

Building Europe's NEXT GENERATION NETWORKS



ANDY STEVENSON - CHIEF EXECUTIVE OFFICER

As 2006 accelerates onwards, Fujitsu Telecommunications Europe is moving into an important new phase of its evolution. Today, our technology accounts for more than 3 million lines of DSL broadband in the UK. This fact underlines BT's choice of Fujitsu as one of 8 preferred suppliers for BT's 21CN, as announced last April, in readiness for the transformation of BT's existing network into the world's first core IP-based network.

In January this year, we finalised our contract with BT to deliver a key component in this IP converged network realisation - our Multi Service Access Node (MSAN) solution. This represents the culmination of more than two years' technology partnership, working with BT to provide the intellectual and innovative technological support that has contributed to establishing the 21CN architecture.

As a global company, we are proud to take part in BT's epoch-making project, demonstrating how next generation networks can provide the fundamentally necessary support for existing features and services, while opening the way for an advanced set of next generation services.

Over the next 5 years, we can confidently predict that Fujitsu's equipment could be used for the majority of UK phone calls made from a fixed line. Most Internet pages streamed into the home or in the office could be delivered by us, as could many other services. The 21CN project will take us into new territories - deploying new technologies, including WDM, GPON and WiMAX, to deliver new customer services. Fujitsu will be playing a key role in BT's £10 billion rollout, with equipment designed and manufactured here in the UK - in Birmingham - to benefit the British public.

In addition to our selection by BT, 2005 included other significant milestones. Winning the Queen's Award for Enterprise: Innovation 2005, in addition to the ISPA Best Hardware Award 2005, was a tangible example of Fujitsu's technology leadership - a position that we constantly work to maintain and extend. It is extremely rewarding to receive such positive accolades regarding our achievements to date, as well as keeping us focused on the challenges and opportunities ahead.

Fujitsu is a technology entrepreneur, with a reputation for creating a series of landmarks that make a fundamental difference to the future of telecommunications and IT. As we work with BT in the coming years to achieve its network vision, as well as with other market players in Europe, we are confident of breaking more new ground that will encourage a more open operational environment to the benefit of operators and their customers.

Here in Birmingham, UK, we are proudly playing our part as a British manufacturer, with a 1000-strong workforce, with the benefit of our parent company's innovation, enterprise and global support. 2006 has got off to an excellent and exhilarating start!

SPRING 2006 ISSUE - CONTENTS:

Realising BT's 21CN	PAGE 2
T&I Secretary Alan Johnson visits Fujitsu Fujitsu Board Moves 21C Communications World Forum Brings NGN to London	PAGE 3
Partner Profile - Meriton	PAGE 4
Fujitsu - Queen's Award for Enterprise	PAGE 5
Fujitsu's Technology Receives Royal Scrutiny Industry Platform - Spotlight on TCN	PAGE 6
Technology Focus - Evolving GeoStream Access Gateway	PAGE 7
Fujitsu Telecommunications Ireland	PAGE 8

Realising BT's 21CN – with Fujitsu's GeoStream Access Gateway

Fujitsu's MSAN solution for the BT 21CN is based around its award-winning GeoStream Access Gateway, which provides a common platform for the support of fibre and copper terminations across a wide range of existing and next generation services to end-users.

The multi-service capability of the GeoStream Access Gateway offers support for the widest breadth of service delivery, including ADSL, ADSL2, ADSL2+, SDSL, VDSL, Ethernet, Gigabit Ethernet, PON, GPON, WiMAX, SDH and PDH – all from the same platform, vastly reducing the operational cost of the access network. Over the past months, GeoStream Access Gateway has undergone exhaustive interoperability testing with the other 21CN vendors, as well as with Fujitsu's Access WDM solution from strategic partner Meriton.

Hiroaki Kurokawa, President of Fujitsu Limited stated: *"We believe that this project is an important international development, demonstrating how next generation networks can provide support for existing features and services, alongside the ability to deliver advanced next generation services. BT's 21CN vision is setting the pace for the global adoption of next-generation network technology. We look forward to working with BT and the other selected vendors in the successful implementation of this strategically important project."*

With Fujitsu's GeoStream Access Gateway, multiple services can be delivered simultaneously, from fast Internet access and video-on-demand, to voice telephony using VoIP. Inherently scalable, the modular technology has been designed to drive down the cost-per-line to a minimum, and to be as cost-effective as possible for an ISP or network operator, whether servicing many thousands of broadband subscribers from a busy urban exchange or delivering broadband to small, remote rural communities.

In addition to its scalability economies, the design offers further cost-saving potential through its lower energy consumption compared to previous technology.

BT Wholesale chief executive **Paul Reynolds** said: *"With 21CN, BT and our suppliers are leading the world in next generation networks. Where we go with 21CN, others will follow, and the experience gained and expertise developed in this transformation of BT's network will set the standard for other NGN deployments. We're moving forward strongly with world class suppliers, and the first customers in the UK will start enjoying services over 21CN within 12 months."*

The installed system also has a smaller footprint than previous-generation technology, allowing more efficient use of valuable exchange space.

Representing Fujitsu's next-generation Multi-Service Access Node, the GeoStream Access Gateway can support many thousands of users on a single ATM/Ethernet network interface, and is arguably the world's most advanced DSL platform, designed to provide operators and service providers with leading-edge cost-efficient technology.

Fujitsu Next Generation Network Vision



With its design and manufacture located in the UK, the product's local focus enables Fujitsu to offer European operators considerable flexibility in design development and supply management. Fujitsu's Birmingham-based engineering facilities represent the global centre of broadband product excellence for the entire Fujitsu group.

Fujitsu was one of the first companies to demonstrate the successful realisation of H.248 in the UK, highlighting its commitment to network innovation and the concept of genuine interoperability and open systems.

Commenting for Fujitsu Telecommunications Europe, Chief Executive Officer **Andy Stevenson** elaborates: *"Since April last year, both the Fujitsu and BT teams have been involved in an exhaustive process, ensuring the optimum fit for BT's 21CN realisation over the coming years. We are delighted to have achieved a successful contract completion. Fujitsu has worked closely with BT on 21CN for more than two years, providing intellectual and innovative technological support that has contributed to the 21CN architecture. Our acknowledged expertise in delivering the MSAN infrastructure will be matched by our service capability over the coming months, helping to realise what will in effect be the world's first fully transformed next generation network."*

Fujitsu welcomes T&I Secretary **Alan Johnson**



Fujitsu welcomed Trade and Industry Secretary Alan Johnson MP to its European headquarters in early December 2005, as part of a regional tour focusing on business in the West Midlands. His schedule included visits to two companies in the region that will be initiating expansion programmes, after receiving grants from the Selective Finance for Investment (SFI) in England scheme. Fujitsu Telecommunications Europe was awarded an SFI grant in support of its innovative work in next generation communication networks. Announcing the award of these grants, Alan Johnson said:

"I am pleased that the Government grant has been able to secure investment from these two excellent and innovative manufacturing companies in the West Midlands. It has been very interesting to hear how they intend to use this financial assistance to take their research and development plans forward."

On the World Stage – **21st Century Communications World Forum Brings NGN to London**

March 2006 sees the second IEC 21st Century Communications World Forum, taking place in London from 27-30 March 2006, aiming to analyse the business and technology requirements of making convergent, IP communications a reality on a carrier scale. Hosted by BT, the event majors on the technical challenges, such as transitioning legacy infrastructure and interoperability issues, as well as the business and economic issues involved in making the transition to IP.

Comprising a high level conference programme, together with a technology exhibition, 21C Communications World Forum offers an invaluable opportunity to gauge the temperature of the next-generation network world-wide. Fujitsu is playing a major role in the event, as a Partner Sponsor, presenting the latest evolution of its GeoStream Access Gateway, designed to realise Fujitsu's strategy of positioning GeoStream as a true "gateway to the NGN".

Fujitsu Board Moves

Fujitsu Telecommunications Europe kicked off 2006 with a new-look Board, following the return of managing director, Shigeyuki Unagami, to Japan after 7 years at the helm.

Andy Stevenson was appointed as Chief Executive Officer, explaining the changes:

"My focus is on consolidating the company's market leadership for broadband-based solutions in the UK and extending our European penetration. I am joined by several new faces, jointly providing an unprecedented level of industry expertise and ability. With the retirement of Mike Armitage after seven years as Chairman, during which he made an outstanding contribution to our company, we welcomed Simon Blagden, MBE, as co-chairman, following his appointment as a non-executive director last year. He brings vast international experience to the role, and we are already benefiting considerably from his expertise."

"We also welcomed the arrival of Hayashi Suzuki from Japan, who has been appointed Vice Chairman and will be further strengthening our links to Fujitsu Japan. Mr. Suzuki was instrumental in the formation of company's products and technology in its early days, and we have worked together for the past 10 years. His experience will be a great asset to us at this important time in the company's development. Hiroichi Inoue has just joined us as General Manager, Global Development, following his recent promotion as a key member of the Fujitsu Photonics Systems Business Unit. His primary focus is on supporting our delivery of BT's 21CN, while co-ordinating and strengthening our R&D capabilities with the support of Fujitsu Japan."

See the **Technology Focus** on page 7 for the full picture. On the Exhibition Floor, please visit Fujitsu on Stand No: 273.

ON THE CONFERENCE PROGRAMME - LOOK OUT FOR:

Andy Stevenson is a featured speaker on the Executive Round Table, **"The Path to Profitability for the 21st Century Network"**
1400-1600 – Tuesday 28th March (by invitation only)

Marc Curtis on **"Delivery of Traditional and New Services on a 21C Access Network"**
1400-1530 – Tuesday 28th March

Simon Rees chairing **"Build, Outsource or Partner"**
1545-1715 – Tuesday 28th March

Partner Profile

Meriton - Network Innovation

Headquartered in Canada with operations throughout Europe, North America and Asia, Meriton Networks Inc. (www.meriton.com) is an innovator in metro optical networks. Meriton's Agile Optical Networking (AON) architecture delivers an end-to-end networking approach to building and operating scalable, multi-topology, multi-service optical networks. In partnership with Fujitsu Telecommunications Europe, Meriton is playing a key role in equipping the next generation of telecommunications networks with the capabilities needed for carrier and enterprise migration to very high bandwidth, on-demand IP services.

Network operators are pursuing the vision of a two-layer network: a packet services layer that carries all services as IP; and an optical layer with automated wavelength-level management and network intelligence to support the service layer's requirements for reach, protection and scalability.

Meriton addresses this vision adeptly because it provides a software-enabled migration from SDH to Gig E. As a transparent system, Meriton handles SDH and Ethernet traffic, as well as all other high-speed bit-rates and protocols, such as Storage Area Network services. When carriers want to migrate from SDH to Ethernet, it is provisioned entirely through software.

This is a unique differentiator for Meriton, and an attribute that is highly valued especially by large network operators.

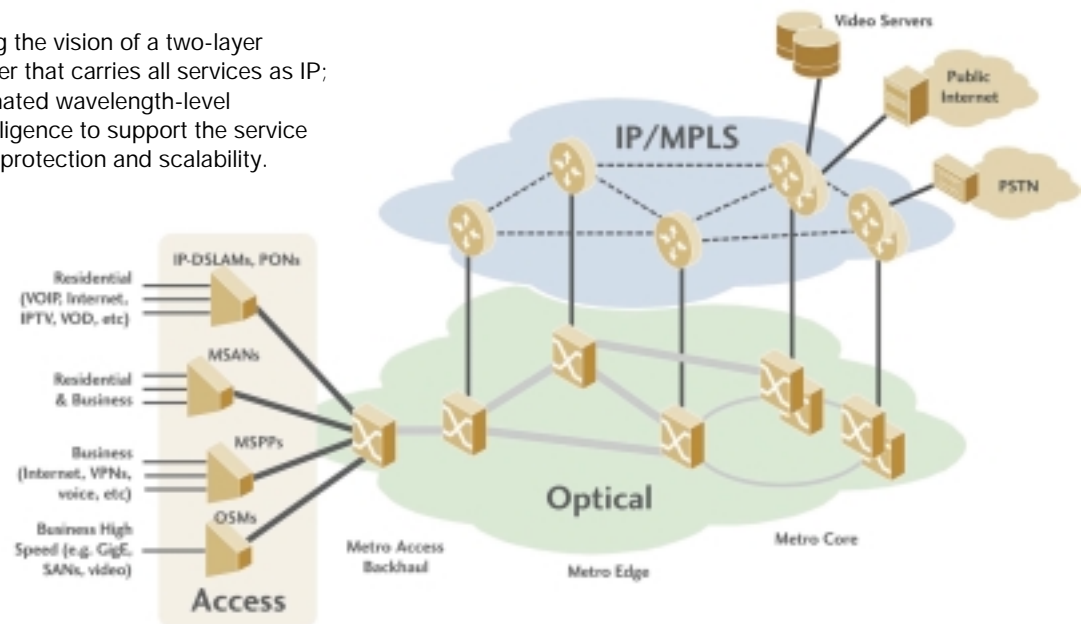
AON at the Access Layer and Beyond

A fundamental principle underlying the Meriton portfolio is the integration of optical ADM and wavelength switching within a single network element. This delivers some unique benefits, including:

- Wavelength and sub-wavelength switching, as a complement to ADM support, within a single network element, and consequently...
- the ability to support a mix of ring and mesh topologies within a single switching platform.
- Highly efficient support for multiple Gigabit Ethernet services over a single 10G wavelength, thereby allowing the efficient backhaul of the next generation of all-IP multi-service access nodes.

Meriton's flagship product for the access network is its 3300 OSM (Optical Services Multiplexer). This platform provides a low start-up cost with 'pay-as-you-grow' modularity, CWDM and DWDM support, compatibility with existing equipment and infrastructure and support for any client interfaces from 100Mb/s to 10Gb/s.

A big brother to the 3300 OSM, the 7200 OSP (Optical Switching Platform) is unique in the industry and is pivotal to the Meriton wavelength networking solution.



The 7200 OSP is a fully integrated optical/layer 1 transport platform, and offers enhanced scalability and multi-degree switching in the metro core. It provides both optical transmission and switching at the following levels:

- 100 Mb/s to 10 Gb/s client interfaces
- CWDM line interfaces (2.5 Gb/s)
- DWDM line interfaces (2.5 and 10 Gb/s)
- DWDM over CWDM
- 100 Mb/s to 2.7 Gb/s wavelength switching
- SDH/SONET VC-4/STS-1 grooming
- Ethernet GFP and switching

The AON portfolio includes the 6400 OTP (Optical Transport Platform), a true ROADM offering flexible transport in ring-based metro core-regional networks. The portfolio is further enhanced by unified network planning and management systems.

Working with Fujitsu Telecommunications Europe

Fujitsu and Meriton have worked successfully over the last three years to complete a portfolio of solutions suitable for the needs of Europe's largest network operators. As an example, Meriton and Fujitsu have proposed an innovative and highly reliable solution for the access broadband portion of BT's 21CN project. The Meriton 3300 OSM provides WDM transport for the Fujitsu MSAN nodes, and transports the traffic via CWDM and/or

DWDM to the metro core. At the metro core sites, the 7200 OSP is used to terminate WDM MSAN chains, which provides a high-density solution and substantial savings in floor space. In addition the 7200 OSP has the capability for seamless translation between CWDM and DWDM, as well as multi-degree, inter-ring connectivity. The resulting architecture is the most cost-effective and future-proof solution, which enables to BT to add capacity and services to its network with unprecedented ease.

Fujitsu Presented with *Queen's Award for Enterprise – Innovation 2005*



Representing a powerful accolade for both the company and the GeoStream Access Gateway technology, Fujitsu Telecommunications Europe was presented with the Queen's Award for Enterprise: Innovation 2005, by Her Majesty's Deputy Lord Lieutenant of West Midlands, Colonel Anthony Griffiths. This prestigious Award was granted for the GeoStream Access Gateway, which is deployed in telephone exchanges to deliver broadband services, and was a key element in Fujitsu being selected as a preferred supplier for BT's 21CN programme. The Award was presented in the presence of the Japanese Ambassador to the UK, Mr Yoshiji Nogami, together with the Lord Mayor of Birmingham, Councillor John Hood, and the Mayor of Solihull, Councillor Alan Martin.

Designed, developed and manufactured by Fujitsu in the UK, the GeoStream Access Gateway technology is playing a key role in the migration of millions of end users to advanced broadband services. Its flexible, scalable design is bringing broadband to large metropolitan areas, as well as remote, rural communities, with the technology capable of simultaneous multiple broadband service delivery, ranging from fast Internet access to voice telephony and video-on-demand.

Mr Shigeyuki Unagami, former managing director of Fujitsu Telecommunications Europe Limited, commented:

"Our company is honoured to be presented with this prestigious award. It reflects the supreme contribution made by all our staff, and the significant investments, which have made our GeoStream Access Gateway such a successful development. The achievement is notable both for the product's innovative design concept and its market performance – Fujitsu's selection for the BT 21CN programme underlines the technology's success. The Queen's Award for Enterprise – Innovation – acknowledges the benefits that the speed of broadband rollout in the UK is bringing to millions of homes and businesses, and also highlights the trade and employment advantages that our company brings to the West Midlands region.

"Our GeoStream Access Gateway is advancing communications at the highest level, assisting European operators such as BT to realise their visions for next generation networks. It is an enabling technology in the widest sense – allowing homes and businesses to receive the greatest choice of broadband services and the best quality of experience; enabling network operators and service providers to offer their customers the greatest range of services at the most competitive prices, while permitting remote rural communities to receive the same degree of choice and quality of service as more densely populated areas."

Fujitsu's Award-Winning Technology Receives Royal Scrutiny

Fujitsu Telecommunications Europe welcomed a royal visitor recently, on the occasion of HRH The Duke of York visiting the company's European headquarters on 1st March.

The Duke of York attended in his capacity as the Special Representative for International Trade and Investment, with this Inward Mission visit to Fujitsu in recognition of the company's excellent track record. The visit was also attended by the Mayor of Solihull and the Deputy Lord Lieutenant, with Fujitsu's co-chairman Simon Blagden acting as host.

The company's Birmingham-based engineering facility represents the global centre of broadband product excellence for the entire Fujitsu group. CEO of Fujitsu Telecommunications Europe, Andy Stevenson, commented: *"We were delighted to welcome The Duke of York to Fujitsu, providing us with the opportunity to demonstrate the ongoing investment and technical excellence that is achieved here at our European headquarters. We are playing an important role in both local industry and across the nation, with our involvement in broadband technology for BT's 21CN programme, and are extremely proud of our long-established track record as a key employer and active contributor to the West Midlands' economy."*



Industry Platform: Spotlight on The Telecommunications Network (TCN)

TCN is an organisation with a 100-year old history, and today is acknowledged as the ICT industry's leading membership organisation, with over 11,000 members nationwide. It began life in 1906 as the Institution of Post Office Electrical Engineers, becoming the Institution of British Telecommunications Engineers in 1981, and finally The Communications Network (TCN). Its mission is to provide high-calibre professional and personal development resources for members, as well as acting as a forum for debate and discussion about the key issues, developments and trends in the industry.

Fujitsu's relationship with TCN dates back to 2004, when it joined as a Corporate Member and most recently, CEO Andy Stevenson was appointed to the Board. Activities have included a cross-section of key projects and initiatives, including the Young Members' Forum, TCN's Mentoring Scheme and a number of Peer-to-Peer events. The focus is very much on providing a two-way exchange between members and the organisation, encouraging and promoting individual and professional skills. An important example of this

is reflected in one of TCN's joint projects with BT, involving the recruitment of BT's First Year Apprentices to TCN, and developing and delivering a Mature Managers' Scheme.

In addition, TCN publishes a quarterly publication – The Journal – and runs a programme of quarterly lectures through the year, covering a range of topical debates and issues, where senior figures from the industry share their experience and views on a wide range of topics, as well as looking ahead to future developments in the industry. It is also introducing new online services, such as TCT – online self-study tutorials.

Looking ahead, TCN is in the process of translating a major strategic review into a new programme, in order to ensure that its direction remains in line with members' expectations and needs. One major initiative to come out of this is to offer industry-standard courses and training, with accreditation for career development. For more information on TCN – please visit www.tcn-uk.org - contact 01932-788861 or email membership@tcn-uk.org

Technology Focus: **EVOLVING GEOSTREAM ACCESS GATEWAY –** *The Picture for 2006*

On show for the first time at the 21st Century Communications World Forum in March will be two of the latest enhancements to Fujitsu's GeoStream Access Gateway:

- Ethernet/IP DSLAM configuration with the new "GE AUX" module – designed to allow operators to take advantage of the economic benefits of Ethernet networks in a planned migration and without compromising on service quality.
- H.248 Access Gateway configuration with the new "AGSF" module – designed to create a cost-effective solution to deploying traditional voice services in a Next Generation Network, delivering the benefits of VoIP with the performance of the PSTN.



These enhancements further realise Fujitsu's strategy to position GeoStream as a true "gateway to the NGN" and are available alongside all the existing features of the platform.

The Gigabit Ethernet Auxiliary module (GE AUX) is a plug-in to the existing GeoStream Access Gateway Hub1000 chassis. Four GE AUX modules can be connected to a single Hub1000, with each providing up to 4 x Gigabit Ethernet and 4 x 10/100 BaseT interfaces.

The Gigabit Ethernet interfaces can be electrical or optical, short or long haul, while interfaces can be unprotected or resilient, including support for Ethernet link aggregation.

When fitted with the GE AUX, the GeoStream Access Gateway can be deployed as an Ethernet-only DSLAM, or as a combined Ethernet and ATM node, simultaneously carrying and switching packet as well as cell-based services. This allows network operators to choose when to migrate services to Ethernet and provides the option of maintaining ATM services if required.

To support Ethernet services, several other features are enabled by software within the GeoStream Access Gateway. For example, the existing DSL line card modules can be upgraded to support the automatic detection of PPP session type, and the seamless conversion of PPPoA to PPPoE – allowing migration of existing end-users to a new Ethernet network without changing their DSL CPE configuration. Similarly, nested VLAN support can also be enabled – allowing scalable VLAN deployments, even for mass residential services.

The AGSF module is Fujitsu's "Access Gateway Signalling Function" which, in conjunction with Fujitsu's previously announced IV-LCSS64 combined ADSL and POTS line card, transforms GeoStream into an H.248 Access Gateway. The AGSF module is a software upgrade to the existing Fujitsu Hub1000, which allows the GeoStream Access Gateway to communicate with Call Agents using the internationally adopted H.248 protocols.

Targeted at delivering genuine PSTN replacement services, the AGSF handles priority for emergency calls and maintains high levels of performance even during overload conditions. To support different service providers and/or distinct service sets, the AGSF can be used to create multiple Virtual Access Gateways (VAG) on a single access platform, with each being controlled by different call agents.

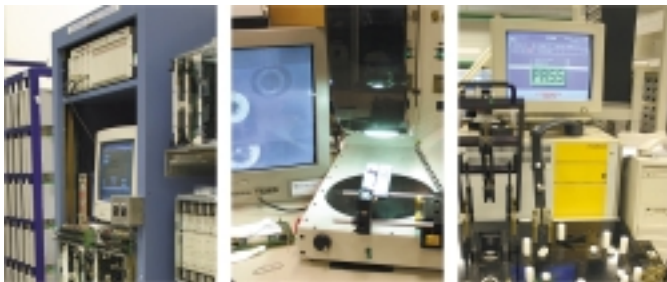
The AGSF runs on the existing HS-IML module within the Hub1000, and can be 1:1 protected for resilience. Each HS-IML module connects to a maximum of 2048 customer lines, with the AGSF processing capacity scaling as each module is added.

These two new enhancements are the latest in a series of ongoing developments to the GeoStream Access Gateway platform – a multi-service access node, delivering traditional and new services over a wide range of fixed access network technologies.

Extending Product Lifecycles Fujitsu Telecommunications Ireland

Established as a specialist division of Fujitsu Telecommunications Europe, and operating as an autonomous enterprise, Fujitsu Telecommunications Ireland is focused on reducing the unnecessary waste of recoverable redundant equipment. This approach can dramatically extend a product's lifecycle, thereby improving customers' profitability.

Based in County Antrim, Northern Ireland, and located within minutes of Belfast International airport, the division provides refurbishment, re-manufacturing and repair services, for customers from the IT and telecommunications sectors across Europe. The division can undertake projects involving almost any electronic and electro-mechanical equipment, with a particular specialisation in telecommunications hardware – from business telephone systems and payphones, to leading-edge broadband technology. Fujitsu's Antrim operation benefits from the support of the entire engineering skill-set available from within Fujitsu's telecommunications research and development department, and the division also provides its telecommunications customers with cable manufacturing services, which include, for example, the production of integration cabling for telephone exchange upgrades.



The refurbishment and materials recycling processes that have been established at Antrim also assist the division's customers to comply with the Waste Electrical and Electronic Equipment (WEEE) legislation, by re-manufacturing otherwise redundant products, and by offering materials recycling and scrap management services. Fujitsu Telecommunications Ireland can therefore make a significant contribution to compliance activity, enabling existing inventory to be re-utilised and returned to the marketplace, maximising its profitable lifespan and minimising the need for its premature disposal.

Payphones are a particular case in point. With the massive market penetration of mobile phones, it is a common misconception that the payphone industry is no longer a viable sector in the fast-changing telecoms climate. Peter Bowman, director of Fujitsu Telecommunications Ireland, explained: *"Contrary to popular perception, the payphone sector is a very long way from being defunct, and is still currently a £100 million industry. A significant portion of our business comes from this*

sector, and we have established a solid reputation for undertaking and fulfilling fast-turnaround refurbishment and re-manufacturing contracts for payphone equipment. Changes to coinage, and to technology – both hardware and software – all have to be addressed, alongside wear and tear effects. Our service enables these issues to be solved without manufacturing new equipment completely from scratch, allowing the operator or OEM to benefit from a dramatically extended product lifespan and a far greater long-term ROI. It saves waste and improves bottom line performance at a single stroke."

Making beneficial contributions to the environment in a different way, and reflecting Fujitsu's corporate philosophy of encouraging links and involvement with local communities, Fujitsu Telecommunications Ireland has also recently been participating in the e-Pals e-mentoring programme. Co-ordinated by the Education Executive of Business in the Community (BITC), the programme encourages companies across the UK and Ireland to find ways of ensuring their activities can make a positive impact on society. The e-Pals programme engages businesses to work in partnership with schools, voluntary/community organisations and SMEs, supporting the use of Information and Communication Technology (ICT). Volunteers from Fujitsu's staff act as mentors, communicating with young people by e-mail on a weekly basis throughout a school year. This helps to develop confidence and raise ICT skill levels, as well as providing the benefit of real-life work experiences and helping to establish positive role models.

Over and above the division's e-Pals involvement, the issues of people skills and training represent an important part of Fujitsu Telecommunications Ireland's operation. Accredited with Investors In People recognition, the division is also a National Training Award winner and monitors training requirements very closely. Peter Bowman again:

"Day-to-day management utilises a cellular structure, with cell members and team leaders meeting each morning, to review the previous day's productivity and agree the new day's objectives. This creates a supportive environment for staff, enabling rapid feedback and timely solutions for any issues, including training. The result is an enrolled, stable, and effective workforce across all functions, including high volume/high dexterity screening, to skilled, component level diagnostics and repair."

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