

# Future of IMT Systems: Wireless World Vision 2020

## Abstract

In view of the ever growing demand for higher spectral efficiency and support of wireless connectivity of a number of devices increasing by several orders of magnitude in the next decade, the Wireless World Research Forum (WWRF) recognized the need to set the investigation of requirements, technical challenges and deployment issues for wireless systems beyond IMT-Advanced as top priority. As a result, the WWRF identified the key technologies and enablers that will help to form the Wireless World in the era beyond 2020. The goal of this talk is to disseminate our findings.

We first present an overview of the WWRF and its mission and objectives. WWRF's goal is to encourage research that will achieve unbounded communications to address key societal challenges for the future. The term "Wireless World" is used in this broad sense to address the support of innovation and business, social inclusion and infrastructural challenges. This will be achieved by creating a range of new technological capabilities from wide-area networks to short-range communications, machine-to-machine communications, sensor networks, wireless broadband access technologies and optical networking, along with increasing intelligence and virtualization in networks. This will support a dependable future Internet of people, knowledge and things and the development of a service universe.

Then we present the WWRF vision for IMT beyond 2020 with emphasis on the advances that would be needed in following areas: (1) Air Interfaces and enabling technologies, (2) Interference management and flexible radio resources allocation, (3) Novel system (including hybrid) architectures based on centralized and/or distributed principles, (4) Security, privacy and trust, (5) Spectrum management and cognitive network design, (6) Enablers to Internet of Things and resulting applications, (7) Role of cloud computing, analytics and virtualization, (8) User Interfaces and needs, and (9) Novel business models.

To conclude, we articulate that the IMT vision beyond 2020 would only be realized by the engagement of (and the collaboration among) many actors from many diverse areas to innovate and implement proofs of concepts and system demonstrators.

## Speaker Bio

Sudhir Dixit is the Director of Hewlett-Packard Laboratories India. He is a WWRF Vice Chair of the Asia Pacific Region and the Chair of the Vision Committee of the WWRF.

Prior to joining HP, he held a joint appointment as a CTO in the Center for Internet Excellence and a Research Manager at the Center for Wireless Communications at the University of Oulu, Finland. During his 12 year tenure at Nokia or Nokia Siemens Networks (NSN), he held the distinguished roles of Nokia Research Fellow, Senior R&D Manager, Head of Nokia Research Center (Boston) and Head of Network Technology (USA). From 2009 to 2012, he was an Adjunct Professor of Computer Science at the University of California, Davis, USA, and since 2010 he has been a Docent (Adjunct Professor) of Broadband Mobile Communications at the University of Oulu, Finland.

He is a Fellow of IEEE (USA), IET (UK) and IETE (India) and received his PhD degree from the University of Strathclyde, Glasgow, UK, and the MBA degree from Florida Institute of Technology, Melbourne, Florida. He has published or presented over 200 papers, co-authored or edited/co-edited 6 books, and holds 20 patents.