Randall A. Snyder
Curriculum Vitae

Professional Summary

Mr. Snyder has over 34 years of experience in telecommunications network and system architecture, engineering, design and technology. He has expertise in the fields of both wireline and wireless telecommunications networking technology. He has been retained as an expert witness in over 300 cases regarding telecommunications technology including over 260 Telephone Consumer Protection Act (TCPA) cases, patent and intellectual property cases, breach of contract cases and other areas of litigation regarding telecommunications network technology.

Mr. Snyder has taught many classes and seminars on both wireline and wireless telecommunication network technologies and has been a panelist and speaker at numerous conferences at the Institute of Electrical and Electronics Engineers (IEEE) and the Cellular Telecommunications and Internet Association (CTIA). He spent several years developing network technology standards within the American National Standards Institute (ANSI) and the Telecommunications Industry Association (TIA), providing technical contributions and authoring and editing telecommunications proposed standards documents. Most notably, ANSI-93, providing interconnection technology between wireline and wireless telecommunications networks.

Mr. Snyder is the co-author of the McGraw-Hill books “Mobile Telecommunications Networking with IS-41,” and "Wireless Telecommunications Networking with ANSI-41, 2nd edition” published in 1997 and 2001, respectively. He holds 40 patents on telecommunications networking technology and has been hired as a consultant by the CTIA, as well as many wireline and wireless telecommunications companies, including Bell Laboratories, IBM, Google, McCaw Cellular, AirTouch, AirTouch International, AT&T Wireless, AT&T Mobility, Lucent, Nokia, Ericsson, Motorola, Samsung, Siemens, Nextwave, MCI, Daewoo, Globalstar, T-Mobile, Sprint, U.S. Cellular, Teleglobe Canada, Teledesic and others. He was also nominated in 2006 for a National Television Arts Emmy Award for Outstanding Achievement in Advanced Media Technology for unique wireless content distribution technology he designed while at Entriq, Inc.

Subject Matter Expertise

- Wireless and cellular network systems
- Wireless and cellular network architectures
- Network interconnectivity
- GSM, UMTS, LTE and ANSI-41 (CDMA) standards and networks
- Location Based Services (LBS)
- Short Message Service (SMS)
- Multimedia Message Service (MMS)
- Wireless Application Protocol (WAP)
- Call Processing and Calling Features
- Billing Systems Support (BSS)
- Operations, Administration, Maintenance & Provisioning (OAM&P, OSS)
- Signaling System No. 7 (SS7)
- LTE Diameter Signaling
- Multifrequency Signaling
- Session Initiation Protocol (SIP)/VoIP
- Automatic Telephone Dialing Systems (ATDS)

Notable Expert Witness Engagements

- Retained as Plaintiff's testifying expert witness in *Satterfield v. Simon & Schuster, Inc.* No. 07-16356, D.C. No. CV-06-02893-CW Opinion. Appeal from the United States District Court for the Northern District of California. Opinion remanded by the United States Court of Appeals for the Ninth Circuit. Personally cited in opinion by N.R. Smith, Circuit Judge, June 19, 2009.

  Result of expert opinion greatly expanded the TCPA and was followed by formal FCC Declaratory Rulings citing this case that text messages are calls as defined by the TCPA, and sending messages to a stored electronic list of telephone numbers falls within the definition of an Automatic Telephone Dialing System (ATDS).

- Retained as Plaintiff's testifying expert witness in *Gomez v. Campbell-Ewald Company*. No. 13-55486, D.C. No. 2:10-CV-02007-DMG-CW Opinion. Appeal from the United States District Court for the Central District of California. Opinion vacated by the United States Court of Appeals for the Ninth Circuit. Opinion by Fortunato P. Benavides, Circuit Judge. Filed September 19, 2014. Appellate court opinion upheld by the Supreme Court of the United States. Opinion by Justice Ginsburg, January 20, 2016.

- Retained by the Department of Justice Canada as Plaintiff's consulting expert in *Commissioner of Competition v. Rogers Communications Inc., Bell Canada, Telus Corporation and the Canadian Wireless Telecommunications Association*, Court File No. 12-55497. Defendants accused of deceptive and misleading marketing practices related to premium text messages leading to improper charging for multimedia content delivery using various mobile billing mechanisms. Case settled favorably for the Canada Competition Bureau in May, 2016.

- Retained by the U.S. Department of Justice as Defendant's testifying expert witness in *In re Inter Partes Review of U.S. Patent No. 7,693,938, U.S. Patent No. 8,103,719, Patent No. 8,438,212, Patent No. 8,438,221 and Patent No. 9,236,954*. Defendant accused of patent infringement in *CellCast Technologies, LLC v. The United States of America*, Case No. 1:15-cv-01307-VJW (Fed. Cl.).

- Retained by IBM de México as testifying expert witness in *IBM de México Comercialización y Servicios, S. de R.L. de C.V. adverse Iusacell, S.A. de C.V.,* ICC Case No. 19879/ASM. International $4B material breach of contract case under the International Chamber of Commerce International Court of Arbitration.

Education

Year	College or University	Degree
1984	Franklin and Marshall College	B.A., Mathematics (minor in Astronomy/Astrophysics)

Professional Experience

From:	January 2007
To:	Present
Organization:	Wireless Research Services, LLC; Las Vegas, NV
Title:	President and Founder
Summary:	Technology and expert witness consulting services. Areas of subject matter expertise include mobile and cellular networking, 2G, 2.5G, 3G, LTE, GSM, ANSI-41, LBS, SMS, MMS, WAP, SS7, Diameter Signaling, Automatic Telephone Dialing Systems (ATDS) and mobile multimedia systems. With this expertise, primary consulting is in the area of system and product analysis, architecture, design, development, management and marketing as well as patent preparation and development, expert reports, expert testimony and litigation support. Particular areas of expert witness experience include patent litigation and the Telephone Consumer Protection Act (TCPA).

From:	September 2007
To:	August 2010
Organization:	Finsphere Corporation; Bellevue, WA (acquired by Visa)
Title:	Vice President Wireless Engineering and Product Management
Summary:	Was among the first handful of employees at Finsphere prior to Series A funding. As vice president of product management and wireless engineering and a member of the executive management team, was responsible for product management activities and wireless technology solutions for Finsphere's products. These products encompassed mobile location based software-as-a-service (SaaS) products offered primarily to financial institutions and banks. Responsibilities included product requirements and system functionality, strategic planning, R&D of new technologies, wireless network interconnectivity as well as wireless technology for Finsphere's products. Was also responsible for market strategies, white papers and development and management of intellectual property and patent applications.

From:	May 2004
To:	April 2007
Organization:	Entriq, Inc.; Carlsbad, CA
Title:	Vice President Product Management
Summary:	Was responsible for the entire product management team and system architecture for Entriq's products and services. Products encompassed mobile and broadband pay media applications (specializing in video), digital rights management (DRM) and security solutions, e-commerce and m-commerce systems as well as ad management and delivery solutions for both broadband and mobile media services. Responsibilities also included network and protocol analysis, market analysis, evaluation of third-party software and services, all vendor contract negotiations, RFP responses and overall administrative responsibility for the entire product line. Was responsible for directing

and managing the technical writing department producing all user documentation associated with the products. Was nominated for a National Television Arts and Sciences Emmy Award for Outstanding Achievement in Advanced Media Technology for unique mobile technology designed, developed and commercially deployed as part of Entriq's solution.

From:	February 2002
To:	November 2003
Organization:	m-Qube, Inc. (acquired by Verisign); Boston, MA
Title:	Founder, Vice President Product Management and Carrier Marketing
Summary:	Was responsible for the entire product management and carrier marketing teams, member of the executive management team and one of the founders. Was responsible for all product management, system engineering and product strategy for all business conducted with the wireless industry and carriers. Was in charge of the market strategy and wireless network architecture for m-Qube's mobile marketing service, a value-added service offering mobile marketing solutions to wireless carriers using short message services (SMS) for GSM and CDMA networks. The service architecture enabled branded companies to deploy promotional marketing and messaging campaign dialogs with mobile subscribers via SMS. The network architecture required definition and design of all aspects of the overall network including SMS technology, interconnectivity to the wireless carriers, signaling, traffic management, market requirements for features and services, network equipment specifications and OA&M.

From:	April 2001
To:	February 2002
Organization:	Bitfone Corporation; Mountain View, CA
Title:	Vice President Product Management and Marketing
Summary:	Was responsible for the entire product management team and all of the company's product definitions, strategies and positioning. Had direct responsibility for market and product requirements, market research, competitive analysis, product strategy and sales strategy. Bitfone's products included the iBroker, a mobile Internet technology infrastructure platform to enhance WAP, MMS, mobile e-mail and wireless messaging. Was also responsible for the mProve product (obtained via merger with Digital Transit, Inc.) providing over-the-air firmware and software update technology to mobile devices.

From:	November 2000
To:	April 2001
Organization:	Openwave Systems (via merger of Phone.com and Software.com); Redwood City, CA
Title:	Executive Director Emerging Technologies
Summary:	Was responsible for new 3G technologies and providing market and product plans for those technologies for the entire product line. Primary responsibility for the 3GPP Multimedia Messaging Service (MMS), collecting market requirements from customers, developing corporate strategy for MMS and preparing the organization for

additional development of the product. In addition, taught wireless technology classes to the different departments at Openwave and educated them on wireless service provider strategies and network technologies.

From:	March 2000
To:	November 2000
Organization:	@Mobile and Software.com (via acquisition); Santa Barbara, CA
Title:	Director Wireless Product Management
Summary:	Was responsible for the product managers and for all of the wireless internet infrastructure products. Responsibilities included the overall market and product strategy for Software.com's wireless e-mail, short message service, instant messaging and unified messaging products. Was responsible for the overall revenues generated from these products based on detailed product plans and internal organizational planning. Much of his time was spent working with the executive management team and the sales directors on corporate market strategy.

From:	December 1999
To:	March 2000
Organization:	FreeSpace Communications, Inc.; Palo Alto, CA
Title:	Consulting Network Systems Engineer
Summary:	Was responsible for the complete design of the backbone network architecture for a new broadband fixed wireless data network. This new architecture incorporated DSL as the backbone network technology. The network architecture required definition and design of all aspects of the overall network plan including DSL technology, IP technology, ATM technology, interconnectivity to the PSTN, operations signaling, traffic engineering, market requirements for network features and services, network equipment specifications and OA&M.

From:	April 1992
To:	December 1999
Organization:	Synacom Technology, Inc.; San Jose, CA
Title:	Executive Director Product Marketing and Management
Summary:	

1998 – 1999 Executive Director Product Marketing and Management

- Responsible for managing the entire product management and marketing department of Synacom Technology, including market research and planning, product management and market communications. Lead the entire design, definition and product direction of all aspects of Synacom's products.

1997 – 1998 Director Systems Engineering

- Responsible for coordinating and managing the overall functional and requirements specifications for all Synacom's products as well as the detailed test

plans used for alpha system testing of those products. Also responsible for directing and managing the technical writing department producing all of the user documentation associated with all of the products. Provided the primary sales engineering support for sales and marketing and was involved in nearly every aspect of the product lifecycle.

1996 – 1997

Director Consulting Services and Principal Engineer

- Responsible for obtaining, coordinating and managing all technical consulting projects performed by the company. These projects included wireless network architecture and design for both IS-41 and GSM networks for dozens of client companies (carriers and equipment manufacturers). In this role, continued as a member of both the ANSI/TIA TR45.2 Subcommittee for cellular radio intersystem operations standards and the ANSI/TIA TR46 Committee for 1900 MHz GSM PCS standards. Major contributor to TR46 in the area of GSM-to-IS-41 network interworking. Also authored, edited and published TIA standard specification IS-93 for cellular network interconnections to the PSTN and ISDN.

1992 – 1996

Principal Engineer

- Consulted for McCaw Cellular, AT&T Wireless, AirTouch Cellular, AirTouch Satellite Services, Globalstar, Nokia, MCI, Sprint PCS, XYPoint, NextWave, NewNet American Personal Communications, CTIA and several other national and international wireless telecommunications companies.
- Wrote wireless network design and analysis papers including HLR specifications, Authentication Center specifications, PCS network design, short message service (SMS) design, intelligent network applications of wireless technology and in-house expert in signaling protocols. Extensive experience with Signaling System No. 7, including both protocol implementation and design. Authored the Standard Requirements Document for the SS7-based A-interface between the base station and MSC used throughout the TIA. Also involved in the design of the Bellcore WACS/PACS technology, digital cellular network service and feature descriptions, SCPs and HLRs. Extensive experience developing the architecture and design of distributed intelligent networks including, SS7, cellular, PCS, AIN and WIN networks. Key member of the original Cellular Digital Packet Data (CDPD) architecture and design team. Designed the CDPD air interface protocol emulator developed and marketed by AirLink Communications, Inc.

From:	December 1990
To:	April 1992
Organization:	AT&T Bell Laboratories; Whippany, NJ
Title:	Consulting Member of the Technical Staff
Summary:	Evaluated wireless technology services for the Wireless Systems Architecture group. Also participated as a system engineer on the design of the Global System for Mobile (GSM) communication architecture and a software engineer developing the base station controller (BSC) for GSM. Also responsible for planning, coordinating, designing and testing the SS7 protocol software for the GSM A-interface between the BSC, MSC and operations and maintenance center (OMC). High-level and detailed

design specifications were developed to coordinate the protocol testing between two remote laboratories. Provided the traffic analysis and traffic engineering of call traffic for the BSC. Specifically designed and developed the dynamic traffic overload control subsystem for the BSC. Presentations were given to technical staffs at multiple Bell Laboratories facilities supporting this work.

From:	May 1987
To:	December 1990
Organization:	DGM&S, Inc.; Mt. Laurel, NJ
Title:	Senior Staff Consultant
Summary:	Responsible for the design, development and test coordination of an advanced intelligent network applications platform for a service control point (SCP). Also spent several years as a consulting software engineer for Siemens AG, developing and testing SS7 and call control software for the EWSD digital switching system for international as well as U.S. national network implementations. This work involved extensive travel to both Frankfurt and Munich, Germany for software system design and testing. Also involved in the concept, design and technical marketing of proprietary enabling technology software products for SS7 and ISDN.

From:	May 1986
To:	May 1987
Organization:	ADP, Inc.; Mt. Laurel, NJ
Title:	Senior Software Engineer and Analyst
Summary:	Responsible for the design and development of data communications and real time database application software for a host data center that provided real time financial information to large brokerage houses. Data communication protocol expertise in HDLC, RS-232 and IBM BiSync.

From:	June 1984
To:	May 1986
Organization:	C3, Inc.; Cape May, NJ
Title:	Consulting Systems Analyst and Software Engineer
Summary:	Civilian consulting systems analyst and engineer to the U.S. Coast Guard Electronics Engineering Center (EECEN) for C3, Inc. Developed sophisticated database software for shipboard use including inventory and law enforcement applications. The work included the follow-through of the entire project lifecycle including writing of requirements, functional, design and program specifications, coding, debugging, alpha and beta testing, release, shipboard installation and continuing technical support of the product. Received a personal commendation from Admiral W.F. Merlin, Chief, Office of Command, Control and Communications, for successful efforts on these projects.

Professional Affiliations, Achievements & Awards

- Personal commendation from Admiral W.F. Merlin, Chief, Office of Command, Control and Communications, USCG (1986)
- Nominated, Technology and Engineering Emmy Award for Outstanding Achievement in Advanced Media Technology, 2006

Patents, Publications & Citations

Issued Patents

Patent	Date	Description
US 9,848,298	12/19/2017	System and Method for Automated Analysis Comparing a Wireless Device Location with Another Geographic Location
US 9,838,872	12/5/2017	Systems and Method for Mobile Identity Protection for Online User Authentication
US 9,818,121	11/14/2017	Mobile Communications Message Verification of Financial Transactions
US 9,736,662	8/15/2017	Mobile Messaging Short Code Translation and Routing System and Method
US 9,679,312	6/13/2017	System and Method to Initiate a Mobile Data Communication Utilizing a Trigger System
US 9,603,023	3/21/2017	System and Method for Identity Protection Using Mobile Device Signaling Network Derived Location Pattern Recognition
US 9,456,348	9/27/2016	System and Method for Automated Analysis Comparing a Wireless Device Location with Another Geographic Location
US 9,432,845	8/30/2016	System and Method for Automated Analysis Comparing a Wireless Device Location with Another Geographic Location
US 9,420,448	8/16/2016	System and Method for Determining and Delivering Appropriate Multimedia Content to Data Communication Devices
US 9,313,628	4/12/2016	System and Method for Determining and Delivering Appropriate Multimedia Content to Data Communication Devices
US 9,185,123	11/10/2015	Systems and Method for Mobile Identity Protection for Online User Authentication
US 9,154,952	10/6/2015	Systems and Methods for Authenticating a User of a Computer Application, Network, or Device Using a Wireless Device
US 9,092,803	7/28/2015	System and Method to Initiate a Mobile Data Communication Utilizing a Trigger System
US 8,954,102	2/10/2015	System and Method for Determining and Delivering Appropriate Multimedia Content to Data Communication

		Devices
US 8,938,215	1/20/2015	System and Method to Initiate a Mobile Data Communication Utilizing a Trigger System
US 8,923,902	12/30/2014	Mobile Messaging Short Code Translation and Routing System and Method
US 8,839,394	9/16/2014	Systems and Methods for Authenticating a User of a Computer Application, Network, or Device Using a Wireless Device
US 8,831,564	9/9/2014	System and Method for Mobile Identity Protection Using Mobile Device Signaling Network Derived Location Pattern Recognition
US 8,819,141	8/26/2014	Centralized Mobile and Wireless Messaging Opt-out Registry System and Method
US 8,761,732	6/24/2014	System and Method to Initiate a Mobile Data Communication Utilizing a Trigger System
US 8,670,753	3/11/2014	System and Method for Determining and Delivering Appropriate Multimedia Content to Data Communication Devices
Israel 200949	1/10/2014	System and Method for Automated Analysis Comparing a Wireless Device Location with Another Geographic Location
Mexico 308720 B	12/4/2013	Sistema y Metodo para el Analisis Automatizado que Compara una Ubicacion del Dispositivo Inalambrico con Otra Ubicacion Geografica
US 8,588,748	11/19/2013	System and Method for Mobile Identity Protection of a User of Multiple Computer Applications, Networks or Devices
US 8,437,784	5/7/2013	System and Method to Initiate a Mobile Data Communication Utilizing a Trigger System
US 8,374,634	2/12/2013	System and Method for Automated Analysis Comparing a Wireless Device Location with Another Geographic Location
US 8,280,348	10/2/2012	System and Method for Mobile Identity Protection Using Mobile Device Signaling Network Derived Location Pattern Recognition
US 8,155,677	4/10/2012	Mobile Messaging Short Code Translation and Routing System and Method
New Zealand 580499	8/31/2012	System and Method for Automated Analysis Comparing a Wireless Device Location with Another Geographic Location
US 8,131,262	3/6/2010	System and Method to Initiate a Mobile Data Communication Utilizing a Trigger System
US 8,116,731	2/14/2012	System and Method for Mobile Identity Protection of a User of Multiple Computer Applications, Networks or Devices
Australia 2008/115299	2/9/2012	System and Method for Automated Analysis Comparing a Wireless Device Location with Another Geographic Location
S. Africa 2009/06947	1/26/2011	System and Method for Automated Analysis Comparing a Wireless Device Location with Another Geographic Location
US 7,792,518	9/7/2010	System and Method to Initiate a Mobile Data Communication Utilizing a Trigger System
US 7,403,788	7/22/2008	System and Method to Initiate a Mobile Data Communication Utilizing a Trigger System

US 6,128,389	10/3/2000	Authentication Key Management System and Method
US 5,970,144	10/19/1999	Secure Authentication-Key Management System and Method for Mobile Communications
US 5,850,445	12/15/1998	Authentication Key Management System and Method
US 5,799,084	8/25/1998	System and Method for Authenticating Cellular Telephonic Communication

Publications

1. What Workers Want from Wireless by Randall A. Snyder; April 15, 2004. America's Network, Advanstar Communications, Santa Ana, California USA.
2. Snyder, Randall A. and Gallagher, Michael D. Wireless Telecommunications Networking with ANSI-41 Second Edition; McGraw-Hill, New York, NY USA; © Copyright 2001 Randall A. Snyder and Michael D. Gallagher. *Foreword by Tom Wheeler, former Chairman, Federal Communications Commission*.
3. Forecasting SS7 Traffic by Randall A. Snyder; November 1, 2000. Wireless Review, Volume 17, Number 21, Intertec Publishing, Overland Park, KS USA.
4. Gallagher, Michael D. and Snyder, Randall A. Mobile Telecommunications Networking with IS-41; McGraw-Hill, New York, NY USA; © Copyright 1997 Michael D. Gallagher and Randall A. Snyder.
5. IS-41/GSM Interoperability by Randy Snyder; December, 1995, Cellular Networking Perspectives, Cellular Networking Perspectives, LTD, Calgary, Alberta, Canada.

Citations

1. Commendation from Admiral W.F. Merlin, Chief, Office of Command, Control and Communications, USCG (1986).
2. Method and Apparatus for Routing Short Messages, US Patent #6308075, Issued October 23, 2001.
3. Mediation Software for Delivery of Interactive Mobile Messaging and Personalized Content to Mobile Devices. Patent Application # 20020120779, August 29, 2002.
4. Automatic In-Line Messaging System, US Patent #6718178, Issued April 6, 2004.
5. Method and System for Wireless Instant Messaging, US Patent #7058036, Issued June 6, 2006.
6. United States Court of Appeals for the Ninth Circuit. Satterfield v. Simon & Schuster, Inc. No. 07-16356, D.C. No. CV-06-02893-CW Opinion. Appeal from the United States District Court for the Northern District of California. Opinion by N.R. Smith, Circuit Judge. Filed June 19, 2009.