

William Webb

Name:	William Webb BEng, MBA, PhD, DSc, DTech, CEng, FEng, FIET, FIEEE
Address	Hawksmead, Moat Lane, Melbourn, Herts SG8 6EH, UK
Position:	Independent Consultant
Date of birth:	4 May 1967
Executive roles:	Webb Search: Feb 2012 – ongoing: CEO Weightless SIG: Feb 2012 – Sept 2019: CEO (part-time position) Neul (start-up) February 2011 – June 2013: CTO. Ofcom (regulator) December 2003 – January 2011: Director of Technology Resources PA Consulting 2001 – 2003: Managing Consultant in the Wireless Practice Motorola 1998 – 2001: Director of Corporate Strategy Netcom Consultants 1997 – 1998: Head of wireless local loop division Smith System Engineering Ltd 1993-1997: Principal Consultant Multiple Access Communications Ltd 1989-1993: Technical Director
Non-Executive roles	IET: President 2014 –2015 (and numerous other roles). Board Member of Cambridge Wireless, 2009-2017, Deputy Chair 2014 - 2017 Governor (non-executive director) at Motability, 2018 onwards. Member of DCMS Science Advisory Council (SAC) 2015 onwards
Key achievements	Co-founded Neul, pioneered IoT connectivity, sold to Huawei for \$25m. Set up the Weightless SIG and grew membership to over 2,000. Devised and implemented UK and international spectrum management strategy. Designed and standardised many wireless systems including GSM-R. Published “The 5G Myth” in 2016, clearly setting out the issues with 5G nearly two years before they became widely acknowledged by mobile operators.
Academic qualifications:	BEng Southampton University, First Class (Top first and all top year prizes), 1989. PhD Southampton University, 1992, entitled “QAM for Digital Mobile Radio”. MBA Southampton University Management School, 1997. Doctor of Science (honorary degree), Southampton University, 2015. Doctor of Technology (honorary degree), Anglia Ruskin University, 2015 Doctor of Science (honorary degree), University of Hertfordshire, 2019 Visiting Professor at Southampton University Honorary Professor at Lancaster University
Professional qualifications:	FEng (Fellow of the Royal Academy of Engineering) CEng (Chartered Engineer) FIET (Fellow of the Institute of Engineering and Technology) FIEEE (Fellow of the Institute of Electrical and Electronic Engineers)
Publications	16 books, author or joint-author on 21 patents, over 100 papers spanning learned journal papers to the Wall Street Journal
Listings and awards	Listed in “Who’s Who” – the definitive guide to the UK’s top individuals. Listed in Marquis “Who’s Who in the US” and “Who’s Who in the World” – who awarded him the Albert Nelson lifetime achievement award in 2017 Listed in Debrett’s “People of Today” Listed in “2000 Outstanding Intellectuals of the 21 st Century”. Awarded IET Mountbatten Medal, one of its very highest awards, in 2018 for promotion of technology entrepreneurship.

Career history

At Webb Search

William is a Director of Webb Search, a consulting company he established to provide technical and strategic consultancy across the wireless communications space. His activities include advising CEOs, Government Ministers, regulatory bodies and acting as an Expert Witness in complex cases involving wireless regulations and patents. Projects have included:

- Support to the regulator in the Channel Islands (CICRA) to devise and implement a novel 5G award process based around a form of beauty contest with particular criteria such as environmental protection and the eventual consolidation to a single network.
- Work for a UK telecoms operator that had become unprofitable, helping them to reduce costs and to separate their national from local business in order to spin it out as a separate entity. The work included a particular focus on all of the systems in use including OSS and BSS solutions and the implications of a split on these systems and the data they hold.
- A study for a drone manufacturer as to the business case for using drones to provide rural coverage in Mexico. This included a very detailed assessment of existing coverage, likely MNO strategy and availability of backhaul and spectrum.
- A critical study for Hong Kong International Airport developing a wireless strategy for the 5G era and including cellular, IoT, Wi-Fi, private cellular, PMR and innovative mmWave elements. This included working with all the MNOs in Hong Kong, key suppliers, the airport and regulatory authorities. (As part of a team led by Plum.) The work continued to support the equipment procurement including developing a detailed use-case document and writing the invitation to tender for suppliers.
- A substantial project for a UK altnet telecoms provider, assisting them on technological choices, the balance between fibre and wireless and a detailed investigation into mmWave FWA solutions. This involved many meetings with investors, suppliers and regulators including applying for code powers and understanding gigabit incentive schemes.
- A project for the fibre-optic network provider in Singapore looking at the possibilities for them to deploy a single shared 5G network across the island.
- A major report for Ericsson on the barriers that make mobile network deployment more difficult such as local authority bureaucracy, health-related limits and lack of international agreements, including tens of case studies across the globe.
- Multiple training courses on spectrum management, mobile communications, fundamentals of mobile phones, 5G, etc. Also a range of webinars and briefings for the financial community on the future roadmaps for technology and networks.
- A major multi-year project for the 5G Innovation Centre at Surrey University, strengthening the links with external bodies, developing visions, enhancing marketing and collaboration with the intent of making the 5GIC the global centre for 5G.
- A study for Comreg (Ireland) on the best use of the 400MHz frequency band, concentrating on smart grid usage and considering a range of technologies including modified LTE.
- Support to Telemach in Slovenia after the regulator threatened to remove their rights to use some of their 2100MHz spectrum. Delivery of a report arguing the case as to why this would be inappropriate and showing the costs and implications for operators and consumers.
- A study for an alliance of satellite operators on the value of the C-band spectrum in the US when taking into account mobile operator strategy and CBRS licensing. The study determined the range of the cells based on various interference calculations and deduced the likely value of the spectrum if sold through trading or similar.
- Expert witness activity across a variety of cases, most recently for Viasat in a case adjudicated by the UK Competition Appeals Tribunal around EC licensing arrangements for satellite and hybrid ground-satellite solutions. Prior cases include a number of IPR adjudications, work on network equipment supply after contract termination by ZTE and on import tariff levels for Amazon products such as the Echo Show.
- Advice to a major Far-Eastern manufacturer on the emerging standards in the IoT space and areas where they could gain commercial advantage.
- The development of substantive course material for the ITU for a year-long spectrum management course.

- A large project for the EC considering whether there would be benefits in converging broadcasting and broadband communications onto a single platform in the UHF band and what the technical, economic and regulatory issues would be.
- A report for the IDA – the regulator in Singapore – on their local requirements for IoT and how the regulator and government might work to facilitate the emergence of a country-wide network. A separate report on 5G and how Singapore should regulate and invest to maximise the benefits it gains from its introduction.
- Support for a UK mobile operator to develop technical and legal cases to influence forthcoming auction and merger rulings.
- A major project for the regulator in Thailand to show the economic value of spectrum and the best approaches to maximising this in forthcoming spectrum auctions.
- A future prediction project for the Wi-Fi Alliance, modelling the possible congestion on Wi-Fi networks under various scenarios and showing the mix of spectrum, regulation and standardisation needed to ensure Wi-Fi remains able to handle projected traffic loads for the next 10-20 years.
- A short study for Rolls-Royce on possible strategies for the deployment of IoT within their businesses.
- Work for O2/Telefonica on their options for enhancing the capacity of their network, the possible role of small cells and the need for additional spectrum to meet growing capacity demands.
- A substantial project for OpenSignal, a company delivering crowd-sourced measurements of mobile network. William assumed the role of CTO for a six-month period, guiding the company to new data metrics and strategies that aligned with the interests of regulators. He developed a personalised network recommendation tool and Quality of Experience measures.
- On-going support to Federated Wireless, a US provider of dynamic spectrum databases, to assist them in developing their strategy and UK presence.
- On-going support to Tutela, a provider of crowd-sourced data, to assist them in developing their strategy and marketplace.

At DCMS (as a contractor)

As part of a consulting activity, William undertook a substantial 18-month assignment where he led the Technical Design Authority function within the 5G team in DCMS. Here he played a major role in setting Government strategy for 5G and telecoms, provided technical support and insight across the team, and was a leading member of the panels determining how best to award the £300m fund allocated to making the UK a world-leader in 5G. Key achievements included:

- Focusing the rail connectivity project on backhaul provision capable of providing at least 1Gbits/s per train.
- Setting the direction for road trials, finding a path through the industry indecision between DSRC/G and LTE-V, showing the lack of need for connectivity for autonomous vehicles and shaping the studies and trials to best deliver improved coverage.
- Taking a leading role in designing the smart city and smart rural trials, biasing them towards IoT connectivity solutions and demonstrating how small cell deployments can only add value in specific cases, rather than in blanket coverage of a region.
- Providing key insight and input for the Future Telecoms Infrastructure Review (FTIR) with multiple input documents, steering the review towards encouraging new MVNO entrants and forms of spectrum sharing.
- Interacting with the Universities and steering their 5G activities to ensure an appropriate balance between research and development, and to provide them key strategic insight on the future role of core networks.
- Working with BT and Vodafone on a proposal for a Future Networks Research Centre (FNRC) to develop a resource of value to the country which can deliver 5G leadership.

At the Weightless SIG

William was the CEO of the Weightless Special Interest Group (SIG) which harmonised the technology as a global standard. He established the SIG, recruiting its Founder Members including Vodafone, ARM and CSR, managed the formation of its legal framework, oversaw the development of its website and marketing, managed the standards activities, recruited volunteer sub-group chairs and managed the finances. He grew total membership from four founders in 2012 to over 2,000 members

by 2015. He wrote the definitive book on Weightless, played a core role as Chief Architect during the writing of the Weightless Specification which the SIG published at a final version in April 2013 and is now coordinating test and conformance activities. As CEO he reported to the Weightless Board giving him substantial experience in understanding the executive to non-executive relationship from the CEO's viewpoint.

At the IET (President 2014-2015)

William was the youngest Chairman and President of Europe's largest professional engineering institution for 100 years. He has been a trustee for eight years as Vice President, Deputy President and President and Chair of the Board of Trustees where other trustees included the CEOs of Rolls Royce and National Grid. He has chaired the Audit Committee, the Knowledge Management Board, the Membership Board, the Global Operations Board and served on the Finance & Investment Committee, the Nominations Committee, a variety of Policy Panels and on Council. As President he introduced a major re-positioning of the IET, moving it towards serving a societal function and away from membership benefits. He worked closely with many other organisations such as the Royal Academy of Engineering, the Engineering Council, Government CSAs and others. His Presidential Address – "From the iPhone to the iET", delivered in the Royal Institution, was seen as ground-breaking in its content and delivery and is available online. Chairing the Board at the IET is a particularly challenging function with its mix of elected and unpaid volunteer board members and an operational staff team.

At Neul

William was one of the Founding Directors of Neul. He played a substantial part in the initial fundraising, generating first round funding of \$10m. He held the role of CTO where he was responsible for the overall technical design of an innovative new wireless technology for machine-to-machine operation in white space spectrum. He led the development of the system specification, the development of and application for IPR, and regulatory interface work around the world including being the author or joint-author of 17 patents. He was responsible for much of its marketing activities, its relationship within the Weightless community and in ensuring Neul optimised its position in the Weightless eco-system. He was an executive member of the Board. Neul was subsequently sold to Huawei in 2014 for \$25m.

At Ofcom

William was the Head of Research and Development and one of the senior spectrum strategists since the inception of Ofcom in late 2003. Key tasks have included:

- Inherited a team of 35 people in the R&D group, co-ordinating internal and external research with a budget of around £8m. On moving into position, William initiated a review of the team and its function which resulted in major changes. William closed the laboratory at Whyteleafe and managed the outsourcing of the work and subsequent redundancy programme. Other major structural changes resulted in only 2 of the original 35 team remaining. William then rebuilt a first-class team of 10 individuals, recruiting into key positions.
- William led a number of key policy initiatives including the Spectrum Framework Review, one of the three key reviews for Ofcom for the 04/05 period. This review set medium and long term Ofcom strategy in all areas of spectrum management including trading, auctions, unlicensed spectrum, and easements. Other key policy roles included taking the lead on ultra-wideband, the licence-exempt framework review, spectrum usage rights and most recently cognitive or white space access to the spectrum.
- He framed and led the overall research agenda, leading to over 50 projects covering a wide range of technical and policy issues and including the publication of the highly regarded Ofcom Annual Technology Reports.

At PA Consulting

William led a range of consulting projects including:

- Development of a European strategy for NEC to enhance their position and profitability in the 3G cellular infrastructure marketplace.

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- Worked with a number of UK operators to help them streamline and enhance their organisational structure, including assessing organisational and technical issues causing poor quality in their network.
- Development of the 3G acceptance strategy and documentation for Vodafone so that they were able to formally accept the 3G equipment from their supplier.
- Assistance to a major supplier in bidding to a 3G operator to supply an end-to-end system including writing the Executive Summary, drafting the prices and developing the key themes for the bid.

At Motorola

William had a number of roles during his three years at Motorola, including:

- Director of Strategy in the Corporate Strategy group based in Chicago, USA, where he was responsible for the development of Motorola's communication strategy. He also managed projects to resolve key issues within Motorola, particularly those that spanned multiple sectors. He was responsible for developing and maintaining the medium and long term visions within Motorola for wireless communications.
- Leading strategy development for fixed wireless activities within Motorola on a global basis. In this position he managed a team of six individuals responsible for gathering and processing strategic information.
- Multiple specific tasks including development of strategy for GPRS and UMTS, development of a range of core business models for use throughout Motorola to assess the value to the operator of new features and assessment of all the capacity enhancement techniques for GSM to determine which techniques provide the greatest return on investment.

At Netcom Consultants:

William was head of the company's wireless local loop division. As such he was responsible for management activities including marketing, recruitment, staff management and project management.

At Smith System Engineering Ltd:

William worked on a range of consulting projects, the most notable of which included a major study for the European Railway Body to define a digital radio system for the European railways. and a number of projects for the Radiocommunications Agency and Oftel to estimate the net economic value of use of the radio spectrum to the UK economy and how economic principles could be used in the assignment and allocation of radio spectrum.

At Multiple Access Communications:

William was involved in a range of research related projects including:

- An in-depth study of the spectral efficiency of modulation techniques for mobile radio.
- Development of a set of complex propagation models for microcells.
- Direction of numerous propagation measurements.
- Design and construction of advanced hardware test platforms.