Collaboration Opens New Lines of Communication

A global leader in a sector synonymous with rapid technological evolution, BT is firmly at the forefront of communications innovation in multiple markets. Fixed-line, broadband, mobile, TV and IT products & services all form part of its extensive portfolio. Employing over 100,000 people worldwide – 83,000 of them in the UK – and with annual revenues of £24 billion, the company recognises the central role that innovation must play in enhancing competitiveness in a fast-moving business environment and, to this end, invests around £500 million/year in R&D.

As a partner and co-investor, BT has worked closely with EPSRC for many years. The relationship provides a clear route to bridging the gap between academic research and potential real-world impact – it helps the company access cutting-edge ideas and skills at UK universities, while enabling EPSRC to develop a clearer understanding of current and future challenges as business sees them. BT investment in EPSRC’s Centres for Doctoral Training (CDTs), meanwhile, is helping to develop the next generation of UK research leaders. The partnership is especially vital as the UK currently has the largest digital economy in the G20 but maintaining this position and maximising the economic and societal benefits will involve significant challenges. Reinforced by its relationship with EPSRC, BT’s policy of ‘purposeful innovation’ aims to marry scientific breakthroughs with practical engineering – enabling the company to optimise traditional communications infrastructure while unlocking the full potential of software, machine learning, quantum computing and the Internet of Things (IoT), for example, and so transform the world through new communications technologies.
Real-World Answers to Quantum Questions

A key BT priority is to translate R&D in the emerging field of quantum communications – communications rooted in the world of quantum physics – into useful, value-adding products & services. To achieve this, the company is lead industrial partner for EPSRC’s UK Quantum Technology Hub for Quantum Communications Technologies. Led by the University of York and including seven other UK universities, the Hub also involves the National Physical Laboratory, ADVA and Toshiba Research Europe. Its R&D programme is exploring topics at the arrow tip of innovation, including fibre and free-space quantum communications, chip-scale components and next-generation quantum communications based on a phenomenon known as ‘entanglement’. BT hosts PhD students at its Adastral Park labs, while collaboration is enhanced by working with InnovateUK and ADVA to support a Knowledge Transfer Partnership associate. The Hub has already generated pioneering results on high-speed quantum key distribution – a potential game-changer in secure encryption/decryption of confidential messages transmitted over the internet.

"The UK has world-beating capabilities in a range of fields critical to the ongoing evolution of telecommunications technology. Our partnership with EPSRC has proven its ability to identify and develop strengths to the UK’s competitive advantage in a market that increasingly defines the world around us and will continue to shape the future.

Fraser Burton, Head of BT University Research, BT plc

Forward to 5G

The world of mobile communications never stands still, with attention now turning to the development of fifth-generation (5G) mobile networks and wireless systems that deliver another step change in capacity and capability. BT is a founding partner of the 5G Innovation Centre (5GIC) at the University of Surrey, which aims to shape standards and product development in this field and was initially supported through the Higher Education Funding Council for England (HEFCE). BT is currently supporting four EPSRC PhD studentships at the Centre, as well as a fully funded Research Associate. These students are contributing to leading-edge work on both of 5GIC’s research threads: data handling (for intelligent content handling) and efficient use of the electromagnetic spectrum (addressing issues such as link capacity and capacity-per-square-kilometre). Their work will help lay the foundations for new communications infrastructure with the flexibility to meet the growing thirst for mobile data and to enable transformative technologies such as the IoT to flourish.

- Accounting for around 2% of GDP, the UK telecommunications sector comprises around 8,000 companies employing over 270,000 people.
- The UK telecommunications market is worth £37.5 billion/year (2015 figures)
- EPSRC’s Business Engagement Forum (BEF) currently comprises 45 companies, including BT.
- ICT networks & distributed systems (£48 million), optical communications (£27 million), pervasive & ubiquitous computing (£19 million) and quantum optics & information (£38 million) are four of the research areas within the current EPSRC portfolio.