BUSINESS INSIGHTS

2016

Nesta is an innovation charity with a mission to help people and organisations bring great ideas to life.

We are dedicated to supporting ideas that can help improve all our lives, with activities ranging from early-stage investment to in-depth research and practical programmes.

BUSINESS INSIGHTS

2016

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INTRODUCTION

hat innovations should businesses look out for in 2016? Making predictions can be difficult at the best of times, but often, if we look hard enough, we can see glimpses of the future in the world we live in today.

At Nesta, the UK's foundation for innovation, we have the privilege of working with some of the most talented and exciting innovators and entrepreneurs - funding them, supporting them and learning about what they do.

We've identified trends and opportunities that we think will matter for businesses in 2016. These cover a range of fields, from finance to retail and from media to healthcare. Most of them include some combination of new technology, creativity and social innovation all of which are important themes of Nesta's day-to-day work.

One thing that links many of our predictions is the coming together of two phenomena: digital technology and people power. The world has already seen how the Internet can transform industries by harnessing the energy and knowledge of 'the crowd'. Wikipedia put encyclopedia salesmen out of business by pooling the collective intelligence of tens of millions of ordinary people. There is more of this sort of thing to come.

Already, the rise of Internet-enabled collective intelligence is prompting working people to think more deeply about how they collaborate on more mundane tasks - for instance, through looking at how to hold better meetings (which we recently wrote about¹). And collective intelligence is changing fields, for example, from politics to healthcare (see the Europe-wide D-CENT project, which we've been studying,² and the PEER project³).

In the coming year, we expect collective intelligence will play a decisive role in more and more fields. This will open existing markets up to new players, and provide new opportunities for existing businesses to connect with the wider public.

The role of peer-to-peer platforms will continue to transform the banking sector. We'll also see tech-enabled people-power transforming the fields of healthcare and education. These three sectors alone account for over a third of GDP in most developed countries and are essential to our physical and economic well-being. Businesses that can use technology to harness people's time, skills and brainpower will be well positioned to take advantage of the aforementioned trends and reap the rewards they offer.

If any of these trends pique your interest, we'd be delighted to talk to you more about them, and to discuss how we might collaborate.

THE RISE OF THE 'BANK' THAT'S-NOT-A-BANK'



t used to be possible to easily identify a bank when you saw one: they had branches, cash machines and managers. Even after the mergers of the 1990s and the bailouts of the 2000s, retail banks looked similar and worked in similar ways.

Now, that is changing. New ways of banking that take advantage of the Internet and the power of the crowd have grown rapidly since 2010. Peer-to-peer (P2P) finance, where businesses and individuals can borrow or lend to one another, has produced its first billion-dollar UK business, Funding Circle.⁴ And crowdfunding is connecting investors and donors with new projects and businesses, replacing the role of business banking and providing a way for businesses to raise money from the people who love their products. These types of alternative finance are growing fast: research by Nesta and the University of Cambridge suggest the market grows by more than 150 per cent per year.⁵

In 2016, we can expect to see lots more 'banks-that-aren't-banks' coming onto the scene. One of the first is likely to be Atom Bank.⁶ This will certainly not look like a traditional bank: in fact, it will be nothing more than an app, but one that offers savings, current accounts, mortgages and more. Other new banks, such as Tandem,⁷ Mondo,⁸ Starling⁹ and the German Fidor Bank¹⁰ are also on their way.

Other kinds of banks will take even more surprising forms. Amazon has recently got into the business of making loans both to companies¹¹ and consumers.¹² The wealth of data it holds gives it the ability to do the kind of in-depth credit rating even traditional banks might

find hard. And different parts of banks' businesses are increasingly being cannibalised by new niche players, from TransferWise,¹³ for foreign exchange, to MarketInvoice,¹⁴ for trade finance.

Nesta has been following and working with the alternative finance sector for the better part of a decade. As well as our annual survey and sizing of the UK market (conducted with the University of Cambridge), Nesta has supported the leading UK alternative platform, Crowdfunder, to help it develop its offerings.¹⁵

The coming year will see a range of new developments in the alternative finance sector that business will have the opportunity to respond to, including: the evolution of open banking, data sharing and crowdfunding and the international development of alternative finance.

The evolution of open banking, data sharing and crowdfunding

New banks should find it easier to win new customers because of the UK Government's commitment to delivering an open API standard in UK banking. This should make it easier for consumers to take ownership of their banking data and share it with third parties (such as other digital banks or fintech companies), creating the kind of ultra-competitive marketplaces that have already shaken up industries like car insurance. It will also create a market for apps and tools that let people analyse spending behaviour and find opportunities to save money.

We also expect to see crowdfunding become more relevant to businesses' corporate social responsibility efforts, as it's a simple way to involve customers and employees more directly in a company's charitable activities. As we wrote earlier in the year,¹⁷ a wide range of institutions - from philanthropist and foundations to local authorities and corporate social responsibility teams within large companies¹⁸ - are experimenting with different types of matchfunding, where the institution tops up a crowdfunding campaign if it can demonstrate the ability to raise a specific percentage of its funding from the crowd. Two funders that have experimented with this method are Plymouth City Council and Big Society Capital.

Crowdfund Plymouth and Big Society Capital

One funder to experiment with this funding method is Plymouth City Council, who in 2015, set aside £60,000¹⁹ – using funds received from developers through the Community Infrastructure Levy (CIL) – to match-fund projects on Crowdfund Plymouth²⁰, a dedicated platform for Plymouth City Council, run in partnership with Crowdfunder.²¹

On a larger scale, the social impact investor Big Society Capital announced their intention to set up a £5 million fund to match crowdfunded investments made by individuals into Social Investment Tax Relief (SITR) eligible charities and social enterprises.²²

The international development of alternative finance

We can also expect to see alternative finance becoming more international. Over the last three years UK crowdfunding and P2P lending platforms²³ have grown rapidly in size and diversity.²⁴ As competition in the market continues to grow, platforms will continue to innovate. Alongside offering new products to the UK market, platform providers are likely to look beyond the UK to explore ways of expanding their platforms to cater to an international market of fundraisers, lenders, donors and investors.

On the P2P lending side there has been some international expansion. Funding Circle²⁵ was one of the first platforms to set up a franchise of their platform in the US in 2013²⁶ and continued this expansion to Europe earlier this year when they acquired Zencap,²⁷ which has operations in Germany, the Netherlands and Spain. In similar style, RateSetter set up a franchise in Australia, in 2014.²⁸

The international appetite of the equity crowdfunding platforms is likely to be further aided by the changes to regulation in the US,²⁹ which will open up equity crowdfunding to retail investors, making the US market more similar to that of the UK. This has already led the first UK platforms to announce they are considering setting up in the US with an ambition to explore US/EU investment in the long term.³⁰

We are also seeing much more interest in alternative finance from institutional investors. In the US over 60 per cent of loans on P2P lending platforms are funded by institutions, such as asset managers, banks (JP Morgan Chase is the latest of the big banks to announce that they will enter the P2P market³¹), hedge funds and insurance companies.³² There are also similar trends in the UK market.³³ In 2016, institutional involvement in the P2P lending and the equity crowdfunding market will become the norm rather than the exception.

The implication of all this is that banks-that-aren't-banks will be evermore important in the year to come, both as a source of funding for businesses and consumers, and as a way for companies to connect with customers.

What this means for businesses

There are two ways of taking advantage of the rise of banks-thataren't-banks: use them, or - more ambitiously - become one.

The first option will be relevant for almost any company, large or small. Businesses that rely on external finance, such as bank loans, are increasingly turning to peer-to-peer platforms as a source of flexible and often cheap capital. But it is also relevant for companies that aren't seeking to borrow. Services such as foreign currency exchange, which banks have traditionally made hefty profits from, are being offered by new entrants at competitive rates. For almost any business, this is worth a look.

Some businesses may want to do more than use the services of new banks-that-aren't-banks. You don't need to be Amazon to start thinking about how peer-to-peer finance technologies can play a part in your business. One way to embrace this is by crowdfunding, to give loyal customers a stake in new products or your business as a whole (companies like BrewDog and Chilango³⁴ have taken this approach to heart). Another is to apply peer-to-peer technologies to corporate social responsibility efforts, getting customers involved in the positive work a company seeks to do and strengthening their links to the overall brand.

Either way, the rise of banks-that-aren't-banks offers a way for companies both to save money and to engage in new ways with customers and markets.

PEOPLE-POWER PLUS TECHNOLOGY: A NEW BUSINESS OPPORTUNITY IN HEALTHCARE



ny business that can innovate in a way that improves people's health stands a good chance of not only of making money, but also making the world a better place too. But the healthcare sector has been a tough place to do business for both traditional players and new entrants. Big pharma is going through a long and painful period of consolidation. Biotech remains as risky as it has ever been. The boom in outsourcing that some had hoped for from the NHS has proved tricky to handle, with as many disappointments as successes.

One area where hopes are higher is health tech. The idea of monitoring and improving people's health through wearable devices has been in the news for several years now. Health and exercise tracking devices, such as Fitbit, have gone from being novelties to everyday items. Genetic testing services, such as 23andMe, have enrolled over a million customers. Adding to this, there are new innovative devices coming to market all the time.

We already have pills³⁵ that broadcast a signal when they have been swallowed allowing precise tracking of medication, home EKGs³⁶ to track brain activity, and Bluetooth-enabled spirometers³⁷ for tracking asthma or lung disease. What was once limited to the pages of *Wired* magazine is now a familiar phenomenon.

We believe that 2016 will be the year this begins to hit the mainstream. What drives it will not be kit, but two trends we have long promoted: the importance of data science and necessity of a people powered healthcare system.

New apps and services transforming healthcare

Making sense of the flood of data now arriving will require sophisticated analytics – perhaps the beginning of a discipline of algorithmic medicine. To use data to pick up a heart arrhythmia,³⁸ or diagnose someone with Parkinson's,³⁹ or give someone a stroke prognosis are challenging and complex problems.⁴⁰ As the results of these analyses are likely to affect someone's care, standards of proof are consequently high. However, we can do all of these things today, and expect more rapid progress in future. As covered in various Nesta reports,⁴¹ data science is a critical skill.

The potential of this combination of rich data and sophisticated analytics is huge. Potentially, we will know who will benefit from which treatment, and who won't. Data will be able to trigger treatment at the right time, rather than when they turn up at A+E. And we will be able to support patients' own self-care with evidence based real-time advice. Further, unlike most medical technology, these innovations would make care cheaper, through precise targeting of treatment.

Grasping this opportunity will require some new ways of thinking and operating. In particular, this new data is produced, owned and controlled by patients. Developing and improving analytics will require negotiating access. While in some sectors of the economy, businesses have been able to make extremely free use of customer data, this is legally and reputationally difficult in healthcare. Patient networks and user communities must be carefully nurtured and collaborated with in order to facilitate access to the best data. As

is often the case in the digital world, the user community is the key asset – indeed it will be both helpful and accurate to see these communities as patient owned and patient led. In essence, data driven healthcare will be people-powered.⁴² Having the right brand and skill set to deliver this will be critical.

It's worth pointing out that communities can do more than pool data. They can offer one another expertise, positive reinforcement, and local knowledge. This 'collective intelligence', explored more fully below, is an important ingredient in a successful community.

Bringing this together, in the next year and beyond, we expect to see health tech transformed by new applications and services that merge biometric data and genomic information with data from other patients, and allow patients to work with clinicians and wider networks to manage their own health. This is complex, systemic innovation - complex in the way that Apple's reshaping of the music and mobile phone industries around the iPod and iPhone were. But the prize, providing powerful, personalised health support, is huge, both from a commercial point-of-view and a social one.

uMotif's 100 for Parkinson's

One project Nesta has been supporting in the area of health tech is uMotif's 100 for Parkinson's, due to launch in early 2016.

The 100 for Parkinson's project is a web- and smartphone-based prospective study where participants will use the uMotif self-management app for 100 days and philanthropically donate their data to drive patient-focused research on how self-management can help improve health outcomes and care, particularly in Parkinson's Disease.

Data from third-party devices (for example wearable technologys such as Jawbone, Misfit and Withings), as well as data from third-party mobile apps (for example, Strava and, mapmyfitness), will also be integrated into the data set. The data set will then be free for academic research. Researchers will be required to define their research question prior to data access and will be encouraged to publish their results in open access journals.

What this means for businesses

To succeed in the healthcare field, businesses should look beyond established and crowded fields like pharmaceuticals or the outsourcing of traditional care. They need both hard skills of data science, and the softer skills of engagement with patient communities.

The businesses that transform the future of health will be those that can combine strong technological nous with the ability to harness people-power - networks of patients, carers and clinicians - and blend this with sophisticated data analytics. It's a tall order, but we believe its time has come.

EDUCATIONAL TECHNOLOGY: WILL THE BUBBLE BURST?



ducational technology (edtech) is in the middle of a boom. Investment is pouring in and startups are emerging at an unprecedented rate (over 1,000 in the UK alone last year). At the same time, new services - including Massive Open Online Courses (MOOCs) such as the Khan Academy⁴³ or Coursera⁴⁴ - are gaining millions of users.

The optimists hope that edtech could go the same way as fintech - creating a huge new sector with multibillion companies and thousands of new jobs. But this is far from guaranteed. Education doesn't have some of the conditions that worked so well in finance where there were discredited incumbents, as well as regulators and policymakers keen to help newcomers thrive.

So what will it take to turn the edtech boom into sustained success, rather than a bubble that will burst? Nesta has been involved in edtech as an investor, a researcher and through running ambitious programmes - for example to promote computer science in the curriculum and coding skills among young people.

We see huge potential for edtech in 2016, but only if edtech firms become much more savvy about how education happens, particularly in schools. They also need to become better at using evidence (very few can currently provide hard evidence that their products work) and tap into young peoples' motivations.

Investing in education technologies that enhance existing teaching practices

Digital technology is often painted as a revolution in teaching and learning. But our own technology trials show that schools are most receptive to technologies that support and enhance existing ways of teaching and learning. These include one-to-one tuition sessions or small group tuition sessions and assessments, in particular those that provide student feedback.

It would be nearly impossible to have one teacher for every student, but new technologies are opening access to individual support.

Third Space Learning

Nesta has invested in Third Space Learning,⁴⁵ which offers remote one-to-one tuition over the Internet to support primary school-age children at risk of underachievement in mathematics. Every week, each pupil and their dedicated tutor have a one-to-one maths lesson in a secure online classroom. Tutor and pupil cannot see each other, but they speak using a headset and share a screen.

After every online maths session the teacher receives individual feedback for the pupil showing their achievement and any gaps, as well as suggested next lessons to assist in the teacher's planning

Another priority area of innovation is providing targeted feedback to learners. Analytic technologies that capture data about learning offer enormous potential to personalise learning for each student in real time, in order to improve their learning outcomes and retention. Cogbooks, ⁴⁶ an online learning platform, does just that. Instead of every learner following the same fixed sequence, students progress through coursework in a way that suits them. It also enables better use of face-to-face time with teachers. There are many other examples of imaginative companies with great technologies: the key is to integrate these into the way education already takes place.

Responding to the demand from young people to create with digital technology

Most of the edtech products currently on the market push content at young people. But many young people want to be digital makers themselves, creating their own content. Nesta's *Young Digital Makers* report⁴⁷ shows how much this is happening already, but it also shows that the demand for digital making opportunities from young people is much higher than the supply. Eighty-two per cent of young people are interested in digital making (representing a possible 8.2 million) and parents are overwhelmingly supportive of it: 89 per cent think it is a worthwhile activity for their children. But we identified only 130,800 face-to-face opportunities to experience digital making.

This is an area where business can really add value, and in time reap the rewards from a much more digitally-savvy workforce. The organisations helping young people learn how to code rely on volunteers, but they struggle to recruit the number they need. The best way of filling this gap will be through businesses – both in IT industries and in other sectors – encouraging staff to help out. In collaboration with the Tech Partnership,⁴⁸ we recently published guidance for employers showing how it could be done.⁴⁹

Five years ago the computing and games industry said that their top priority was not new tax breaks or public subsidy: what they really needed to sustain their position was a flow of young people who understood computer science and how to make digital products. At the time, IT in schools was often too boring and passive. Some progress has been made in changing this – but we need a step change in engagement from business if the opportunity to train and benefit from the next generation of digital makers isn't to be missed.

Helping schools – and parents and pupils - make better use of their data

An enormous amount of data is collected on the performance of schools and their students – whether it's through league tables,⁵⁰ Ofsted inspections,⁵¹ the national pupil database⁵² or in schools' collection of information on attendance, behaviour and student progress. Products are being developed to help schools make better use of their data – something that businesses can support. 2016 looks set to be a year that sees an important shift in how data is used in education.

One company that exemplifies this shift is Arbor Education,⁵³ which helps schools learn from their data to improve educational outcomes for students. It provides several solutions for school leaders, including big data analytics to enable schools to compare their performance against the national average, local average and crucially against schools with a similar pupil profile and real-time tracking of in-school targeted interventions on student progress and behaviour.

Another way of using existing information to create stronger educational outcomes is a much more active use of open data to create new products and solutions, for instance through online tools such as Skills Route.⁵⁴

Skills Route

Skills Route is an online tool that uses open data on the performance of post-16-year-olds in schools and colleges in different subjects. It helps young people identify providers offering their chosen subjects and predicts the grades they'll receive. Based on these predictions, the tool also lists potential higher education institutions and career progression routes, with average salaries. This is a world first – and could help schools become much better aligned with what's genuinely needed by businesses and the future labour market.

What this means for businesses

The educational tools provided by the organisations listed above bring together technological know-how with a deep understanding of educational realities. Together, they have the potential to transform how the sector works – and to help edtech thrive, rather than disappoint as a bursting bubble.

Spending on education in the UK accounts for 6.2 per cent of GDP, making it bigger than the car, steel or communication industries.⁵⁵ The UK has a great many strengths in this area, but we're failing to join up the dots – to link technological creativity to what really goes on in classrooms and schools. 2016 needs to be the year when that's put right. There is currently a huge demand from young people for digital making tools that is being largely unmet. Products that help schools make better use of pre-existing data – such as Arbor Education and Skills Route – have also demonstrated clear value. Now is the time for business to support these exciting innovations and benefit from the skills and learning they enable young people to develop.

COLLECTIVE INTELLIGENCE: AN EVOLVING RESOURCE



he potential for harnessing collective intelligence to crowdsource information and ideas is being recognised by governments and businesses alike.

Collective intelligence emerges from the collaboration of many people working together to solve problems. After 20 years of regularly using digital media, huge numbers of people have become competent at communicating, sharing ideas, producing content and accessing information online. These distributed and diverse cognitive skills are increasingly being perceived as potential resources, which are relatively easy and inexpensive for organisations to access. The MIT Center for Collective Intelligence says "While people have talked about collective intelligence for decades, new communication technologies—especially the Internet—now allow huge numbers of people all over the planet to work together in new ways. The successes of systems like Google and Wikipedia suggest that the time is now ripe for many more such systems."

We are currently witnessing the diversification of collective intelligence solutions with platforms being increasingly tailored for different objectives: co-creation of open source software, deliberation and voting, micro-task allocation, data capture and most notably knowledge management and distribution. While communities of open source developers have been at the forefront of the collective intelligence movement and have created online environments for

remote collaboration and knowledge sharing, we are now seeing more traditional organisations wanting to leverage people's skills and expertise. There is a growing demand from governments and administrations to involve citizens in the decision-making processes that affect their day-to-day lives. In 2015, the Paris City Hall asked citizens to participate in deciding how best to use 5 per cent of the city's budget, and a similar model of participatory budgeting is being tested in Reykjavík, Iceland. In Spain, the new administrations in Barcelona and Madrid are examining new forms of collaborative policy drafting. As well as potentially leading to greater satisfaction in the provision of services, there is also a wealth of expertise, talent and knowledge within communities that could be tapped into by local authorities and representatives.

Advances in technology together with new scientific insights on collaboration and decision-making provide for a unique opportunity to redesign our democratic institutions and make them more legitimate and effective. Seizing on this opportunity, leaders and citizens are increasingly collaborating to solve society's biggest problems.

The MacArthur Foundation Research Network on Opening Governance⁵⁶

We expect 2016 to see a consolidation of tools and initiatives for harnessing collective intelligence. The success of these tools, however, relies on designs that are accessible to wide audiences and support individuals and communities to control their data.

The new tools that enable innovative forms of participation, such as Assembl,⁵⁷ DemocracyOS,⁵⁸ Liquid Democracy⁵⁹ and Your Priorities,⁶⁰ are still being developed and tested. The most effective and successful tools for collective intelligence have been developed by and for open source software communities. Platforms such as GitHub⁶¹ or Stack Overflow⁶² have huge amounts of users and information, but are too complex and domain-specific to be simply adapted to other audiences. Similarly, traditional knowledge management systems are embedded in organisations

CASE STUDY

and cannot be generalised to the wider public. The main challenge is to develop new platforms adapted for a broad range of citizens, and to ensure that they can be scaled to respond to increasing demand for participation.

D-CENT

Digital tools for direct democracy(Decentralised Citizens Engagement Technologies)

www.nesta.org.uk/project/d-cent

D-CENT⁶³ is a Europe-wide project that brings together citizen-led organisations that have transformed democracy over previous years, and helps them to develop the next generation of open source, distributed, and privacy-aware tools for direct democracy and economic empowerment.

Currently there is a suite of tools to help citizens to stay informed and get real-time notifications about the issues that matter to them; propose and draft solutions and policy collaboratively; decide and vote on solutions and collective municipal budgeting.

The Cooperative Councils Innovation Network

www.coopinnovation.co.uk/

The Cooperative Councils Innovation Network⁶⁴ is a collaboration between local authorities who are committed to finding better ways of working for, and with, local people for the benefit of their local community.

Councils across the UK have faced substantial cuts to their funding since 2010, and this is set to continue against a backdrop of rising demand for services. Several cooperative councils such as Oldham or Edinburgh, have launched campaigns to encourage citizens to help them make decisions about how council money should be invested, where the savings might be made, and what local priorities should be.

Nesta's insight for businesses

We should expect to see many more platforms for collective decision-making that harness the views and expertise of citizens. The main challenge business faces is to ensure these are sufficiently inclusive to reach a diverse range of citizens, can be tailored for the different objectives and contexts and can be scaled easily.

There is also an opportunity to differentiate between products in this area through the control and transparency of the information offered. And there is growing demand for analystical tools that allow individuals and communities to make the most of their data. As awareness of the value of data resources grows and spreads, and tools and skills for investigating such data become more accessible, more individuals and communities will want to control information they see as 'theirs'.

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