MANUFACTURING IN THE UK

With so much uncertainty to contend with, what are manufacturers doing to capitalise on the challenges ahead?
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UK manufacturing has a lot to contend with at present, but whether economic or political it needs certainty

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Leti and Soitec embark on a five year partnership deal to push advanced substrate research

UK Government announces first UK-based space ports with vertical and horizontal capabilities

NPL and NGI launch characterisation service to help kick-start UK’s graphene industry

Intel’s decision to sell Wind River to TPG Capital has been welcomed by CEO Jim Douglas

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For What’s Next.
UK manufacturing has a lot to contend with. Coming to terms with the digitalisation of the factory process, recruiting skilled labour, providing adequate training, boosting productivity and investment, let alone regulation and trade barriers. Manufacturers are faced with a very challenging economic environment.

Earlier this year, Stephen Phipson, the CEO of the manufacturer’s association, the EEF, said that the sector would succeed, but only if it worked together, sharing knowledge and experience.

A recent poll of manufacturers found they remained generally positive, with business confidence holding up and many of those questioned looking forward to the second half of the year. But many companies are becoming increasingly rattled by the prospect of the unknowable. Chief among them is Brexit and the uncertainty that currently surrounds the process of leaving the European Union.

It’s not just the economic environment that is proving challenging, but the political one as well.

That lack of clarity around what Brexit actually means, is starting to have an impact on the manufacturing sector – in particular in terms of business investment, which has slowed.

Most of UK business appears to be in a ‘wait and see’ pattern and in this special issue of New Electronics, in which we look at the current state of manufacturing, most would appear to be reasonably stoic – simply wanting the government to ‘get on with it’.

Last week at the Farnborough International Airshow, companies including Rolls-Royce and Airbus, warned of the dire consequences of a hard Brexit, while Jaguar Land Rover, the UK’s biggest car manufacturer, has hinted that £80 billion of planned UK investment could now be at risk.

It’s unlikely that come March 2019 those companies will close factories, whatever the conclusion of Brexit negotiations between London and Brussels they’ve all invested heavily in the UK. The big question will be whether they will continue to invest in the UK, or use the UK as a base to research and develop new products.

Many seem to forget that these companies are foreign-owned, with little allegiance to the UK. The chance of investment going elsewhere must be high.

Whatever the outcome of the next few weeks or months, business needs clarity. Continued uncertainty, both economically and politically, benefits nobody.

Neil Tyler, Editor (neil.tyler@markallengroup.com)
Substrate innovation centre

LETI AND SOITEC EMBARK ON FIVE-YEAR PARTNERSHIP TO PUSH ADVANCED ENGINEERING SUBSTRATES RESEARCH. NEIL TYLER REPORTS

Leti, a research institute of CEA Tech, and Soitec, a specialist in designing and manufacturing innovative semiconductor materials, have announced that they will be collaborating as part of a five-year partnership agreement. This joint venture comes in an effort to drive research into advanced engineered substrates, including SOI and beyond.

The agreement includes the launch of a new world-class prototyping hub that will bring together equipment partners with new materials. The Substrate Innovation Center will feature access to shared Leti-Soitec expertise around a focused pilot line. Key benefits will include access to early exploratory sampling and prototyping, collaborative analysis, and early learning at the substrate level, with the aim of eventually leading to streamlined product viability and roadmap planning at the system level.

The mission of the Substrate Innovation Center is to become the world’s preferred hub for evaluating and designing engineered substrate solutions to address the future needs of the industry, inclusive of all the key players, from compound suppliers to product designers. Using state-of-the-art, quality-controlled clean room facilities, and the latest industry-grade equipment and materials, Leti and Soitec engineers will be looking to conduct testing and evaluation at all levels of advanced substrate R&D.

Intel to acquire eASIC

Intel plans to expand its programmable solutions portfolio to include structured ASICs by acquiring eASIC, a structured ASICs provider, which will join Intel’s Programmable Solutions Group. Intel believes that having a structured ASICS offering will help it better address high-performance and power-constrained applications that it sees many of its customers challenged with in market segments like 4G and 5G wireless, networking and IoT.

Teledyne e2v wins space contract

Teledyne e2v, in partnership with Surrey Satellite Technology (SSTL), and the Centre for Electronic Imaging (CEI) has been awarded a contract to develop technology building blocks of a low power and high resolution CMOS image sensor, tailored to address the small satellite Earth Observation (EO) market.

Under the contract, which was awarded by the UK Space Agency, Teledyne e2v, in collaboration with other organisations within Teledyne’s Imaging Group, will lead the development of new technology which will simplify EO satellite system design using CMOS Time Delay and Integration (TDI) image sensors.

The CMOS TDI platform will bring small pixels, high line rates and on-chip functionality, including digital outputs, to enable cost-effective small satellite optical payloads. The technology will support a number of emerging EO applications such as land use mapping, urban infrastructure, agriculture, national resource management, disaster management, maritime, security and surveillance.

The hope is that larger constellations will be able to be launched to achieve higher temporal resolution.
Boeing donates $5m for STEM

Boeing announced it will be donating $5million towards ‘Newton Europe’ to help launch STEM-focused ‘Newton Rooms’ across nine European countries.

Pioneered by non-profit organisation, FIRST Scandinavia, Newton Rooms are themed classrooms focused on experiential learning. The Boeing multi-year investment will establish Newton Rooms in the United Kingdom, Germany, Netherland, France, Italy, Spain, Belgium, Poland and Sweden.

Newton Room concepts will include aviation-related STEM concepts, experiential learning – with potential themes such as space, biofuels and advanced materials. The funds will also go towards developing a portable package of flight simulator panels and classroom materials used to create a temporary room in virtually any suitable existing space.

XinaBox xChip boost

RS Components (RS) is adding more ways to prototype and expand the functionality of popular single-board computers like Raspberry Pi and BeagleBone, with XinaBox xChip hardware modules.

The xChip concept makes a wide variety of electronic functions available in a standardised modular format that can then be assembled, in any order, to build electronic devices quickly and easily.

No soldering or breadboarding is required and users can begin coding in minutes without prior electronics knowledge, as there is no need to design and debug hardware. xChips work in all popular programming environments.

RS is stocking an expanding selection of xChip cores which will enhance opportunities for developing Internet of Things (IoT) and other projects.

Solar supercapacitor

A solar-powered supercapacitor could help make future wearable technologies lighter and more energy-efficient, say researchers from the University of Glasgow’s Bendable Electronics and Sensing Technologies (BEST) group.

The supercapacitor uses layers of flexible, 3D porous foam formed from graphene and silver to produce a device capable of storing and releasing around 3 times more power than any similar flexible supercapacitor, the BEST team says.

The team demonstrated its durability, showing that it provided power consistently across 25,000 charging and discharging cycles.

They have also found a way to charge the system by integrating it with flexible solar powered skin already developed by the BEST group, effectively creating an entirely self-charging system, as well as a pH sensor which uses wearer’s sweat to monitor their health.

The hope is that this could take wearable health monitoring systems to remote parts of the world where solar power is often the most reliable source of energy, and also increase the efficiency of hybrid electric vehicles.

UK spaceport

AS PLANS ARE ANNOUNCED FOR UK SPACEPORTS, SCOTLAND IS SET TO HAVE A PIVOTAL ROLE. BETHAN GRYLLS REPORTS

Government has announced plans for the development of UK-based vertical and horizontal spaceports.

A proposed vertical launch site in Sutherland, Scotland has received funding of £2.5 million from the UK Space Agency, which the Government anticipates will create hundreds of new jobs.

Prestwick, Scotland is also in the running to receive further investment of £2 million towards the development of horizontal launch sites, the Government adds.

“The spaceport grant will help to kick-start an exciting new era for the UK space industry, and this is only the beginning of our LaunchUK campaign,” says Graham Turnock, Chief Executive of the UK Space Agency.

“As a nation of innovators and entrepreneurs,” says UK Government Business Secretary, Greg Clark, “we want Britain to be the first place in mainland Europe to launch satellites as part of our modern Industrial Strategy. The UK’s thriving space industry, research community and aerospace supply chain put the UK in a leading position to develop both vertical and horizontal launch sites.”

Simply put, this new product line helps our customers to speed up the development and reduce the investment for a new graphene-based device,” says Graphenea’s CEO, Jesus de la Fuente.

Spanish graphene producer Graphenea, has announced a new range of graphene-based field effect transistors (GFETs) available for industrial and commercial use.

The range of ultrasensitive devices is intended to pave the way for major strides in data collection and parsing for companies and researchers, previously unable to acquire this technology without major investment.

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Ground breaking GFETs

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The hope is that this could take wearable health monitoring systems to remote parts of the world where solar power is often the most reliable source of energy, and also increase the efficiency of hybrid electric vehicles.
Last week saw the launch of a new service by the National Physical Laboratory (NPL) and the National Graphene Institute (NGI), based at the University of Manchester, with the aim of helping the UK cash in on the ‘wonder material’, graphene, by providing what’s described as the ‘missing link’ for industrialisation of the material.

Graphene, in its commercial form, can come as flakes, in a powder or as a liquid, but each comes with a variation in their properties, yield, and the reproducibility of the product.

For commercialisation to be achieved, material standardisation will be crucial but, as with all new technologies, international standards for graphene are in their infancy. As a result, manufacturers are unable to verify that the graphene that they are working with has the desired properties. In fact, as the market is unregulated, companies cannot even be sure what material they are buying.

In response to this, the new graphene characterisation service, led by the organisations leading the standard for graphene, will allow companies to understand the properties of the material they are working with in greater detail.

Both NPL and NGI are hoping that the service will help to accelerate the industrialisation of graphene in the UK – forging the missing link between graphene research and development, and its application in next generation products.

According to Andrew Pollard, Science Area Leader of the Surface Technology Group, “Every industry is eagerly awaiting the introduction of graphene technologies, but the lack of standardised measurements have long been a stumbling block for wide industrial implementation.

“By introducing this service, alongside the development of international standards, to the UK’s emerging graphene economy it will help to accelerate the commercialisation of next generation technologies”.

Hailed as a ‘wonder material’, graphene has the potential for improving a host of applications including inexpensive water purification systems; greener, more efficient cars and planes; flexible phones and solar cells, and even biomedical applications such as wound healing and cancer treatments. Even Internet of Things technologies are set to benefit from wider graphene use as a result of more effective sensors.

First isolated in the UK by researchers at the University of Manchester, where the NGI is based, the early adopters of graphene technology are already seeing benefits, but in order to fulfil its massive potential, it needs to be industrialised – which will see the quality and reproducibility of the material on offer increase, due to standardisation, and the price of graphene drop, due to economies of scale.

Only by doing this will it be possible to achieve its wider use and pave the way for new graphene-inspired applications.

NPL led the development of the first graphene ISO standard, on graphene terminology, and in collaboration with the NGI, produced the NPL Good Practice Guide on the characterisation of graphene. Its expertise underpins the new characterisation service, offering NPL’s robust measurements for the properties of commercially-supplied graphene, and comment from the NGI on the material properties and its suitability for selected application(s).

By providing reliable, accurate and consistent measurement and assessment of graphene, and giving industry the information it needs to scale up the production and application of the material, it is hoped that this initiative will help to ensure the UK remains a world-leader in the graphene industry helping to foster graphene innovation hubs across the UK.

Ray Gibbs, CEO at Haydale Graphene Industries, said: “As Chairman of the Joint Working Group on Graphene Standardisation between China and the UK, I am acutely aware of the importance of accurate measurement and characterisation of Nano materials.

“This initiative will help bridge the gap between industry looking to promote its products and the consumers who need to be certain of materials and their properties. Confidence is key. Delivery of this will ensure consistent repeatable quality materials are available, essential for commercial uptake.

“In an industry only just reaching delivery of ‘commercial’ quantities, there is a considerable need for independent verification of material characteristics and properties.”
Wind River is once again a standalone business after Intel concluded its sale of the vendor of embedded operating systems to TPG Capital (TPG), the global private equity platform of alternative asset firm TPG.

The sale of Wind River had been announced earlier this year.

According to Intel’s top IoT executive, Tom Lantzsch, the sale of Wind River was intended as a move “to sharpen our focus on growth opportunities that align to Intel’s data-centric strategy,” despite industrial IoT remaining a part of that strategy.

While Wind River had been part of Intel’s IoT Group, it accounted for only a small percentage of that business.

Wind River, which has been in business for 40 years, supplies the software that runs the computing systems that support modern infrastructure, and operates across a diverse range of verticals in both the commercial and military space.

The company will be led by Wind River President and now Chief Executive Officer Jim Douglas, while Nehal Raj, Partner and Head of Technology investing at TPG, will serve as Chairman of the company’s Board of Directors.

Speaking to New Electronics, Douglas said that he welcomed the move suggesting that the partnership with TPG would open up a host of new opportunities to innovate and would help the company to “evolve our industry-leading software portfolio.”

For TPG the purchase of Wind River has bought several attractive opportunities going forward, according to Douglas.

“It’s kind of two-fold, sector specific from an investment perspective,” he explained. “Firstly, looking at IoT in general but also at the rejuvenation of industrial infrastructure – much of which needs updating. It provides a great growth opportunity for the business.”

With Intel’s decision to divest itself of Wind River both companies worked closely in the process to identify a suitable buyer.

According to Douglas, “We were looking for a future partner in growth and saw the value of a different structure i.e. outside Intel, and the opportunities that would bring, in terms of faster growth.

“We were in the fortunate position of engaging with TPG. They saw us as an asset they wanted to grow, rather than as something they could strip. There is certainly an alignment between the two businesses as to how we want to execute and accelerate the growth curve that we are on. And TPG’s vast portfolio of investments and contacts provides us with another major advantage.”

When it was decided to sell Wind River, things moved quickly but in an orderly way, according to Douglas.

“‘We struggled under Intel to make any deals as it didn’t fit with their financial logic.’ Jim Douglas

“We had our own separate networks and enterprise resource planning and customer relationship management systems while we were a subsidiary under Intel, so it proved to be a very simple divestiture. We came to TPG with a full management team, so there’s been the added benefit of continuity both within the business a well as how we interact with our customers.”

Douglas said that he was looking to ‘fill-out’ the board and further announcements would be made in ‘due course’.

He accepted that there had been ‘certain limitations’ under Intel’s ownership because of the company’s focus on silicon.

“Under Intel’s ownership, and this isn’t a criticism, it was just frustrating, the focus, quite naturally, was on silicon. That made far more sense financially for them, while we wanted to invest in software necessary for the IoT domain. That hamstrung us as a standalone entity and one that had its own growth objectives,” Douglas said.

As an Intel subsidiary, Wind River also “lost the right to have strategic relationships with a lot of the other silicon suppliers,” Douglas said.

“Our newfound independence will allow us to grow a lot faster and be more focused. More importantly, we can now turn our attention to mergers and acquisitions as part of a combined organic and non-organic growth strategy.

“We struggled under Intel to make any deals as it didn’t fit with their financial logic.”
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Since the 1970s the manufacturing sector in the UK has been portrayed as a sector in decline, and while it may no longer account for a quarter of the UK’s economy, as it did then, the UK remains a leading manufacturing nation - currently the eighth largest in the world.

According to the manufacturer’s organisation, the EEF, manufacturing in the UK as of 2017/18, accounts for 11 per cent of GDP; employs over 2.5 million people; and is responsible for 44 per cent of UK exports and 13 per cent of business spend on research and development.

And while the contribution to GDP may have declined, many of the services that once would have been attributed to manufacturing have actually been allocated to different parts of the economy. In fact, if you were to include their contribution, by some accounts, manufacturing’s share of GDP could almost double to 19 per cent.

Whatever the actual figure, manufacturing remains an essential component of the UK economy and a source of skilled labour. It has a big stake in automation, is a significant user and developer of technology and a sizeable investor in R&D, as well as playing an important part in the global economy.

The EEF’s annual conference, held earlier this year, saw the Federation’s new CEO, Stephen Phipson suggest that while manufacturers were facing a challenging political environment, the sector would succeed. But he warned that it would only do so by working together, sharing knowledge and experience.

According to Damon de Laszlo, chairman of the Portsmouth-based connector manufacturer Harwin, “Despite what many news reports suggest, manufacturing in the UK is doing remarkably well. The sector is growing and exporting and we are seeing significant levels of investment.”

While de Laszlo paints an upbeat picture he accepts that, “A lot of companies are rattled by the prospect of the unknowable, chief among them Brexit. But so far, there have been few significant problems, and for most businesses, we remain in a ‘wait and see’ pattern.

“None of our programmes are being curtailed or impacted. As with most businesses, we can only do what we can, and our programme for investment, apprenticeships, training and R&D can’t be switched off – we are planning for the long-term.”

De Laszlo highlights a number of the issues that are impacting manufacturers in the UK. Some have been affecting the sector for many years, such as the lack of skills, while others are relatively new.

Among the key ones are: digitalisation, access to labour, training, finance and investment as well as regulation and trade barriers, and the undoubted challenges that will come with leaving the European Union.

Most manufacturers accept that to be successful they will have to deploy advanced – and largely digital – technologies, if they are to compete
in an increasingly global marketplace.

The concept of the smart factory is gaining ground and is seen as helping to improve supply chain relationships.

According to Jon Stark, CEO, Peratech, a specialist supplier of force sensing HMI/MMI solutions, “Cloud-based computing, communication, and data-sharing are the foundations upon which we now operate. As a business we wouldn’t be able to compete without these ever-improving IT services.”

However, he warns that, “The sheer volume of business, market and IP intelligence in our industry can be overwhelming. But, by taking the time to focus and articulate clear strategic questions, we are able to source answers, make decisions, and follow through on actions that make positive, sustainable change.”

He makes the point that businesses need to be careful not to waste time collecting intelligence that will not create enterprise value.

“Although, at the same time, sometimes we don’t know what we don’t know, so we have to take risks, and learn fast,” he says.

Technology enables companies to monitor and act upon data derived from machines, people and processes and by delivering real-time data, can highlight weaknesses in systems before they become problems, enabling operators and decision-makers to better manage systems and achieve greater efficiency.

While the case for the adoption of digitalisation is becoming better understood, investment has been less than forthcoming and it is rather the opportunities associated with how technology can help to unlock longer term value, embedded in products – whether that’s through new service offerings, performance monitoring and upgrades – that is drawing the attention of businesses.

Investment is being held back by a lack of confidence in the future, according to the EEF and while most businesses, when asked, suggest that financing is straightforward, very few have said that they found access to finance ‘easy’.

Even if manufacturers do have the cash for investment, many appear reluctant to spend it on technologies and plant that will improve profitability and productivity.

According to de Laszlo, there is too much negativity. “Business sentiment is dominated by uncertainty, which is holding back the investment that industry needs.

“Harwin is a small to medium-sized business and I believe that there is a lot of innovation going on in this space. Unlike publicly quoted companies, we’re not having to report to the City every quarter, or explaining why we are spending 10 per cent of our turnover on capital expenditure.”

De Laszlo sits on the EEF’s Economic Policy Committee and says that there are plenty of smaller businesses that, “Understand the need to keep on investing in new technology.

“We’ve been installing computer systems that are able to handle the data generated and required by Industry 4.0. Our entire workforce is being retrained, which will enable Harwin to fully embrace the concept of Industry 4.0, or the smart factory, and increase productivity as a result.”

While it’s difficult to quantify the impact of this move to smarter manufacturing, de Laszlo suggests that installing the right technology will, “Benefit the business across the board. We will be able to integrate point of sale material, which will enable us to undertake better forecasting, which in turn will support improved production planning capabilities.

“By being able to track your systems in real time, instead of deploying theoretical models of output, we will be better able to understand where inefficiencies are. With current systems it’s not possible to capture or process data. We will have real information to do something with.”

Customers of manufacturers face the same challenges of needing to change and improve continually, of upgrading products annually, and of satisfying ever-changing customer demands.

“Our role is to enable that change - better, faster, and cheaper than our competitors can - and to do that, we partner, collaborate, and co-create products directly in the existing supply chain, minimising our customer’s uncertainty of getting a quality product to volume distribution on time,” explains Stark.

“For better or worse, this has been the business model in smartphones for almost a decade. Having started in 2014 with early collaboration, solutions-thinking, and global partnerships, we have modern customer-engagement in our company’s DNA.”

But while the opportunities that advanced digital technology offers are significant, if the education system is unable to produce young people qualified to work with it, then UK manufacturers will struggle.

In an interview with the Guardian newspaper, Joe Kaeser, the global chief executive of Siemens, the engineering giant, warned that as the next industrial revolution gets under way, many traditional roles will disappear and that it would become a lot harder to retrain workers whose
skills would no longer be relevant.

An obvious solution lies with apprenticeships. But while apprenticeships may finally be seen by many as an alternative to university, the positive view held by manufacturers is being undermined by the fact that many are finding the system extremely difficult to make work for them.

According to de Laszlo managing such schemes and the management of human resources is a massive overhead for smaller businesses.

“We can only afford to do that if we are able to increase our productivity.”

One of the big issues for business is that Government is continually ‘tinkering’ with the education and apprenticeship systems.

“I wish the Government would stop meddling,” de Laszlo says. “If you want enough of the right type of apprenticeships, you need to encourage local colleges to run courses, but every time you change how they are managed or the courses they provide, it throws existing programmes out of kilter.”

One big issue is the confused messaging that has surrounded the Apprenticeship Levy. Few companies have any confidence in the Levy achieving its stated aims, and many have been highly critical of the administrative costs of managing the system.

“But it’s not just issues about the Levy, three local colleges, that we use, were unable to guarantee places for apprentices, because they couldn’t guarantee their budgets.

“The liaison between business and education is difficult, we move at different speeds. The education system is dictated by terms and holidays, which simply don’t apply to industry.

“Industry needs certainty and the messing around with the system that we’ve seen has created massive uncertainty, for a scheme to work and be accepted it requires top management to buy into it and be willing to promote it, and that takes a lot of hard work to deliver.”

Harwin is currently working with Havant & South Downs College to deliver an internationally recognised engineering qualification and to provide students with work experience at the company’s factory in Portsmouth.

“The college approached Harwin, as it wanted a better relationship with industry, and out of our discussions the Harwin Academy was established.”

Twenty students will be starting the full-time course in September this year, and at the end of their first year will be able to apply for a full-time apprenticeship with Harwin, or continue to study full-time at the college.

“The idea is to give them a better understanding of industry and the chance to operate very modern equipment, which they would otherwise not come into contact with.”

De Laszlo says that it’s a “hugely exciting opportunity, but requires real commitment.”

Manufacturers who want to succeed will need to have growth strategies that not only involve getting more efficiency out of their existing processes and investing in new equipment, but will need to be able to find customers to sell to.

Technology enables companies to monitor and act upon data from machines, people and processes

“Innovation and speed to market will be critical.

As Stark explains, “Being a technology solutions company, Peratech must fully embrace the required speed and simplicity of integration far sooner in our research and development lifecycle if we are to catch the mass-commercialisation wave.

“As a newcomer in the force touch business, we entered the market without fully developed reference designs and were forced to invent-to-order. As a result, our competitors were designed into products before we were. We could simply not invent fast enough.”

To address this the company took what Stark describes as a “design-thinking approach” at the earliest stages of technology and product development.

“That meant innovating around established technology applications, our customers’ product development lifecycle, and their existing manufacturing supply chain. As a result, we shortened our time-to-design-win by months.”

However, a growing number of companies are wondering where future profits will come from, according to the EEF, which is disconcerting and could help to explain why overall manufacturing growth has been sluggish.

No review of UK manufacturing can take place without reference to Brexit. Companies like Boeing, Airbus and Jaguar Land Rover have expressed their opinions and raised concerns over the prospect of a hard Brexit.

Manufacturers dislike anything that creates uncertainty, but most seem resigned to the fact that, ‘Brexit is happening,’ so for many, it’s a question of ‘just getting on with it.’

Despite that stoicism, the road to Brexit is certainly proving politically more difficult than anyone expected and what the final deal will look like, and what that will mean for business, remains anyone’s guess.
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Could the roll-out of the T-Level help to change the face of technical education in the UK? By Bethan Grylls

The T-Level is a new, 2-year, technical Level 3 qualification, which will replace the current suite of vocational qualifications.

Due to be rolled out between 2020-22, we can expect to see the end of Government funding for BTECs, OCR Nationals, EAL, and City & Guilds qualifications. Instead, each of those awarding organisations will tender to be the sole provider of T-Levels.

T-Levels are intended to provide a simpler system of qualifications for students aged 16-18, offering a technical alternative to A-Levels and a more college-based alternative to apprenticeships, although including a 45-day mandatory work placement. They are based upon a map of 15 occupational pathways, including engineering, in a bid to help employers.

The Further Education (FE) system in the UK is a complicated one, with numerous post-16 qualifications available in engineering alone and that, coupled with the lack of apprentice placements on offer, has resulted in the Government looking to reform and simplify the technical qualification system.

Extensive consultation with educational experts and industry resulted in the T-Level, an idea born out of the Lord Sainsbury ‘Post-16 Skills’ Review in 2016 of vocational education and is, according to Damian Hinds, Secretary of State for Education, central to the “greatest shake-up of technical education for 70 years”.

The Department for Education (DfE) has committed to funding of £500million per year to support the introduction of T-Levels, covering additional classroom hours, as well as the 45-day work placement.

Doubts have surfaced however, with universities and educationists worried that T-Levels will only add to the confusion that already exists in what is already a reform-heavy UK education system. For example, the Apprenticeship Levy, recently introduced, still has employers confused over the paperwork, and questioning whether it will help to improve the quantity and quality of apprentices. In fact, since it was introduced, the number of apprenticeships has tumbled to just 261,200 apprenticeship starts for the 2017/18 academic year, compared to 362,400 in 2016/17.

“T-Levels are a good idea, but so many things are going on at the same time,” said Professor Ewart Keep of the Department of Education at Oxford University. “The system has undergone a lot of change in recent years and left many people baffled.”

Imperial College London and University College London are said to be sceptical about T-Levels, and have said that they will not recognise the qualification.

A spokesperson for Imperial said: “We do not believe that T-Levels provide suitable preparation for students.”

Many others remain undecided on the reform, Oxford University has said that it will be “watching with interest.”
and will base its judgment, as the T-Levels are rolled out, on how they’re implemented.

A lack of information about the T-Level, with almost half of education providers rating their understanding of T-Levels as either “middling or poor”, according to research from City & Guilds and AELP, is another concern.

“I think most colleges are keen that T-Levels are a success,” Prof Keep said, “but they’re concerned about the work placement element. They’re also nervous about staff retraining costs and whether or not they’ll be enough young people to make T-Level pathways viable.”

Businesses have also expressed concerns, with the City & Guilds and AELP’s research revealing that just 17% believe themselves to have a good understanding of the qualification, while only 8% say they currently offer placements that match requirements.

“The Government will need to spend a lot of time, energy, and money trying to get the message across to employers that the T-Levels are coming and getting employers engaged in the process and ready to offer placements,” said Prof Keep.

Anne Milton, Minister of State at the DfE said this is something the Government is already doing, having launched piloted work placements to build up a network of employer contacts.

According to Milton, the DfE is putting “real money” into both building relationships between industry and educators, and is working to create flexible work placements that suit the employer, rather than being delivered in a continuous block.

“It’s essential that the work placement is piloted,” agreed Prof Keep. “The problem is, running a pilot in a few colleges is very different from trying to get enough work placements to support the full programme.”

According to Milton, T-Levels will provide a recruitment pool for future talent. She describes the UK being at a “tipping point”, saying that big employers who pay the Apprenticeship Levy are seeing “unintended beneficial consequences”. For example, small organisations having the capacity to do work they couldn’t manage previously, and she believes the same for the T-Levels. “I think there has been a desire from employers to do their bit in terms of corporate responsibility.

“I’ve listened to the feedback from some of those pilots,” she continued. “What even surprised me is the appetite from employers to offer placements.

“In the long term, we might see employers asking for T-Level students rather than A-Level students,” said Dr Rhys Morgan, director of Engineering and Education at the Royal Academy of Engineering (RAE). “We hope to move closer to ending the disparity between academic and vocational qualifications.”

“There’s quite a lot of intellectual snobbery around T-Levels,” Milton agreed. “For some, the only route into a decent job is via higher education.”

However, she added, many employers believe graduates don’t have the skills they require. It can take years, she said, before graduates are productive. “The knowledge they’ve gained from university doesn’t necessarily make them fit for the workplace,” she contended. “T-Levels are designed by employers.”

Prof Keep remains doubtful. “T-Levels won’t change the negative attitudes attached to vocational courses.”

“We’ve turned the system on its head,” Milton claimed. “Rather than Government driving course content, employers have to say what they need.”

The Institute for Apprenticeships (IfA) is responsible for designing the Standards, bringing together trailblazer groups (employers) to create the content. “The IfA will pull in different employers with expertise in different areas for each of the T-Levels,” Milton explained.

Despite Milton’s optimism, Prof Keep questions whether the content will be what the industry wants and adds that it is unclear to him what mechanism will be available to amend content deemed unsuitable.

The RAE is hopeful over the introduction of T-Levels and is working with the DfE to, as Dr Morgan described, “ensure that the qualifications are right not only for today’s jobs, but also future occupations.”

The main issue is whether, as Prof Keep identifies, young people will be ready to move from GCSE to Level 3. He points to 2016/17 enrolment numbers which reveal that the majority of young people are taking a transition level, with 700,000 currently on entry level and levels 1 and 2.

“The number of young people that are going to be ready for this quite demanding course is low,” he warned.

Milton conceded that a transition level is needed, but said that it wouldn’t happen yet.

As T-Levels are rolled out it will be a matter of waiting to see whether they will achieved their goals. Perhaps this reform will address the skills gap.

The current FE system is not working effectively, it’s too complex, said Dr Morgan, a “simpler system” would be good for employers and students. “If successful, the qualifications will have much stronger market value and confer much greater social and economic mobility on students who do not want, or are not suited, to a university education.”

“We need to ensure our young people have a good start in life and provide them with the knowledge and skills they need. At the same time we need ensure that we are giving employers the employees they need,” concluded Milton.
The Maker movement has been described as a genuine alternative to traditional forms of manufacturing, allowing individuals to gain access to digital fabrication facilities, share knowledge through online platforms and open source technologies, and use platforms like crowdfunding to finance innovation and scale-up their businesses.

While many have talked of the Maker movement as being a ‘key disruptor’, how true is that in actual fact? At present, most Makers remain small-scale, and can’t really be described as having had a significant disruptive effect on the wider economy.

As the pace of economic change has accelerated, and at a rate that would have seemed impossible to previous generations, how important a role does the Maker movement play?

It is certainly growing, driven by the digital revolution, in which innovation, iteration and collaboration have become more important. For many businesses, working together with open source communities and openly sharing ideas is now the norm.

The breadth and depth of people involved with the Maker movement is significant, just look at the number of Maker Fairs that have appeared in the past few years - but is it more a ‘making culture’ than a movement?

For many distributors, the Maker movement is seen as providing significant opportunities for growth.

“The Maker movement has taken affordable cutting edge technology and the demand for consumer devices, created by the Internet of Things, and run with it!” says Peter Wenzel, Global Director of Raspberry Pi, Single Board Computers and Software, at Premier Farnell.

According to Wenzel, Makers have benefited from the fact that more tools are now available to anyone who wants to create and innovate within this space.

As a result, both distributors and some manufacturers have sought to make more competitive products and services available to enable Makers to do more.

Makers tend to primarily address what is described as the ‘long tail’ of demand that exists for personalised products, and have focused on niche markets that could, in time, be picked up by larger commercial manufacturers.

“To succeed, makers need a readily accessible source for their products and components; content to help them innovate and general services and support as they look to design, build, and take their ideas into production,” says Wenzel. “The Raspberry Pi Foundation, for example, has created a marketplace that other manufacturers have now entered with competing products, such as Tinkerboard.

“The development of more accessible and affordable technology has helped to grow the market of Makers working with it.”

“New technology has helped to fuel the Maker movement,” agrees Mike Bray, Vice President of RS Component’s DesignSpark. “Driven by a combination of connectivity, data and hardware, RS believes that the market is growing strongly. Over the past twelve months, a lot of new products have appeared that look to broaden opportunities in this space.

“We are witnessing a trend in which Makers are being turned into ‘professional Makers’, not only innovating but commercialising their ideas.”

While some Makers are certainly showing a degree of business maturity, as they look to scale up
in a wide range of application environments, including voice control, speech output, IFTTT integration, sensor monitors and so forth."

A growing number of Makers are seen as looking to try and connect with existing firms and make use of resources, beyond those that are currently available to them. In fact, the Contract Electronic Manufacturing (CEM) sector has become more willing to work with Makers, providing value-added services such as production engineering, as well as low-volume manufacturing.

“We are seeing more manufacturer engagement with the Maker community,” Bray suggests. “More products are coming through from Makers and we need to provide them with a route to market, as well as create supplier interest in what they are doing.”

“The Maker community will only become a strong revenue generating space when Makers are able to take their ideas and turn them into ‘real’ commercial products, that can then be sold in volume,” suggests Wenzel.

With the rise of smart industry and Industry 4.0, there are some who suggest that incumbent businesses are already adopting the techniques and approaches championed by Makers, and while they may look to use Maker creativity and knowledge, they might not need to work with Makers at all.

Bray disagrees: “I believe that our engagement with Makers is deepening and their impact and the thinking around how we engage with them is changing. They offer huge potential and we want to encourage more businesses to come through, via the movement.”

“All distributors are paying more attention to Makers than they did, say five years ago,” argues Wenzel. “We are more aware of their needs, whether in terms of how they create, their working styles and their characteristics.

“There is a huge opportunity here, and by supporting these Makers and young businesses as they get started, giving them the full breadth of experience that we have built up over many years - from optimising designs to managing the supply chain - we can help them succeed, and in doing so create future revenue streams.”

“Today, we find that conversations with manufacturers include how to tap into the potential of the Maker movement, it’s becoming increasingly important,” says Bray.

The Maker movement tends to comprise digitally savvy individuals, who are happy to engage and collaborate with their peers. For many it’s about having access to functionality, rather than about the ownership of products.

They also represent societal trends in which environmental sensitivity is more important and where distributed manufacturing, open and social innovation, and recycling are championed.

The opportunities presented to Makers are not closed off, and those trends are having an impact on Universities, spin-outs and SMEs, who are also taking advantage of a more open and collaborative market, leveraging new technology, services, and the products Makers use.

Engaging with the next generation is certainly an important issue that the Maker movement is seen as helping to address. It is perceived as a means by which advanced economies could reach a younger audience and inspire them to start careers in engineering.

“The Maker market offers a more creative approach to engineering,” suggests Bray. “We need to talk less about STEM and more about STEAM in which the arts, science and technology are brought together.”

So where are we? The Maker movement is certainly helping to develop a more collaborative and participatory approach, but is it bringing the type of disruption envisaged a few years ago?

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Despite economic and political uncertainties, distribution within the UK remains relatively strong, and distributors are in an upbeat mood.

Distributors have seen continued growth for the past 8 quarters and the sector is in a much better position than it has been in a long time, said Adam Fletcher, chairman of both the Electronic Component Supply Network (ecsn) and the Association of Franchised Distributors of Electronic Components (afdec).

Matthew Thorpe, regional sales manager for the UK and Ireland at Premier Farnell agreed. “All forecasts point towards growth over the mid-term, albeit at a slightly lower rate than the global average. The Industrial Internet of Things (IIoT)

The boom continues
Distribution in the UK has been experiencing a prolonged period of growth, but while economic and political challenges mount, the sector remains positive about the future. By Bethan Grylls

and industrial sectors remain a key focus and the market continues to benefit from the UK’s strong engineering heritage.

“We are seeing businesses bringing R&D to the UK to take advantage of this strong skills base, as well as the return of some small volume production, which had previously been moved abroad.” He points to industries like robotics and autonomous vehicles as the main areas of growth, describing the UK as an “exciting place to be.”

Trade deals
With less than a year before the UK leaves the EU, many markets remain uncertain as to how it will affect trade. As for the electronics sector, Premier Farnell doesn’t see any immediate concern.

“We are confident in our ability to supply our UK customers,” said Ralf Buehler, SVP sales and marketing for Premier Farnell. This upbeat assessment comes from a number of investments made by the company. Firstly, a £60million investment in a larger distribution centre in Leeds, and secondly, in its inventory, which Buehler said is reviewed on a continuous basis.

The new distribution centre will service the company’s eight other centres globally, and mean that exports and imports can be minimised. Time-to-market will be unaffected despite the prospect of trade deals posing problems, explained Buehler.

Fletcher points to a marked increase in export sales for UK manufacturing companies, as a result of the devaluation of Sterling, post the vote to leave the EU in 2016.

Currency exchange rates are a two-way sword however. He warned, “While you might be exporting well because your prices are competitive, your input pricing goes up. That will affect your profitability unless you can increase your sell price.”

Buehler is sanguine about the possible impact of Brexit and also over the possibility of a trade war between the US and China, or with the EU. “The global economy is – and has been – dynamic for some time, and we aren’t more concerned about a possible trade war than other factors effecting global trading.”

“The actions of the US Government are a concern,” Fletcher
countered. “but we are very much on the side-lines. We can’t influence it, all we can do is work with it as it comes.”

Fletcher mentioned that care would have to be taken so that products aren’t purchased in the UK and sold into the market to try and get around the duty America has imposed upon China. With regards to US tariffs on European goods, Fletcher hasn’t seen any signs that would lead him to think this may happen, but argues that this position could change.

MLCCs in demand
Supply and demand and component shortages remains a concern.

“At the moment the biggest issue for the components industry is with multi-level ceramic chip capacitors (MLCCs),” contended Fletcher. He described it as a ‘merchant-market commodity product’ – something that is so basic and a component so many make, that no one has ownership over it.

Over the last two decades, capacitor manufacturers have made heavy investment into material science to make denser products, he explained.

The smaller MLCCs like 01005 are popular in applications such as mobile phones, but with the UK’s market focus on industrial, the larger MLCCs such as 1206 are in much higher demand in Britain.

The problem, according to Fletcher, is that smaller MLCCs are cheaper to make and have a wider global demand; and with no real ownership and no one willing to invest, MLCCs like 1206 are becoming obsolete, with demand far exceeding supply.

“We’re going to find that in North America and Europe, growth will be hampered or limited by the availability of MLCCs. If you can’t get the MLCCs, demand for semiconductors, connectors, LEDs and the like, will be affected,” Fletcher stressed.

He admitted that the UK has overcome shortages before, with the likes of memory and processors, but there have always been ways around it. For example, socketing processors in the end-line. “The only answer is to redesign MLCCs,” he suggested.

“On a macro level, the main challenge is the availability of key components,” Thorpe added, “some are on allocation with extended lead times, and we don’t anticipate significant improvements over the next twelve months.”

Trends and needs
The Internet of Things (IoT) has now become a key driver in the market, according to Cliff Ortmeyer, global head of solutions development at Premier Farnell.

AI and machine learning have become new growth areas, reaching into news areas such as transport and healthcare. So much so, according to Ortmeyer, that within the next 10-15 years we could be heading towards a position where this technology will drastically change the way in which we live and interact.

And as the IoT presents new opportunities, Buehler said a new type of customer is emerging: users who do not have prior development experience.

For example, Hanhaa, a London start-up specialising in IoT, has launched a platform, Sumbisa, that intends to enable quick and simple IoT device deployment and data monitoring that is accessible to anyone.

It offers a new approach for developers and IT professionals to build IoT applications by using a Microsoft Excel add-in, and will be exclusively available from Farnell element14.

With the integration of technologies like 5G and automotive, distributors are having to reinvent themselves, becoming ‘technology providers’.

As part of the Avnet Group, Ortmeyer suggests that Premier Farnell is in a strong position to support every stage of the design and manufacturing process, and is well placed to help reduce time to market – a key driver in the distribution market. But not only that, it is also well placed to assist start-ups and hobbyists and meet the demands of this fast-growing past of the distribution market – the maker market.

Fletcher questioned whether this is the type of service customers want. “Most organisations, in my experience, want to have some flexibility. They want to be partners with a range of companies. They don’t just want one partner that dominates from the prototype stage through to commercialisation.”

Ortmeyer disagreed, and argued that the Avnet ecosystem means that “customers spend less time having to identify the right partner or bringing them on board a particular project, all of which will help the customer.”

As for the future, Fletcher is upbeat. “They’ll be no stopping the market. Some shortages will hold us up for a while, but internationally the convergence of technologies like 5G, automotive, connected cities and IoT is going to drive the electronics market for at least the next five years. And it’s going to grow very quickly.”

While there are plenty of known ‘unknowns’ to contend with, from looming international trade wars, to the unexpected twists and turns that make up the UK’s efforts to exit the EU, let alone anticipating how technology will evolve in the coming years, all the distributors can do is watch, listen and prepare for what they think is likely to come.

But despite all this uncertainty, it seems that for now, like Thorpe said, Britain is an exciting place to be.
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At a time when Brexit dominates the political and economic landscape, it’s reassuring to note that the UK’s technology sector remains extremely competitive, and continues to attract venture capital investment.

In 2017, for example, British technology businesses attracted $7.8 billion of funding, almost double that of the previous year and, according to research from Dealroom and Tech Nation, the UK’s venture capital investment remains significantly higher than in either Germany or France.

A report by accountants EY, found there was a 22 per cent increase in digital investment into the UK last year, helping to offset a decline in investment into other sectors such as financial services and logistics, due to worries over Brexit.

However, while the UK saw an increase it compared poorly with the rest of the European Union - where investment in digital projects jumped by 33 per cent.

The decision by the EU’s investment fund, the European Investment Fund (EIF), to close down funding to UK start-ups certainly hasn’t helped, having in previous years accounted for a third of all the investment in UK-based venture capital funds.

Commenting, Steve Varley, EY’s UK chairman, said: “At a time when investor sentiment towards the UK as an attractive destination is weakening, opportunity arises in the shape of digital.” But he also warned that, “An urgent digital drive is needed with a renewed focus on digital skills, infrastructure, and investment in research and development that will help to shape the UK as an attractive environment, and help maintain its competitiveness post-Brexit.”

While the UK may have a vibrant and growing tech scene, funding for start-ups remains a challenge.

The big issue for UK start-ups has always been, and remains, ‘scale up cash’ to help businesses grow. Investors either lack the necessary scale to support these businesses or are taking too short-term a view.

When it comes to raising finance to support start-ups, what approach should entrepreneurs take, if they are looking to engage with investors?

According to those who have worked in or with start-ups, the most important thing is to look at other competitors in your chosen market.

Which technology investment?

Despite Brexit uncertainty, levels of investment into the UK’s technology sector remain strong. But which technologies are attracting investment? By Neil Tyler

Crucially, look at what they’ve done and are doing, and then copy the most obvious processes – key, is to invest your time in what makes you or your product better. That will include talking to the market and finding out whether your product or service is useful or not.

Another important step is to test the market. It’s not always expensive to get good insights into what the market wants or needs, but those findings could prove crucial as to...
whether investors will want to back a business.

As one start-up said, as part of the research for this article, when you are setting up a start-up you should, “Do what you love and do what you find stimulating, you’ll be able to make a reasonable living out of it.”

When it comes to what investors take account of, top of their list appears to be the issue of trust. If an investor decides to put money into a business, that decision will be determined by the team that makes up the start-up.

Traction, or proof of potential success, is also a key requirement. For many investors the strength of your business is not how you would spend any investment, but how much progress you can make without investors and whether your team has the experience to deliver.

One of the biggest challenges, when it comes to investing in technology, is that there are so many different areas to actually invest in.

While there are numerous sources of funding for technology companies in the UK – from venture capitalists (VCs) to the UK Government’s own National Productivity Investment Fund that’s looking to help commercialise research - and the launch of UK Research and Innovation (UKRI), brings a more focused effort to better integrate research with innovation, the number of tech trends is growing rapidly.

Among those attracting most of the investment are companies involved in technologies such as: machine learning, voice, cybersecurity, virtual and augmented reality, cloud computing and data and blockchain.

There is also growing demand for more flexible consumption, or ‘pay as you go’ models, which are becoming more important. This is being driven by the growing connectivity of devices and the Internet of Things (IoT), which is enabling more devices and products to become suitable for ‘as a service’ consumption.

**Investor opportunities**

One of the technologies deemed to provide investors with real opportunities is deep learning, which uses neural networks to self-teach machines that many see as the most important artificial intelligence (AI) technology.

Over the past twelve months, the drive to develop AI application specific chips has intensified, with companies investing heavily in AI research and development.

Among those sectors that are expected to benefit most from AI are healthcare, science and education, according to a report from PricewaterhouseCoopers.

Another key technology is voice, which is expected to start to replace touchscreens and keyboards as the digital user interface of choice. A growing number of manufacturers have introduced a range of ‘conversational’ machines and apps, and by 2020 it is expected that 50 per cent of online search will be conducted by voice, compared to 20 per cent recorded in 2017.

But for voice to be adopted, speech recognition platforms will need to be able to reach 99 per cent accuracy and that seems some way off - Google admits to a 4.9 per cent failure rate in speech recognition.

Cyber security is another area where investments are being made and there is a significant move, within the industry, from passive detection of attacks towards a much more pro-active hunting of threats actors using intelligence. As a result, both AI and unified threat management are seen as key technology trends.

Last month, for example, the government opened a cyber innovation centre in London. The London Office for Rapid Cybersecurity Advancement (LORCA), is intended to help innovative start-ups in the cybersecurity space to grow their businesses.

Commenting, the centre’s director, Lydia Ragoonan said, “We’ll be working with industry to understand their needs and with investors who can help to develop the solutions scale at pace.”

Risks are growing at a time when new tech cycles such as the IoT provide hackers with an increased ‘attack surface’. In response, facial and voice recognition, as well as biometric access technologies could start to take off, as could behavioural analytics.

Investment in augmented reality (AR) is expected to become more disruptive as Microsoft, Apple, Google, Sony, Samsung and Facebook all look to improve their virtual reality (VR) and AR software. VR suffers from a lack of content and as such, is unlikely to meet investor expectations, at least in the short to medium term.

One of the most exciting areas, in terms of development and investment, is in blockchain - a shared, digitised, decentralised ledger - that allows transactions to be recorded, verified electronically and encrypted over a distributed server network.

This year has seen many blockchain technology platforms move from the development phase to pilot phase across a variety of sectors, including the banking, media and industrial sectors.

Many parts of the global supply chain are, over time, expected to start using blockchain technology, for such things as retail payments, money transfer services, consumer lending, crowd funding and real estate transactions.

Figures for investment in the UK’s digital and tech businesses are holding up and as the economy continues to change, so there will be many new businesses and sectors appearing that weren’t there before.

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**At a time when investor sentiment towards the UK as an attractive destination is weakening, opportunity rises in the shape of digital.**

Steve Varley
Never before has it been so important to match innovative product design with an innovative approach to testing and compliance. As technology progresses and multiple capabilities are incorporated into a single product, it is vital that compliance requirements and test approaches are considered from the initial design stage. Pre-compliance work early on in the product design/manufacturing phase, is therefore, vitally important, as any changes can be made sooner rather than later. This approach will avoid retro-fitting at a later stage which is costly and will invariably delay the time to market.

While testing both end products and their components is critical, this can often be duplicated unnecessarily to ‘cover all bases’. This reflects a poor understanding of the intended environment and of the specifications used to determine if testing should be done. Consequently, most will err on the side of caution and often over test their products and systems.

However, you cannot sensibly test for every mode in every configuration that is laid out in the relevant standards, as this would be too expensive and time consuming. Therefore, consider performing testing to establish the “worst case” modes of operation so as to reduce test time and cost.

Take a step back and identify all the possible issues that could occur, but do not take this approach too literally. Are those potential issues mainly mechanical, electrical or EMC/radio emissions or other? For example, the Machinery Directive defines a machine as “an assembly… of linked parts or components, at least one of which moves…”. However, a laptop computer is an assembly of linked parts which move and we would never consider that something that required assessment under this Directive and on closer reading we see there is a specific exclusion for “certain electrical equipment such as IT equipment”.

Counterfeit challenges

The laws of demand and supply are fuelling the significant rise in counterfeit electronic products as consumers increasingly demand cheap goods. This is becoming an issue, particularly for UK and European manufacturers which design and develop products in their own country, but outsource the manufacture to low cost regions.

While they may have checked the quality of their immediate supplier’s operations, they cannot be assured that the various component manufacturers further down the supply chain are as rigorous in their quality control.

Not only can electronic products and components be counterfeit, their testing and compliance documentation can be too. It is, therefore, essential that those importing goods go beyond just gathering test reports.
and certification evidence to ensure that their supply chain complies. Indeed, many retailers send out their own experts or sub-contract expert organisations to audit factories abroad regularly.

As a core reason for manufacturing being moved to countries like China is cost, the ideal scenario of fully and regularly auditing all the suppliers in the chain often cannot be justified financially. A more realistic approach is to create a supply chain matrix, and focus the audits on the high-risk suppliers, and on those in the supply chain responsible for supplying safety-critical parts.

It is also important to ensure that any factory you deal with outside the EU has a Quality Management System in place and is regularly audited by an independent third-party. Do also consider pre-shipment and post-shipment inspections, taking random samples from boxes.

**Wireless complications**
The design of electronic products is becoming increasingly complex and test standards are failing to keep up with these product innovations. Both designers, manufacturers and end users are, therefore, often confused as to which standard, or multiple standards, should be applied.

For example, many integrating wireless systems into their product are relying on the use of wireless modules which already meet some or all of the Radio Equipment Directive (RED) requirements. However, once these modules are integrated into another product, this changes the regulatory requirements as it is the entire host product itself, and not just the module, which now falls within the scope of the RED.

The assumption that no further action is required because the wireless module is compliant as an independent component is therefore incorrect. Despite this, it is worth remembering that integrating a pre-approved module will save manufacturers time and money when it comes to testing the whole device.

Don’t fall in the trap and treat everything like a wireless product. If you integrate a wireless module into a domestic washing machine, the product is still a domestic washing machine and must be treated as such.

**Considering risk**
All European product Directives (Radio Equipment Directive, EMC Directive, Low Voltage Directive etc) now incorporate a requirement for risk assessment. Not only does the risk assessment process ensure that products meet regulatory requirements, it reduces the risk of costly non-compliance, which would require product re-designs and re-testing, and cause significant time-to-market delays for new and upgraded products. Risk assessments can also improve product performance and reliability by reducing the chances of failures, helping to strengthen a brand’s market reputation.

Risk assessments should be conducted at the start of the conformity assessment process, and not at the end, and it must be a continual process that is reviewed with every product modification. Where compliance is shown to be affected, the subsequent risk controls should be established and documented in the technical file before updating the declaration of conformity and/or EU-type examination certification as appropriate.

**Technical file**
A technical file is documented evidence to show that the product properly complies with the requirements of the Directives which apply to it. It can be a traditional paper file, or stored electronically, with hyperlinks to documents. It must also be kept up to date as the product is adapted, which means that the technical file cannot be put away and forgotten, and must be retained for ten years.

The manufacturer must establish the technical documentation, and the importer must ensure the manufacturer has met their obligations. If a product is re-branded, so that there is no traceability to the original manufacturer, then the company which has re-branded and sold the product takes on the responsibilities of the manufacturer, and they must issue their own declaration of conformity and compile the technical documentation to prove compliance.

**An innovative approach**
To expedite the test process, remember that a test laboratory will not be familiar with individual products. Test laboratories see hundreds of product types of all shapes and sizes using multiple technologies, and every manufacturer has their own implementation of test modes. It is therefore important to prepare user manuals for the test software and operation of test modes, ensuring that instructions are crystal clear, including detail such as screen shots and photographs. Also, where setups are complicated, consider attending testing to assist the laboratory in the early stages.

As electronic products, their components and the supply chain becomes ever more complex, alongside a market that is demanding ever more innovative products at less cost, never has it been more important to have a clear product strategy.

This must go beyond design to include target markets, with a compliance test strategy that supports that from the outset. Hoping for the best at the test stage is not a workable solution in this highly competitive marketplace, as re-designs further down the line will be significant both in terms of cost and timescales.

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“Never before has it been so important to match innovative product design with an innovative approach to testing and compliance”
Richard Poate
ELECTRONICS DESIGN SHOW

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A strategic outlook

From identifying key technological developments to managing supply chains, the EMS industry has to contend with a range of challenges, as John Dignan explains.

For suppliers, customers, and associates alike, directional questions to guide their decision-making process are crucial, and for businesses in the EMS space it’s critical to undertake extensive market research and intelligence gathering to ensure that they remain ahead of the market.

For an EMS business, a strategic outlook is vital as it allows it to predict: sourcing, equipment, skill base requirements, and to maintain its competitive position.

For example, when it comes to the technologies that we are preparing our design, development, manufacturing and distribution teams for, Dynamic is looking at: the Internet of Things (IoT) and the shift towards The Blockchain of Things (BIoT); Fintech; Augmented Reality (AR); Li-Fi; Artificial Intelligence (AI) and medical devices.

We believe that the IoT, when combined with blockchain, is set to make IoT devices even more useful by creating a digital record across hundreds or thousands of computers, helping to reduce the risk of hacking. It could usher in a host of new services and businesses.

Supply chain issues

But if we, as an industry, are to meet the needs of our customers, we need to better understand trends in our supply chain and manage them effectively.

Aggressive mergers and acquisitions, especially among semiconductor manufacturers, have led to consolidation and changes in distribution sales models. As a result, end-customers have fewer supplier options and fewer qualified design resources. We expect semiconductor suppliers will continue to win share, and will likely have pricing/margin power over the industry for a number of years to come, and in the chip industry, mergers have created mega-suppliers with considerable power.

When two OCM suppliers merge, there’s a tendency for mature lines to be phased out in favour of newer and more profitable ones and we’ve seen end-of-life notices from OCMs accelerate within the past year.

At the end of the day, OCMs want to satisfy all demand, but they don’t want to get into a situation where they expand and then the market contracts.

Therefore, the reality is that where we once had several choices, we now have one or two, or sometimes a sole supplier.

Passives lead-times are stretching to 30-plus weeks, with some orders quoted for delivery into

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mid-2019. That’s a long time for buyers to live hand-to-mouth. This leads to a ‘bunker mentality’ within the procurement department that double, and even triple, orders to stock up on supply.

The term ‘allocation’ is now back on the table.

Of course, in any scenario when demand exceeds supply, there is an impact on cost, with prices rising at an extraordinary rate. For the first time in years, we are beginning to see price increases in chips, making buyers anxious. Naturally, business is booked well in advance to avoid absorbing an increase, especially in a margin-sensitive business such as EMS.

Being involved in the design stage allows your EMS partner to design the product for manufacture, taking into consideration components that may create a challenge for the Original Equipment Maker (OEM) to secure. Products can be designed with an alternative component, one that could be easier to source, or one that isn’t approaching its end of life or obsolescence.

Technology migration, particularly within the already-volatile memory market, has had a ripple effect on availability.

There is currently a transition in the flash market from 2D to 3D technology. Flash is, of course, the key component in SSDs. This movement is naturally driving a shortage in both flash memory, with a knock-on effect on SSDs.

Demand gradually puts pressure on established technology, such as DRAM, with DIMM modules for servers in short supply at a time where cloud technologies drive demand up for server production.

This shouldn’t be a show-stopper, however. Take a sustainable approach by forging open book and transparent relationships with your OCM partners.

We’re now seeing shortages across a wider range of products such as passives, MLCCs and tantalum and some resistors and diodes. The industry’s largest DRAM supplier, Samsung, is considering increasing its DRAM output, even as it adds capacity for newer technologies.

But how should they do this? Does the OCM add capacity, which is expensive and takes considerable time to ramp-up, to a point where the return on investment is visible? If they don’t add the required capacity, could they run the risk of losing the sale?

And it’s not just the OCMs who face challenging decisions, the EMS buyers do too, as the suppliers and distributors are allocating products, using customers’ buying history as a baseline.

The solution, to reduce or eliminate risk, is to take control of the parts of the supply chain that can be controlled. Work with like-minded OCM partners only, and form a two-way relationship. Develop your supply chain for cost-effective solutions to reduce waste.

Work with your OEM partners to design products with the circular economy in mind, which we at Dynamic EMS see as becoming more important to our EMS business model, and our OEM customers, who now request our company mission statement in regard to environmental issues and/or policies, such as, Just-in-Time (JIT).

We’ve recognised that what we are experiencing currently, is part of a continuous cycle. As this cycle develops, we will see new, smaller component manufacturers emerge and grow. These companies are born as developmental spin-offs from the larger existing companies, with the talent, experience, and resources in place to transform and disrupt the market once more.

So it’s a cycle, do what you can to sail through it with the minimum amount of disruption - change is a business objective, belt up and hold on tight, as it could be a bumpy ride.

Value chain
Manufacturers have moved up the value chain to concentrate on more technically advanced industries or products and look to compete on innovation and flexibility.

Dynamic EMS has looked to reposition itself as more than a company focussed on Printed Circuit Board Assembly (PCBA) dedicated to a build-to-print model – as a standalone service it is no longer valid or competitive within the UK.

In order to remain competitive, businesses need to evaluate where else they can add value along the production lifecycle and they need to embed this service into the company’s DNA. Promote it well to change your target markets’ natural perception of your business.

Over the past five years, innovation has been identified as one of the main drivers of growth. This goes hand-in-hand with continuous reinvention, but also expands out to ensure that, as a company, you are continuously connected to innovation and hubs of technology talent.

By forging strong connections to governmental authorities and through our open-door policy, local authorities, incubators, seed funders, universities, and colleges are able to see manufacturing in action and how we at Dynamic EMS, look to engage with technology and innovators.

While it is a competitive environment and EMS businesses tend to be cloaked in non-disclosure agreements, privacy policies and paranoia, it’s crucial that as an industry we learn to share.

It’s my personal belief that there is enough Total Available Market (TAM) for us all to succeed and grow, but beyond that, perhaps we should continuously consider the health and well-being of the entire industry.

“If we, as an industry, are to meet the needs of our customers, we need to better understand trends in our supply chain and manage them effectively.”

John Dignan
Industry’s Smallest Through-Hole Reed Relay

Industry’s Smallest Through-Hole Reed Relay launched by Pickering Electronics

Tiny footprint reed relays feature very fast operate and release times making them ideal for high speed test systems

Pickering Electronics, the reed relay company which has pioneered miniaturisation and high performance for over 50 years, has announced its smallest reed relay. The Series 124 is part of Pickering’s new ultra-high density 6mm² MN reed relay range product line, which takes up the minimum board area of only 4mm x 4mm, allowing the highest packing density possible. Series 124 relays are also the lowest profile on the 4 x 4mm footprint, measuring just 9.5mm high. Devices are currently available in 1 Form A [energy to make] with options of 3 or 5 volt coils.

Series 124 reed relays feature a sputtered ruthenium switch rated at 5 watts, 0.5 amps. These are the same reed switches as used in the long-established Pickering Series 111, 115P and 115 but are orientated vertically within the package, facilitating such high density.

More Wearable Enclosures From OKW

BODY-CASE

OKW has added a new size M and two stations to its BODY-CASE range of fully wearable enclosures.

BODY-CASE is OKW’s first enclosure that can be worn just like a watch. Each enclosure is supplied with two 18 mm spring bars for a wrist strap. And with an optional fastening kit, BODY-CASE can also be worn on a lanyard, clipped to a belt pocket, fitted to a key ring or carried loose.

BODY-CASE is now available in two sizes: new M (50 x 41 x 16 mm) or the existing L (55 x 45 x 17 mm). The two new stations enable BODY-CASE to be stored conveniently when not in use.

BODY-CASE enclosures can be supplied fully customised to customer requirements.

New military-grade laptop

New military-grade laptop PSU is 90% smaller and lighter, 80% lower cost

UK company, On-Systems, launches revolutionary disruptive technology, delivers new technology platform for harsh-environment PSUs

On-Systems, a young British company that specializes in innovative power supply design for harsh environments, today launched Pebble, a new COTS rugged, 24V single laptop power supply for defence, avionics and mobile applications that is a fraction of the size, weight and cost of current designs. Pebble is the first in a series of harsh-environment PSUs from the company which combine a new topology, custom-designed FET drivers and fast switching speed to deliver industry-changing benefits.

On-Systems’ new topology combines three stages into one, reducing IR losses and increasing efficiency. On-Systems has worked with a leading power semiconductor company to design new very fast FET drivers, allowing the Pebble to switch at up to 40 times typical switching frequencies.

Lowest RDS (on) automotive-qualified MOSFETs

Lowest RDS (on) automotive-qualified MOSFETs by Nexperia launches lowest RDS (on) automotive MOSFETs down to 0.9 mΩ

High efficiency saves space and system cost, ultra-reliable for safety-critical designs

Nexperia, the global leader in discrete, logic and MOSFET devices, today announced the release of the company’s lowest RDS(on) automotive-qualified MOSFETs. The AEC-Q101, Trench 3, 40 V automotive superjunction MOSFETs in the rugged, electrically- and thermally-efficient Trench756™ package deliver a footprint reduction of up to 81% when compared to traditional solutions such as bare die modules, D2PAK or D2PAK-7 devices.

The 0.9 mΩ, 220 A DC-rated BUK9J09-40H MOSFET suits applications up to 1.2 kV and is also lower cost than larger D2PAK devices which were the previous best solution.

As well as reducing RDS(on) the new devices also feature an improved DC current rating of 220 A – a first for the automotive PowerSO8 footprint. This enables higher power density on a small footprint, which is especially valuable for safety-critical automotive applications that require dual redundant circuitry.

NXP i.MX 6Solo5 processor

Computer on module with NXP i.MX 6Solo5 processor

The efuAX5 is another compact and inexpensive module in efus form factor designed for easy interfacing and simple boardbase.

The module offers up to 1 GB RAM, 1 GB NAND Flash, and 32GB eMMC. Available interfaces are 2 x Gigabit Ethernet, 2 x USB, 2 x CAN, 2 x I2C, 2 x SPI, 4 x UART, GPIOs, 2 x SD-Card, 125 or ASIP for audio, PDE as well as analogue and digital camera.

A WLAN/Bluetooth module with chip antenna or antenna socket is an option.

Displays can be connected via digital RGB and LVDS (up to 4WGA).

A resistive as well as a capacitive touch controller can be connected via the 12C interface.

Operating systems supported are Linux, WECl2013/7 and Android. Long term availability to 2025.

Red Pitaya at the heart of radar warning

STEMlab from Red Pitaya at the heart of radar warning and information disaster management system

Multi-function, open-source, reconfigurable test & measurement platform used for waveform synthesis, IF signal sampling & signal processing

Red Pitaya, the company that is pioneering the move to low cost, open-source, reconfigurable instrumentation with its credit-card-sized STEMlab® platform, today announced that a consortium including a members from a major European research organisation, two German universities and industry, is using STEMlab to perform waveform synthesis, IF signal sampling & signal processing on a new radar warning and information system for applications in disaster management (RAWIS) that is currently being developed.

During a search and rescue operation, emergency teams and trapped survivors are exposed to high risk from partially-destroyed buildings and structures which can collapse causing injury. More, the situation is constantly changing as debris is moved. RAWIS will monitor any movement in the disaster environment and warn individual of any danger.

Smiths Interconnect Launches SpaceNXT™ Q Series

Smiths Interconnect Launches SpaceNXT™ Q Series of Coaxial Cable Assemblies

Flexible cables pre-tested and qualified for next generation commercial space applications

London, UK – Smiths Interconnect, a leading provider of technologically differentiated electronic components, subsystems, microwave and radio frequency products, announces the release of the SpaceNXT™ Q series of flexible coaxial cable assemblies. The Q cable assemblies offer many advantages over standard DRP or off-the-shelf (COTS) products: they are pre-tested and qualified for the space environment, readily available cut to length, dual-terminated assemblies, and offered at cost-effective prices.

“The SpaceNXT™ Q cable assemblies benefit from Smiths Interconnect’s design expertise gained from over 30+ years of space heritage, totalling over 300 satellite applications, and 40 miles of assemblies”, says Paul Harris, VP of Sales & Marketing. “They provide our customers with a combination of highly reliable technology, and lower cost of ownership that enable operators to overcome potential market entry barriers while enjoying the benefits of an established technology partner.”

For more information and to visit our SpaceNXT™ Q series page go to www.smithsinterconnect.com

TII, Inc. Acquires Compona AG

TII, Inc. Acquires Compona AG of Switzerland

TII, Inc. a wholly-owned subsidiary of Berkshire Hathaway, today announced the acquisition of privately held Compona AG of Switzerland and the company’s German subsidiary, Cosy Electronics GmbH. Both Compona and Cosy are specialty distributors of interconnect products and provide services such as in-house assembly of specific connector ranges and full support on custom cable harnesses.

The Compona Group is well known for their technical expertise, consistent quality and on-time delivery. Compona CEO, Ret Norell, will continue to lead Compona AG reporting to Glyn Denchey, TII President, EMEA.

The combined revenue and market share of TII and Compona will create the largest specialty distributorship of interconnect, passive and electromagnetic products in Switzerland. Cosy GmbH will expand the TII footprint in Germany while also enhancing value added capabilities and technical expertise. In the face of increasing international competition, Compona’s business will benefit from TII’s broad and deep stocking strategy and global warehouse network.
Widest selection of electronic components

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