The Internet of Everything: Unlocking the Opportunity for UK Startups

CISCO

The road to digitalisation

Everywhere we look, businesses are becoming more efficient, consumers are making better-informed decisions and whole industries are being transformed as the real impact of technology becomes clear.

From healthcare to transport and beyond, the shift to digital ways of thinking is helping to streamline processes, remove inefficiency and create better experiences for patients, passengers and the general public alike.

The Internet of Everything is not only a great leveller for businesses – small and large – but for consumers and governments alike. It's a call to arms to be innovative, collaborative and ambitious. Once companies become digital they have the opportunity to completely re-imagine their business models to connect people, process, data and things across industries, cities and countries to realise new economic value.

The scale of this activity is almost unimaginable. Today, around a billion devices are connected worldwide – which is still less than 1 percent of the potential total. At Cisco, we believe that number will grow to 50 billion by 2020. From buildings to buses, energy grids to elephants, everything is being connected. Almost everywhere, opportunity awaits – not just in tech-friendly vertical sectors such as energy and retail but in arts and entertainment, manufacturing, agriculture,

waste management, financial services, real estate, education and much else besides. In all of these areas, the benefits of digitalisation and connectivity will be enormous – greater efficiency and economy, better end-user experiences, greater usage of assets and clearer views of the business.

Impactful as our progress has been, the reality is that we are still at the start of this journey. Today, most of the things we connect are familiar personal and household devices – laptops, mobile phones, set-top boxes. Now, though, the real focus is not just on conventional things but the Internet of Everything (IoE) – the connection of people, processes and data as well as things.

To build on our progress, we need to start from the ground up, from exciting students who will engineer the future, through to supporting the startup community to drive innovation. Recent research conducted by Cisco has identified over 200 startup businesses across the UK and Ireland that are making real inroads when it comes to the Internet of Everything, but they are arguably only the beginning.

How will we realise all of this potential in the UK? At least as importantly, who will turn ideas into the working applications, services and business models that will revolutionise these industries? The answer to those questions lies in not one place, but many.

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Bringing the IoE to life

Governments worldwide recognise the importance of the IoE to the broader economy. In early 2014, UK Prime Minister David Cameron announced a £45m fund available to British firms working on Internet of Things-related projects. And in early 2015 Ofcom, the UK's communications regulator, announced broad support for IoT applications and services, identifying several areas for investment and attention such as network security and data privacy. As part of this initiative, Ofcom has already released spectrum for machine-to-machine communications, putting the UK among the first countries in Europe to enable new IoE-based innovation opportunities in this way.

Many other important initiatives are under way, particularly those relating to data. Some agencies are now opening up their data sources to the IoE community, creating a platform with tremendous potential for creative startups. Developers wanting to use Transport for London's data, for example, need only sign up on the TfL website to start using the data feeds straight away – a quick and hassle-free route into data-driven public transport applications.
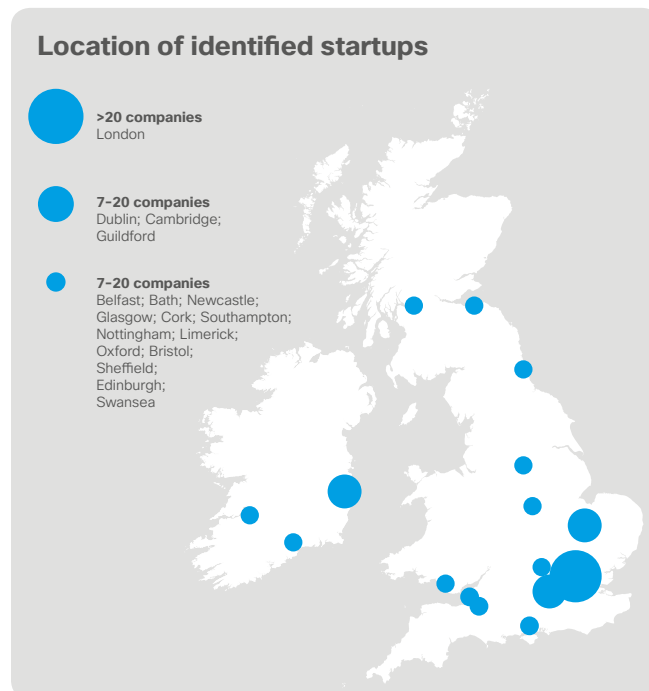
Vendors, too, are working hard to create environments where IoE applications can thrive, in particular the hardware and software platforms that can provide the basis for real innovation. Whole new industries are emerging around low-power sensors, for example, while established vendors are extending their existing portfolios to make life easier for IoE applications. Cisco, for example, allows developers to run their own Linux-based applications on its IOx-based hardware devices such as rugged routers – devices just as valuable in shopping malls as they are in the Sahara. Such initiatives are enabling a whole new raft of IoE applications at the edge of the network – places where conventional networking technology often cannot operate safely or at all.

Armed with these new platforms, UK companies of every size are devoting time and ingenuity to designing and building IoE applications, from the smallest SMEs to the largest enterprises. These companies are not just digitising in the conventional sense but finding completely new things, people and processes to connect, from their supply chains to their office spaces and their customers. And increasingly, IoE innovation is emerging from the UK's startup community, a rapidly growing collection of businesses devoted to connecting our world.

The UK's acceleration and incubation ecosystem, which includes organisations such as IDEALondon, is already well populated with thriving startups using IoE thinking and disciplines to solve real-world problems, finding highly creative solutions to a dizzying array of challenges both old and new and creating real value for their partners and customers. Some of those companies are highlighted in this report – a small but representative selection from Cisco's recent UK-wide search for the nation's most innovative IoE startups, that begins to paint a picture of the scale and scope of the opportunities that lie ahead.

These businesses are just the first wave. In the coming months and years, they will be followed by an army of new startups taking advantage of everything from ageing infrastructure to advanced new data collection and analysis techniques to create new businesses and reinvent sectors. The new industrial revolution starts here.

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Location of identified startups

>20 companies
London

7–20 companies
Dublin; Cambridge; Guildford

7–20 companies
Belfast; Bath; Newcastle; Glasgow; Cork; Southampton; Nottingham; Limerick; Oxford; Bristol; Sheffield; Edinburgh; Swansea

Joining up, joining in

Exactly where and how do you get started in the world of IoE? Motivation and experience clearly varies a great deal according to who you speak to, but as our interviews with startups founders reveal throughout this report, some common themes rapidly emerge, not least the difficulty of doing it all yourself. Technology is rarely a problem – today's tech-savvy entrepreneurs are digital natives well accustomed to solving problems with a wide variety of digital tools. But while many traditional tech startups can build entire businesses using little more than free developer tools and rented server space, most IoE startups typically need much broader business-focused skillsets.

One specific factor to consider is the likely profile of a typical customer – not always a single app-focused consumer, but in many cases a large enterprise, energy supplier or government department. Even finding the right person to discuss pilot projects with can be a challenge in such large organisations.

As more than one founder mentioned during the preparation of this report, the hard part is not writing the code or building the infrastructure – it's simply being allowed to play at all. That fact is driving a steady flow of entrepreneurs towards incubators, accelerators and other startup support organisations including government-sponsored grants and initiatives, as they look for help with all the skills and disciplines they need to create a foothold in a fast-moving and highly competitive industry. Finding strong sources of support is important for any new business but especially for IoE startups, not least because of the complexity of many of their propositions. Explaining the value of new IoE initiatives to large enterprises has challenges all of its own. Startups may be fluent in the languages of technology, but finding the right words for enterprises, government agencies or investors often requires a different approach.

Finally, location matters. While London's startup community is still a significant focus for activity in the UK, many successful IoE businesses are now locating themselves elsewhere. A survey by Tech City UK in early 2015 revealed that 74 percent of companies and 85 percent of digital workers are now located outside of the capital, with several of the country's 23 technology communities showing faster growth than London. Transcending geographical barriers is critical in accessing the best resources and talent. The National Virtual Incubator alliance (NVI) joins the dots between incubation centres, science parks and academic departments through a network of 13 nodes across the country, extending as far as Swansea and Strathclyde. The network has created a community of over 750 ambitious startups which have access to technology, resources and support that may otherwise be beyond their reach.

Many IoE applications require both hardware and software-based skills, and some regions are especially well-equipped with the expertise and resources needed on both sides of the equation. This is particularly true of areas such as Cambridge and the Midlands, where everything from development of low-cost, low-power processors to pioneering connected car technology are in full swing. By facilitating collaboration with businesses, academic institutes and research facilities, the NVI provides a strong support network for young startups regardless of physical location.

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The IoE isn't just focused on cities and urban environments, of course. Many startups are finding opportunities at the very edge of our high-speed, high-bandwidth world. Low-cost, low-power cellular networking technology that operates across long distances is emerging rapidly, for example, enabling remote sensing and data gathering applications in areas far beyond the reach of the networks most of us take for granted. Such networks may be slower than their urban cousins, but they are still capable of transmitting millions of messages per day, and can reach parts other networks simply can't. They enable farmers to measure water and irrigation levels in pastures or keep track of livestock, without having to jump in the tractor – saving them invaluable time, money and preserving valuable natural resources. Examples abound far and wide; in Africa elephants are being connected to the network, helping to monitor their wellbeing and protect them from poachers. With the Internet of Everything, you really can connect everything.

IoE for industry

While nearly every business sector provides significant opportunities for IoE startups, Cisco has identified four key vertical sectors that it believes will have the greatest impact on the UK economy in the short term – healthcare, retail, transport and energy.

The value at stake for the IoE is defined as the potential bottom line value which could be created, or exchanged among companies and industries, if they harness the IoE over the next decade. Startups in the healthcare industry have the greatest opening and stand to reap over £48billion from maximising the opportunities generated by IoE. The retail industry is not far behind at £37billion with transport (£11billion) and energy (£7billion)

organisations also set to build on some significant opportunities to transform their industries.

These industries have one important thing in common; they are already hard at work capitalising on IoE opportunities, and are building tangible examples that demonstrate its value and impact. While the value at stake in each sector varies, each provides very substantial opportunities and incentives for businesses of any size to participate, especially those solving real industry problems.

This section highlights some of the specific prospects within each industry, and identifies some of the startups to watch.

Healthcare

The potential of connectedness to forge lasting change has long been understood in the healthcare world. Today, much of the interest and attention is focused on wearable technology such as fitness bands or heart rate monitors, and the connected health applications that they enable. The ability to monitor a patient's blood pressure or oxygen levels remotely, or to keep a distant eye on elderly patients at risk of falling, has some very clear benefits, and many businesses now exist to enable exactly these sorts of applications. Already, more than 1.8m people are connected to telecare systems in the UK, and the government's aim is to roll out telehealth access to 3m people by 2017. But the potential extends far beyond individual monitoring. Integrating the wider public health system and providing smarter communication and data exchange between patients, doctors, pharmacies and hospitals, for example, presents huge opportunities for better, more effective and more efficient treatment. As pressure to maintain costs in our health systems increases and the available resources diminish, the ability to do more with less will only become more critical in the near future – a big opportunity for IoE startups to bring some much-needed new ideas.

Few industries offer as many opportunities to connect not just machines but people, processes and data too. Cisco estimates that the value of the overall healthcare-related IoE opportunity in the UK at £48.5billion in the next decade alone, the highest of all the sectors in this report. Chronic disease management, in particular, has the potential to generate £9billion over the same period – a very substantial opportunity for new startups looking for high-volume, high-value applications.

IoE drivers in the healthcare industry

Home care
Many home care solutions already exist for patients, particularly relating to remote consultations. But significant opportunities remain in sensors and monitoring, as well as ongoing management of chronic conditions – the primary market for startups such as HandleMyHealth.

Prevention
IoE-based applications and services dedicated to prevention of disease have real potential in the healthcare sector and a great deal of industry support, thanks to their inherent focus on cost savings and risk reduction. Support for prevention-based approaches is emerging from many sources, not least the insurance industry.

Data analytics
Data has a vital role to play in healthcare applications, especially in predictive and preventative contexts. Great opportunities exist for startups that understand the complex interplay between patient data, strict regulatory pressures and wider privacy considerations.

Portals
Modern hospitals may have multiple information systems, as well as cameras, sensors and other data sources. Many European startups are looking at ways to bring all of these together via portals, which can also integrate thousands of GPs and pharmacies in patient-centric models that allow everything from remote consultations and monitoring to management of medications and results.

Startup spotlight
HandleMyHealth

Handle My Health are the creators of MIAMI, the smartphone and web based health ecosystem, allowing users to centralise their health record and build realtime data on top for more useful insights for a personalised experience. Described by founder Jack Bowman as "the Facebook of healthcare", MIAMI gives users a centralised view of health and wellness information, everything from fitness and medical device to treatment status, and allows users to share data about their health and treatment with carers and doctors, in realtime. As such, it occupies a central position within the existing healthcare matrix – a fact that provides Handle My Health with both a big opportunity and a substantial set of challenges.

"We certainly anticipated resistance to change – and it is very hard to change this sector", says Jack Bowman, founder of HandleMyHealth. "The incumbent gatekeepers have a lot of influence, and often lock key parties into long-term contracts that make it hard for complimentary and competitive innovators. That's frustrating, but exciting too – we want to genuinely solve a problem - something HealthKit is providing exposure to". Handle My Health provide users with the ability to receive a personalised health experience, through owning and choosing who has access to their holistic health information, plugging the data gap that exists, whilst enabling innovation through their MIAMI ecosystem and linking to health records.

He cites long development times as a potential stumbling block for other startups, conceding that his own high standards have occasionally got in the way of his own progress. "I'm a perfectionist and it's meant that sometimes it's taken too long to get prototypes out. Get it out there fast!"

http://www.handlemyhealth.com

Startups to watch in healthcare

uMotif uses simple and engaging web and mobile apps to help people track and monitor their health and choose to share their data with their clinicians, carers, friends and family members to improve care.

Hoobulu is developing a 360 degree ecosystem that brings together connected devices, data and people into one platform.

HandleMyHealth allows individuals to sync, monitor and manage hundreds of pieces of key information from medical devices, applications and more, all in one location.

Kinesis Health Technologies develops mobility and falls risk assessment technology, using body-worn tri-axial gyroscopes and accelerometers in conjunction with Bluetooth.

pureLiFi develops wireless networking technology based on light, with no interference problems for medical applications

Transport

The UK's sprawling, highly diverse transport networks represent a very different but similarly significant opportunity for IoE entrepreneurs. Some problems are old and well-known ones; ageing infrastructure, inescapable geographic scale and incompatible information and data sources all conspire to make travel on roads and railways a frustrating and inefficient business. Others are newer but equally critical; managing rapidly increasing commuter train volumes on a London underground system built over 100 years ago, for example. The numbers are on the rise everywhere; 1.46bn rail journeys were made in 2011/12, a figure will that will rise another 400m by 2020. This increased strain on the transport network is costing the UK economy up to £8bn each year, according to the CBI, and the fiscal impact is only set to get worse as congestion builds.

Building transport infrastructure to address these challenges is expensive, a fact which puts many large-scale projects beyond the reach of the startup community. But many smaller problems can be fixed with the right combination of ingenuity and creative partnerships, and new open data sources (such as those provided by TfL in London) are opening the door to innovation in many areas. From locating trains more accurately to predicting public transport problems and reducing traffic in urban centres, the potential for IoE startups to solve real transport problems is immense; a market worth £10.4billion in the next decade, according to Cisco estimates.

IoE drivers in the transport industry

Parking
UK motorists spend an average of 106 days of their life searching for parking spaces, according to a 2013 study by ParkatmyHouse. As much as 30 percent of urban traffic is caused by drivers looking for parking spaces, according to some estimates. And the problem is not just limited to car drivers; commercial delivery vehicles, too, waste millions of hours annually looking for the right parking spot at depots and ports or outside stores. Opportunities for IoE-based solutions to these problems are rife, amounting to a £2billion business in the UK alone.

Augmentation/overlays
Many transport networks already have existing monitoring technology that can no longer support modern demands. Railway networks, for example, typically rely on train detection technology more than 100 years old. Overlaying new technology on top of these old networks and sensors provide completely new predictive maintenance analysis tools, as well as superior traffic management and anti-collision measures. Diagnostics and analytics are predicted to save the rail industry some $27 billion globally, according to GE.

Passenger data
Aggregation of user data provides a wide range of opportunities for IoE startups, from congestion management applications to retailer-focused analytics that provide better information about flow of potential customers through stations.

Passenger experience
Passenger experience can be vastly improved by adopting a 'Stations-as-a-service' (Staas) approach to transport networks. Services such as reliable, low-cost wi-fi connectivity and real-time travel updates make the lives of commuters easier and their journeys more predictable, with many extended benefits including safety and security.

Alchera Technologies

Alchera Technologies, one of the winners of Cisco CREATE's Transport Challenge 2014, has designed an intelligent camera platform which helps owners and managers of public spaces to understand exactly how those spaces are used. By tracking and analysing activity in locations such as rail platforms and road junctions, it can predict the emergence of flash queues at busy stations or traffic jams and safety issues on the roads – thus enabling more intelligent, more dynamic allocation of resources as well as better forward planning.

"Many startups in the IoT space have a problem with perception around their reliability and experience", says Alchera founder Mark Nicholson. "This isn't just about software applications – we're now installing hardware in a regulated environment, and that presents a number of challenges around getting people on board and persuading them that you're a safe pair of hands". He says that Alchera has done that in two ways: by running several trials in conjunction with customers, and by partnering with organisations such as Cisco to ease the transition into the industry. "Partnerships really help to build a level of trust and rapport with the eventual end customer", he says.

Nicholson says that the hardware-related aspects of IoT businesses create some specific challenges – some obvious ones such as cash flow, as well as less obvious areas such as sourcing enough components for prototyping and manufacturing. But he is confident about the potential for transport-related IoE applications: "This space still has needs that nobody has thought of yet".

⊛ **http://alcheratechnologies.com/**

Startups to watch in transport

Davra Networks provides a complete IoT platform that allows its customers to define, build and bring to market vertical specific IoT applications.

Vroomin is a startup focused on becoming the Facebook for vehicles, using their number plates.

The Floow provides telematics insight to insurers, delivering excellence in data collection, storage, management & enhancement and interpretation.

Vicinity Systems develops unique navigation technology products for Internet Connected Vehicles, Google Glass & mobile devices. The company also develops eco-navigation products for electric and commercial vehicles.

pureLiFi uses the visible light spectrum instead of radio frequencies to enable wireless data communication.

Retail

Retail has long been a rich environment for technology providers, but the Internet of Everything is breathing new life into it. From supply chain dynamics to the customer experience, the opportunity to improve the efficiency of the retail process and create new revenue opportunities is vast – a £37billion industry, according to Cisco estimates.

Of all the sectors examined in this report, retail stands to gain tremendously from digitisation and the arrival of IoE applications and services. Already, more than half of UK shoppers use retailer-specific apps at least once a week, an indication that their behaviour and expectations are changing fast. A Cisco study in late 2014 revealed that today's consumers demand new kinds of digital experiences, both in-store and out. Above all, these shoppers are looking for so-called hyper-relevant experiences. 39 percent of respondents identified greater efficiency in the shopping process (ensuring items are in stock, for example, or faster checkout times) as the area retailers most need to improve. Retailers that can build the processes to support these consumer needs stand to capture a profit improvement of more than 15 percent, according to estimates by Cisco Consulting Services.

Those opportunities have not gone unnoticed by the startup community. Many entrepreneurs have been drawn to retail, thanks to familiarity of the environment and the relatively low barriers to entry – especially in areas such as mobile analytics, already a very crowded market. The ability to track individual shoppers and their trolleys, or to identify and optimise key shopping 'paths' within stores, has many powerful applications with relatively easy sales pitches, and many trials are now underway in the UK. But many opportunities remain, particularly in supply chain and loyalty-based applications. The trick is to ensure that however smart the technology or the idea, it has immediate context and value for retailers – not always a given amid the current retail noise. That in turn will ease the path towards the holy grail of retail startups – the in-store trial.

IoE drivers in the retail sector

Supply chain optimisation
IoE has many applications in supply chain environments, particularly the ability to help dynamically allocate goods flows in real-time. By keeping smarter tabs on where everything and everyone in the supply chain is, retailers and suppliers can achieve much greater transparency of the overall process and much more granular control – with inevitably positive results for the business. One specific area of focus is so-called 'last mile' optimisation, particularly for home delivery services involving a complex mix of web services, warehouses, delivery vehicles and route planning.

Omnichannel
The merging of the physical and digital worlds has redefined the notion of channels for retailers, who now have lots more tools to play with. Engaging with customers via their apps and social networks in-store as well as out, for example, is one area with great potential for building loyalty and creating upselling opportunities. Similarly, finding new ways to understand behaviour and improve the value exchange over commodity offerings such as in-store wi-fi can have significant impact on long-term loyalty and repeat purchasing.

Omnifi

Omnifi is a UK startup focusing on the development and management of connected locations, advising clients on integrating their physical locations as part of their multi-channel operations; and providing them with an innovative blend of retail and venue technologies designed to support everything from user engagement, off-line and online-sales, digital shopper marketing and experiential activation.

"The hardest bit of this is persuading retailers to buy something new and unfamiliar", says Simon Liss, managing partner at Omnifi, a business focused on maximising the potential of connected locations. "They typically don't have a budget for these sorts of projects, and it's not always clear who should own and pay for it – the web team, the retail team and marketing often all have a claim".

Liss remains undaunted by these obstacles. "I love the fact that it's unclear, that the medium hasn't been defined – all these tools and parts still to be assembled", he says. And he cautions against entering IoE retail markets with the sole intention of making money. "If you define your reason to start in money terms you're unlikely to focus on quality. If you look after the ideas and the customers, the money will follow. Always look at need rather than noise".

https://www.omnifi.co.uk/

Startups to watch in retail

Beacondo is a development house providing free tools that let anyone make iBeacon-enabled apps for retail, schools, museums, coffee shops and more – without writing code.

Wittos increases the value of being online for internet users in locals spaces through behavioural analytics on WiFi networks.

Evrythng is a Web of Things software company, making products smart by connecting them to the Web; helping to manage connected products, make product operations smarter with real-time tracking analytics, and help customers connect to products in a smarter way.

Viewsy brings the power of web analytics to the physical world, allowing, bricks-and-mortar retailers to track their customers' behavior and giving definitive answers to the myriad strategy questions they face.

WiCastr is a cloud-managed small wireless device that broadcasts digital content to any WiFi enabled device in proximity without relying on an active Internet connection, data plan or app.

Energy

Another sector with tremendous opportunities for both suppliers and consumers, the energy industry is currently attracting a lot of attention from IoE players. The ability to bring together and analyse data from multiple sources such as smart meters, environmental sensors, spreadsheets and more has huge implications for energy management in buildings, for example; at the other end of the chain, energy producers, suppliers and distributors benefit enormously from the ability to connect, move and measure energy resources more effectively.

Both sides face major economic upheavals, for very different reasons. In early 2015, industry body Oil & Gas UK reported that the oil and gas sector spent and invested £5.3bn more than it earned from sales in 2014, thanks to falling oil prices and rising costs; and that cost and efficiency measures need to improve by up to 40 percent per barrel of oil if there is to be a sustainable future for the UK's offshore sector. At the same time, the industry is facing a major skills falloff, with as many as 50 percent of oil and gas workers expected to retire in the next decade and take their unique knowledge with them. So there is intense pressure to find new ways to automate and digitise wherever it can; and in particular, to share information and connect the previously unconnected, in pursuit of safer and more efficient ways of finding, extracting, refining and transporting its end products.

At the consumer end of the chain, revolutions of a more positive kind are underway. From smart meter applications to home monitoring devices, renewable energy integration and electric vehicles, the potential is huge – a £7.5billion opportunity over the next decade, according to Cisco estimates. As always, the winners will be the startups who can provide real value to the industry rather than just clever ideas – a critical takeaway for anyone considering an IoE startup in any sector.

IoE drivers in the energy sector

Data management and analytics
Energy applications can generate huge amounts of data, at both production and demand ends of the chain. Big opportunities exist in several key areas, such as transporting that data securely and efficiently across long distances in the absence of traditional networks; or in new methods for analysing building performance data.

Asset tracking
Energy industry assets are expensive, remote and difficult to track across long distances. Several startups are already focusing on continuous monitoring of assets, using RFID and other sensor-based technologies.

Collaboration
Sharing knowledge and data is critical to the future of the energy industries. How do companies in Aberdeen share expertise with their partners in Houston? How can energy suppliers communicate credibly with householders and businesses about optimising their energy needs in a connected world?

EnergyDeck

London-based EnergyDeck is building an analytics-based Internet of Things platform for the built environment, taking a very different approach to energy and resource management than existing systems. Its value proposition is based around highly flexible data import capabilities, crowd-sourcing of building performance data and advanced analytics, all delivered through a simple web-based UI. Customers, who range from blue-chip real estate fund managers to tenants and service providers, use EnergyDeck to extract meaningful insights from the vast amounts of data coming from their buildings, and share them with key stakeholders and at industry level.

Defining the scope of the business was critical to its ongoing success, says founder Benjamin Knott. "We started out selling to SMEs, but they're very hard to reach and sell to at scale. It's about picking your battles carefully – which platforms, which verticals. It all looks easy initially, but it takes a long time to refine".

Ultimately, he says, success in IoE may fundamentally depend on the human aspects of your business, not the most technical ones. "We're all tech natives, so that's the easy part... It's the relationships that are really important, particularly the combination of tech, sales and customer skills".

🌐 **https://www.energydeck.com/home/**

Startups to watch in energy

Permasense is a world leader in the field of continuous corrosion monitoring, providing real-time data-to-desk measurement of pipe wall thicknesses in inhospitable and inaccessible environments.

EnergyDeck is a flexible web-based platform that drives effective tracking and management of building performance.

GridCloud enables real time control and measurement of electricity across any grid network, allowing managers of buildings, industrial facilities, and grid networks access to vital analytics and control dashboards from any web-enabled device.

Traceall Global Sensor technology and cloud management platform for maintaining control of assets in the supply chain, including the oil and gas industry.

IntelliSense.io open IoT platform dedicated to owners and operators of complex infrastructure including Factories, Oil &Gas and Mining fields.

Advice from Startup founders

It's fine to be a perfectionist, but don't let that get in the way of real progress. Get prototypes out early and roll out incremental changes often

Get started early, and fail quickly – don't waste time and money on projects with limited potential, and do have the discipline to drop ideas that aren't working. BUT...

Be ready for a long haul once you're up and running. Lots of IoE projects take a long time to really get moving, especially where regulators are involved.

Get as many deals in the pipeline as possible, as early as possible. Sign contracts before your contacts move on to new pastures!

Pick your target customers carefully. SMEs are often hard to target and work with; larger enterprises may be more bureaucratic, but they have bigger budgets too.

Make sure purchasers/partners see you as a serious player, not just a lifestyle business. They want to know you can take on serious work.

Build a good team of people you like, with complementary skills. Think especially hard about the people you'll need to achieve your targets in the future, not just the ones you need today.

Conclusion

As this report illustrates, finding new things, people and processes to connect to the Internet of Everything is hardly a problem. From energy and retail to arts and entertainment, manufacturing, agriculture, financial services, real estate, transport, healthcare, education and many more, every area of human endeavour is already being touched by the IoE in some way. Inevitably, some are moving faster than others, driven by both the scale of immediate need and by the ingenuity of the business community; but in the long term, every aspect of our lives is likely to be transformed for the better, simply as a result of being better connected.

The really good news is that the barriers to joining the IoE phenomenon are getting lower every day. Many of the core technologies for building the IoE are already well established and well understood, and there is a huge well of technical resources and case studies to help new entrants deal with the technical integration issues. More challenging for IoE startups are the associated business skills, especially those involving partnerships or pilots with large enterprises. Some sectors have very specific regulatory challenges that make progress slow and frustrating; others may be more dynamic but also more densely populated, creating high levels of competitive pressure. At Cisco, we have a focus on providing ongoing support and connections for these entrepreneurs through programmes such as our British Innovation Gateway initiative (BIG), which aims to discover and foster new British talent within the realms of IoE. Initiatives like this one and ongoing collaboration with larger business will continue to be crucial to the success of these innovative startups who are poised to help us reap the benefits of digitalisation and greater connectivity on a life-changing scale.

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