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How to make studying work more for you

Degree apprenticeships

Demand for degree apprenticeships is set to increase, but will there be enough places on offer to plug the tech sector’s skills gap?

Ignytjac also wanted more practical experience, having been left frustrated by her college course. “We spent just two hours a week in the lab - there wasn’t time to learn anything,” she explains. “In IT, the most important thing is that you see how things are done and you do them yourself.”

Sweetman regularly speaks to companies that are struggling to recruit software developers and data analysts, and believes degree apprenticeships are becoming a more and more important channel to bring in new talent.

“There’s a huge numerical imbalance between the number of skilled people out in the workforce and the number of vacancies available that companies are struggling to fill,” he says.

Degree apprentices very quickly become highly valued and contribute to the company

Bob Clift, head of higher education programmes at the Tech Partnership, believes there are other great benefits for employees: “Degree apprenticeships are very quickly becoming highly valued and contribute to the company.”

Next year will see the launch of two new degree apprenticeships, in cybersecurity and data science. The Digital & Technology solutions degree apprenticeship is based on standards set by the Tech Partnership, a network of more than 1,000 employers that includes senior representatives from tech companies.

The courses are delivered by traditional universities and involve a mixture of online learning and regular workshops. What’s crucial, says Sweetman, is the involvement of business, which allows them to ensure the courses cover what’s going on out in the real world.

It’s a view that’s echoed by Anand Tailor, 20, and Dragana Ignjatovic, 23 - two degree apprentices at Tata Consultancy Services currently working at PwC.

Tailor had a place at university which he decided not to take up. “I wanted hands-on experience within a particular environment and learning on the job,” he says. “Even though you can do years in industry [as part of a degree], I thought it would be better to get myself straight into the workforce.”

He agrees that degree apprenticeships are particularly suited to IT because they move with the times: “You could take a degree in IT and when you finish it will be totally outdated and new technology will have come out,” he says.

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Yet while around 30,000 people completed computer science degrees last year, there are currently only around 1,000 degree apprenticeships available, covering 24 different subjects.

However, Clift warns that due to their growing popularity, there may not be enough degree apprenticeships to go around.

“Companies only take on a certain number and depending on the economy, sometimes they can only take very few,” he says. MH
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The ‘internet of things’ is transforming daily life – and the jobs market for graduates along with it, says Mark Hillsdon. The technology sector is not only growing rapidly itself, but also transforming the way business is conducted. Lucy Jolin reports on why there’s never been a better time to enter the sector.

The great tech disruption

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Online living

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Innovation

cloud-based solutions.

candidates with a strong knowledge in areas such as device and network security are crucial – as is the ability to analyse data. Employers are also looking for graduates who can work in teams, with a strong knowledge of network administration and device and network security.

But technical know-how is only part of the picture – communications

problem solving skills as important too, says Matthew Owen, managing director at the IoT connectivity provider, M2M Intelligence. "They [graduates] certainly need to have the ability to comprehend the technologies being deployed, but far more important is their overall awareness of business and their ability to work in a fast-paced and constantly changing environment."

Companies are starting to cast the net further afield, taking on graduates from a far wider range of disciplines. Virtua often looks for people with a background in the arts, says Gabrain, because alongside their analytical skills, they are creative and can play a key role in user experience, and making sure a product is actually something that people want to interact with.

Teamwork is also important. IoT is not about heaving away on solo projects, but involves interaction with other teams, and users and customers. "Candidates need to show that they can empathise with the client," adds Owen. "Helping students become ‘work-ready’ is one of the driving forces behind Fast Track, a programme run by the Future of British Manufacturing. It matches students from some of the UK’s leading universities with companies, to help them develop their next big innovation or connected product."

Maika Kwon recently graduated in systems engineering at the University of Warwick and is now on a placement recovering clearer forms of energy, finding new ways to beat hackers, designing the next generation of video games: a career in tech is full of possibilities. Technology is at the forefront, endlessly innovative, financially rewarding - and you don’t even necessarily have to be ‘technical’ to make your mark.

“We are employing in just about every segment across our business – everything from marketers to product developers, as well as technical roles,” says Alan Laing, managing director UK and Ireland at Sage, a British software company that employs about 13,000 people worldwide.

“I’ve never seen a better time to get into tech. There’s more opportunity and more chance to apply creativity, technical excellence and multiple different skill sets to the opportunities out there than ever before. For example, the tech industry is going to employ more creative people in the next two years than any other industry.”

Tech needs new blood; a recent study from the British Chamber of Commerce found that three out of four UK businesses reported a digital skills shortage. This means salaries for the right people are going up. According to the Tech Nation report, the average salary in tech is now just over £30,000 – on average, that’s 4.8% higher than non-digital jobs.

What’s the best way to get there? There are multiple routes: a degree and postgraduate study, for example, are essential. It began to emerge, there was a rush to connect everything, explains Matthew Owen, managing director at Virtua. “In the early days of IoT it was almost a case of getting data from anywhere … some people saw it as an excuse to connect everything, explains Matthew Owen, managing director at Virtua. “In the early days of IoT it was almost a case of getting data from anywhere … some people saw it as a bit of a panacea that could solve all of our problems,” he says.

Now businesses have moved on from this scattergun approach. IoT is about devices, from simple sensors to smart phones, which talk to each other over the internet. And that’s good news for graduates.

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“Every single industry is either being disrupted, enhanced or changed by tech, bar none”

The average salary in tech is now 4.8% higher than in non-digital jobs

TV’s Level 3 high up to honours degrees and beyond. “The new degree apprenticeships, in particular, are really set to shake up the way we bring people into industry,” says Colin Bamister, head of partnerships at northern SME for the global tech company VMWare. “You can get a recognised degree without any of the debt and in the intervening period, work and earn a salary.”

Daniel Burton, 19, is currently undertaking an apprenticeship at Hospitality IT specialist Lolly. He spends three days a week testing products and software at Lolly. The other two days are focused on programming and development.

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The team at Lolly have really encouraged me and put so much trust in my work, which has really helped with my own self confidence,” says Burton. “This role has really cemented my thinking that I would like a job in IT. I love the work I am doing, and believe in it really will help to support my future within the IT sector.”

For a career in tech, says Bamister, and you’ll find a sector ripe with opportunities for everyone. “This is about transforming businesses, not just about coding,” he says. “Every single industry is either disrupted, enhanced or changed by technology. It’s a fabulous time to be entering the sector, as it is so relevant to every industry, bar none.”

Sponsorship agreements

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The drive for renewables

Emboldened by recent innovations, the renewables sector is booming - and on the lookout for STEM graduates, says Lucy Jolin.

From Elon Musk agreeing to build the world’s biggest lithium-ion battery to Volve’s announcement that all their new cars will be hybrid or electric from 2019, clean tech is moving out of the fringes and into the mainstream. In 2015/16, the renewables sector provided about 126,000 jobs. “This is a great sector to specialise in now, as storage and electric vehicles (EVs) become more popular,” says Daniel Brown, external affairs officer at the Renewable Energy Association (REA). “The energy storage and electric vehicle sectors employed an additional 16,000 people in 2015/16. These are set to grow significantly, as EVs become increasingly popular.”

Skills are vital in this sector - but so is passion. “Being a clean technology business with a clear focus on sustainable transport, it’s important that our recruits not only have the technical ability, but also have a genuine interest in sustainability; it just doesn’t work otherwise,” says Fiona Clancy, director of hydrogen car manufacturer Riverisimple. “It’s a sector that takes in many skillsets, says Brown: electricians and engineers for the solar industry, chemists and data analysts for energy storage, and physicists for bioenergy. That means many degrees could be relevant. Libby Moxon, for example, is about to start the fourth year of her MSci course in physics and astronomy at the University of Birmingham. She recently completed a nine-week summer placement at Tokamak Energy, a company that is aiming to find new, clean energy sources using the power of nuclear fusion. “We are very aware of the energy crises we are now facing and the fact that we do need to be looking for alternative forms of energy,” she says. “Fusion is an effective form of energy but produces a lot of long-term radioactive waste. Fusion is much less damaging to the environment. It’s exciting to know that you are working towards something that is helping the world to be a better place.”

Calling online crime fighters

Global demand for cybersecurity professionals is increasing rapidly, along with the rewards accrued by those in the industry. David Benady finds out why the sector is booming.

Cybersecurity tips

- Keep threats away from end users as much as possible by scanning inbound email content and web connections for malware.
- Protect the network perimeter with firewalls to make sure that only legitimate connections come in.
- Accept that you are not going to keep out every single attack. If something penetrates your perimeter, you need to protect the internal system as quickly and smoothly as possible. That means identifying malicious and unusual connections and network vulnerabilities.
- Every employee needs to be made aware of the dangers of clicking on all email attachments.
- Decide whether you will ask employees to work only on company-owned devices. Many organisations allow staff to use their own devices, but this increases the threat of being hacked.

The lack of supply means that cybersecurity is now one of the most lucrative careers in technology.

He says the industry is seeking staff with “Sherlock Holmes-type” investigative skills to identify and fight off threats. “The industry is increasingly looking for people who are monitoring what is going on and using the tools that are available to spot when something looks suspicious, then being able to investigate that,” adding: “The key skill is the sense of wanting to find out why - why is this like this, why did it go wrong and what are we doing to do about it?”

When Lee started in the industry 15 years ago, there were about a dozen positions of malware appearing every day. Now, that rate has increased to 1.5m a day. “When there are a dozen pieces, you can do a lot of the detection code-writing by hand,” he says. In the future, most of the donkey work of monitoring and protecting systems will be done automatically through machine learning algorithms. This will require staff to develop algorithms while others find new ways of combating the criminals and seeking out vulnerabilities in their systems.

Some 87% of cybersecurity workers globally did not start out in the industry, according to the GISW study - but many of them had worked in other areas of technology before gaining enough experience to enter this highly specialised field. But due to the looming shortage, of staff the cybersecurity industry is now making an urgent plea to the current generation of digital natives to get involved and join the fight to save the internet from the cybercriminals.

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We’re all kinds of digital and technical roles for tech talent. Are you an innovative thinker? Do you have a real passion for tech? Then help to create the digitally focused retailer of tomorrow.

Data protection

Some 87% of cybersecurity workers globally did not start out in the industry, according to the GISW study. But many of them had worked in other areas of technology before gaining enough experience to enter this highly specialised field. But due to the looming shortage of staff, the cybersecurity industry is now making an urgent plea to the current generation of digital natives to get involved and join the fight to save the internet from the cybercriminals.
Once the contract gets signed, it is my job to bring to fruition everything that has been planned and to implement it. That requires a lot of planning. All the turbines and components are manufactured in our factories and I am responsible for making sure they are produced on time and I also gather a team of people.

One of the biggest logistical challenges is transporting the massive wind turbines, which can be up to 120 metres high with blades spanning 90 metres. These huge structures have to be taken by road from a sea port – many are manufactured in Vietnam – to the wind park, which could be a nine-hour drive.

“It’s a big task in itself to physically get the roadworks ready for transport,” she says. “It requires us to make a lot of modifications to the roads infrastructure and we need to do a lot of widening of corners.”

Maqsood was born and raised in Pakistan and studied electrical engineering at the University of Engineering and Technology in Lahore. She had dreamed of becoming an engineer since she was five when she decided to follow in her father’s footsteps. After graduating, she worked for Norwegian telecoms giant Telenor in Pakistan before emigrating to the UK in 2009 and working as a project manager on the switchover from analog to digital TV.

She says there is room for more women in the wind energy sector, though adds that she has experienced no discrimination.

“You can imagine, in Pakistan, it was quite odd for a woman to be an engineer – there were only a few girls in my class. Then I was really surprised when I came to the UK and again there were only a few girls in engineering. I work with colleagues from other countries like Denmark and Germany and there are a lot more women in project management,” she says.

She loves her new career in wind power, especially visits to remote windswept mountains and sweeping hillsides. Fighting climate change and saving the planet take her to some truly beautiful places.

Interview by David Benady
Revolutionise retail for millions of customers every week

The Guardian | Tuesday 17 October 2017

Mathematics

Graduates can count on maths

Mathematics graduates already have a vast amount of roles open to them - and as the importance of data continues to grow across all sectors, that number is only set to increase. By David Benady

A maths degree also equips graduates with a wide range of computing skills

"A maths degree opens all doors - you can go into pretty much anything," says Noel-Ann Bradshaw, faculty director of employability in the Department of Mathematical Sciences at the University of Greenwich.

"The jobs that are most popular are those like data scientist, statistician, and any sort of analyst - there are so many roles open in all sorts of companies with analyst at the end," she says.

A bachelor of science degree in mathematics also equips graduates with computing skills, as they use a variety of software programmes in their studies. And they gain valuable experience in solving some tricky problems - an essential part of studying maths.

Maths graduates are suited for careers as systems analysts - examining how well computer software and hardware fits the needs of a business - or operations analysts, crunching data for the operations department in a business. They are as well placed to step up to management roles as they are versed in the key management skills of data and problem solving. Financial roles such as accountancy or actuarial work are also open to maths graduates.

Emma McEntee - wasn’t interested in the typical financial or teaching jobs

Maths graduate Emma McEntee works as a biostatistician for Parexel International, which carries out drugs trials and studies on behalf of pharmaceuticals companies.

Emma McEntee graduated with a Bsc in mathematics from the University of Greenwich, then took a master’s in medical statistics at the London School of Hygiene and Tropical Medicine. After leaving school, she knew she wanted to work with maths, but was unsure about which area, so she chose the Greenwich Bsc course, as it offered a 12-month work placement in the third year.

"I wasn’t interested in the typical financial or teaching routes. I wanted something a little bit different," she says. "It just so happened that I landed a placement scheme at a large pharmaceutical company."

She decided biostatistics was the career for her. "I have had a lot of opportunities to work as a lead biostatistician on several studies, which means I am responsible for overseeing the statistics and computer programming activities for an entire clinical study," she says.

Not bad for a career she discovered ‘completely by chance’.

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As fears grow of a robot-driven jobs apocalypse in the coming decades, it is reassuring to know that the technology field offers a wealth of lucrative career opportunities even for graduates with non-technical degrees.

Jobs in technology span from the highest skilled roles, such as data scientist, algorithm developer or cybersecurity specialist, to less data-intensive work, such as repairs or support roles in sales and HR.

For graduates, technology careers fall into two broad areas. There are the most advanced technology jobs: coding mobile apps and web pages, creating computer games or writing algorithms to interrogate data, for example. For these roles, often in specialist agencies or consultancies, candidates need an impressive portfolio of their own work, showing off the designs and apps they have created. Meanwhile, those involved in the exciting and futuristic areas of machine learning and artificial intelligence (AI) will probably be very highly qualified, but there are many roles where you don’t have to be a technical prodigy to excel.

Graduates can also follow a more traditional route, working in long-established IT and business functions at big organisations. There are opportunities for those with a sharp business brain and an ability to communicate with non-specialists.

"Every company needs a successful technology strategy to support their business and to have one eye on how their world might be disrupted, and try to guess the next big thing," says Doug Rode, a technology specialist at recruitment consultancy PageGroup. "A lot of people come into technology support roles and this gives them business knowledge. I know of chief information officers who have worked their way up through business support and business analysis roles," says Rode.

"Companies need people who understand tech but have a broader business understanding. The trick is translating tech issues for people without technical knowledge," he says. A good way to develop these skills is working in a retail environment, for instance at an Apple Genius Bar. Staff in these hi-tech stores sell and service for Apple products and advise consumers on using and repairing them.

After a tech job? Here’s where to look

• The number of tech businesses grew by 28% in 2015, more than twice as fast as the growth in non-digital businesses (up 13%).

• Most of the UK’s tech startup activity is centred in London, where new digital businesses have grown 42% in the past five years. Other fast-growing centres include Belfast, Newcastle, Edinburgh, Birmingham and Glasgow.

• In 2015, the turnover of UK digital tech was estimated at £170bn – an increase of 22% (£30bn) in just five years.

Source: Tech Nation 2017

Communication and people skills are increasingly in demand in the tech sector

Behind the scenes, staff are fixing and restoring gadgets. An Apple spokesman says the company employs 14,400 retail staff across Europe including its "highly trained geniuses". He says the requirements are "an ability to learn and time management". Across Apple, 37% of new hires globally are women and 52% of new hires in the US are from minority groups, he says.

There are also jobs at other consumer technology retailers, such as Dixons Carphone’s technical service arm Team Knowhow. As chief executive of the company’s services business Feilim Macle explains: “We do a very wide range of roles, everything from being on the road delivering and installing our customers’ kit, to being on the phone dealing with service enquiries, and roles that require very specific technical skills,” he says.

With automation, robotics and AI forecast to affect many areas of the jobs market including white collar roles, graduates may find that a career in technology helps them to stay one step ahead of the robots.
**Time to break the gender divide**

More women are needed in UK tech. So what is being done by universities and employers to recruit them? By Kim Thomas

Women now outnumber men at undergraduate level in medicine and the biological sciences. But in the physical sciences, the pattern is different. According to UCAS only 23% of students starting physics degrees in 2016 were women, while for engineering, the figure was 17%. Women also leave science and engineering careers in greater numbers than men: only 6% of working engineers are women.

It matters for two reasons, says Helen Wollaston, chief executive of Wise, a campaign to attract more women into science and engineering. The first is the impact on women themselves: apprenticeships available, while 32 universities and colleges are piloting conversion master’s courses in engineering and technology. Some universities, says Wollaston, are adding technical elements to courses such as business studies, as another way of engaging women’s interests.

Why are these subjects still so unattractive to women? Carl MacFie, professor of biological physics at the University of Edinburgh, thinks there is an “element of machismo” in perceptions of physics as a particularly “hard” subject, and that engineering is still regarded as “very hard-hat wearing, tramping around site in steel-capped boots”.

Pinamala Shivaprasad, a PhD student in chemical engineering at the University of Bath, agrees. Outreach work in schools has made her aware of an “information gap” in the UK. “When we ask children to draw what an engineer looks like, we always have a man with a hard hat,” she says.

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engineer looks like, we always have a man with a hard hat” It’s very different from Shivaprasad’s experience in India, where 28% of engineering students are women.

Wise is working to attract more girls in by emphasising the importance of qualities such as creativity, organisational skills and sociability in engineering. It is also emphasising the usefulness of engineering, which research has shown particularly appeals to girls. “Rather than just say: ‘You could be an engineer’, we say: ‘You could be designing buildings that are more carbon neutral, or you could be involved in renewable schemes that need engineering and tech skills’,” says Wollaston.

Some engineering firms are working hard to recruit more women. BP, for example, runs women-only recruitment days to attract female engineers, and also offers flexible working to retain its female staff. The ideal candidate these days, says Wollaston, is one who has personal and communication skills as well as technical ones. “Having a combination of great people skills, great creativity and great technical knowledge will be a passport to a really good job—somebody with that combination of skills is going to be the most sought-after kind of person.”

**Women in Stem**

**Emily Atkinson made the switch from English and philosophy to tech. Here’s how she did it**

Emily Atkinson made the switch from English and philosophy to tech. Here’s how she did it

before returning to the UK. A friend suggested the Silicon Roundabout jobs fair in London, where Atkinson encountered online printing and design company MOO. In July 2011, she joined the company as a graduate full-stack software engineer and hasn’t looked back.

Since then, she’s worked in all aspects of software engineering, including front-end, mobile and back-end development. “I’ve been able to work on a number of different teams and really gain experience in all those different areas,” she says.

“During my time at MOO I discovered I enjoyed back-end work most and now focus on that. I’m now a back-end software engineer at Gdeel Nait, working the platforms that power Vogue, Q2, Wired and Tableau.”

But Atkinson also has what she calls her “side career.” Four years ago, she co-launched and ran a community for women in tech now known as DevelopHer. Initially, they ran events on tech topics. “But we asked the community what they wanted, and we expanded into doing technical and soft skills workshops.” For example, we ran a coding workshop for 200 women with two other organisations.

They launched a six-month mentoring programme with an event at Downing Street, taking 15 women and matching them up with a set of mentors. “We tracked their progress as they could feel back here they were doing, and it was incredibly successful,” says Atkinson, who’s now managing director of DevelopHer.

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“When we returned six months later, we brought 35 of our members and invited leaders from other women’s groups in London. We’re all in this together and we all have the same goals for a diverse and inclusive tech community.”

Atkinson says that making those connections has been key to her career. But it’s also vital to remember, she says, that there are many ways into Stem. “There are so many other courses around, or you can go to events and talk to people about their careers. You don’t have to do something in your early 20s or be to pursue a career, particularly in Stem—it’s a field where you can start at any age.”

Interview by Lucy Jolin
Graduate roles

Find your pathway into tech

The range of roles and specialisations in the tech industry is extensive, offering graduates and non-graduates alike the chance to enter into the industry, says David Benady.

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Engineering

Once the contract gets signed, it is my job to bring to fruition everything that has been planned and to implement it. That requires a lot of planning. All the turbines and components are manufactured in our factories and I am responsible for making sure they are produced on time and I also gather a team of people.

One of the biggest logistical challenges is transporting the massive wind turbines, which can be up to 120 metres high with blades spanning 90 metres. These huge structures have to be taken by road from a sea port – many are manufactured in Vietnam – to the wind park, which could be a nine-hour drive.

“It’s a big task in itself to physically get the roadworks ready for transport,” she says. “It requires us to make a lot of modifications to the roads infrastructure and we need to do a lot of widening of corners.”

Maqsood was born and raised in Pakistan and studied electrical engineering at the University of Engineering and Technology in Lahore. She had dreamed of becoming an engineer since she was five when she decided to follow in her father’s footsteps. After graduating, she worked for Norwegian telecoms giant Telenor in Pakistan before emigrating to the UK in 2009 and working as a project manager on the switch from analog to digital TV.

She says there is room for more women in the wind energy sector, though adds that she has experienced no discrimination.

“You can imagine, in Pakistan, it was quite odd for a woman to be an engineer – there were only a few girls in my class. Then I was really surprised when I came to the UK and again there were only a few girls in engineering. I work with colleagues from other countries like Denmark and Germany and there are a lot more women in project management,” she says.

She loves her new career in wind power, especially visits to remote windswept mountains and sweeping hillsides. Fighting climate change and saving the planet take her to some truly beautiful places.

Interview by David Benady
The Guardian | Tuesday 17 October 2017

Sustainability

The drive for renewables

Emboldened by recent innovations, the renewables sector is booming - and on the lookout for STEM graduates, says Lucy Joinl

From Elon Musk agreeing to build the world’s biggest lithium ion battery to Volve’s announcement that all their new cars will be hybrid or electric from 2019, clean tech is moving out of the fringes and into the mainstream. In 2015/16, the renewables sector provided about 125,000 jobs. “This is a great sector to specialise in now, as storage and electric vehicles (EVs) become more popular,” says Daniel Brown, external affairs officer at the Renewable Energy Association (REA). “The energy storage and electric vehicle sectors employed an additional 16,000 people in 2015/16. These are set to grow significantly, as EVs become increasingly popular.”

Skills are vital in this sector - but so is passion. “Being a clean technology business with a clear focus on sustainable transport, it’s important

Cybersecurity tips

- Keep threats away from end users as much as possible by scanning inbound email content and web connections for malware.
- Protect the network perimeter with firewalls to make sure that only legitimate connections can make it through.
- Accept that you are not going to keep out every single attack. If something penetrates your perimeter, you need to protect the internal system as quickly and smoothly as possible. That means identifying malicious and unusual connections and network vulnerabilities.
- Every employee needs to be made aware of the dangers of clicking on all email attachments.
- Decide whether you will ask employees to work only on company-owned devices. Many organisations allow staff to use their own devices, but this increases the threat of being hacked.

The lack of supply means that cybersecurity is now one of the most lucrative careers in technology.

He says the industry is seeking staff with “Sherlock Holmes-type” investigative skills to identify and fight off threats. “The industry is increasingly looking for people who are monitoring what is going on and using the tools that are available to spot when something looks suspicious, then being able to investigate that,” adding: “The key skill is this sense of wanting to find out why.

Global demand for cybersecurity professionals is increasing rapidly, along with the rewards accrued by those in the industry.David Benadyfinds out why the sector is booming

Why is this like this, why did it go wrong and what are we going to do about it?” When Lee started in the industry 15 years ago, there were about a dozen instances of malware appearing every day. Now, that rate has increased to 1.5 times a day. “When there are a dozen pieces, you can do a lot of the detection code-writing by hand,” he says. In the future, most of the donkey work of monitoring and protecting systems will be done automatically through machine learning algorithms. This will require staff to develop algorithms while others find new ways of combating the criminals and seeking out vulnerabilities in their systems. Some 87% of cybersecurity workers globally did not start out in the industry, according to the GISW study. The number has decreased to 77% in the UK. Some 3% are still getting used to new technologies and other 2% are looking for new industries for a career change.

We make

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The ‘internet of things’ is transforming daily life – and the jobs market for graduates along with it, says Mark Hillsdon

The internet of things (IoT) is revolutionising how we live, from the way we control our central heating, to wearable fitness trackers that tell us how far we’ve walked. It’s also beginning to usher in what has been dubbed “the fourth industrial revolution”, as it transforms manufacturing processes from inventory management to quality control and assurance.

However, research early this year by satellite communications company Inmarsat revealed that many organisations lack the skills to develop, manage and deploy IoT solutions, especially in areas such as data analytics and cybersecurity.

And that’s good news for graduates.

IoT is about devices, from simple sensors to smart phones, which talk to each other over the internet. “It’s the use of technology to gather insights around a particular problem that can help you make smarter decisions,” says Paul Gudonis, president of Inmarsat’s Enterprise Business Unit.

When the technology first began to emerge, there was a rush to connect everything, explains Adam Gabrault, head of connected solutions at the Internet of Things University Network (IoTU). “In the early days of IoT it was almost a case of getting data from anywhere … some people saw it as a bit of a panacea that could solve all of their problems, “ he says.

Virtusa. “In the early days of IoT it was almost a case of getting data from anywhere … some people saw it as a bit of a panacea that could solve all of their problems, “ he says. Now businesses have moved on from this scattergun approach. Data is a new business staple, and as the technology has matured, so has the thinking about how to put this data to use. Sensors are now deployed more strategically, to solve particular problems, and helping businesses to do this is where a new wave of technology graduates come in.

With demand outstripping supply in the job market, skills in areas such as device and network security are crucial - as is the ability to analyse data. Employers are also looking for candidates with a strong knowledge of network administration and cloud-based solutions.

But technical knowledge is only part of the picture – communications and problem solving skills are important too, says Matthew Owen, managing director at the IoT connectivity provider, M2M Intelligence. "They [graduates] certainly need to be the same as today. "You could take a degree in IT and when you finish it will be totally outdated and new technology will have come-out," he says.

Companies are starting to take on graduates from a wide range of disciplines, including the arts and engineering firm Autodesk. There’s a reality check, she says, between seeing what industry is really like, and the perception her course had given her. “I’m looking forward to finding ways to bridge that gap," she says.

She’s also discovered that technology doesn’t stand still. “Textbook skills like coding are important, but I feel like the willingness to learn and having a drive is even more crucial," she adds. Gudonis agrees. “I think one of the most important mindsets for graduates is being really open to the courses cover what’s going on out in the real world. It’s a view that’s echoed by Anand Tailor, 27, two degree apprentices at Tata Consultancy Services currently working at PwC. Tailor had a place at university to study systems engineering at the University of Warwick and is now on a placement programme that is the involvement of an apprenticeship is based on standards set by the Tech Partnership, a network of more than 1,000 employers that includes senior representatives from tech companies.

The courses are delivered by traditional universities and involve a mixture of online learning and regular workshops. What’s crucial, says Sweetman, is the involvement of the company, which allows them to ensure the courses cover what’s going on out in the real world. "It’s a view that’s echoed by Anand Tailor, 27, two degree apprentices at Tata Consultancy Services currently working at PwC.

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Next year will see the launch of two new degree apprenticeships, in cybersecurity and data science, that have been specifically developed to plug these gaps, along with a master’s programme: “It’s not just apprenticeships, it’s the whole skill set,” he says. Yet while around 30,000 people completed computer science degrees last year, there are currently only around 1,000 degree apprenticeships available, covering 22 different subjects. However, Clift warns that while not enough degree apprenticeships is the number of working graduates, there may not be enough degree apprenticeships to go around.

“Companies only take on a certain number and depending on the economy, sometimes they can only take very few,” he says. MH
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