Hello, and welcome to the Economist Intelligence Unit’s Digital Economy podcast. I am your host, Pete Swabey.

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As cloud computing, increasingly ubiquitous network connectivity, and commodity hardware have reduced barriers to the technical infrastructure of the digital economy, talent and skills have emerged as the most sought after fuel for innovation. If you’re starting a digital business, your number one consideration is mostly likely access to skilled employees.

At the same time, digital technology is transforming the way in which skills are formed and talent is distributed. Online learning materials, which range from formal distance courses to how-to videos on YouTube, theoretically make it easier than ever to learn the necessary skills for digital work than ever before. And remote working, made possible by the internet, has extended the talent pool that companies can draw on -- although as we’ll hear, for some that has meant bringing work closer to home.

At the same time, geography still seems to play a role in the market for digital skills. Hubs like Silicon Valley and its imitators serve as beacons for digital talent and companies who seek to employ them must contend with eye-watering salaries and rents.

On this month’s episode, we discuss the dynamics of digital skills, exploring how digitisation itself is shaping their supply and demand. My guests are Joysy John, director of education at UK innovation foundation Nesta, and Chris Johnson, CEO and co-founder of talent acquisition platform Uncubed. I started our conversation by asking Joysy what Nesta’s research tells us about the digital skills that will be in high demand in future.

Joysy John

So Nesta’s has done quite a lot of research into what are the skills that are going to be in high demand in the future. We’ve looked at 41 million job adverts and looked at what are the skills that will see an increase in demand and what are the skills that are going to see a decrease in demand. And we noticed that jobs that are going to see a decrease in demand are requiring a lot of digital skills. But there are some jobs like teaching or chef, which will require, which we'll see an increase in demand or actually seeing a lower percentage of digital skills that are required. So based on our analysis, the top, or the most promising digital skills are things like animation, multimedia production, design and engineering, research and quantitative analysis. So some of the more advanced digital skills, rather than the basic digital skills that can be automated away, the research
shows that just having these technical skills or digital skills is not enough. You need creativity, collaborative problem solving, communication skills alongside the digital skills as well.

Pete Swabey

Chris, does this match your experience at Uncubed? What do you find are the digital skills that are most in demand among US employers?

Chris Johnson

Yes it does. And we tend to focus in particular on some of the skill sets that Joysy mentioned, software development and software engineering and data science. And then the related sort of suite of skill sets required to build web driven businesses. And two professions or skill sets I think are growing notably fast. One is of course software developers, which gets a lot of press and attention, and even civic attention as cities try to figure out how to make more of these jobs available and accessible, and that is projected to grow 21% in the next 10 years. And these are US Bureau of labour statistics numbers But the growth is pretty similar for data science on the data science side, the US Bureau of labour statistics is projecting a 19% increase over the next 10 years. So, you know, pretty fascinating in that if you go back to the 90s when there was this massive sort of trend towards outsourcing, uh, you know, I think that the thinking was at least in the US economy and certainly elsewhere, that a lot of these jobs were not going to be available in the US and now 2019 going on 2020, you have the government itself projecting these really massive increases in the numbers of jobs available here in the US.

Pete Swabey

So we can’t discuss skills without talking about education and training. And we’ve seen in the last decade some innovations in training. I’m thinking of online training resources, and also skills bootcamps. Joysy in your experience, what impact have these new methods have, which are the most effective and not only on the availability for, of skills for employers, but also about the accessibility of careers in digital technology.

Joysy John

I think it’s a really interesting space because there are lots of innovations happening in that space. So you have these MOOCs, the massive open online courses like Coursera, Udacity, TEDx. But there are also a whole range of other online courses, you know, LinkedIn learning and others they have an interesting model. Some are like a university which is online and people can access it anywhere. And then there are others that are much more like a trade school. But the biggest challenge with these online courses is the low retention rate. So hundreds, thousands of people sign up, but not many complete or not many go on to get the certification.

So Nesta is doing some research to really looking at what motivates adults to learn and how can you give them the right information, advice and guidance so they can continue on this lifelong learning journey. You’re also launching a career tech challenge, which is specifically looking at addressing this issue of not enough people using the online tools to up-scale and re-skill.
Pete Swabey

Is it fair to say that these things haven't had the impacts that we were expecting four or five years ago?

Joysy John

I would say it has had an immense impact because a lot of people who couldn't have access to high quality education can now access it. And without MOOCs that wouldn't be possible. But in terms really helping people transition into jobs, it still hasn't delivered on that promise. And there are some new models, you mentioned bootcamps that have come up which give three months of training and, but they cost $10,000. So it's very expensive. And there's a very small subset of society that can actually access these bootcamps. There are some other innovations that are happening, which are absolutely free. And the only criteria for getting in is motivation and your potential to work hard. And one example of that is Ecole 42 based in France and now they have opened in US and the model has been replicated in many other countries like Russia and many countries in Africa.

Pete Swabey

Chris, so in your work you connect candidates with employers. Have you seen these new approaches to skills development having an impact so far on, for example, the supply of skilled candidates on offer?

Chris Johnson

I think all of these models have fallen way short versus the headline promise. And certainly the, the idea that a lot of investors dumped, you know, hundreds of millions or really billions of dollars into, I think the numbers of people that have either found a new career or learned a new skill set outright through self-directed online training is actually quite small. And there certainly are success stories, but I think as a people just might not be ready to learn that way.

I think on the other hand, the bootcamp model, which Joysy just touched on and laid out some of the different models and structures that we're seeing in the market now, I think that has been effective. And to her point the original model is quite expensive and therefore you know, prohibitive for people if it's $10,000 or more per person, but the model itself has been quite effective and I think what people are seeing out of it is a chance to in a concentrated time really learn a new skill set that can get a job and it's not perfect, but we see plenty of bootcamp grads end up with very successful careers. Even at my company Uncubed, our lead software developer came from a bootcamp. She was a teacher and worked in education before.

Pete Swabey

Chris, flipping now to the sort of recruitment side, what, your company helps employers be more attractive to these kind of candidates, the candidates with the digital skills that they need. What are the best employers doing to attract that talent and what advice in particular do you give to, as you
mentioned earlier, more traditional established companies who feel they might be competing with startups and digital giants for the best candidates?

Chris Johnson

Yeah, I guess overall the biggest trend that we've seen is that companies have started to treat the job search as an experience instead of a transaction. So, I mean, really going back to the Dawn of newspapers, the thing that's been used to attract potential employees is a classified ad. And then of course when the internet emerged in the eighties and through the nineties you had these online versions of that same classified ad, a tiny square of text that was meant to tell you all you needed to know to create interest around a job opportunity. Now it's a very different world, and so much of what we do is visual and everything from Instagram where people are looking at images all day to even the way we communicate with images and emojis instead of text. And so companies are embracing that and they're realising that now it is an experience and, and they're really trying to customise each step of that candidate journey and that candidate experience so that it feels compelling and it creates interest in those roles.

The second part of your question, what advice would I give to companies and especially traditional companies want to compete for in demand skills. And this is something we're seeing right now. I think what we saw in the last several years was large companies trying to look like startups. And there had been this massive explosion of new companies and they were, they were winning in the talent market mostly because they just seemed more exciting and candidates were more drawn to them. And of course at the forefront you have the larger tech firms, the Googles and the Amazons. But then you have the countless startups behind that.

And so large companies were trying to emulate that and they were trying to say, "Hey, look at us. We're a startup too." And they would try to create this image of, you know, people sitting on the floor on beanbags and, you know, trying to creatively come up with ideas. And I think that that worked. I think it had its moment and it allowed candidates to look at larger traditional companies differently. But I also think that's over, I think it's passed, and the smartest, traditional companies now are marketing the stuff that they're really good at. And this is certainly what we coach them to do. So, you know, we always joke that very few people have ever left a company because they didn't spend enough, you know, refurbishing the conference room. It's usually other things like, is the management good?

Does the person have a clear career path at hand in that company? And why have you been around a hundred years, or longer, 200 years? And it's probably because you've figured out a lot of things and probably been very innovative throughout that history.

Pete Swabey

One of the, one of the most complex and perhaps fraught topics related to recruitment in tech has been diversity. Joysy, would you argue that there is a, beyond the moral reasons for increasing the diversity of the employee base in technology, would you argue that it is a method for expanding your access to digital skills?

Joysy John
Absolutely. If half the population is not even participating in creating technology solutions and algorithms, then of course you have a problem. There’s a moral problem but also an economic argument because there’s quite a lot of research showing that when you have diverse people creating solutions, you’re better able to meet the needs of a diverse population. And this problem in technology, the diversity problem in technology has been there for a long time. And with AI it has sort of accelerated that program, that problem.

Pete Swabey

Why do you say that? Why AI in particular is accelerating and do you mean the visible effects of that lack of diversity are perpetuating or do you mean the input as well?

Joysy John

I think both ends because there are a lot of cases that have come to the forefront where the diversity issues have been reported in the media, because AI is just a way of looking at mass amounts of data and we know human beings are biased and if the data that we are generating is biased and these machines are using that data to train algorithms, then of course the output is going to be biased. And until you have people coming from diverse backgrounds, not just the technologist, but also people from psychology and behavioural science and social studies to really understand, you know, what is the problem that they’re trying to solve and how can these different people work together to come up with better solutions. So yes, there is a huge problem when it comes to diversity in tech.

Pete Swabey

And what can employers do about that? What if I’m head of a technology division within a large company and I’m concerned about this. How do I go about addressing this?

Joysy John

I think employers need to change their recruitment development as well as retention practices. And they need to get over the prejudices that they hold about a certain gender or race or geographic background or even age. You know, there are a lot of issues when you see a particular CV, especially when there are, you know, thousands of people applying for a role. Employers are looking for how to screen out. And one of the things that they can do is use tools that help them address this bias, so Nesta has invested in a tool called Applied where it blanks out the job, the person’s name as well as the location and the gender.

There are other things that employers can do in terms of investing in upskilling and reskilling and recruiting from non-traditional pathways. What I mean by that is opportunities like digital skills apprenticeships, opportunities where you have a return to work programs, really investing in that talent development and pipeline. Not just for people who are already within the workforce, but also how do you recruit, not just going to the top Ivy League Universities, but how do you recruit from a broad set of institutions.

Pete Swabey
Chris, can I ask you, do you see evidence among your clients as a, for a desire to broaden the pool of digital talent that they're drawing from?

Chris Johnson

We do. And specifically on the university point that you make, Joysy, there's, we think there's two levels to it. So the first one is the fact that most large companies in the US focus on a core group of schools and almost uniformly that's 20 to 40 schools.

Chris Johnson

But then structurally you have this real blocker to having a diverse and inclusive workforce because those schools match up very poorly with a diverse, you know, cross section of students. And so just structurally these companies are putting themselves at a huge disadvantage. So that's, that's one level. And then the other one is more broadly, I mean, we certainly coach our or challenge our clients to drop their university requirements. I think oftentimes new companies and people think this is often like a traditional company problem and it's really not. You get a startup, most of the, most startups are put together by pretty well educated folks and when they open doors for the business, they just draft some basic requirements to work there. And I think a lot of them without thinking critically about it, just put 'needs a university degree'.

Chris Johnson

And that carries on for years and years and years. And then they find themselves in this issue, whether they're feeling like they're not, that the workforce is not diverse and inclusive enough. And we would argue that that's one of the core reasons and especially in this environment where the boot camps have grown and really proven to be a successful feeder as a new, into the labour market for some of these in demand digital skills. So if you lift the university requirement, it's going to give you lots of access to people who either couldn't for financially or just didn't pursue a university degree.

Pete Swabey

Joysy, another dimension of diversity is the geographic diversity of a company. And as Chris mentioned there, on the face of it the ability that digital technology offers for both skills training and work to be distributed around the world should mean that a company no longer needs to have a place and it should be distributed all around the world. At the same time, we always hear about these ecosystems, these hubs of digital talent and skills. Silicon Valley obviously being the first one, but a series of would be Silicon Valley's are emerging around the world, which would suggest that in fact place is important. So what's going on? Why has the potential of digital technology to remove the geographic boundaries to skills and jobs not happened as fast as we might have expected?

Joysy John

That's a really interesting question and that goes to show the importance of place and the role that it plays in creating social networks, social capital because urban areas where you have good infrastructure, good learning institutions, good training provision and high density of employers who
are looking for talent. You know, those sort of regions emerge as the points of innovation. And that’s why places like Silicon Valley, London, Berlin, and others have really evolved as these hubs of innovation and where there are lots of opportunities or jobs.

But I think with these global organisations, even if you’re headquartered in one of these hubs of innovation, you can still have access to talent that’s based anywhere and everywhere. Because you know, in, I guess a few decades ago, everyone was talking about having access to skills and you had to be in a particular location. But now with internet access and with access to opportunities, you can be based anywhere and work for one of the biggest firms, tech firms. So I think it has levelled the playing field to a certain extent. But until, and unless you’re in an area, if you’re in a rural area where there’s not enough good broadband, then yes, you know, you’re limited to access to those jobs.

Pete Swabey

Chris, how have you seen the ability for jobs that are particular digital related jobs to be done remotely? How does that affect the jobs market?

Chris Johnson

Yeah, it’s pretty interesting there. There are some fascinating trends happening right now in the United States. One is that people are moving at the lowest pace in 70 years. This is new US census data that just came out. And so not since the 1940s has the population been so stable and immobile in terms of location and undoubtedly there’s a ton of factors there. And, but the one of the upshots of that is that people are certainly moving around less for jobs. And so it either implies that they’re finding more locally or they are able to work remotely or they’re just not taking those opportunities. So they’re choosing to stay where they are rather than pursue something new, even if it’s, you know, maybe a level up. So that’s, that’s one.

But the other thing that’s been really fascinating and I don’t think anybody would have predicted it in the 90s, is that rather than outsource jobs to other countries, and of course India was probably the country where most of that happened, at least with American employers in the 90s. Now a lot of times what’s happening is companies are looking into these not as populous parts of the United States as say the Midwest for these skill sets. And so, you know, they’re finding basically a cost arbitrage opportunity for one where they can pay someone in, say, Iowa than they can in San Francisco. And then two, they’re finding acts that they’re finding more supply. So it’s less competitive to compete for that software developer who’s living in Iowa than one who’s in San Francisco. And hearing from dozens of large tech firms all the time with with new offers. So I would say that’s an unexpected trend or it’s an unexpected development in, in the labour markets at least versus where we were at in the 1990s.

Pete Swabey

Great. Thank you. So often we hear about the digital revolution being compared to the industrial revolution and when one of the impacts of the industrial revolution was the creation of a large volume of sort of medium skilled jobs. Whereas when it comes to the digital skills we’re talking about programming and data science, these are still very high value jobs in the sense that they command high salaries and businesses are prepared to pay those. But, also, they require a lot of
training to enter. Do you think, Chris, that's just the nature of the work, the complexity of
development and data science means that it's always going to be a profession you might say or a
middle class job or could this provide large volume of jobs in future?

Chris Johnson

I hope it does. I would say, I don't know. And the things that I struggle to make sense of are,
especially comparing with the industrial revolution, is that these are largely specialised skill sets. So if
we over-simplify and say industrial revolution or even post World War II America, an able bodied
person could find a career that would support a family and allow them to do pretty well for
themselves, even without an education. And now we're looking at these very specialised skill sets. I
also think it's early and I think that we are seeing things that are being sort of democratised at point
to graphic design as one example. And not that long ago, you would've had to hire somebody who
had a pretty sophisticated understanding of graphic design to make something that looked, you
know, passively attractive for today's internet. And now you've got a platform, just to use an
example like Canva where someone like myself who has virtually no graphic design ability can go on
that platform and in, you know, moments make something that looks pretty good.

And so as you see some of these skill sets made available in a different format. I mean, it's quite
possible that a number of professions and hopefully large volumes of sustainable jobs will come out
of it. I guess on the flip side, I worry that one of the things the internet does is just quickly sort out a
top and a bottom and including for labelled labour markets. And so, you know, it's created lots of
these gig opportunities in the form of delivering runs, whether it's in an automobile or around on a
bicycle or you know, all of the gig economy work. But are those, and while those are very attractive
and fill a need for lots and lots of people in terms of their flexibility and their ability to be anywhere
are those really the jobs that, you know, people are wanting to create. And so that's, I think that's
the thing that remains to be seen.

Joysy John

I agree with you that some of these skills will become much easier to develop as well as apply and
are not just in design but also in artificial intelligence. You don't need to be, you know, an expert in
statistics or you know, an expert in coding to be able to apply some of these learning algorithms
because technology has become so much easier than it used to be 20 years ago when I first learned
programming. Because I think now anyone, anywhere with access to the internet can learn these
skills and can easily apply it. But we need to remember that these specialised skills will be a small
proportion of all the jobs that are out there. And if we overly emphasise on technical skills and forget
the human skills that will be increasingly needed in a world where people are based, are working in a
much more distributed fashion. If we don't have the social and emotional skills, it'll be much more
complex or difficult to do these jobs of the future. So I think it has to be a combination of both.

Pete Swabey

Great. So to finish, I'd like to ask both of you based on your research or your experience, how do you
think that the supply and demand of digital skills and more broadly, the nature of work in digital
technology is going to evolve in the next 10 years? And I'd like to start with you Joysy.
Joysy John

You know, Nesta’s vision in this space is really using, harnessing technology to reduce but not drive inequality and the way we are heading. The world is changing so fast. The jobs are evolving so fast and people do not understand, you know, what are the skills that they need to build? And even when they know that these are the skills that they need to build, they find it really hard to build those skills due to lack of time, resources, or access to these learning opportunities. So I really hope that we can build a world where employers, governments, civil society and training institutions are working together to create a learning ecosystem and help people learn throughout their life and prepare them for a fast changing world.

You know, what people are learning in universities is not going to be relevant as they enter the workforce. And people who are in the workforce will need to constantly evolve and change and learn new skills. So I really believe that as a world, you know, there’s quite a lot of fear about what’s going to happen, you know, are robots going to take our jobs. But I do believe that if we can act collectively around harnessing human potential and focusing on the things that truly make us human, and using technology to augment what we do and not replace what humans can truly do, then we can create a better world and create a much better labour market.

Pete Swabey

Same question for you Chris.

Chris Johnson

Yes, I would echo parts of that and, and I do think that for all the gloom and doom stories that are out there and you don’t have to look very far to find as many of them as you’d like, but I think that the, the labour markets are pretty good about sorting some of this stuff out. So if there are, if there is a skill set that’s really in demand and pays quite a bit of money, then I think the market will figure out how to create more of those jobs and/or it create more of those, and address the supply shortage, also. I also have a lot of confidence in humanity, I guess, in finding creative ways to put ourselves to work. And I think if you look at history, all of the technological threats that we’re supposed to put us all out of business, I guess in certain sectors or so you have such a dramatic impact on work. I think some of that has played out and lots of it hasn’t. And so I am actually fairly optimistic and I think that it’s still very early. I think there’s a, there’s a lot of imbalance now, but I’m hopeful that as time passes and, as Joysy says, as we get smarter about keeping that human element at hand and front and centre, that hopefully it’ll be a tool to create more and better opportunity rather than less for a smaller number.

Pete Swabey

Chris, Joysy, thank you both for joining us.

Joysy John

Thank you.
Pete Swabey

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