Expert view

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OLD TECH

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Efficient IT

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The power behind decisions   DECEMBER 2013

THE 21ST CENTURY POWER RANGERS

How data centres are driving a global IT transformation

Opening shots Shane Richmond

The data centre is truly a wonder of the modern world

LET'S play a quick word-association game. What's the first thing that comes to mind when I mention the following technology brands: Amazon? Apple? Facebook? If your answers were "books", "iPhones" and "interminable privacy settings", then congratulations, you're pretty much normal. However, these companies are also notable for their extraordinary achievements in the world of big data.

While Amazon is best known as an online bookshop that is increasingly becoming an online everything-shop, its global computing system, Amazon Web Services (AWS), might soon be its most significant product. Anyone can use it to store data, run cloud computing programs or host virtual machines. Amazon has built its own computers, data and networking systems and even power substations to ensure that it all runs smoothly.

Costs are low because of the enormous scale of the service, which has more than five times the server capacity of its 14 biggest rivals. It is thought that Amazon spends around $1billion every year on AWS and it is expected to be worth around $50billion by 2015.

Meanwhile, in North Carolina, Apple has been quietly building two vast solar panel farms and a fuel cell farm to generate power for its nearby data centre. One solar farm covers 100 acres and the combined facilities generate 50 megawatts of power – about 10MW more than Apple's data centre requires.

Unlike AWS, Apple's data centre is not available to third parties – at least not directly – but its influence is significant in other ways.

Apple is not the only company with data facilities in North Carolina; Google and Facebook are among the companies that have put data farms there, partly due to low energy costs and high capacity. However, the massive power demands of those other data centres have so far been met mostly by "dirty" power. Apple's effort to generate "clean" power will encourage others to do the same.

Facebook is making similar moves. The 1.2 billion-member social network announced last month that its new Iowa data centre, due to come online in 2015, will be entirely wind-powered. Facebook's data centres are cutting edge because of the company's need to find ever faster ways to collate the masses of information uploaded every second. Google has spent more than a decade solving similar problems.

All of this matters because data centres are important to our infrastructure, and they come with challenges. Their huge power requirements and cooling needs lead to them being sited in remote locations, often where it's cold, or being

built without a roof to release heat. The big tech companies can push the boundaries because only they are dealing with these problems at sufficient scale.

All of which means that if you are considering building a data centre for your own business, think twice. There might be good reasons why you need one but it's likely that your needs could be better met by a behemoth such as AWS.

And the next time Google delivers your search results in a micro-second or Facebook assembles a list of photos of old classmates, think about the massive data operations powering the technological marvels that we take for granted. The data centre is truly a wonder of the modern world.

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Shane Richmond is joining *Business Technology* as its regular technology commentator. Shane travels the world advising businesses on changing technologies and was head of technology (editorial) at Telegraph Media Group.

Twitter: @ shanerichmond

Streamlined systems are back in vogue

BUSINESSES are making their IT more efficient to help shut down wasted energy resources in the office and make their systems cost-effective.

Ashish Gupta (pictured), senior vice president and head of infrastructure services division in EMEA at IT and engineering services firm HCL Technologies, says: "Efficient IT is part of a larger trend about sustainability. We are starting to see a lot of CIOs ask how to reduce facilities or what is it I can do to integrate all the data coming out of these systems in a way that will have a direct cost effect."

A study by IBM, conducted with the support of the UK's Department for Environment, Food and Rural Affairs (Defra), found that, through its green strategy to reduce energy consumption, the firm has saved more than $100million since 1998.

Doing things like switching off a computer at night, choosing energy efficient equipment for the office or putting programs in place to power down idle PCs should all be part of a organisation's strategy to make IT more efficient. But software can also help a firm locate the best places to save energy.

Martin Callinan, country manager at IT asset management software service provider Express Metrix, says: "A lot of technology in offices has accumulated over time, and an IT director might have inherited systems which they were unaware of. What we find is that a lot of customers have old devices, with old operating systems – they actually have the licence rights for later versions, but they do not have the holistic report about where it all is. We provide a view of exactly what is out there and who is using what."

Callinan explains that by reducing the number of applications a company has, it not only becomes more cost effective but is helping the environment.

Efficient IT isn't just a theory, it's a way of life

By Joanne Frearson

EFFICIENT IT is all about using technology in a way that minimises damage to the environment. It concerns how products are manufactured, managed, used and disposed of.

Figures from the Global Agenda Council on Governance for Sustainability, which was established by the World Economic Forum, show the information and communication technologies (ICT) industry currently accounts for 2 per cent of global carbon emissions, putting its carbon footprint on a par with the aviation industry, or the equivalent of 50 million cars.

This figure is forecast to at least double in the next decade.

To make the environment more sustainable, it involves not only creating an efficient IT strategy in the office, but also using technological innovations that will help us in many facets of our lives.

ICTs are being used to develop smart cities to help create sustainable economic development and the efficient use of natural resources. Sensor networks, for example, have recently been used to monitor power levels in data centres.

IBM has up to 40,000 sensors in some of its data centres in North America. Roger Schmidt, an IBM Fellow, says: "We as an industry are putting more and more effort into our data centres to provide a feedback loop for improvement on reducing power and improving performance. People did not look at putting sensors in data centres five years ago."

Now IBM has "different types of sensors and monitoring points, such as temperature, humidity, water flow rate, air flow rate and power on the servers, measuring everything."

A robot was even developed to help with this. Schmidt says: "We let the robot run overnight and it takes a complete set of temperature and humidity metrics, providing a 3D profile of the parameters. You can look at this to determine where your good places and bad places are in the data centre to make improvements."

Smart appliances are set to be widespread in the near future

It is expected that, as smart cities continue to evolve, these types of devices will be used more and more in homes as people increasingly use smart appliances to monitor energy efficiencies.

Ashish Gupta, senior VP and head of infrastructure services division in EMEA at HCL Technologies, says: "We are at the early stages of this trend. You will have the ability in the next 10 years to control almost all electronic devices in your house, including fridges and appliances, using an iPad-type device. It will start to drive more efficiency.

"It is not that far off, but it is still going to take some time. It involves changing old technologies and that is not always cost-efficient."

Some firms are starting to create products in this area to be used in the household.

Angela McIntyre, research director at technology advisory firm Gartner, says: "Appliance manufacturers are participating in these programmes to document the benefits of smart appliances for the household. Smart appliances are being made available first to builders and to consumers through a small number of retailers."

*Expert*Insight

The living, breathing data centre

Why it is worth investing in expert support

INDUSTRY VIEW

Everyone relies on IT, whether it is just to check emails, book a hotel room or run a global organisation, but let's get to the bones of it – all this IT activity has to be performed somewhere and that somewhere is the data centre. It's the data centre behind the operations that is key to providing 24/7/365 continuity of service. We expect the internet to be accessible 100 per cent of the time. It is therefore essential for the data centre to run constantly, but also efficiently.

Data centres are often described as living and breathing entities; they continually change, grow and evolve like human beings. Once conceived they are designed, built, created and nurtured for the rest of their working lives. A data centre has certain needs to allow it to function; it needs food (power to operate) – this allows it to keep cool and perform its functions. Nurturing is a must to ensure that it can function efficiently and continue to thrive while being able to embrace new experiences, or technology that it is subjected to; like new energy-efficiency tools and measures. Steps

need to be taken to increase energy efficiency, especially as only a fraction of the energy required to run a data centre is used to actually deliver a service.

In addition regular auditing and performance analysis check-ups ensure that the data centre continues to operate at optimum levels, and therefore keeps functioning healthily; liken this to a regular workout at the gym. A fit person is more energetic and therefore more able to take what life throws at them. If a data centre is looked after and fed with clean and healthy food, then it has greater immunity and is therefore better protected from possible illnesses. Above all, the data centre needs to keep fit and healthy to ensure the entire entity is fit for purpose.

Of course, in order to build, manage, maintain and achieve efficiency within a data centre there is a need for professionals who know and understand how it ticks. Like any specialist career, individuals need to be professionally trained to ensure that they have the appropriate skills, knowledge, qualifications and certifications to prove they can excel in the job. The risks of relying on unqualified individuals are potentially huge when you consider the astronomical costs associated with outages. When this is at an average of more than £6,788 per minute for enterprises where the

data centre is core to the business*, who can afford to take this risk?

With a team of professionally trained, qualified and certified individuals, the risks are significantly reduced and data centre managers can feel confident that their staff and data centre are totally fit for purpose. When you also consider the impressive return on investment you can gain from utilising trained staff, surely the

answer to having a healthy and efficient data centre is having trained, qualified and certified employees who you can rely on to deliver consistent results.

Andrew Stevens is CEO/managing director at CNet Training
01284 767 100
www.cnet-training.com
Source: Ponemon Institute based on current exchange rate from US dollars

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*Expert*Insight

Data centres have to provide optimum performance

Helping customers identify the right solutions for their needs

INDUSTRY VIEW

As we increasingly consume cloud services, social media applications and shop, bank and work online, the demand on data centres to manage, process and store this data also grows. Ensuring the optimum performance of the data centre at all times is therefore critical. Ask any service provider, and they will tell you that a significant chunk of their budget and resource is continuously invested into avoiding system downtime.

The causes of data centre power outages can be hard to predict: human error, equipment failure and external power disruption are all unpredictable. But there are some measures operators can take into account when designing their data centres that can help to maximise the resilience of their infrastructure from the outset, and potentially future-proof their facilities from any changes to the ageing power distribution network. Data centres need to protect their power supply

so that, in the event of a mains failure, servers keep on running and users do not experience any service interruptions. Most commonly, this power protection comes in the form of Uninterruptible Power Supply (UPS) systems, which provide continuously clean power into the data centre, even in the event of a total power failure.

As winter approaches and we are faced with increasing warnings about the risk of both short and long-term energy shortages, now is a good time to think about the power structure that supports data centre operations. It is no secret that the National Grid is struggling to meet current demand, with little significant increase in power generation capability planned in the next decade other than from renewables (particularly wind-generated).

This impacts on the stability of the National Grid, with increased grid-switching (increasing risk of micro-breaks and voltage dips) and the requirement for larger power consumers to take themselves off-grid during times of peak demand.

This is the ideal opportunity for data centres to consider smart grid technology and on-site power generation as an alternative to reliance on traditional grid supply. Energy efficiency, cost-savings and demand-response payments from the suppliers themselves are just some of the incentives for large power consumers such as data centres to move away from complete dependence on the grid. Embracing new technology such as Super-Caps, DC flywheels and lithium-ion batteries as forms of

Renewable energy sources can help prevent power outages

energy storage, combined with UPS, generators and solar panels will make data centres of the future efficient, resilient and environmentally sound.

Riello UPS manufactures products designed to ensure power quality and business continuity, guaranteeing a clean, reliable power supply and system performance even in the event of critical situations. Our approach is based on helping customers identify the right combined UPS solution for their needs – whether they are running a data centre or any other operation where a continuous electrical supply is vital.

Leo Craig (left) is general manager of Riello UPS
0800 269 394
www.riello-ups.co.uk

GETTING From A TO GREEN

Technological advances in IT efficiency mean logistics can be both less costly and more environmentally responsible

By Joanne Frearson

MORE than two thirds of transport-related greenhouse gas emissions are from the road in Europe – but technological solutions are being implemented by companies to clean up the sector and make it more efficient.

Emissions from transport have increased by 36 per cent since 1990, according to the European Commission. Overall it is responsible for around a quarter of EU greenhouse gas emissions, making it the second-biggest emitting sector after energy.

Technological solutions used by companies include sensors in delivery trucks, which can give them the best route to a location, while mobile applications are making it more efficient to find park-and-use car-sharing services.

Video conferencing is encouraging companies to interact without the need to get on a plane and travel.

Jim Gown (inset), chief sustainability officer at Verizon, says: "We are taking transportation to the next level by finding ways to keep things off planes and putting them on boats and taking things off trucks and putting them on rail."

Route optimisation technology is helping Verizon cut down greenhouse gas emissions in transport.

Gown says: "It is about getting the right person to the right location, with the right inventory in the most efficient way."

Route optimisation uses a combination of GPS and telematics or ICT. The technology tells Verizon where their vehicles are, what skill sets the technicians driving them have, and what product inventory they carry, as well as information about the car or truck.

"We have over 20,000 Verizon technicians that are on the road at any given time," says Gown. "It is also helping business customers who have fleets of cars focus on what is idling and give them the best route optimisation.

"It looks at how well the engine is performing with on-board diagnostics and communicates this back and forth in real time with the office.

"It is an IT application that is in its immature state. I think there is a lot of potential for this application from an IT perspective and as a telematics solution. That is how I see IT software bringing change that is a shade of green. That is a sustainable operation and we can say we drove shareholder value because we took care of the customer more quickly."

Consumer goods firm Kimberly-Clark, which has well-known brands such as Kleenex in its portfolio, also uses technology called the i2 Transportation Management solution to operate a league table, which ranks available carriers according to the lowest cost per route.

The i2 Transportation Management solution keeps an up-to-date record of all prices offered by all carriers per route at any one time and then, as orders come in, it automatically offers the contract to the lowest price carrier.

If this carrier is unable to fulfil the job, the software automatically forwards the order to the next carriers, until the best available price for the route is obtained.

The company has estimated that it will save £1million a year by allocating transportation contracts more cost efficiently, route by route. Kimberly-Clark also estimates that its £1m cost-efficiency saving corresponds to a reduction in mileage of 380,000 miles and a reduction in CO2 of as much as 540,000kg.

Peter Surtees, European supply chain director of Kimberly-Clark, says: "When we reduce the number of miles travelled on the company's behalf, we directly contribute to a reduction in CO2 emissions."

Greenhouse gas emissions created by people who have to drive around to find a parking space can also be reduced by using a mobile device to prepay for parking.

Molly Webb, head of smart technologies at The Climate Group, says: "Parking is an example where mobile phones are starting to have an impact in cities, where someone can book and pay for a parking space on their phone."

She explains: "Thirty per cent of traffic in cities comes from people circling the city looking for parking space. You can tackle something like that with some very easy fixes."

Applications can also be used for car sharing to help reduce emissions. The average car owner leaves their car idle 23 hours a day, so sharing schemes could dramatically reduce the number of cars needed per person.

Webb says: "There is the whole area of infrastructure-sharing such as car and bike sharing. Technology has enabled social trust. We now have apps that allow you to feel confident in doing that. We want to be able to use infrastructure more efficiently without having to use a major engineering fix."

Companies are curbing the need for travel in the workforce by using video conferencing for meetings. IT and engineering firm HCL Technologies has seen an increase in clients wanting these services to reduce the need for travel. Gown says: "I think any step towards making companies and individuals less labour-intensive and more virtual is a step towards a sustainable operation."

Transport contributes a large amount to greenhouse gases, and technology that can combat this, and can help make delivery routes quicker and parking easier to find, will help reduce transport's carbon footprint.

Verizon is using route optimisation technology to cut down energy consumption

IT goes nuclear to bridge the power shortage gap

PLANS have recently been unveiled for a brand new nuclear power station in Britain. The two reactors at Hinkley Point C in Somerset will, according to the government, help make the UK IT industry more efficient and sustainable, reports global data centre information portal DATACENTRE.ME.

Hinkley Point C is the first new nuclear power station to be built in the UK in 20 years, following an agreement between the UK government and a consortium led by French energy company EDF. It will provide a stable source of clean power from 2023, generating enough electricity to power nearly six million homes, or an area twice the size of London.

The new nuclear power station will also reduce the UK's emissions by nine million tonnes of CO2 per year, helping to meet climate targets.

Caroline Hitchins, owner and founder of DATACENTRE.ME, says: "According to the government, establishing two brand-new nuclear facilities at Hinkley Point will go a long way towards meeting the ever-rising energy demands of the IT sector.

"We are told that nuclear power has a decided advantage over sustainable energy in that it does not rely on environmental factors to work properly and it does not pollute like traditional fossil fuels. We are assured that nuclear energy offers a good alternative source of power for data centres, collocation facilities and web hosting companies.

"The UK leads Europe in nearly every IT category, including data centre construction, colocation, high-speed internet and fibre optic infrastructure. Whilst it may be extremely costly to build the nuclear power plants, some consider them vital if the UK is going to meet the booming energy demands of the future.

"In a world increasingly more dependent on cloud computing, virtualisation and on-demand IT services, we are assured that nuclear power is the most cost-effective and sensible solution."

Hinkley Point C news conference

Secretary of State for Energy and Climate Change Ed Davey (second from left), speaking to reporters earlier this month

Expert Insight

A promising future for international investors

Turkey enjoying the benefits of being the fastest-growing economy in Europe

INDUSTRY VIEW

The Turkish economy has been robustly growing with an annual average growth rate of more than 5 per cent over the last decade. As such, Turkey has been the fastest-growing economy in Europe and one of the fastest-growing economies in the world. Turkey's proven record of economic success over the last ten years has impressed and encouraged many experts and international institutions to make confident projections about Turkey's future. For instance, according to a report issued by the OECD, the Turkish economy is expected to grow with an average annual real GDP growth rate of 5.2 per cent between 2012 and 2017, standing out as the fastest-growing economy among the OECD countries.

Thanks to its geographic position at the crossroads of Europe, Asia and the MENA region, its population of 76 million people – more than half of which is under the age of 30 – and, along with its young, dynamic and well-educated workforce, Turkey has emerged as a safe harbour for international investors. Its vigorous economic growth has made Turkey one of the most attractive destinations for foreign direct investment (FDI) in the world. Turkey has received a tremendous amount of FDI over the last decade, attracting around US$123 billion, more than US$11 billion of which was in the ICT
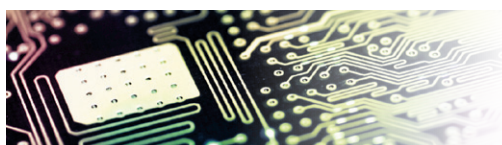
sector, accounting for 8 per cent of the total FDI.

Turkey offers vast opportunities with its dynamic and rapidly growing domestic market for international investors, and its ICT spending is projected to increase in parallel with the positive GDP trend in the future. ICT spending in hardware, software, IT services and the telecommunications sectors in Turkey is forecast to reach US$25billion by 2016. Owing to its young population and people's incremental interest in new technologies, the ratio of internet users is projected to rise to 47 per cent by 2017, up from 42 per cent. Similarly, mobile phone subscription and 3G use are expected to increase, reaching a 3G coverage ratio of 91.3 per cent by 2017, up from 88 per cent in 2012.

As a result of Turkey's investor-friendly policies in the last decade and its appealing investment opportunities in the ICT sector, global giants have shown great interest in Turkey. For instance, Ericsson, Huawei and Vodafone Group have established their regional R&D centres in the country. Besides, many global companies relocated their regional headquarters to Istanbul; for instance, Microsoft manages 80 countries from its office there. Similarly, Intel, Verifone and Ericsson have their regional headquarters in Turkey, managing 67, 30 and 22 countries respectively.

The ICT industry in Turkey has been one of the top industries benefiting from infrastructure investments from both public and private sector over the last decade. Turkey has more than 200,000km of fibre-optic cable infrastructure, which is expected to grow very rapidly over the next years, and population coverage ratio of broadband services is 98 per cent in the country. In 2012, a total of more than US$2.9billion investment was injected into the telecommunications sector, up from US$2.8billion in 2011.

Turkey's advantages in the sector are not limited to efficient hard infrastructure, but also include available lands and spaces for new investments with lucrative government incentives. One of the most important advantages government provides to investors in the ICT sector is technology development zones (TDZs). These zones are designed to support software development and R&D activities and attract knowledge-intensive investments. TDZs offer ready-to-rent office spaces and infrastructure facilities. Software development and R&D activities in TDZs are exempt from corporate and personnel income taxes, as well as VAT for the sales of software produced exclusively in TDZs. A 50 per cent reduction in the employer's share of social security premium is also available in TDZs.

R&D projects, steered out of TDZs with a minimum of 50 personnel, can benefit from R&D incentives. Incentives for R&D include exemption from personnel income tax and reduction in social security premium and more. R&D projects do not only benefit from tax and social security incentives, but also grants which are provided by TUBITAK (Scientific and Technological Research Council of Turkey).

Apart from grants and incentives, Turkey offers appealing opportunities such as special governmental projects in the sector. Turkey's high-tech education initiative, the Fatih Project, is full of opportunities for technology companies with

Turkey's IT infrastructure has more than 200,000km of fibre-optic cable at its disposal

its large-scale and huge market value. Spanning over four years, the Fatih Project envisions utilising high-tech devices to increase the quality of public education by equipping students in pre-school, primary and secondary education with tablet PCs and classrooms with interactive smart boards.

The project is estimated to create a market of about US$7billion over the first four years. The Fatih Project presents opportunities on such a scale that a technology firm can potentially leap ahead of its competitors. Around 12 million tablet PCs would be distributed to students nationwide within the first four years, to be followed by 1.5 million units per year afterwards. The project includes installation of smartboards in 620,000 classrooms. Global investors can both contribute to and benefit from such a promising project.

According to the *ISI Emerging Markets Report*, the information technologies market in Turkey is expected to grow by an annual average rate of 12 per cent, while the software market will grow by 14 per cent annually between 2012 and 2017. In order to ensure a continuous growth in the sector, the government has embarked on realising grandiose targets to be achieved by 2023, the centennial of the foundation of the Republic of Turkey. Some of these ambitious goals include increasing the sector's share in GDP to 8 per cent from 3.9 per cent, reaching an ICT sector size of US$160 billion, which will require an annual market growth of 15 per cent, and increasing R&D expenditure to GDP ratio to 3 per cent, up from 0.85 per cent.

In a world economy that is facing many uncertainties and sluggish demand, most investors prefer to adopt a wait-and-see attitude and look for safe harbours. With its young population and dynamic economy, Turkey offers ICT investors many opportunities in a promising future.

info@invest.gov.tr
www.invest.gov.tr

How to save the real world by moving hardware into the virtual one...

VIRTUALISATION and cloud computing are helping businesses become more efficient at managing their IT services, as well as decreasing their carbon footprints. Virtualisation allows computers to run several operating systems at the same time, so businesses do not have to buy a hardware server each time they need a new application.

Roger Schmidt, an IBM Fellow, says: "I think businesses around the world are realising the opportunities that are there and the cost improvements that can be achieved through virtualising. Everyone is being pushed on costs now.

"You really do not want to put out a new piece of hardware from every application that comes across from a business. It keeps adding energy to your data centre that has to power that new application. This is very wasteful.

"Now you can create virtual machines without the need to buy hardware. It is agile IT, faster, better, and at a larger scale" – Ratmir Timashev

"If that application can be virtualised and you have servers that are sitting idle, you can add more applications to that and you can save a huge amount of power, because you do not have to add a new piece of hardware. That's the crux of the whole thing."

By reducing the amount of power a system uses it also makes it a lot more environmentally friendly.

Ashish Gupta, senior VP and head of HCL Technologies' infrastructure services division in EMEA, says: "Virtualisation combines inefficiently used resources into one box. Firstly, this creates savings on the amount of servers you need. Secondly, the space used is quite

low; and thirdly, as power is reduced the carbon footprint is decreased. These are the reasons why virtualisation is catching on."

Research, according to Ratmir Timashev, chief executive officer of Veeam, has shown that through virtualisation, a computer will be using 60 to 80 per cent of its resources, while by just using hardware only 10 to 20 per cent of its resources are being used.

Timashev says: "The demands for business are constantly increasing, businesses need to provide new services to customers. These services have to be provided in a very efficient way and they have to be provided quickly because of competition.

"Data is growing exponentially. People are demanding more and more services and using more devices. They want to be able to access data 24/7 from any device. That puts lots of pressure on IT to provide all these services. Virtualisation makes this possible for IT to react quickly to business needs."

Setting up new hardware servers to put applications on can also take time, and companies may lose out on providing important services to their customers if they are not in a position to respond quickly.

"Businesses need more services for their customers, better

services and faster services," Timashev says.

He explains that if a company decided to buy a new server and applications and then configure everything this could take months, if not years, whereas "with virtualisation the service can be provided extremely fast within maybe hours, if not minutes.

"Now you can create virtual machines without the need to buy the hardware and configuring hardware – your virtual machine has already been configured and you can just start it and provide the service to the business. It is agile IT, faster, better and at a larger scale."

As data centres get more costly to manage by companies on their own, more and more firms are turning to the cloud.

Schmidt says: "Bigger data centres are getting bigger, client businesses are growing, the smaller data centres are disappearing – they just do not have the skills to run data centres anymore in their own business. A lot of this is being turned over to the bigger data centres and the cloud. If you have a skilled workforce operating a data centre in the cloud, you can really start to do stuff that probably the client in a small data centre could not do."

Virtualisation and the cloud are reducing the carbon footprint of companies, and can help them use IT resources much more efficiently and respond to their clients' needs quicker.

BizTech's C-SUITE spot

How the USAF made Tom Davis a better CTO...

By Joanne Frearson

A STINT in the United States Air Force and a tongue-lashing by a drill sergeant for marching 50 airmen back to the barracks helped Tom Davis, chief technology officer (CTO) at LANDesk, take the initiative and concentrate his career in IT.

Davis says: "The military has lots of rules and regulations, but it is very ripe for anyone who is willing and capable of stepping up to take the initiative."

He once marched a group of 50 airmen back to the barracks as they did not know where their drill sergeant had gone. "Some of the other drill sergeants gave me quite a tongue lashing," says Davis. "But as they walked away they were giggling about the fact that I had done this on my own. It was a good opportunity for taking the initiative."

Back on civvy street, Davis has applied what he learned in the military to his career. At LANDesk Davis is currently focused "on the idea of helping IT become more effective and more efficient.

"IT is changing due to the explosion of different technological devices – mobile phones, iPads, tablets and laptops. People now are always connected." To make IT more efficient following the upsurge in devices, Davis explains that "we are empowering the end user" to take their own initiatives and solve the problems they face.

One way LANDesk does this is through applications. He says: "Users want a device they can interact with and an application that does something productive for them.

"Application delivery is really important and can take many forms – how you deliver an application on an iPad is very different to how you deliver an application on a desktop computer.

"It is different if you have a virtualised environment. We support many methods for delivering applications – we give the IT end-user choice in how they want to approach, deliver, maintain and support their applications."

At LANDesk, end-users can get services from IT and, conversely, IT can publish services to them. They can collaborate with one another on finding problems or getting answers to their own problems. He explains this makes IT more efficient. Another big growth area that Davis believes will help IT is the cloud, while mobile

Below: Tom Davis' experiences in the US Air Force helped focus his IT career

devices will become more capable as more business applications are delivered on them. To understand what customers want from their devices, end-user data is filtered back to LANDesk to provide the firm with information on how to make them more proficient.

"From what we are doing in IT, the most interesting things that we often find are the things that we had no idea about," Davis says. "It is not monitoring the things that we know about, but asking questions that we had not considered in the beginning.

"Collecting that information, running analytics and looking at data visualisation are really ways for us to see trends in how users are using it. The cloud, mobile and data visualisation are the three things that I think will really help change the future of IT."

By looking at what the end-user wants and making services that are more effective for them to use makes IT more efficient. It is all about taking the initiative and helping people solve problems to changes in technology.

ExpertInsight

Data centres are at the heart of everything we do

Over the past couple of years the term "data centre" has begun to be used in the general media. With the mass adoption of mobile devices, cloud services and e-commerce, the general public has been introduced to the terminology, and given some idea of the purpose they serve.

What is a data centre?

Any facility that contains computing equipment with its own dedicated power and cooling systems. There is no minimum or maximum size. Most of the talk in the media, and within the data centre industry itself, is about the big projects; facilities the size of several football pitches and housing thousands of cabinets. However, most data centres are considerably smaller than this and many organisations operate their own business-critical facilities in-house.

What do data centres do for us?

Certainly here in Britain we are totally dependent on data centres. Quite literally everything and anything you can think of will have a level of dependency, so here are a few to get you started: all mobile technology, phones and tablets; all email and cloud services; all forms of electronic payments for your groceries, your wages, your direct debits, mortgage, rent, council tax; and all centralised transport systems, such as the Underground, air travel and trains.

Data centres use lots of power

Compared with a normal office block or residential property, data centres use vastly more electricity. A large facility housing 1,000 moderately loaded cabinets with a good PUE of 1.2 uses 42,048,000kWh per year, equivalent to 8,409 households.

There is no denying that data centres do produce a lot of CO2, but let's put the numbers into perspective. The highest estimates for northern Europe's data centre energy consumption are around 65tWh. This produces around 32,500,000 tonnes of CO2 per year. In comparison the lowest estimates for CO2 produced by Europe's air travel is 125,000,000 tonnes of CO2 per year.

What is the most important aspect of a data centre?

This will depend on the owner-operator's

Although an agricultural industry in a developing country, many Kenyan flower farmers are already dependent on data centres

motivators and drivers but, as a generalisation, the most import aspect of a data centre is its ability to stay "on". This is usually referred to as uptime. Most facilities are designed to provide the highest level of availability or uptime they can, within certain constraints, with the major constraint often being budget. Uptime is achieved by building resilience into systems.

What is the future for data centres?

Data centres are here to stay. As we all become more dependent on technology – in particular mobile technology – data centres will sit at the heart of everything we do.

The thing I would like to see in the future is a focus on reusing the heat produced by the IT hardware and the use of renewable energy technologies to power data centres. Future-Tech has designed and built several data centres that can reuse the heat they produce.

To learn more about data centre design, how to ensure resilience, energy efficiency and provide less carbon intensive IT services, contact us.

James Wilman is sales and marketing manager at Future-Tech EMEA. He sits on the British Standards TCT/7/3 expert panel which is working on the new data centre design, construction and operation standard.
info@future-tech.co.uk
www.future-tech.co.uk

"Things will change a lot, in a way we are not used to"

The world is rapidly becoming dominated by technological advances – and to reap the benefits we must keep up, Professor Tyler Cowen tells Joanne Frearson

DOWN the phone I can hear the lively voice of an eclectic man. I am talking to Professor Tyler Cowen, who occupies the Holbert C. Harris chair of economics at George Mason University in the US. Our conversation covers a bewildering range of subjects, quickly moving from his visit to 10 Downing Street to the best places to eat in London and Haitian voodoo art, which he is a particular fan of.

Cowen's background is impressive. He has a PhD in economics from Harvard, where he was mentored by the 2005 recipient of the Nobel Prize in Economics, game theorist Thomas Schelling.

But the real reason I am interviewing him is to talk about his book, *Average Is Over: Powering America Beyond The Age Of The Great Stagnation*, Cowen's follow-up to his bestseller *The Great Stagnation*. It is a look at the other side of what happens when IT is used to improve business efficiencies, the impact it can have on society, and what we should be doing about it.

"If your skills are complementary to the computer then your wage and labour market prospects look cheery," says Cowen. "But if they aren't things are likely to be worse. A lot of procedures can now be automated at a much lower cost. Things we never would have thought of five years ago can now be done by software.

"If you look at education there are now programmes that can grade essay exams. It is not quite there yet, but three years ago who would have thought there would be software that could grade exams?

"I think in the next few decades there will be a lot more dynamism and artificial intelligence, smart software and robots will do a lot more things. Things will change a lot, in a way we are not used to. It will be very exciting, a lot of positives, but also a lot of challenges. In my book, I am partly telling people to get ready for this. It is starting to come."

Cowen thinks new technologies are helping countries emerge from the great stagnation. He is renowned for his theories on the global economy, visiting Downing Street in 2012 to present his ideas on the slowing down of productivity.

Although he claims new technologies are helping drive economies, he believes it will only lift "some people" out of stagnation. According to Cowen, the middle class is thinning out due to the rise in automated services, and he predicts those that can market themselves using technology will do best.

He says: "The notion of how you put yourself forward, you have a lot more wealthy people say in London or New York, but the number of hours they have a day is never going to go up. What works in getting their attention? I think this is a big economic problem.

"That is what more and more people are trying to solve. The media too, they measure value very rigorously in terms of website hits and what is the most emailed article – what can you do other than put photos of kittens on your front page that can get readers attention?"

Social media is one tool Cowen says people can use. He started an economics blog called Marginal Revolution, which he writes with co-blogger Alex Tabarrok, that is regularly ranked among the top three economic blogs, and gives a running analysis and commentary on what is going on in the world.

Cowen says changes will be needed in the education sector for people to transition effectively into this efficient technology environment. Although he expects costs in the long run it will be a much more positive scenario.

"Education should be matching how the job market is changing," he says, "but in reality it changes much less rapidly and is more bureaucratic. That is a big problem. The quicker the world is changing the more important retraining and flexibility become.
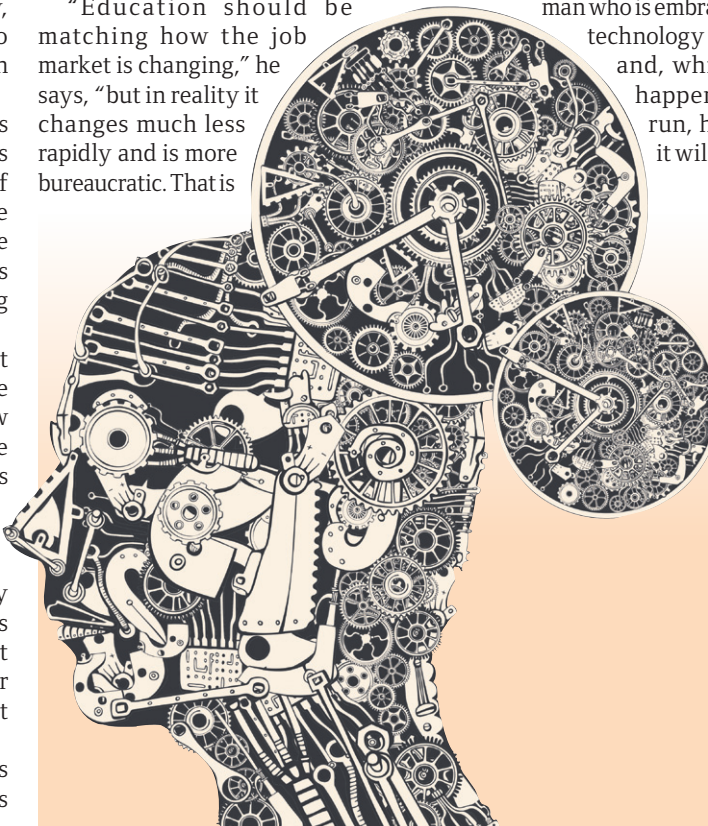
"It is not a task of picking exactly the right curriculum and sticking with it for decades. It is a question of getting students in a position when, after they are out of university, they can adjust, they can retrain, and those skills tend to come at earlier ages.

"The education sector should be more like the tech sector, more dynamic. If someone asks, how do you solve the problems of the tech sector, it is not to produce the one product, it is to make it more competitive and dynamic. We are seeing some of that, the amount of innovation in education now is much greater than 10 years ago. It just takes a long time to get it working."

A rise in efficiencies in technology is likely to make certain jobs redundant and unless people embrace these changes and become more educated about them it is possible they will be left behind.

The conversation turns from educating the world about technology and economics to how to pick an efficient restaurant. Cowen has produced several books on the subject, including an ethnic dining guide for the Washington DC area and his book, *An Economist Gets Lunch: New Rules For Everyday Foodies*. He's a man who is embracing this new technology environment and, while costs will happen in the long run, he's confident it will be positive.

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Trimming the IT wasteline

Thousands of tons of perfectly efficient IT power is ending up in landfill – but Computer Aid International is diverting it to better causes...

By Joanne Frearson

THERE is a buzzing sound in the meeting room of not-for-profit firm Computer Aid International. The room looks out to a storage area where volunteers and staff members are busily working refurbishing computers to send to developing countries.

There is a shipment ready to go to Chile, where Computer Aid International has a partnership with the Chilenter Foundation to provide disadvantaged groups and schools with PCs. Other countries the charity sends to include Kenya, Nepal, Liberia and Malawi, where computers are used in orphanages and universities, as well as to provide doctors and nurses in remote areas with training.

The charity has a long list of high-profile names behind it. Buckingham Palace, the British Museum, British Airways and Telefónica all donate their unwanted PCs to Computer Aid International.

The good news is, this is not only helping developing countries, but it is also helping the environment by providing a way in which companies can dispose of their IT systems more efficiently.

E-waste is a major issue globally, and by donating PCs to Computer Aid International it has a much lower impact on the environment. E-waste has been identified

Above right, top to bottom: E-waste is a fast-growing environmental concern; Nurses e-learning in Nakuru, Kenya; Schools in Africa are benefiting from Computer Aid's efforts. Below: Children in Liberia learning on recycled PCs

as one of the fastest-growing waste streams in the EU, according to a report from the European Waste Electrical and Electronic Equipment Directive.

It constitutes 4 per cent of municipal waste today and is increasing by 16 per cent to 28 per cent every five years – three times as fast as the growth of average municipal waste.

The consequence of e-waste is the release of greenhouse gases and air pollution from processing hazardous and toxic materials which can be dangerous to human health. Empirical research has shown that the production of each PC uses 22kg of toxic chemicals, 240kg of fossil fuels and 1,500kg of water.

Educating companies and people about what should be done to help reduce e-waste is one of Computer Aid International's major causes, and the charity's policy is it is always better to reuse than recycle.

Suzanne Featherstone, director of fundraising at Computer Aid International, says: "We've all got to up our game and not pollute the world. The number one aim is to reuse rather than recycle to make sure we get the maximum benefit of a single bit of metal or plastic which is inside the computer. During a computer's lifecycle we

are trying to get the maximum amount of use out of it."

Statistics from Computer Aid International show if you reuse a PC it gains another three to four years' lifespan, which amounts to 20 times more usage than just recycling. "As time goes on, the cost of production and getting a new item produced can be high in terms of the Earth's resources," Featherstone says. "There are lots and lots of resources on the Earth, but they are getting more and more difficult to get to. That is something to bear in mind when we decide what areas we should be recycling in and whether we should use a new or refurbished PC.

"What we also need to look at is the amount of energy it takes to dispose of something. It is a bit like when we put out our domestic recycling – you've got to look at what happens to it next. Things like plastic can be broken down, but it takes a lot of energy to do that. How much energy are you going to expend recycling a computer?

"If you can reuse, it is much better than going straight to recycling if you think about what happens otherwise. If we reuse we are protecting natural resources, maybe only for a couple of years, but we are still building that layer of protection for the environment. That gives the environment more time to sustain and protect itself from human activity. We've got to look at it holistically."

The European Union has legislation in place so countries in the region dispose of electrical equipment appropriately and all member states have been asked to impose criminal sanctions for any illegal import of e-waste by February 2014. The EU has also set targets for countries that they must reuse or recycle 85 per cent of their e-waste by 2019. A researcher at Computer Aid International says: "The trend is to apply the principal of producer responsibility and put the onus back on the companies, as well as to encourage them to reuse rather the recycle."

Computer Aid International advocates that producers should pay for the end-of-life management of their goods, shifting the financial and environmental burden of e-waste away from vulnerable communities and incorporating the cost of this technology into the product price.

However, not all countries have e-waste policies in place, and Computer Aid International is working to help educate developing countries about the harmful environmental impacts of end-of-life ICT equipment. The charity has formed a strategic

Above: Recycled PCs can gain another three to four years extra lifespan. Below: an old laptop gains a new lease of life

partnership with the Waste Electrical and Electrical Equipment Centre in Nairobi, Kenya. It has also worked alongside the Balkans E-waste Management Advocacy Network to tackle the e-waste problem in the West Balkans through improved policy and practice across the region. The network is funded by the European Union.

The researcher says industrialised countries in Europe can work in parallel with developing nations. "There is a general trend of increasing consumption for ICT in industrialised countries, but they are disposing of their devices every three to four years. In developing countries they need computers, and it is really important to reuse PCs which are not at the end of their life."

Solar-powered internet cafés which are housed in shipping containers are also being provided to remote areas to help developing countries.

Chiao Kwan, marketing and PC donations officer at Computer Aid International, says: "The solar-powered internet hub it is kitted out with 10 to 12 computers and sent to rural areas of countries where there is hardly any access to electricity. These help the community to get online.

"We have one in a refugee camp in Kenya where there are so many people that do not have any access to the internet. They want to get online and search for missing relatives as well as learn IT skills. Doctors and nurses also use them and it provides them with e-learning training.

"We have agricultural projects as well – the farmers can use the computers to check the weather update, forecasts and get advice on crop treatments.

"Reusing computers by shipping them out to developing countries not only gives people access to services they never would of got otherwise, it is also making IT more efficient. Reducing greenhouse gases is imperative to protecting our environment, and using computers for as long as possible is one way society can do this."

Cool IT down

To embrace efficient IT, data centres need to come out of the office cupboard, says Simon Campbell-Whyte

ONLINE shopping, emailing colleagues, searching on Google and using cloud applications for businesses are all things we take for granted. But each time we use the internet it involves at least one or more data centres, and if they are not designed correctly they can release greenhouse gasses that impact on the environment.

The data centre industry is an emerging area and standards are still being developed to make sure centres are being managed appropriately. To help make sure standards are introduced, the Data Centre Alliance (DCA), a not-for-profit industry association based in Europe, has been formed to promote the adoption of best-practice design and operational standards for data centres as well as act as an accreditation body for these.

It is presently working with the UK's Department of Energy & Climate Change (DECC) to try to help make data centres more efficient as well as help smaller companies understand what they can do to be more cost-effective and reduce their carbon footprint.

Simon Campbell-Whyte (right), executive director at DCA, says: "If you look at energy use when it comes to digital services, it is not sustainable the way we are going – unless we

ExpertInsight

Europe's largest indirect evaporatively cooled data centre

Significant energy savings set it apart from the competition

INDUSTRY VIEW

DigiPlex's success in providing reliable, energy-efficient data storage is set to grow at its new €60million data centre at Fetsund, Oslo, with the help of Munters Oasis™ indirect evaporative cooling (IEC) technology.

Munters' innovative Oasis™ IEC 200 is at the heart of DigiPlex's Air to Air (A2A) cooling system, which has been designed to provide an ultra low PUE of 1.12 and cooling pPUE of 1.06.

DigiPlex and Munters' award-winning natural free-cooling will use 52 Oasis™ IEC 200s to reduce energy consumption and provide a secure data hall climate. The new facility will cool more than 10 megawatts of IT power, and is set to be the largest indirect evaporatively cooled data centre in Europe.

The Fetsund data centre will operate 25,000 servers in 4,200m² of white space, with the Oasis™ IEC halving the energy used to keep computers and servers at 24°C (75°F), thus reducing the overall power costs for customers.
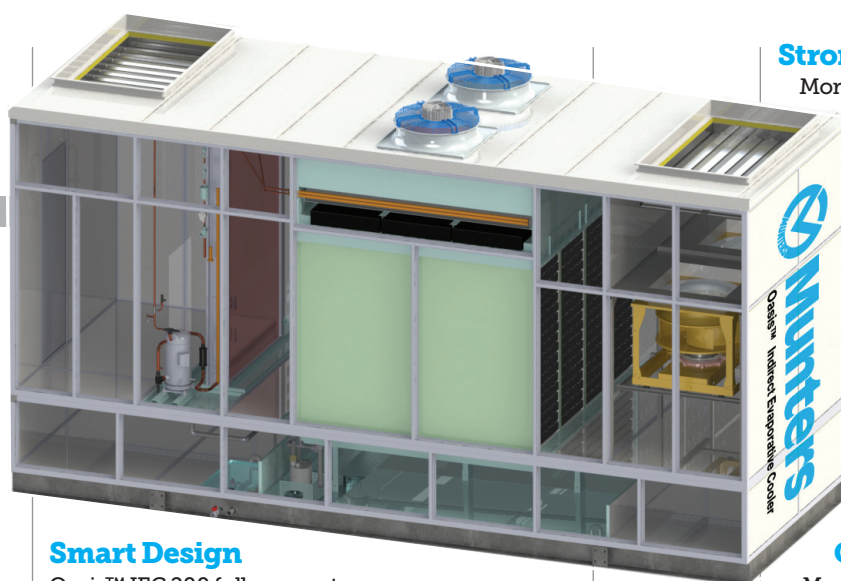
Smart Design

Oasis™ IEC 200 fully separates the air flows, eliminating risk of data hall contamination as well as humidity issues which could cause server corrosion, and is a low-cost system to maintain.

The Oasis™ IEC can use collected rain water, and DigiPlex is considering this approach at Fetsund as an environmentally friendly option. Furthermore, DigiPlex and Munters were recognised for this innovative Air to Air cooling system in 2012, as winners of a European DCD Innovation Award.

Strong Track Record

More than 100+MW data centres worldwide have been installed with Oasis systems.

Greg McCulloch, DigiPlex's chief operating officer, explained: "Driving energy efficiency in our industry is a major focus for us and this system halves the amount of energy used to keep our servers working at an ideal temperature.

"This not only helps save our customers thousands of pounds in energy costs but also ensures that our facilities are among the most sustainable in the sector.

"Oasis™ IEC will halve the amount of energy used to keep our servers working at an ideal temperature."

Clear Savings

Munters' dedicated data centre team worked closely with DigiPlex to develop its modular A2A cooling system, and the Oasis™ IEC 200 will help provide annual cost savings of 40 per cent and a total energy consumption reduction of 65 per cent, when compared with common high-efficiency free cooling solutions. Munters is a global leader in energy-efficient air treatment, with over 460 Oasis™ IEC data centre cooling systems currently in operation.

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find some sort of paradigm shift, much better ways to be energy efficient, or make users aware that the internet does not come free and is not free of carbon emissions. We just have to find ways of being more innovative.

"The most efficient data centres are probably the larger ones, which are more purpose built. They are just like factories, except you've got power going in and digital services coming out. The digital services, the actual output of the factory, are controlled by the user – when you use our mobile phone or Twitter, for example."

He explains the digital output of the data centre translates physically into wasted heat, and that if this is not dispersed effectively it can have an impact on the carbon emissions that the data centre releases.

"Most buildings are designed to keep the heat in, whereas data centres need to be designed to keep the heat out," says Campbell-Whyte. "Purpose-built data centres built on a larger scale tend to be the ones that are more energy efficient."

Although large data centres might be designed in a way that helps them reduce their carbon footprint, in the UK the government is taxing them if they have a standby generator. This can make it costly for them and does not put the UK on a competitive playing field with other countries.

Standby generators can increase a firm's carbon emission if used, and under the EU Emissions Trading Scheme, a policy to combat climate change and reduce industrial gas emissions cost-effectively, they have been targeted as a
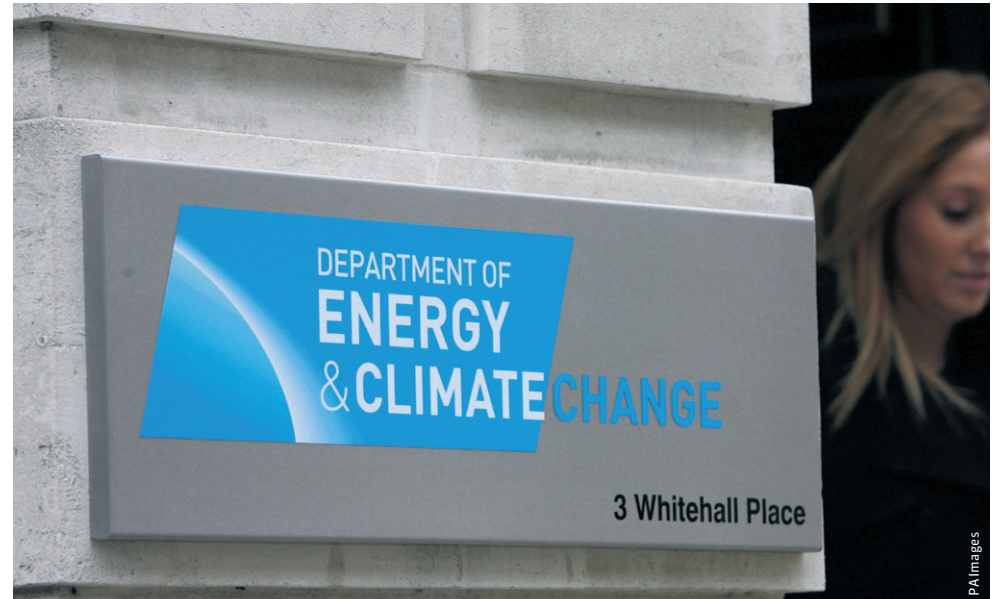
way in which firms can decrease their carbon footprints.

It is up to each country in the European Union to determine how they interpret the trading scheme, but in the UK the government has decided to include standby generators as part of the scheme's application to data centres.

Campbell-Whyte says: "The way the EU Emissions Trading Scheme in the UK has been deployed is, if you have a standby generator of over 20 megawatts it can cost you up to £15,000. Data centres on a larger scale are more energy efficient and can deliver energy savings, but the scheme effectively penalises their back-up generators.

"As long as there is no power outage they are not going to be used at all. The emissions they actually produce are tiny, but they still qualify under that scheme. We have written to the DECC on this and are waiting their response. Our European partners have already implemented differently and that makes our digital economy less competitive here.

"The way it is implemented in the UK appears to be about capturing large data centres that we want to encourage people to use. It does this by having them sign up to the Emissions Trading Scheme even though they are not actually emitting anything because it is for back-up purposes. That is a problem."

Another problem is that some firms still use outdated data centres. "There are companies where someone, 20 years ago, said, 'lets get a computer

system and put the data centre in the back-office cupboard'," says Campbell-Whyte. "Over the years, it becomes a bit of a noose around the neck for these companies. They might have invested a lot of money into having all their equipment in a room, which is not the best place for it."

The DCA suggest that companies with outdated, inefficient data centres should look at how much energy they are using and how to consolidate it.

"A lot of servers are just idling, so they are burning energy sitting there when no one is using them. There is a way you can consolidate that computing resource," says Campbell-Whyte. "I still see data centres where the energy used to run them is more than twice the amount of energy you need to

run the IT, which is a crazy situation." He also advises companies to consider using shared data centres to help reduce their carbon footprint.

"There are third-party type facilities which are multi tenanted," Campbell-Whyte says. "A shared resource makes some strong economic arguments. They are designed to be energy efficient as they've got that volume and have economy of scale."

Regulations and standards needed to make data centres more environmentally efficient are still evolving, and more help is needed by the government to make the UK a competitive playing field. Taking the data centre out of the back-office cupboard and putting it into an environment that is specially designed for it is one way carbon emissions can be reduced.

The Data Centre Alliance is lobbying the DECC to make data centre emissions legislation workable

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Expert Insight

Turkey: global opportunities for smarter investment

INDUSTRY VIEW

Technology Development Zones (TDZs)
Turkey has established 52 technology development zones (TDZs), of which 37 are operational and 15 are currently under construction. Today, more than 2,200 companies have developed plenty of projects in TDZs, and more than 16,000 R&D experts are working on around 6,000 software and R&D projects in these zones.

TDZs offer unique advantages to investors, such as ready-to-rent office spaces and infrastructure facilities. In addition, software development and R&D activities in TDZs are exempt from corporate and personnel income taxes, as well as VAT for the sales of software produced exclusively in TDZs. A 50 per cent reduction in the employer's share of social security premium is also available in TDZs.

R&D centres
Turkey has introduced an exclusive incentives scheme to support R&D and innovation activities. Today, 142 R&D centres are operational within this exclusive incentives scheme, while 25 of them are operating in the ICT sector.

Companies with R&D centres in Turkey may benefit from all incentives with the same degree regardless of the zone where the investment takes place. Similar to the incentives offered in TDZs, incentives for R&D centres include tax deductions, VAT exemptions, and social security premium support. As is the case with TDZs, more than 15,000 R&D experts are also employed in these R&D centres.

Global players
Ericsson, Huawei and Vodafone Group have established their regional R&D centres in Turkey. As well as this, many global companies have relocated their regional headquarters to Istanbul. For

instance, Microsoft manages 80 countries from its office there. Similarly, Intel, Verifone and Ericsson have their regional headquarters in Turkey, managing 67, 30 and 22 countries, respectively.

Huawei
Serving 45 of the world's top 50 telecom operators, Huawei established an R&D centre in Istanbul in February 2010, which became the second largest R&D centre the company operates outside China. Employing 750 people as of 2012, 85 per cent of whom are Turkish, Huawei makes a great contribution to the Turkish IT industry and economy, with an overall employment figure

of 4,000, including business partners and suppliers in its ecosystem.

Fatih Project
Turkey's high-tech education initiative, the Fatih Project, is full of opportunities for technology companies, with its large scale and huge market value. Spanning over four years, the project envisions using high-tech devices to increase the quality of public education by equipping students in preschool, primary and secondary education with tablet PCs and classrooms with interactive smart boards. The project is estimated to create a market of about US$7billion in size over the first four years.

The Fatih Project presents opportunities in such a scale that a technology firm can potentially leap ahead of its competitors. Around 12 million tablet PCs would be distributed to students nationwide within the first four years, to be followed by 1.5 million units per year afterwards. The project includes installation of smart boards in 620,000 classrooms. Global investors can both contribute to and benefit from such a promising project.

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*Expert*Insight

Have your cake and eat it

How to lower costs while increasing performance and efficiency

INDUSTRY VIEW

It's often the case that ongoing investment in the latest technology can be seen as an unnecessary expense. How do you convince your financial director to continually invest in new technology without it seeming like it's just the IT department's chance to get their hands on some new toys?

ServerChoice is a company that likes to look at things differently. Its motto is "Smart Thinking. Delivered." and this has become its mantra across all the services it provides.

ServerChoice believes that, through a continued investment in technology, it is possible to lower costs and, crucially, at the same time improve performance of your IT systems – a combination that any FD surely could not resist. A key component in achieving this is taking advantage of the latest innovations, such as higher-density computing (eg, blade servers), lower-power equipment and virtualisation.

Mark Boost, CEO of ServerChoice, said:

"It's amazing the amount of times we've seen potential customers look to move vast amounts of power-hungry legacy kit into our data centres, meaning they could end up paying for much more space and power than they actually require."

As part of ServerChoice's standard data centre offering, staff will work closely with prospective clients and encourage investment in new technology. This ultimately reduces a client's footprint within the data centres and, critically, lowers power use. Over the life of the contract this can drastically shrink the total cost of ownership (TCO), often repaying their initial investment in new kit many times over, especially when capital allowances are also claimed.

Boost added: "With our innovative approach not only will the FD be happy making savings, but also the IT guys still get their hands on the latest kit!"

It doesn't stop there either. TCO remains a factor after installation, where comprehensive power monitoring can provide customers with usage reports and trends, so they can make informed decisions about their IT usage. ServerChoice champions this way of thinking and believes that, with the right technology and the right attitude, data centres can actually reduce energy consumption in the long run and thus save their customers money.
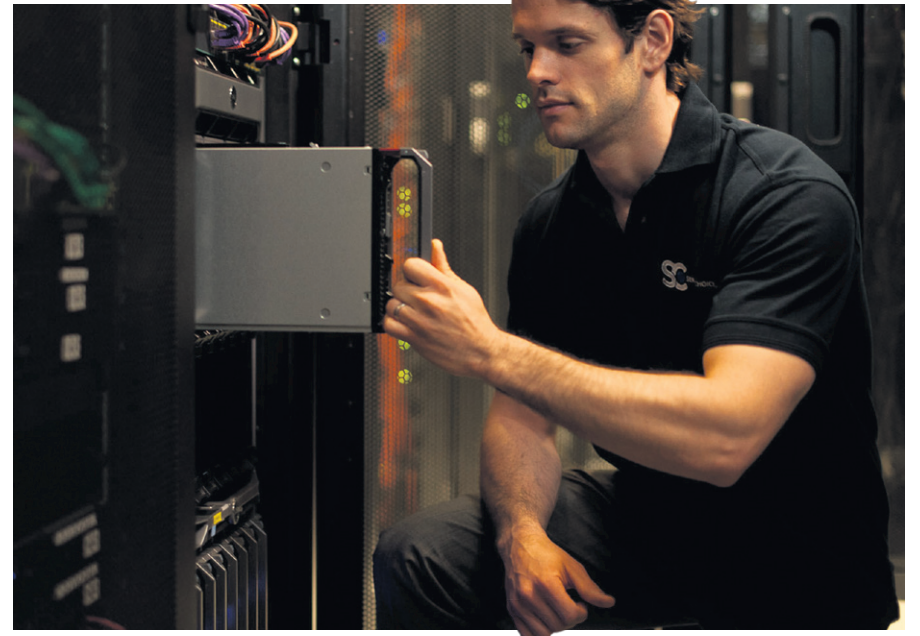
Where energy is sourced is also worth consideration: ServerChoice's SC-2 Data Centre, for example, buys energy under a sustainable procurement plan. This means a proportion of the power comes directly from renewable sources and so could help with a customer's corporate social responsibility targets.

But efficiency is only part of the package: a best-fit data centre also has to have the right location, security and reliability. ServerChoice's SC-2 Data Centre is a security-focused facility with a minimum of N+1 redundancy across all core infrastructure components. Its prime position in Hertfordshire, just outside of the M25, means it's a much lower-risk location yet is still easily accessible. It's only by fulfilling all these criteria that a highly energy-efficient data centre can truly be the right choice.

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www.serverchoice.com

INSPECTOR DOGBERRY

AS RECOMMENDED BY THE WORLD ECONOMIC FORUM

THE collaboration between information and communication technology ICT company Fujitsu and venture start-up firm RESC has inspired Dogberry to take up driving lessons – the firms are to build a new eco-friendly electric scooter which integrates the fields of ICT and energy.

The companies anticipate future demand for electric scooters in a society in which renewable energy uses ICT to reduce concerns about battery charging and replacement. They plan to roll out the first scooters to delivery companies by 2015

and to the general public by 2020.

Fujitsu and RESC are designing the electric vehicles thanks to global warming and the depletion of petroleum resources increasing the need for people to get around with zero CO2 emissions.

But there are issues that still need to be resolved before that can happen, including the ability to monitor battery capacity and deterioration, and the construction of a supporting infrastructure.

By integrating ICT and energy fields, Fujitsu and RESC will build a new system that will be able to manage and analyse batteries. In other words, a battery's remaining charge, deterioration and location can be kept track of and resources can be managed efficiently.

INDIAN electronics firm Wipro has been ranked first place in the Greenpeace International guide to green-er electronics report.

The company has been committed to promoting the role of Information and Communication Technology in climate change. Wipro was the top scorer for commit-ting to reduce its absolute greenhouse gas (GHG) emis-sions by 44 per cent by 2015.

The company also scored highly on performance in the collection and recycling of post-consumer e-waste. Wipro provides a conveni-ent take-back service to its customers through 17 direct and 300 authorised collec-tion centres – the highest in India by any computer manufacturer.

THE European Commission has awarded the Data Centre Alliance and the University of East London a €1.7million grant to fund the data centre industry's first major government-funded R&D programme.

As every time he sends a tweet it involves a data centre, Dogberry is pleased to see research in the area. Simon Campbell-Whyte, executive director at DCA, says: "The project represents the coming of age for the data centre industry. It is the start of the road to becoming better funded, more sustainable, more efficient and having the tools and support other industries, critical to the economy, enjoy from publically funded research."

Twitter: @dogberryTweets

Feeling green

RESEARCH by technology advisory firm Gartner has showed there are psychological differences between the developed and emerging markets when it comes to green IT.

The research says: "Many people in emerging markets don't understand the implication and benefits that green IT can bring and, hence, don't take it seriously as it doesn't directly affect them in terms of cost. If something doesn't impact the income or expenditure of these consumers, it's usually not considered to be a quintessential habit." According to Gartner, in other geographies

where consumers have become more aware, green IT is seeing more adoption. The report says that, in countries where consumers are more aware, these people are also "transplanting their conviction when they get to the workforce".

BEST of the BLOGS

By Matt Smith, web editor

▶ *Editor's pick*
Microsoft Green Blog
http://blogs.msdn.com/b/
microsoft-green

The great thing about efficient IT is that it can both help the environment and save money. If you're considering a move to boost efficiency, where better to start than with advice from one of the world's biggest technology companies? Microsoft's Green Blog details its green and efficiency initiatives.
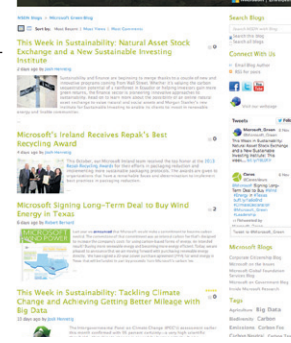
GreenBiz
bit.ly/sgc3SP

GreenBiz's Computing & IT section provides updates on all things green and technical, from the use of big data to boost fuel efficiency to the environmental merits of new consumer technology such as the iPad. On top of all this, expect to find insights from key industry figures.

Forrester Green IT
bit.ly/1ceB1NH

Research specialist Forrester has an in-depth Green IT section on its blog site. Take a look to find thoughtful pieces from its analysts on topics including the utilisation of energy surplus, building zero-carbon data centres, and optimising processing efficiency within your organisation's systems.

Sustainable Software Blog
http://sustainablesoftware.
blogspot.co.uk

There is a lot of talk about efficient hardware and how it can save both money and CO2 emissions, but good software can be just as crucial in the drive for sustainability. The Sustainable Software Blog takes a look at the environmental impact of computer software based on its energy consumption.

Planet of the Apps

Easy Battery Saver Free, Android

Do you wish your phone's battery would last longer? Download this app to keep track of its charge and efficiency.

Battery Optimus £0.69, iOS

This cheap app provides handy statistics and tips to help preserve your battery's condition for as long as possible.

Turning the heat up

ExpertInsight

Hillstone offers expert help to test new data centres

The appointment of a specialist experienced commissioning agent will ensure the success of completing an integrated system testing (IST) of a new-build data centre.

The commissioning agent's responsibility will include working alongside the project team to review the completed build and to prepare for combined testing of the mechanical and electrical systems in the data centre.

Such an extensive programme would be scheduled for the final

weeks of the project and would extend beyond previously performed vendor site acceptance testing.

One of the fundamental aspects for achieving a successful IST is to place the room under full load conditions by using specialist convection server simulation load banks, either as distributed load in an empty white space or installed in IT rack cabinets.

"When the space is put under true heat load conditions we have a unique opportunity to fully prove the operation and redundancy of the cooling system during electrical mains failure, to prove the successful operation of the standby power systems will not compromise the working data hall," says Paul Smethurst, managing director of Hillstone Products Ltd.

"With the use of environmental

measuring equipment and performed thermography studies we can also verify the general thermal conditions used in CFD modelling with the demonstration in a live situation, thus ensuring the data hall will run to full design and build criteria.

"Once the facility is commissioned and the report is issued, the end client can start deploying IT equipment with confidence. Also the marketing advantage this gives a data centre co-location provider is vital to selling the space to prospective tenants."

The Specialist Data Centre Commissioning division of Hillstone

Products has delivered IST projects across the UK, Europe and the Middle East, ranging from 40KW to facilities designed with more than 2500KW of IT load. They hold a large stock of server simulator load banks and environmental testing equipment for multiple simultaneous delivery of data centre commissioning projects.

Hillstone's website, www.hillstone. co.uk, provides extensive details of IST commissioning and services.

Paul Smethurst is managing director of Hillstone Products Ltd
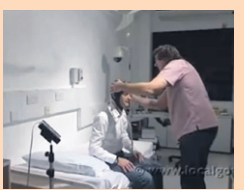**0161 763 3100**
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Video bonus
Great Ormond Street Hospital creates efficient IT
http://youtu.be/ohudUtFnwoQ
A look at Great Ormond Street Hospital's 2011 IT transformation

Efficient IT

Business

Brazil

ICT DEVICES in the agriculture and land-use sector are being used in Brazil to reduce overall emissions, according to a report by the Global e-Sustainability Initiative (GeSi), *The Role Of ICT In Driving A Sustainable Future*.

In Brazil many farmers and livestock herders undertake what is called slash-and-burn farming, whereby they cut down the foliage and burn the remaining waste to clear the land. Not only does this destroy carbon sinks in the form of trees, but it also releases carbon held in the foliage.

According to the report, the use of satellite detection systems in conjunction with ICT can help determine where deforestation is occurring, and provide information to law enforcement officials against individuals involved in these practices.

Deforestation is the single largest component of Brazilian greenhouse gas emissions, comprising 42 per cent of Brazil's emissions total.

Slash-and-burn farming is becoming an increasing concern in Brazil

United States

THE United States Environmental Protection Agency (EPA), the Coast Guard and cruise ship firm Carnival have signed an agreement to develop advanced emission control technology to be used in waters surrounding United States coasts.

Under the agreement, Carnival will develop and deploy a new exhaust gas cleaning system on up to 32 ships over the next three years, to be used in Emission Control Areas (ECAs).

These new controls combine the use of sulphur oxide (SOx) scrubbers with diesel particulate filters – these combining technologies are well known in the power plant and automotive sectors, but have not previously been used together on a marine vessel.

They will provide an opportunity for ECA compliance at a significant (50 per cent or greater) reduction in cost and may yield emission reductions beyond those required by current legislation. The advanced technology can also provide additional benefits in the reduction of particulate matter and black carbon.

The ECAs were developed by the US and Canada through an agreement with the International Maritime Organization in order to protect human health and the environment by significantly reducing air pollution from ocean-going vessels.

By 2020, ECA limits will reduce nitrogen oxide (NOx) emissions by 320,000 tonnes, particulate matter (PM) emissions by 90,000 tonnes, and SOx by 920,000 tonnes. Each year, the standard will also result in the prevention of thousands of premature deaths while relieving respiratory symptoms for nearly five million people.

EPA and the Coast Guard are committed to ensuring the ECA is implemented using the flexibilities allowed by the International Maritime Organization for the development of advanced technologies while achieving health and environmental benefits. EPA and the Coast Guard continue to talk with several marine companies regarding other technology development programmes which may be appropriate to support.

ExpertInsight

Building London's most efficient data centre

Neil Cresswell explains why Virtus is causing a stir

INDUSTRY VIEW

With the bold claim of building and operating London's most efficient and flexible data centres, Virtus Data Centre CEO Neil Cresswell is confident that Virtus' highly energy and cost-efficient data centres and flexible product portfolio are one of the best solutions to driving down costs for companies choosing to outsource their IT requirements.

As the company announced the start of construction on its second data centre, LONDON2 in West London, as well as its intention to start the search for its third data centre site, Cresswell said: "All our facilities are designed to allow for maximum flexibility while maintaining the highest levels of efficiency. LONDON2 will take us one step further. There we are deploying the most advanced and efficient cooling systems and power supplies, which are historically the two largest non-productive energy sinks in a data centre."

Virtus LONDON2 will be London's most energy efficient data centre, with the lowest power and cooling consumption per IT unit (known as PUE in the DC industry). Cresswell added: "As it's located on the prime fibre network routes in West London it provides maximum access to low-cost, high-quality connectivity. Location is important for our customers so we ensure that all our facilities are close to major transport links. LONDON2 benefits from a fast train link to Paddington and the Crossrail development.

"The Virtus build approach focuses on cost efficiency for its clients without compromising on quality. This, combined with industry-leading flexibility, makes Virtus Data Centres the most efficient and flexible available in London. Innovation is at the heart of the company's culture, and its flagship site LONDON2 is testament to that."

Steve Norris, chairman of Virtus Data Centres, also stands by the Virtus commitment to efficiency and flexibility. He said: "We wanted our LONDON2 facility to be at the cutting edge of environmental efficiency and we're proud of what we've started."

It seems London's mayor Boris Johnson also endorses this new approach to building ultra-efficient data centres. In a recent statement he said: "I am delighted that Virtus has chosen to invest in London again. London is leading the global digital technology revolution and is the world's leading technology hub with great British technology, creativity and innovation. Up-and-coming companies like Virtus are at the heart of that whole explosion of talent in London, and I'm pleased to see them using so many state-of-the-art ways of saving energy and improving efficiency."

Virtus caused a stir in the market earlier this year with its CoLo-On-Demand product, which allows companies to rent data centre space on a flexible basis.

"Other elastic services are about to be launched, including Connectivity-on-Demand which allows customers to pay for the connectivity bandwidth that they actually use rather than being committed to fixed consumption rates and hefty penalties for overuse," said Cresswell. "We will also be introducing our new V portfolio of services which include 'pay as you grow' and 'flex' colocation in racks, pods or suites. Our goal is to make IT more efficient, more flexible and more cost-aligned to changing requirements."

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@VirtusDCs
www.virtusdatacentres.com

The new Virtus data centre will be London's most efficient

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World

Japan

THE Japanese government is doubling its funding of projects implemented by the United Nations Industrial Development Organization (UNIDO) in developing countries to catalyse green growth pathways through the adoption of advanced clean energy technologies.

According to Kandeh K Yumkella, director general at UNIDO, many developing countries, especially in Africa, experience difficulties in attracting investment partners and accessing innovative products and technologies to pursue sustainable industrial development and economic growth.

He says: "In many cases, the problem stems from local enterprises lacking sufficient information about international market trends, technology sources, best practices and foreign investors.

"On the other hand, international players are not in a hurry to invest in developing countries due to the uncertainty of the investment climate, business environment and legal framework. Countries also often face language barriers, geographical distance problems and technological gaps."

Another joint UNIDO-Japan programme will also be implemented to offer advisory services to potential Japanese investors and to the business community in developing countries, to facilitate investment promotion efforts, technology transfer and other opportunities for international industrial co-operation.

It will focus on Africa and will be implemented by advisers assigned to UNIDO field offices in three selected African countries. Algeria, Mozambique and Tanzania are currently under consideration.

The advisers will facilitate investment and technology co-operation opportunities between the recipient countries and Japan, and access to related products and services. The funding will contribute to achieving green growth in Africa.

A separate project in India also funded by Japan will focus on demonstrating ultra-low-head micro hydropower technology to help increase access to renewable energy for productive uses in rural areas, an innovation currently only available in Japan.

This is an environmentally-friendly system that neither requires large-scale engineering work nor advanced technology, making it a suitable way to generate electricity, especially in developing countries.

China

THE Global e-Sustainability Initiative (GeSi) SMARTer 2020 report suggests greenhouse gas emissions will rise following an increase in ICT penetration rates as the Chinese economy expands.

The report says: "Emissions are expected to grow from 197Mt in 2011 to 326Mt by 2020. End-user devices will remain the largest contributor and constitute 68 per cent of the entire ICT sector's emissions by 2020."

Although a survey last year by Alcatel Lucent and Tsinghua University of ICT professionals in China showed that, while they were open to going green, they were still struggling with how to use technology to achieve carbon reduction targets.

Professionals had a high level of understanding of what green ICT is and why it is important, but a lack of understanding existed when it came to implementing it to help China to achieve its social and economic goals.

More needs to be done to educate Chinese professionals about how to implement strategies to reduce greenhouse gases in ICT.

The survey suggested that a co-ordinated approach between the technology industry, Chinese government, enterprises and education authorities will be the key to ensure companies understand the best way to use ICT to reduce carbon emissions on a national scale.

Driving data centre energy efficiencies

The disconnect between IT and facilities continues to challenge the industry

ExpertInsight

INDUSTRY VIEW

For many data centre companies, "green" is a competitive differentiator driving data centre consolidation efforts, closer scrutiny of IT capacity management, and efficiency-minded engineering solutions.

In the seven years since Uptime Institute took up the task to improve the economics and sustainability of global enterprise IT, the data centre industry has dramatically improved its energy efficiency.

These improvements are largely attributable to data centre designers and operators providing more efficient cooling of IT equipment, with companies focusing on efficiencies that can be gained from airflow containment, increased inlet air temperature on servers, and increased monitoring of cooling.

This is a positive trend in terms of cost, efficacy and enhanced consciousness of the industry overall. These improvements can typically be accomplished inexpensively and with current staff resources.

Power usage effectiveness (PUE) is the metric used to determine the energy efficiency of a data centre's facility infrastructure. In 2007, the Uptime Institute surveyed its network members (a group of large, traditional enterprise data-centre owners and operators) and determined that the average enterprise data centre had a PUE of 2.5. This means that for every 2.5 watts in at the utility meter, only one watt is delivered out to the IT computing load. According to the Uptime Institute's 2013 industry survey, featuring 1,100 enterprise data-centre end users, the average global, self-reported PUE is now 1.69, a significant improvement over early estimates.

The first round of data centre efficiency gains were, however, mainly due to low-cost improvements and self-funding projects, led by the facilities teams, because the cost of inefficiency was allocated to their department. The Uptime Institute has long maintained that future significant improvements in data centre efficiency will depend on the IT departments taking the next steps.

The Uptime Institute conservatively estimates that up to 10 per cent of enterprise servers are running obsolete or unused software and have no function at all, yet remain in operation. Decommissioning a single 1U rack server can result in savings of £300 per year in energy costs, an additional £300 in operating system licences and up to £1,000 in hardware maintenance costs.

In 2011, the Uptime Institute introduced an annual programme to encourage the removal and recycling of obsolete IT equipment in an effort to decrease data centre energy use. Since the programme was launched, participants have decommissioned and recycled 30,000 units of obsolete IT equipment.

This corporate disconnect between IT and facilities operations continues to challenge the efficiency of the data centre industry, and further significant improvements will only be made once data centre managers can overcome this organisational barrier and get executive-level support to focus on the IT side of the equation. The industry has to move beyond using only PUE as the key efficiency measurement.

Founded in 1993, the Uptime Institute is an unbiased, third-party data-centre research, education and consulting organisation, best known for the creation of the globally implemented Tier standard classification of data centre infrastructure. It has certified more than 300 data centres in 51 countries worldwide.
pcollerton@uptimeinstitute.com
www.uptimeinstitute.com

BizTech Zone

The future

Taking care of business across the country

Constant Power Services Ltd offers power protection solutions for customers requiring assistance and guidance with many aspects of their power installations, including UPS systems, diesel generators, central battery systems (static inverters) for emergency lighting applications, associated switchgear, remote monitoring and containerised power solutions, as well as offering certified electrical installation of all the equipment they supply.

Constant Power Services Ltd was formed in the late 1980s to provide a reliable source of service support and engineering in the field of uninterruptible power supplies and power conditioning. Forming an integral part of the Italian Riello Elettronica Group, Constant Power Services is now firmly established as one of the UK's most trusted power protection and support suppliers.

The company has worked extensively towards providing a total power solution, having installed numerous generator and UPS packages complete with associated switchboards for distribution and automatic changeover facilities. Working with a wide range of specialised partners, Constant Power Services has also consolidated its position as a major UPS supplier to numerous hospital and health authorities throughout the UK.

Based in Hitchin, Herts, the company's sales representatives and fully qualified service engineers cover the whole of the UK and the Republic of Ireland to guarantee a rapid and efficient response to any customer requirements. Constant Power Services has a network of directly employed engineers covering the UK, providing 24/7 rapid-response call out contracts all inclusive of parts and labour, both during and after the warranty period.

Engineers are fully trained on the entire UPS range and carry an extensive kit of spare parts to all site visits, minimising inconvenience and any disruption to your business. They also maintain a significant level of UPS stock in the UK, with units usually available from 1kVA up to 400kVA to ensure that urgent requirements can be met as quickly as possible.

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0330 123 0125
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In focus: Flexible IT equals efficient IT

Keysource has been involved in the design and build of some of the leading, most energy efficient data centre facilities, both in the UK and internationally. We caught up with board director Rob Elder (pictured) to get his views on achieving efficient IT.

What key role does data centre design and build play?
With cloud computing growing in prominence, there is a need for efficient data centre facilities that can reduce costs and minimise environmental impact without compromising on resilience.

Flexibility is key to efficiency, so providing high-performance data centre space as and when required is crucial. The IT demands of most businesses can fluctuate considerably from day to day and this means that modular, scaleable solutions are often an extremely appealing option.

What solutions can help drive efficiency?
It is important to remember that efficiency isn't just about power consumption. In fact enabling the deployment of the latest IT technology and reducing the total cost of ownership actually delivers the greatest business benefits. Outside of the IT itself the biggest win is around the cooling. This is why we developed an award-winning solution called ecofris, which is designed to deliver the highest levels of performance and efficiency in the data centre.

What else should businesses consider?
Improved management through the deployment of the latest tools combined with integration will see businesses achieve the highest levels of efficient IT. Working with our customers this integration delivers valuable real-time insight to facilitate automation or actions to improve performance of each aspect of IT right through the full stack.

....

0845 204 3333
www.keysource.co.uk

Elbert Hubbard, philosopher

"The world is moving so fast these days that the man who says it can't be done is generally interrupted by someone doing it

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The debate
Why is efficient IT good business?

Caroline Hitchins
Owner and founder
DATACENTRE.ME

IT costs money... lots of money. And within that, one of the largest costs is that of the energy used. But it's not just the power that the IT equipment uses – it's the power needed to get rid of all the heat the servers and network equipment produce.

Often, particularly in company server rooms, the cost of running the cooling system is an additional 100 to 200 per cent. That can be a massive amount of energy used, not to mention the huge additional cost.

That's where a well-designed and professionally-run commercial data centre really scores. The data centre industry has put massive effort over recent years into solving this energy inefficiency. Now, a combination of advanced design and economies of scale means modern data centres only need 20 – 50 per cent additional energy for the cooling, meaning that a good, modern data centre can be twice as efficient as in-house server rooms.

This all goes towards making IT more efficient, more affordable and far kinder to the planet.

+44 (0)7544 121900
www.datacentre.me

Prof Ian Bitterlin
Chair, EMEA Technical
Working Group, The Green Grid

Sustainable IT is good business for the planet and for bottom lines. Data-generation, transmission and storage for business, scientific research, education, medicine and social applications is growing exponentially – and this needs energy to power it.

In the 1860s, William Jevons predicted that increasing the energy efficiency of any process leads to greater consumption: his paradox, the "Rebound Effect", has proven correct for the growth of internet traffic. Combating this deluge of data, exacerbated by faster networks and the "internet of things", the energy effectiveness of ICT hardware has been following a similar, but consistently smaller, exponential growth curve – to the point where keeping hardware such as servers beyond two to three years is proving uneconomical.

Metrics for analysing, and improving energy performance of ICT systems that are now being adopted in ISO standards. Only with continuous improvement in energy effectiveness can we ensure that sustainable IT is good for business.

ian.bitterlin@emerson.com
www.thegreengrid.org

Leo Craig
General manager
Riello UPS

Efficient IT obviously has cost-saving benefits, not least in terms of energy bills. Looking at the bigger picture, smart grid technology, which is ideal for the power-hungry IT industry, further reduces the amount of power drawn from the National Grid – reducing costs, improving corporate social responsibility and, most importantly, limiting the pressure on our increasingly strained power infrastructure.

European directives for businesses on energy management will be coming into force before 2016*, at which point businesses will have to undergo an energy audit to ensure they are doing their part to reduce power consumption.

Considering both the current issues with the UK power structure and forthcoming European regulations, it makes good business sense for firms to voluntarily run IT efficiently now, rather than to have their hand forced in a couple of years.

0800 269 394
www.riello-ups.co.uk

*EU directive 2012/27/UE

Emma Fryer
Head of Energy and Environment,
techUK

There are two kinds of efficient ICT. The first, sometimes called "green ICT", refers to the ICT itself – where the computing devices and systems are energy efficient. Then there is ICT that delivers efficiencies elsewhere – such as online car tax applications, teleworking or transport logistics, sometimes called "enabling ICT". While enabling ICT can deliver much greater energy savings, both are equally important. Our *High Tech: Low Carbon* report sets this out.

Energy efficiency is also of critical importance in data centres. Data centres are relatively new features on our urban landscape. They effectively consolidate computing activity – in other words, instead of leaving servers distributed around offices in cupboards and rooms, they are all kept together offsite in purpose-built facilities. This one action reduces energy consumption by about half. Nevertheless, a whole mythology has built up around the way data centres use energy. In a series of papers, techUK has debunked these myths and explained what data centres do and why we need them.

01609 772137
emma.fryer@techUK.org

Andrew Stevens
CEO/MD
CNet Training

Many people perceive day-to-day IT-related activities such as surfing the net, checking email or texting as free, when we all know that it actually isn't. Everything IT-related has a direct and indirect cost, everything is powered and requires storage and processing costs, culminating in costs that eventually have to be paid for by the organisation, individual or cloud provider.

However, all IT feeds back to a data centre, the brain of the operation where everything is securely processed and stored. Data centres are expensive to run and enormously expensive if they experience outages, so IT efficiency and efficiency of systems, processes and management are an absolute must. With the right professional knowledge and skills the data centre could function to optimum efficiency and provide a consistently high level of service to benefit everyone. Without it, costs of business will rise, businesses will fail and the economy will be damaged. Efficient IT is not an option, it is a global necessity.

01284 767100
www.cnet-training.com

Expert Insight
Design and build service for renewable installations

INDUSTRY VIEW

Organisations face unprecedented challenges in terms of power security and renewable energy, according to Nick Watkins, managing director of Thamesgate Group and co-founder of its Eco Power Supplies division. He says: "Destabilisation of the National Grid, rising electricity costs, and the need to decarbonise electrical supplies are board-level issues driving IT-managers to review their power systems."

Green energy solutions
Renewables have an increasing presence within the electrical supply chain and their rising power capacities make them attractive secondary power sources for IT environments. On-site generated power (solar PV or wind turbine) can be stored for back-up usage or exported to the grid to offset energy costs.

Eco Power Supplies provides a complete design and build service for renewable installations. Projects range from energy storage facilities for smart grid operators to solar PV systems using the latest lithium-ion technologies.

High-efficiency UPS solutions
For IT applications, Eco Power Supplies works with leading uninterruptible power supply manufacturers to install their latest high-efficiency systems. These include: UPS from the Carbon Trust's Energy Technology List, modular systems utilising a "pay as you grow" strategy and models suitable for decentralised (in-rack) or centralised deployment up to 6MVA.

Some of these UPS can also be installed with lithium-ion battery packs to improve their total cost of ownership and operate within a smart grid charge-discharge environment. "Traditionally, IT

A recent 3MW energy storage installation in the Shetlands

users only faced the problem of how to ride through a typical mains power failure. Today they face far wider concerns as virtualisation and cloud-based services drive the adoption of more complex IT systems," adds commercial director Robin Koffler. "Everyone wants a 'green' data-centre operation. We guarantee to provide the most eco-friendly and secure power solution."

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