but were also applying their skills in the creation of new businesses. For instance, doctoral student Roberto Costumero Moreno aimed to apply the broadened perspective he gained on the world to improve society.

“The spirit at EIT Digital is wonderful. The people here learn how to make an impact on society. The EIT Digital open and innovative courses focus on expanding and growing potential businesses across Europe and beyond,” he explains. “Within EIT Digital we have the concept of a complete digital society. That society has no borders and this kind of thinking results in finding solutions that could help anyone, anywhere.”



VR co-design platform HYPER enables clients to physically experience their visions

Or you have Dr Julia Wache, who completed her studies at the EIT Digital Doctoral School in 2017. Wache is the co-founder of feelSpace, a company that produces a vibrotactile compass belt that helps to guide the visually impaired. The company, which was nominated for the EIT Change Award in 2017, aims to support the 30 million blind and partially sighted people in Europe, with the doctoral programme providing a valuable platform to learn the essentials of growing a business.

“In this programme, you learn some basics of entrepreneurship, and you have a chance to look outside of your research bubble,” Wache explains. “It is an environment where I could learn all of the key aspects of becoming an entrepreneur without any major risk.”

The mooc activities continued to go from strength to strength, with 25 courses now available via the Coursera platform, and almost 70,000 students from around the world enrolled on them during the year.

These activities helped to position EIT Digital as a leading player in digital innovation, transformation and skills, as the high volume and quality of outcomes delivered over the years establishes the group at the heart of the innovation ecosystem in Europe and further afield.

This enhanced awareness of the numerous factors that can support entrepreneurial activity has seen a flourishing number of innovation ecosystems emerge around the world. Startup Genome identifies nearly 100 spread around the world in their latest Global Startup Ecosystem report. With \$2.3 trillion invested in the global startup economy between 2015 and 2017, the growth in startup activity is considerable. What’s more, ecosystems are witnessing a shift away from startups specialising in apps, digital media and other aspects of the internet, towards new areas such as Fintech and Cybersecurity.



Happy graduates of the EIT Digital Doctoral School



Darja Isaksson, Director General of Swedish Innovation Agency Vinnova, at the Stockholm Innovation Day

The decade has also seen considerable progress in our understanding of just how to grow a successful startup, with the work of Eric Ries and Steve Blank arguably leading the way. Ries began popularising his lean startup methodology in 2008 when he fused the lean manufacturing principles of Toyota with the customer development methodology of Blank.

2018: HARVEST FOR VALUE

2018 was typified by attempting to truly harvest value across innovation and entrepreneurship, ecosystems, and education. It was a year in which the support ecosystem curated by EIT Digital continued to grow, with 215 partners on board by the end of the year, with 53 of these from industry. This ecosystem is the foundation of the organization, with the pan-European, cross-sectoral nature of the network an apt reflection of the broadening scope of the work done.

Plans were agreed to further expand the geographic reach of the network, with new satellite facilities in Edinburgh and Braga to be launched in 2019, thus bringing the total number of locations where EIT Digital operates to 18. The Braga satellite in particular is further evidence of the growth in the ARISE programme, with 15 startups from across Southern and Eastern Europe supported during the year.

One of these is Bulgarian startup Checkpoint Cardio, which joined the EIT Digital Accelerator to help develop its remote monitoring solution. The company was recognised as the most innovative company in Bulgaria in 2017, and has since gone on to provide remote monitoring of over 40,000 patients.



European Commission Director-General for Education, Youth, Sport and Culture Themis Christophidou addressing the annual EIT Digital Conference in Brussels



DIGITAL ACCELERATION

The EIT Digital Accelerator continued to grow, with 29 new scaleups enrolled during 2018, bringing the total number of businesses supported by the programme to 61. The Accelerator provided these companies with over 2,500 new customer leads, with 84% of them outside of the home country of the startup. The success of the programme is emphasised by the €137 million in funding raised by startups during the previous 3 years, with €18.2 million of that directly resulting from the Accelerator's activities.

Further work was undertaken to deepen ties with the ecosystem in Silicon Valley, with EIT Digital hosting Jyrki Katainen, then Vice-President of the European Commission, responsible for Jobs, Growth, Investment and Competitiveness at the Silicon Valley Hub to explore topics such as artificial intelligence and the digital single market. Three startups from the EIT Digital Accelerator were also showcased in Silicon Valley, including German startup OptioPay, which was named the best European tech scaleup in the field of digital finance in the 2017 EIT Digital Challenge.



EIT Digital DeepHack San Jose, California

As the doyen of open innovation, Henry Chesbrough, says, “Eric Ries and Steve Blank have made a fundamental contribution to the study and practice of entrepreneurship. As they have taught us, a startup is not a smaller version of a large company.”

71



Demonstration of the EIT Digital-supported sea waste collector WasteShark at the Innovation Day in Eindhoven



*Makers & Shapers interview
with MEP Eva Kaili*

Their work rests on the principle that the biggest cost to any start-up is developing a product or service that does not gain traction in the market. Taking a traditional waterfall-based approach to developing that offering can be fatal, therefore, as it leaves the customer out of the equation until the product is launched.

*Makers & Shapers interview with
Philips CEO Frans van Houten*



Digital Finance was a clear area of focus for EIT Digital during 2018, with the era marking a fundamental transition from the conservative industry of old to the agile and rapidly changing digital industry being driven by a new wave of fintech startups. EIT Digital’s activity in the area resulted in 12 new products being launched, with a summer school course on machine learning for digital finance attracting participants from over 20 countries.

TRANSFORMING EDUCATION

The evolution of education continued apace, with the burgeoning blended learning courses available via Coursera increasingly influential. During 2018, the first student was recruited to the EIT Digital Master School from the Coursera MOOCs. Dutchman Erik Wouters and American Christopher Ohara had studied the EIT Digital Embedded Systems programme on Coursera, before undertaking the two-year EIT Digital Master School via the Eindhoven University of Technology (TU/e).

This transatlantic collaboration continued via a partnership between EIT Digital and UC Berkeley to develop a cybersecurity course for professionals. The course was designed to be conducted partly in Munich, and partly in California, with content provided by senior figures from the cybersecurity industry.

“The EU Commission recognises the need for a strong capability in cybersecurity and actively promotes resilience to cyberattacks in the EU,” said Roberto Viola, Director-General, DG Connect, European Commission. “Today’s executives need to be aware of the cybersecurity risks for their organisations and sufficiently competent to take responsibility for a viable cyber-resilience strategy. This is why such transatlantic programmes can be of added value.”



2019: DEEPEN AND SCALE

As the decade drew to a close, there was a growing discontent with the Silicon Valley-based model of innovation, which led to a strong desire for digital innovation to take a European flavour. This was reflected in the Strategic Innovation Agenda for 2020–2022, in which EIT Digital outlined five core challenges to be addressed:

- 1 We need to bring European values to the digital world by building global European digital businesses and scaling up disruptive digital ventures that have potential for global success.
- 2 We have to further address fragmentation to support digital enterprises and entrepreneurs. The completion of the Digital Single Market must be accelerated and the whole of Europe turned into a “de facto” domestic market for European entrepreneurs.
- 3 It is necessary to raise R&D investments in digital technologies and emphasise on software, where currently American and Asian companies are leading the way.
- 4 We must strongly increase deep tech innovation investments and take mature research results from laboratory to market, especially by means of entrepreneurship.
- 5 And we have to adapt the European education system to the digital reality, to equip people with the right digital skills, and to deploy digital technology in order to support education.

These objectives would be met by driving market uptake of world leading European research results, supporting international growth, both across Europe and globally, and by fuelling the European market with a strong flow of digital entrepreneurs. The key to each of these, is the strength of the ecosystem EIT Digital is able to muster.



Makers & Shapers interview with F-Secure chairman Risto Siilasmaa

By having a minimum viable product to take to market, and then iterate furiously based upon the feedback received from real customers, the pair believe that it allows entrepreneurs to fail without costing them the business, with the learning they gain from each failure helping to make the startup more effective and more resilient.

Makers & Shapers interview with Siemens CEO Roland Busch





Demonstration of the SARA social robot at the annual EIT Digital Conference in Brussels

This has seen a fundamental change in how society supports entrepreneurial activity, with corporate examples including Telefonica’s Lean Elephant and Bosch’s Startup Platform, which is one of the 7,000 or so incubators that are believed to exist globally. It is created an environment where founders are able to bring their ideas to market at a much lower cost than was the case a decade ago.

Presentation of 2020–2022 Strategic Innovation Agenda to MEP Eva Kaili and EU Commission Vice-President Andrus Ansip

EXPANDING THE ECOSYSTEM

As Cambridge University’s Peter Williamson argues, an ecosystem is only as strong as the members within it, and the connections that bind them. 2019 was a year in which both of these were strengthened. The partner network grew to 278, of which 186 were from industry, with this growth in part due to a diversified search for potential partners.

The ecosystem was also strengthened by two new satellites in Edinburgh and Braga that formed the beachhead for further work in Scotland and Portugal respectively. What’s more, an innovation hub was created in Tel Aviv for the wider EIT ecosystem, with plans afoot for a hub in Beijing to complement the existing facility in California.

EIT Digital also played a strong role in the Horizon Europe programme, which has a renewed focus on digital activities, together with the €9 billion Digital Europe programme.

“The digital transformation is one of the most impactful changes going on in our society; it affects the daily life of every single individual,” EIT Digital CEO Willem Jonker told the annual conference in Brussels. “Europe has to play a prominent role in this transformation in order to ensure that European values are respected in the digital world to the benefit of our citizens, institutions and businesses.”



DRIVING CHANGE

The various innovation activities undertaken by EIT Digital throughout 2019 helped to drive this transformation. 15 startups were launched with the help of EIT Digital, with 70 new products being brought to market. Among these were London-based startup **HYPER**, who emerged out of the HyperCRC innovation programme. They provide a spatial design platform that fuses virtual reality with real, motion-tracked models. Through EIT Digital, they received support from Virgin Galactic and Thales Group.

Similarly, German startup **Ariadne Maps** has been working to help organisations better understand their properties. The startup, which was born out of the People Movement Analysis and Optimisation of Infrastructure Innovation Activity, achieved rapid success, with a deal struck with Deutsche Bahn within months of incorporation, and further collaboration with Ferrovial before the year was out.

These successes are reflected in the high position achieved in the rankings for public business accelerators produced by Swedish intelligence company **UBI Global**, which placed the EIT Digital Accelerator in the top 5 globally, and the best pan-European accelerator.



Finals of the EIT Digital Challenge scaleup competition



Opening of EIT Digital Edinburgh Satellite with Scottish Innovation Minister Ivan McKee



Portugal's Minister of Science, Technology and Higher Education, Manuel Heitor, at the inauguration of the EIT Digital Satellite in Braga

BUILDING THE CHANGE MAKERS

The educational work of EIT Digital continued to grow, with 380 new students enrolled in Master and Doctoral programmes, bringing the total to over 2,280 since 2011. What's more, 12 summer schools were executed, with a total of 480 participants, and over 100,000 learners participated in the Massive Open Online Courses on Coursera.

Work also continued in the cybersecurity domain via the Concordia consortium, which was charged with piloting a Cybersecurity Competence Network for the EU as part of the Horizon 2020 programme. EIT Digital used its extensive expertise in the domain to design and develop a cybersecurity-specific methodology for new courses for the sector.

The project builds upon a partnership with Berkeley Executive Education's Haas School of Business, which saw the completion of the Cybersecurity 360 for Professionals programme, and showcases the growing ability of EIT Digital to provide just-in-time high quality education content.



EIT Digital Supervisory Board 2018 with Raymond Freymann (chairman 2015-2019) and Linnar Viik (chairman since Sep 2019)

2020: INCLUDE AND SUCCEED

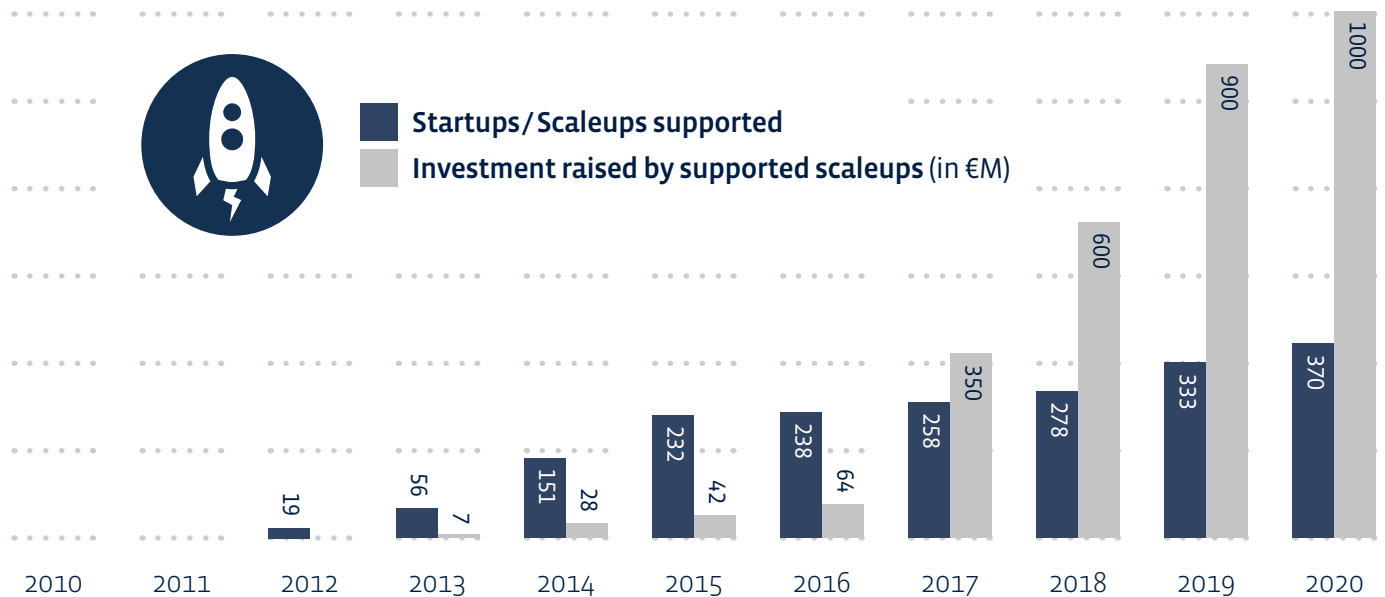
2020 has been an unforgettable year in so many ways, but for us, it has also marked our 10th anniversary. With a further streamlined governance of the organisation, as well as concrete advances on inclusiveness and diversity at all levels, the year began with an ambitious business plan for the 12 months ahead.

With a focus on the highly interdependent aspects of operational excellence, impact and sustainability, EIT Digital’s targets for 2020 were continued growth of our ecosystem (especially in RIS countries), increased focus on venture creation and growth, as well as enhanced education activities and student recruitment.

In addition, existing sustainability instruments should deliver increasing income, and two new sustainability instruments should support venture investments as well as student scholarships.



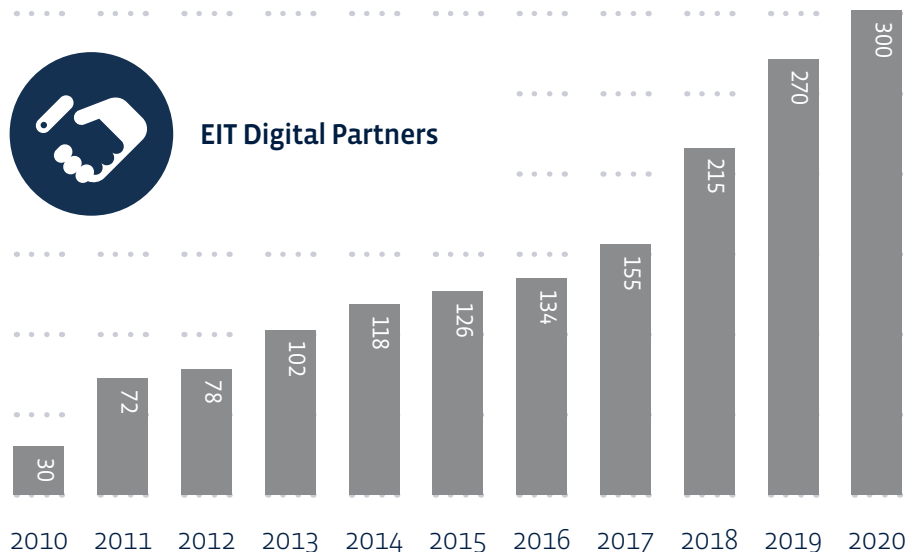
EIT Digital Summer Schools go online during COVID-19 pandemic



When the 2020 business plan was produced, no one could foresee the global pandemic that would do so much to define the year. The social and economic impact of the pandemic has been especially severe given our core aim to bring people and organisations together. Lockdown measures and travel restrictions have severely impacted our operations, but it is a mark of our resilience that the digital infrastructure in place meant that many of our core processes were in place to allow operations to continue online.

With the digital infrastructure in place, we were able to transition online in record time and limit the negative impact of the pandemic. As such, despite the disruption we were able to achieve most of our targets in the innovation domain, with the only exception being the accelerator, where intake and matchmaking were seriously affected.

In our educational work, we have been able to successfully move most of our activities online, so delivery has largely been unaffected. The uncertain environment has affected our ability to recruit master's students however, while we also had several challenges moving our professional education programs online, which has negatively impacted our sustainability targets for the year.



EXPANDING TO NEW REGIONS

Despite limited mobility and the widespread suspension of our economies, progress was made in further expanding our ecosystem. In January, we were able to announce Tallinn University as a new partner of the EIT Digital Master School, thus enlarging our network into the Baltics. We were also happy to open a new Satellite in the Belgian port city of Antwerp. Opportunities for further Satellites in Estonia, Greece, and Slovenia are being explored. This expansion and reinforcement help to serve the whole of Europe with an increased focus on the Regional Innovation Scheme (RIS) countries.

AN ORGANIZATION SHAPED BY INNOVATION

Our first priority was and will always be the health and wellbeing of our staff. As a result of the Corona pandemic, all physical events planned for the year were cancelled, business trips postponed, and Colocation Centres shut as staff and stakeholders worked from home to keep people safe and prevent further spreading of the virus.

At the same time, we were fast to move core processes online to ensure that work could continue wherever possible. This allowed us to take rapid steps to mitigate the effects on our partners and sustain our Business Plan 2020.

We successfully moved two Brokerage sessions for the EIT Digital Call 2021 online, while also achieving our goal of focusing a growing share of our innovation activities on new venture creation. We were also able to give practical help to our partners and Accelerator scaleups in their efforts to continue business during this challenging time and succeeded in our virtual recruitment for our pre-acceleration Venture Program by



OEDIPUS Innovation Centres foster the creation of products and services for a blended industry

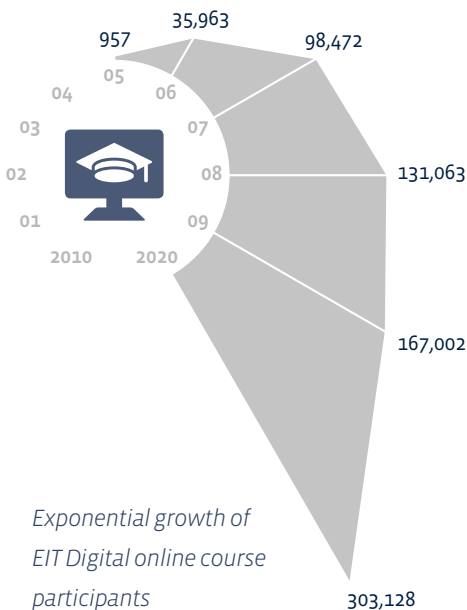
almost doubling applications. We were also able to achieve a record number of submissions for the 2020 Challenge scaleup competition, and successfully moved our Summer School courses on-line, while also arranging with our partner universities to conduct master programs partially online during the autumn.

Last, but by no means least, we were also able to secure additional financial support for selected projects and ventures as part of the wider EIT crisis response plan.

ENHANCING COLLABORATION AND DIVERSITY

In 2020, EIT Digital accelerated collaboration with its fellow EIT Innovation Communities. For instance, we lead an Innovation Impact Activity on Artificial Intelligence with EIT Health, EIT Manufacturing, EIT Urban Mobility and EIT Climate-KIC. We also ran, with EIT Health, an Innovation Thematic Activity on combating childhood obesity and worked with EIT Food and EIT Manufacturing on digitized production test beds. Lastly, we supported the Smart Sustainable Cities activity led by EIT Climate-KIC and an activity on the Circular Economy that was led by EIT RawMaterials.

Building on recent achievements, EIT Digital continued pushing its agenda on gender diversity as a key pillar to support the EIT Digital strategy. The goal of our “gender diversity action plan” is to undertake structured actions to increase awareness of female diversity initiatives, improve our ability to attract female talent in technology, and be seen as an employer of choice.



Exponential growth of EIT Digital online course participants



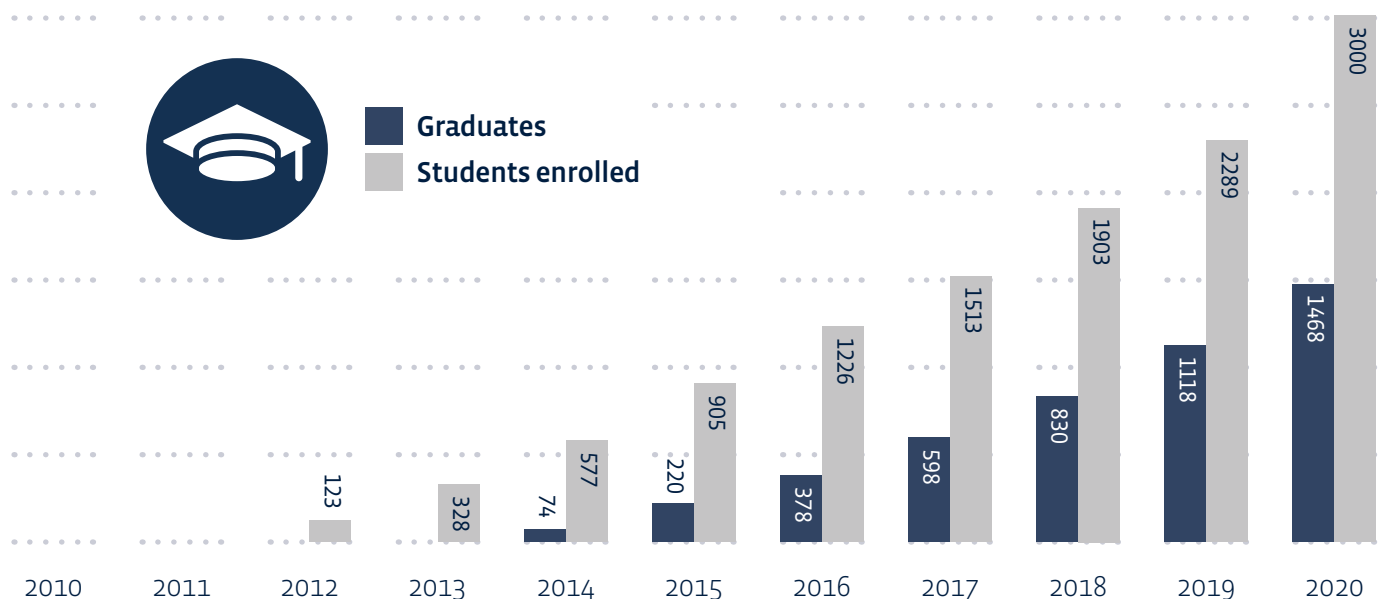
SHAPING POLICY

As part of our activities in strategic innovation of Europe, EIT Digital launched a series of studies focusing on the main policy challenges in the digital domain. In 2019, EIT Digital published the first report in this series, focusing on the Digital Transformation of European Industry – a process that will revolutionise the structure and governance of markets and lead to a significant reconfiguration of work and employment.

In the spring of 2020, we published a second report on ‘European Digital Infrastructure and Data Sovereignty’, followed closely by a policy report on the European Approach to Artificial Intelligence. EIT Digital’s reports offer regulators concrete scenario-based frameworks for digital policy development and thus aim at supporting the decision-making process at national and European levels.



EIT Digital Master School



CELEBRATING THE FIRST DECADE

While the year has undoubtedly been one of the most disruptive in living memory, 2020 has also been the year in which we commemorate the first 10 years of EIT Digital. The initial activity that fell under our 10-year anniversary celebrations was the launch of our Makers & Shapers video journey. This series consisted of a collection of interviews with top decision makers in European digital industry and authorities, each of whom shared their vision on key areas of digital innovation and the way forward for a strong and digital Europe. Makers and Shapers is an important contribution to inspire entrepreneurs, and engage innovators, investors, and policy makers in Europe's effort to be a major player in digital innovation.

Eventually, we decided to turn our traditional annual Brussels conference into a special 10-year anniversary feature event that would resemble a TV-show and present in an online format a selection of personalities that helped us build and shape EIT Digital to the organisation it is today.



VIPQ computer vision for retail and fashion

PREPARING FOR THE NEXT DECADE

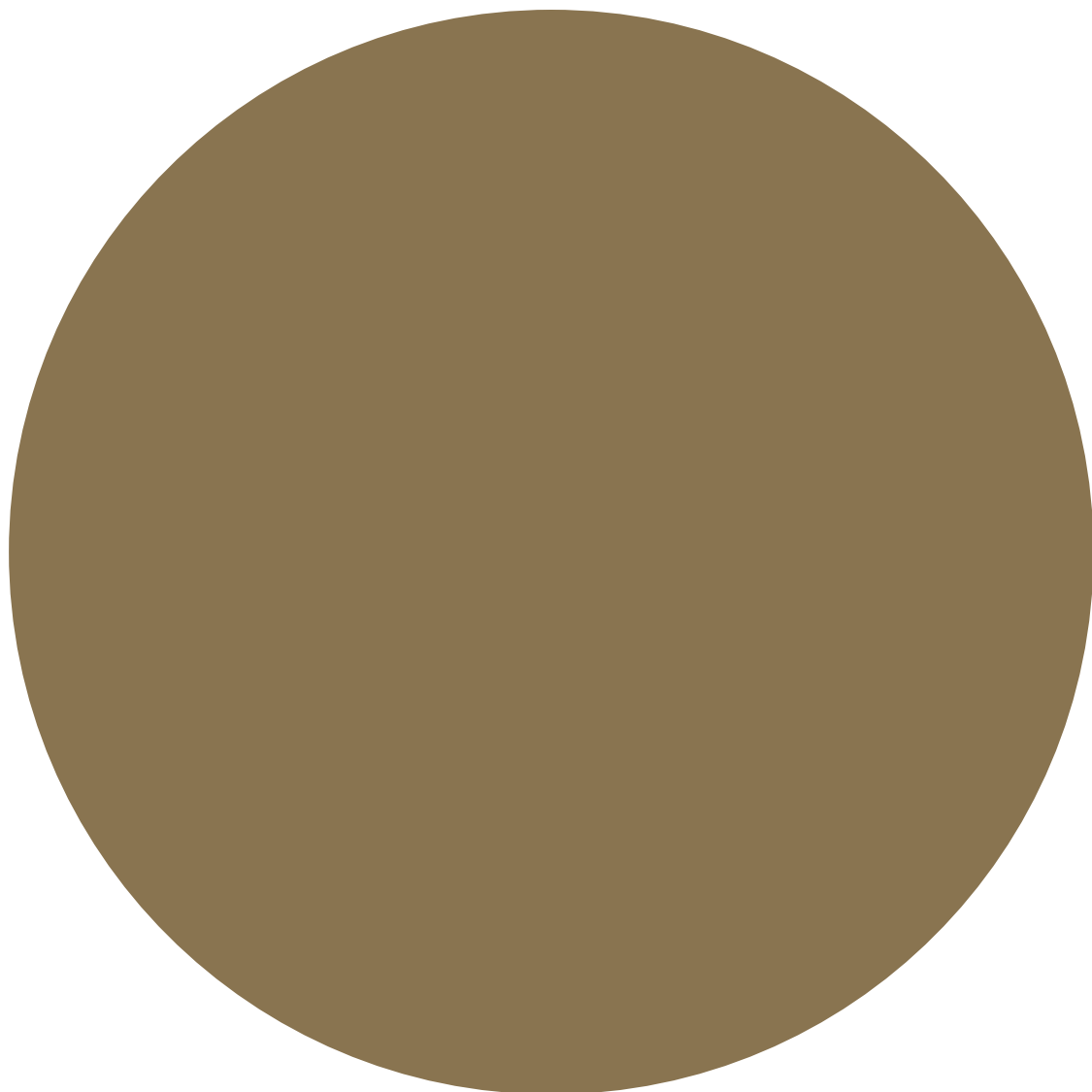
Since its launch, EIT Digital has equipped more than 3,000 alumni and 120,000 MOOC learners with the skills to innovate and become entrepreneurs; EIT Digital has supported more than 370 startups and scaleups to grow internationally, created more than 180 new ventures, raised €900m for supported ventures, and launched more than 430 products and services commercially. EIT Digital's ecosystem grew from 30 partners in 2010 to nowadays more than 300.

Our organisation continues to build on these strong achievements and in the coming years will focus on further increasing the global impact of European actors in the digital world.



uAV-Retina, future drones for emergency management, at EIT Digital conference in Brussels

2020–2030



EIT Digital in the next decade and beyond

The challenges presented by the 4th industrial revolution were vexing us as individuals, organizations, and as a society, and the events of 2020 have merely served to accelerate many of the changes already underway. These events have also placed tremendous strain on the interconnected and interdependent world that we believe is at the heart of innovation, and indeed of a liberal and prosperous society.

Digital technologies have been a key driver of growth throughout the last two decades, and will continue to be so, but we cannot overlook the challenges that have in some instances been caused or exacerbated by the very technologies we have so championed. Now is the time for EIT Digital to stimulate the kind of digital innovations that are not only inclusive and serve all aspects of society, but reinforce core European values.



The age of miniaturisation



Clean room manufacturing



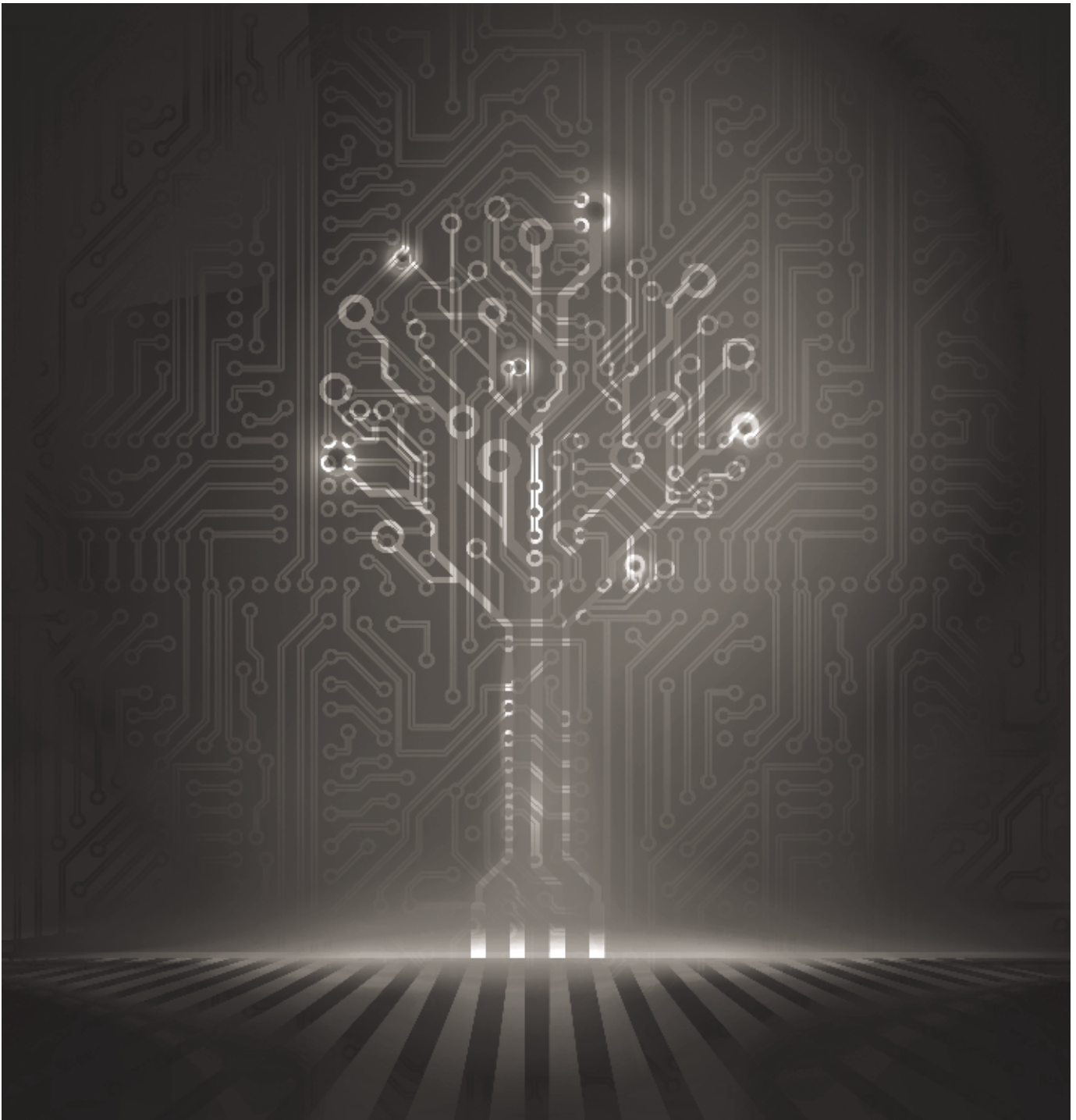
Quantum computing

As the world entered 2020, there was a strong sense that we had a handle on change. We were certain there would be a lot of it, but in an era defined by the 4th industrial revolution, there was a sense that we understood the technological, social and economic developments that were laid out before us.

So when the World Economic Forum produced their annual Global Risks Report in January 2020, it was perhaps no great surprise that they determined the main risks facing the world to be climate change, economic confrontation, and domestic

political polarisation. Similarly, when the Economist produced its annual forecasts for the year ahead, it seemed wholly sensible that they thought British life would be dominated by Brexit, American life by the upcoming presidential election, and global life by the likelihood of a halt to the prolonged period of economic growth that has defined the last decade.

Without being at all critical of these, or any other esteemed bodies that have aimed to predict how the future might unfold, the coronavirus pandemic that began to spread



Working for a New Digital that is inclusive, fair, and sustainable



THE DIGITAL FRONTIER

EIT Digital aims to strengthen Europe's position in the digital world by delivering breakthrough digital innovations to the market and helping to breed the next generation of entrepreneurial talent. The digital frontier is a constantly changing one, but it is our mission to help businesses and entrepreneurs be at the forefront of that frontier.

These innovations are likely to include a continuation of the miniaturization trend that has already seen ever smaller mechanical, optical, and electronic products and devices. This is likely to involve continued developments in areas such as quantum computing, nanotechnology and graphene.

We are also likely to see the continued explosion of data, together with the use of artificial intelligence to make sense of that data. It will also see the widespread rollout of 5G technology, and the developments that will be made possible from this infrastructure, together with developments towards 6G towards the end of the decade.

These developments will be accompanied by discussions, initiatives and policies to ensure that technology evolves in an ethical way that sees the benefits distributed widely across society rather than coalescing into the laps of a shrinking global elite.

We must aim to ensure that European values are strongly represented in the digital world, with European digital businesses at the forefront of the future. Europe will achieve this through robust support for the Digital Single Market, which will help to make it the de facto domestic market for European entrepreneurs.

across the world in February 2020 changed everything, and certainly in the short-term, rendered any predictions largely null and void. From an innovation perspective, the pandemic has provided just the kind of burning platform that the OECD, and others, argue is often the crucial start point for any kind of meaningful change.

WINDS OF CHANGE

The coronavirus has created an obvious need to change, as organisations across the world have had their standard ways of working upended, but it is also transformed the nature of change. For instance, traditionally innovation and transformation would be a capital-intensive endeavour that would require a lot of rumination (on account of the aforementioned cost) to secure buy-in and action. That sort of time is not available, and so many of the foundations of the agile movement, such as speed of iteration and minimal viable products, have become essential

ingredients of attempts by organisations to pivot at a speed and scale seldom seen before.

The pandemic has also precipitated a more open and collaborative approach to innovation. We have seen pharmaceutical companies working together to create a vaccine, computing companies pooling computational resources to mine genetic data, and tech companies working to pool their data to lend support to the battle.

Perhaps the defining feature of the response, however, has been the speed with which change has been possible. Nowhere has this been more evident than in healthcare, which has traditionally been a craggy rock on which the dreams of many an innovator has become marooned. Within weeks, however, we have seen telehealth rolled out en-masse to allow remote consultations to proceed, and data is being utilised to track, monitor, and identify people at various stages of infection.



Test of biometric payment solution PeasyPay – an EIT Digital spin-off – in a Budapest café



3D printed remote monitoring device for corona patients



Grocery delivery by last mile autonomous delivery platform LMAD at the Aalto University Campus



COVID-19 contact tracing token



THE NEXT GENERATION OF DIGITAL ENTREPRENEURS

The importance of digital innovation has never been greater than it is today. Europe has a world leading education and research foundation to build innovations upon, and we need to do more to bring that knowledge and expertise to market in the form of transformative innovations.

This can only be done via the development of the next generation of digital entrepreneurs that have not only exceptional technical skills, but also the business acumen to develop and grow their ideas. We plan to continue the success of the Master and Doctoral Schools, which have embedded innovation and entrepreneurship activities to ensure our technical leaders have the skills and mindset to create and run successful startups. What's more, our Master and Doctoral Students will increasingly participate in our innovation activities through internships, post-master's positions in ventures and startup creation.

MOVING FAST AND BUILDING THINGS

The period has also been defined by a sense of frustration with the Silicon Valley model of innovation. Discontent prompted Silicon Valley icon Marc Andreessen to share his frustration at the inability of Silicon Valley to produce vaccines, medicines, masks, and ventilators. “We could have these things, but we chose not to—specifically we chose not to have the mechanisms, the factories, the systems to make these things. We chose not to ‘build,’” he says.



Successful examples of EIT Digital Accelerator portfolio scaleups

While the Valley has provided us with Zoom in order to communicate, iPads to keep us plugged in, and Netflix to keep us entertained, the limitations of the innovations produced there have been laid on top of more long standing concerns about the wider societal implications of a model that appeared to sweep all before it for the best part of two decades.

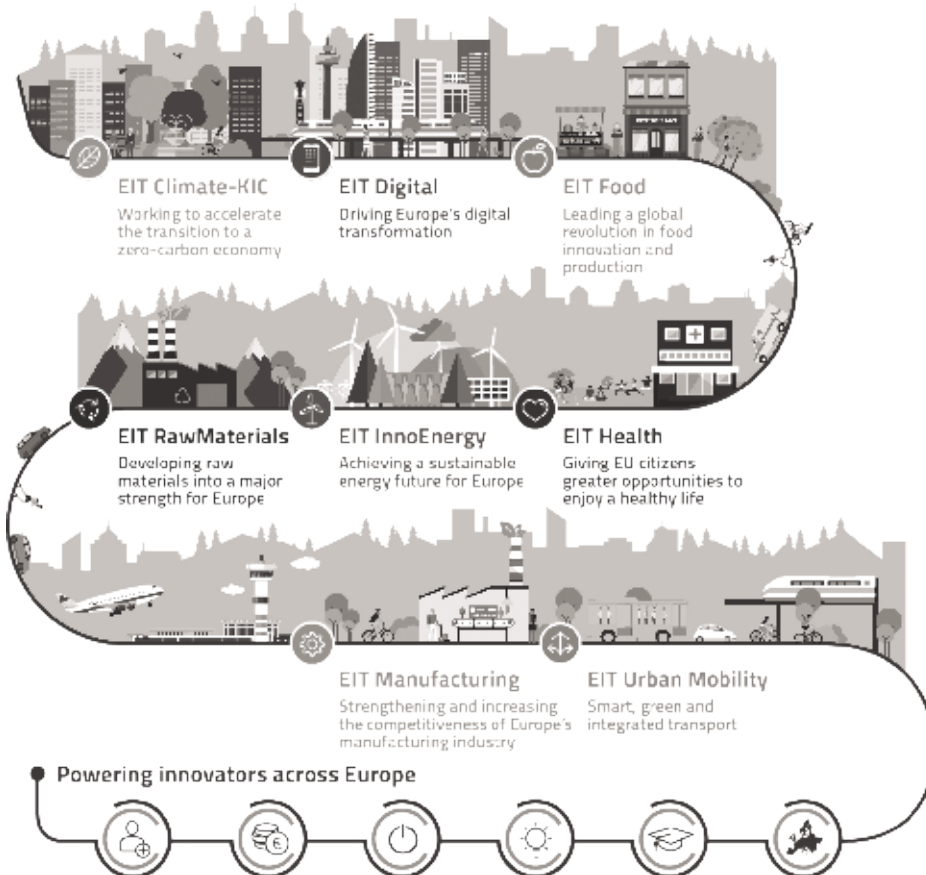
This is not a new accusation, with Andrew Grove also bemoaning the lack of manufacturing prowess in Silicon Valley a decade ago. He argued that it was vital that physical capabilities had to be maintained alongside digital capabilities, in a missive that chimed with EIT Digital's CEO Willem Jonker's desire to see digital developments form in a very European way.

These current and budding entrepreneurs will also be supported in the creation and development of their new ventures, whether through open innovation activities complemented by innovation acceleration events in our DeepHack series, pre-incubation support through our RIS Venture program, and Innovation and Entrepreneurship activities in the education programmes. What's more, the EIT Digital Accelerator aims to help startups scale up so that their ventures achieve lasting impact across both Europe and the world.

The growing number of hubs and satellites that are part of the EIT Digital network will be central to this process. As research from IMD highlights, innovation is often at its strongest in smaller economies, with the latest Startup Genome report into the global innovation ecosystem also highlighting the growing spread and importance of smaller ecosystems in less celebrated parts of the innovation landscape. EIT Digital plays a crucial role in finding and supporting these hives of innovation and will continue to do so in the decade ahead.

We are especially focusing our efforts on areas that have been identified as vital for European digital sovereignty. The EIT Digital Strategic Innovation Agenda 2020–2022 outlined our priorities as we aim to support innovation in the areas of Digital Technology, Digital Wellbeing, Digital Cities, Digital Industry, and Digital Finance.

The interdisciplinary nature of technology in these areas means that a growing volume of work in the future will be undertaken in partnership with other members of the EIT Innovation Community. For instance, we will be running partnerships in the wellbeing domain with EIT Health and EIT Food; with EIT Manufacturing in the digital industry domain; and with EIT Urban Mobility in the digital cities sphere.



The EIT family is well prepared for the next decade

“Europe has great potential to draw level with its American and Asian competitors and win the race on data platforms for industry and ethical AI applications,” he told the 2019 EIT Digital Conference. “At EIT Digital, we believe that only a concerted effort of all stakeholders can sustain the competitiveness of a sector that is vital for Europe’s economic success. Our mission is to bring tech ‘makers’ (i.e. tech firms and universities) and ‘shapers’ (i.e. regulators) together to create a digital world that respects European values.”

GLOBAL INNOVATION

What of China? In a recent speech, Chinese President Xi Jinping outlined his support for open innovation. “China will not close its door to the world; we will only become more and more open,” he said. “We should give equal emphasis to ‘bringing in’ and ‘going global’, follow the principle of achieving shared growth through discussion and collaboration, and increase openness and cooperation in building innovation capacity.”



The builders of a strong digital Europe



LEADING THE WAY

To build a strong digital Europe, EIT Digital will increasingly engage in thought leadership initiatives that help to drive the digital agenda. The Makers and Shapers video series, for instance, features captains of industry, high-profile startup executives and key policymakers, each of whom are sharing their vision of digital innovation.

We will also continue to provide European decision makers with policy recommendations to help ensure the soil is fertile for digital innovations to thrive. Following our highly praised policy report on the Digital Transformation of the European Industry, we released a second report on European Digital Infrastructure and Data Sovereignty, which itself was followed by a policy report on a European Approach to AI.



Serving as a digital compass for society

As Imperial College London's George Yip highlights, whilst historically Chinese entrepreneurship has focused primarily on the enormous domestic market, there is a growing sense that Chinese firms are making their mark globally. This growth extends beyond well-known companies, such as Alibaba and Huawei, and includes a large number of companies that are as internationally successful as they are largely unknown to many in the west.

Yip cites examples ranging from Hikvision to Malong Technology, Mobike to Weihua Solar, modern Chinese startups have moved beyond the copycat accusations of old, and now innovate in their own right. It is a situation that Alex Lazarow believes is spreading beyond Beijing, with what he refers to as "frontier innovators" emerging in all corners of the world. Such startups are writing their own rules and charting their own paths, challenging what the model for innovation should be, and redefining what it means to innovate. It is debatable that these startups have been any more successful in helping the world tackle the pandemic

than their Silicon Valley peers, however. What they do highlight is a clear shift in how China, and other markets around the world, are approaching innovation.

From Delhi to Detroit, this new breed of startups build their organisations in a global, distributed way, with talent recruited from wherever it may be. They strive not only to make money, but make a tangible difference to society. They are comfortable operating in an environment where “moving fast and breaking things” is not tolerable, and where the education, energy supply, and financial services that many Silicon Valley startups take for granted cannot be guaranteed.

“The world outside the Valley is different, where startups often must cope with political or economic instability and lack of infrastructure, where there might be little or no access to angel investors, venture capitalists, or experienced employee pools,” Lazarow says. “Under such conditions, entrepreneurs must be creators who build industries rather than disruptors who change them.”

It is 16 years since CK Prahalad published his ground-breaking book on the Fortune at the Bottom of the Pyramid, and as startup activity has become democratised around the world, the future will be driven less by startups parachuting into regions from celebrated western hubs, and more by ventures whose very being is rooted in the territories they aim to serve.

BEYOND SOFTWARE

Whereas Andreessen famously remarked that software would eat the world, the coronavirus pandemic has provided a timely reminder that it is just as important that we find novel ways of rethinking healthcare and education, making food production and distribution sustainable and efficient, and generally deploying our technical abilities in sectors across society, not just on those that offer the least resistance.

These efforts will be supported by a continuously growing organisation. We began life with a core group of 30 partners in 2010, and this has grown year on year to over 300 today, with the network expected to reach 340 by 2021. We are also expanding our geographic footprint to ensure that no stone is left unturned in finding the best innovations in Europe, and then helping to scale those innovations across the world.

2020 has highlighted the challenges society continues to face in terms of diversity and equality, and we are striving to make the digital scene more representative of society as a whole. To set an example ourselves, we are focusing on hiring more female staff; increasing the share of women in higher management positions; deploying gender diversity awareness training; enhancing efforts to recruit female students; and giving greater visibility to female entrepreneurs.



Robert Solow famously remarked in 1987 that “you can see the computer age everywhere but in the productivity stats,” and there has been little sign that the wave of innovations that have emerged since the dot-com era have found their way into economic growth, or indeed personal prosperity. At a time when the Silicon Valley titans have boomed, productivity growth across the economy has flatlined, with an increasing disconnect between economic growth and labour’s share of GDP.

It is a problem that Henry Chesbrough believes requires society to do more not just to create a more diverse array of innovations, but to ensure those innovations are well disseminated. This need for greater dissemination of technology was recently promoted by a report from MIT’s task force on the work for the future, which argued that there are relatively few organizations that are fully utilizing the technologies of our age, and that productivity stats won’t really move until these technologies are utilized not by the 1% of organizations at the frontier of our economy, but the remainder who are thus lagging far behind.

“Something is not right, and the root of the problem is in how we are managing and investing in innovation, both inside individual organizations and also in the larger society,” Chesbrough says. “We must extend beyond the creation of new technologies, to also include their broad dissemination and deep absorption, in order to prosper from new technologies.”

The digital inequalities evident in society before the coronavirus pandemic have become more so after it, as key areas such as education and healthcare have moved online, areas with poor digital coverage have suffered. Similarly, the economic fallout of the pandemic has raised concerns around the concentration of innovation, as cash rich companies Hoover up innovative startups at cut price valuations. Uber has already provided investment into scooter startup Lime, and are thinking of acquiring food delivery startup GrubHub.

There is a growing consensus that innovations of the future should provide benefits across society, both in terms of high-wage jobs, and economic growth. This was emerging before the pandemic, and it seems inevitable that the post-pandemic world will demand a more equitable development of new technologies that shares the fruits of progress more broadly, whilst also positioning society to tackle events such as the coronavirus pandemic and the climate emergency.

GROWING STRONGER, GOING FORWARD

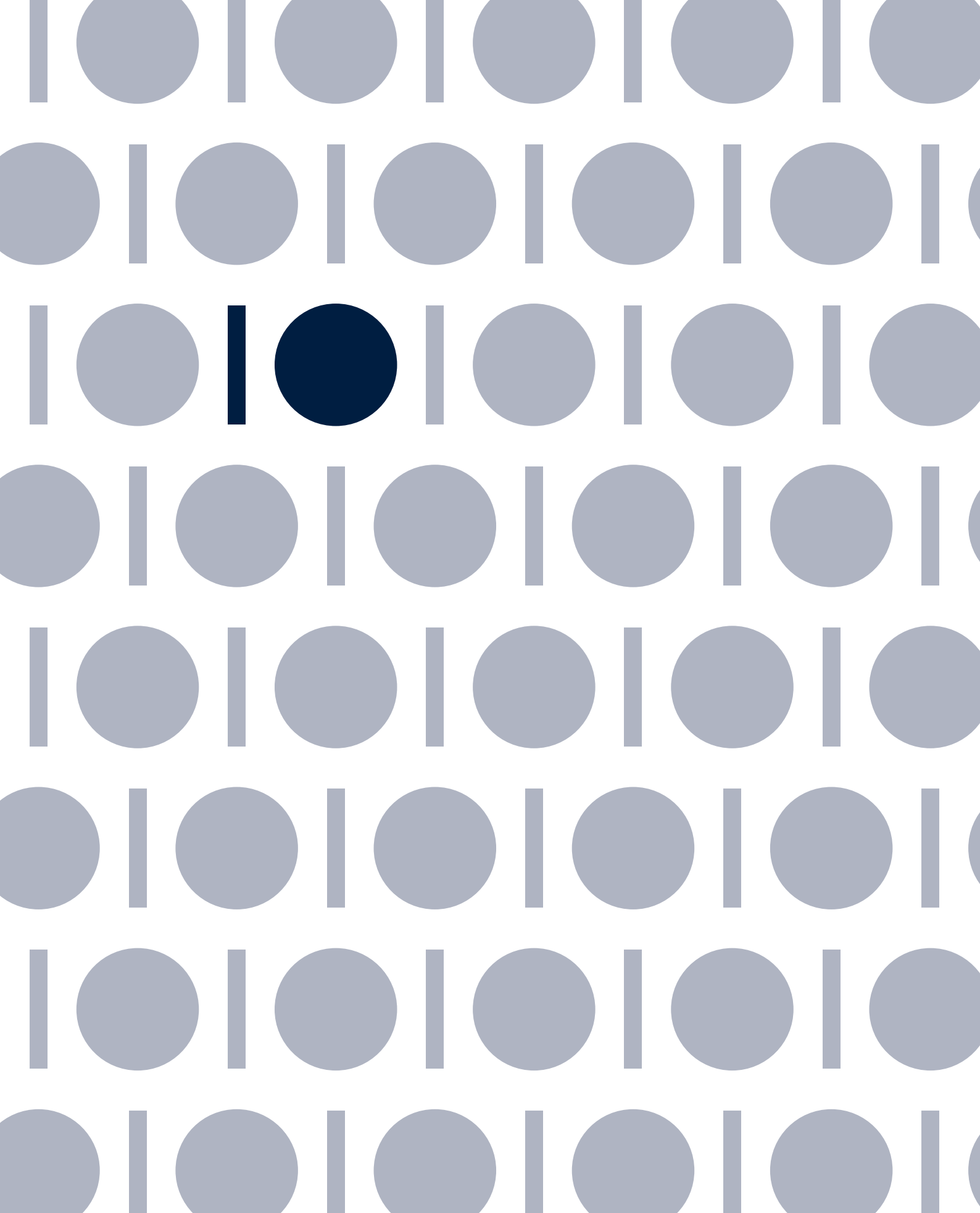
These efforts will help to further develop EIT Digital into an impactful and sustainable organisation. Despite decreasing EIT financial support, we will further develop our sustainability strategy to generate additional income, reinvest in impactful activities, and solidify EIT Digital's position as a key driver of Europe's digital transformation.

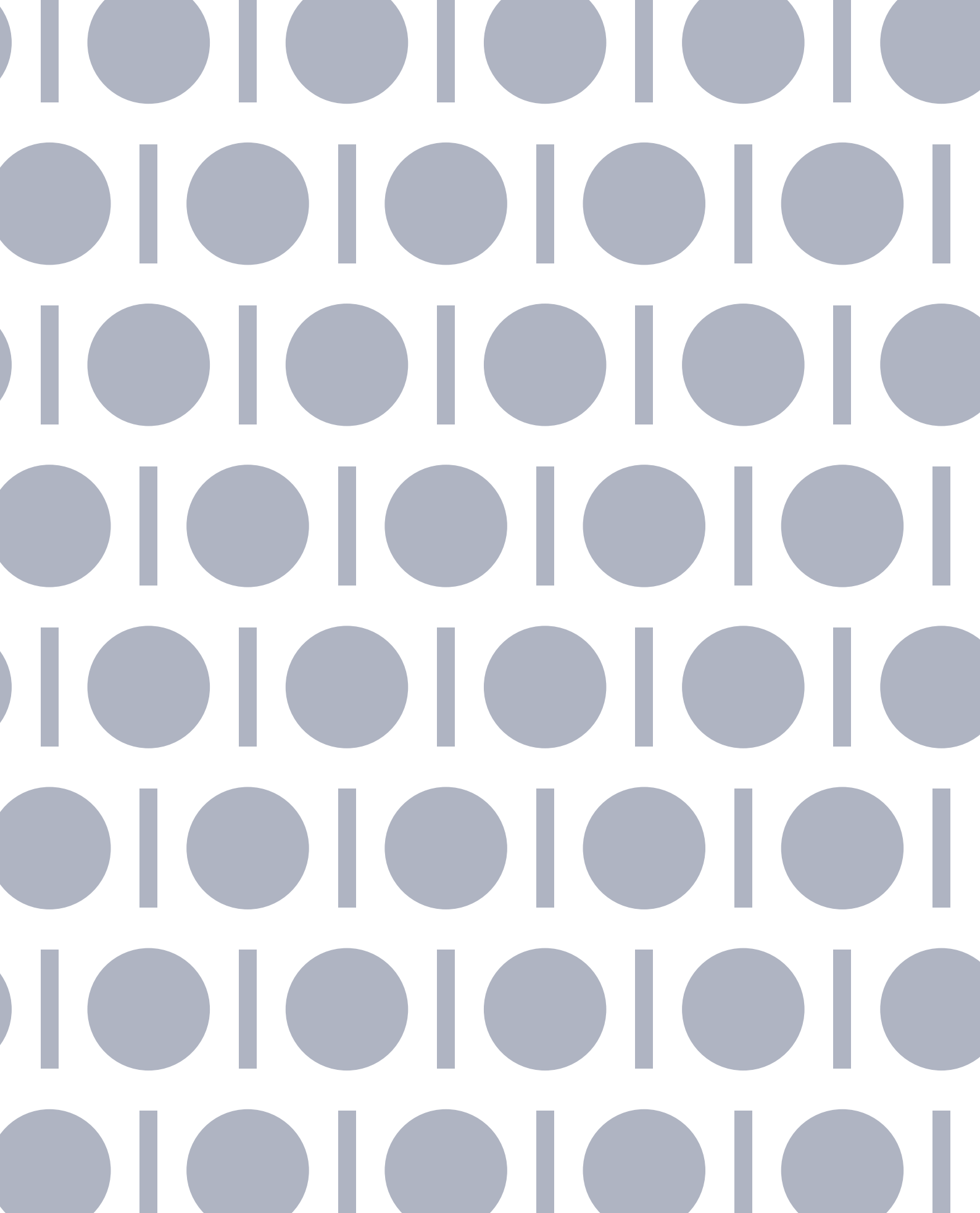
As the post-pandemic world threatens to erect borders and promote nationalistic responses, we firmly believe that our potential will be achieved only if we remove the fragmented digital markets across Europe and develop a truly pan-European digital ecosystem. In the 10 years of our existence, we have made strong progress towards that goal, but there is much still to be done, and it is a mission that drives all of us at EIT Digital forward each day.

It has been a fantastic journey thus far. We thank all of those who have participated in it with us, and we look forward to welcoming all of the fellow adventurers that will be driving us forward over the next ten years.

Acknowledgments

The journey of the EIT Digital community has been a joint achievement of many. Throughout the past decade the growing community of EIT Digital witnessed countless individuals that supported all in their different ways the success of EIT Digital. This includes students, researchers, teachers, entrepreneurs, staff at all levels of our partner organisations, investors, people serving on governance structures, as well as the staff of the EIT Digital organisation. As a first wave KIC, EIT Digital is extremely grateful for the support of the EIT and the European Institutions. A special thanks also goes to our fellow EIT KICs for the numerous fruitful collaborations. These joint efforts made EIT Digital become the largest digital innovation ecosystem in Europe, contributing to building a strong digital Europe that is inclusive, fair, and sustainable.





CELEBRATE INNOVATION
EIT Digital 2010–2020

FOR A STRONG DIGITAL EUROPE



EIT Digital is supported by the EIT,
a body of the European Union.

ISBN 978-90-90-33712-8



9 789090 337128 >