

Curriculum Vitae of Jerry A. Kaufman



Educator, technologist, author, product developer, patent analyst, expert witness, business executive and consultant specializing in wireless, cellular and mobile communications: Bluetooth, Call Records/Billing, CDMA2000, CMDA, GSM, LTE, Messaging, SMS, TCPA, UMTS, WCDMA, Wi-Fi, WiMAX, 3G, 3GPP, 3GPP2, 4G, 802.11, and 802.15.

Jerry's unique background, accomplishments, expertise and experience qualifies him as an expert on wireless and cellular communications systems, technologies, services and products from a technical and business/industry perspective.

PROFESSIONAL SUMMARY

Jerry A. Kaufman began his career in telecommunications in 1970 designing and developing communications networks and systems for large commercial and government organizations. Since 1990, all of his work has focused on mobile, cellular, and wireless technologies, standards, spectrum, networks, and services.

As an educator, Jerry teaches courses covering mobile, cellular, and fixed wireless technologies, networks, and services. As an expert witness, he has authored numerous expert reports and has been deposed numerous times in cases ranging from the use of cellular technologies to theft of trade secrets. As a patent analyst, he has performed claims analysis on hundreds of telecommunications patents for patent litigation, patent infringement, and patent validity. As an author, he has written numerous analytical reports on cellular carriers, emerging wireless technologies and related markets. As a business executive, he has been responsible for the management, sales, and marketing of communications systems, networks, and services. And, as a product/systems developer, he has designed and developed a variety of communications network and management systems for leading communications manufacturers.

SELECTED ACCOMPLISHMENTS

- Designed a wireless in-building Location Information System (LIS) using interactive IR transceivers for real time tracking of people and equipment.
- Developed a telecommunications traffic analysis program (using Erlang & Poisson theorems) to automate the process of network design, call routing, cost reduction, and improved QoS.
- Developed specifications (design, performance, functions, and capabilities) for various in-building single-cell, multi-cell, and multi-user (SC/MU & MC/MU) wireless business communications systems and associated wireless phones.
- Developed a system for automated traffic routing and queuing using LCR.
- Designed a web-based system to host and produce e-tradeshows: scheduled, live, online interactive, industry focused B2B tradeshows.
- Designed and implemented multi-hop/node regional and national communications networks.
- Designed and developed a system for real time capture of network traffic information.
- Developed specifications for advanced voice and data business communications systems.
- Developed specifications for Wireless Local Exchange Services (WILES) in PCS, LMDS, Cellular, Satellite, GSM, and WLL Networks.

Mr. Kaufman’s unique coupling of knowledge and understanding of wireless products and markets with expertise in standards, technologies, and protocols derives from over 45 years of work as an educator, expert witness, patent analyst, business executive, product developer, and product designer.

System, Product & Market Knowledge	Technology & Protocol Expertise
802.11 Wi-Fi/WLAN 802.15.1 Bluetooth Automatic Telephone Dialing Systems (ATDS) ¹ Evolved Packet Core (EPC) Evolved Packet System (EPS) Global System for Mobile communications (GSM) Long Term Evolution (LTE) Long Term Evolution Advanced (LTE-Advanced)/(LTE-A) Public Land Mobile Network (PLMN) Public Switched Telecommunications Network (PSTN) System Architecture Evolution (SAE) Universal Mobile Telecommunication System (UMTS)	Code Division Multiple Access (CDMA) Direct Sequence Spread Spectrum (DSSS) Frequency Division Duplex (FDD) & (LTE-FDD) Frequency Division Multiple Access (FDMA) Frequency Hopping Spread Spectrum (FHSS) Orthogonal Frequency Division Multiple Access (OFDMA) Single Carrier – Frequency Division Multiple Access (SC-FDMA)/Clustered DFT-S-OFDM Time Division Duplex (TDD)/(LTE-TDD)/(TD-LTE)/TDD LTE Time Division Multiple Access (TDMA) Time Division Synchronous Code Division Multiple Access (TD-SCDMA) Wideband Code Division Multiple Access (WCDMA/UMTS/CDMA Direct Spread)
Advanced E-UTRA and Advanced EUTRAN/(LTE-Advanced access network) Authentication Centre (AuC) Base Station Controller (BSC) Base Station Subsystem (BSS) Base Transceiver Station (BTS) Circuit Switched Core Network (CS CN) Equipment Identity Register (EIR) E-UTRAN NodeB (eNB) Evolved Packet Data Gateway (ePDG) Evolved Universal Terrestrial Radio Access Network (E-UTRAN)/(LTE access network) Feature Phones Gateway GPRS Support Node (GGSN) General Packet Radio Service (GPRS) Generic Access Network (GAN) GSM/EDGE Radio Access Network (GERAN) Heterogeneous networks (HetNet) Home Location Register (HLR) IP Multimedia Subsystem (IMS) Lawful Intercept (LI)	Access Network Discovery and Selection Function (ANDSF) Access Stratum (AS) Authentication, Authorization, and Accounting (AAA) Call Detail Records/Charging Data Records (CDR) ³ Call Session Control Function (CSCF) Carrier Aggregation CDMA2000 1X (TIA/EIA/IS-2000) 1X Advanced CDMA2000 1xEV-DO Release 0 (TIA/IS-856), Revision A (TIA/EIA/IS-856-A) EV-DO Revision B (TIA/EIA/IS-856-B) DO Advanced Circuit Switched Fall back (CSFB) Control Channels Control plane Coordinated Multi Point operation (CoMP) Data Link (DL) Layer/Layer 2 (L2): Medium Access Control (MAC), Radio Link Control (RLC), Packet Data Convergence Protocol (PDCP), Broadcast/Multicast Control (BMC), Link access protocol on the Dm channel (LAP-Dm)

¹ Includes the Telephone Consumer Protection Act (47 U.S.C. § 227) (TCPA) covering unsolicited commercial voice, MMS, SMS and text messages/calls

System, Product & Market Knowledge	Technology & Protocol Expertise
Location Based Services (LBS) ² Media Gateway (MGW) Mobile Management Entity (MME) Mobile Stations (MS) Mobile Switching Center (MSC) Mobility Management Entity (MME) Multimedia Broadcast Multicast Service (MBMS) Multimedia Messaging Service (MMS) Multiple Input Multiple Output (MIMO) Node B Operations Support System (OSS)/Business Support Systems (BSS) Packet Data Networks (PDN) Packet Data Serving Node (PDSN) PDN Gateway (P-GW)/Packet Data Network Gateway (PDN GW) Radio Access Network (RAN) Radio Network Controller (RNC) Radio Network System (RNS) Relay Nodes (RN) Serving Gateway (S-GW) Serving GPRS Support Node (SGSN) Serving-Gateway (S-GW) Short Message Service (SMS) Short Messaging Entity (SME) Small cells: Femto cells, enhanced local access, Home eNB (HeNB), Micro/Pico base stations Smartphones Subscriber Identity Module (SIM) Telecommunications Management Network (TMN) Trusted and Untrusted Non-3GPP Access Network gateways Universal Integrated Circuit Card (UICC) Universal Subscriber Identity Module (USIM) Universal Terrestrial Radio Access Network (UTRAN) User Equipment (UE) Visitor Location Register (VLR) Wireless Access Gateway (WAG) Wireless Local Area Network (WLAN)	Enhanced Data rates for GSM Evolution (EDGE) Evolved Universal Terrestrial Radio Access (E-UTRA) Flexible Layer 1 (FLO) High Speed Downlink Packet Access (HSDPA) High Speed Packet Access (HSPA) High Speed Packet Access evolved (HSPA+) High Speed Uplink Packet Access (HSUPA) International Mobile Subscriber Identity (IMSI) Interworking WLAN (I-WLAN) Licensed-Assisted Access (LAA) Logical Channels Logical Link Control (LLC) Long Term Evolution (LTE) LTE-WLAN integration Mobile Application Part (MAP) Network Layer/Layer 3 (L3): Radio Resource Control (RRC), Radio Resource management (RR) Non-Access Stratum (NAS) Packet Data Convergence Protocol (PDCP) Physical Layer (PHY)/Layer 1 (L1) Policy and Charging Rules Function (PCRF) Power Control Quality of Service (QoS) Radio Access Bearer (RAB) Radio Bearers (RB) Radio Network Layer (RNL) Traffic Channels Transport Channels Transport Network Layer (TNL) Universal Terrestrial Radio Access (UTRA) Unlicensed Mobile Access (UMA) User plane Voice over LTE (VoLTE) Voice over Wi-Fi (VoWiFi)/Wi-Fi Calling

³ Includes analysis (accuracy and errors) of cell phone usage, records, billing systems and methods.

² Includes analysis of services, technologies, architecture, functions, accuracy, and errors relating to cell site/tower coverage and mapping, cell phone triangulation, positioning, location determination and tracking.

Professional Activities and Services

Mr. Kaufman's professional activities and services are focused in five areas: **Expert Witness/Subject Matter Expert, Patent Analysis, Consulting, Teaching, and Market and Technical Studies and Publications.**

Patent Analysis and Intellectual Property

Patent analysis services include:

- Infringement Analysis
 - Identification of infringed claims
 - Identification of products that infringe the asserted claims
 - Identification of technical standards⁴ that infringe the asserted claims
 - A technical analysis explaining how and why the asserted claims are infringed by the accused products and or technical standards
- Non-Infringement Analysis
 - A technical analysis explaining why the asserted claims do not infringe the accused products and or technical standards
 - A technical analysis explaining why the accused products and technical standards do not infringe the asserted claims
 - Assessment of a patent's validity
- Business, market, and industry value analysis for input into valuation, damages, and royalty base computations
- Quantification and qualification of the commercial benefit, value and importance of a patent and its claims to cellular carriers, equipment manufacturers and their customers/subscribers
- Entire market value rule (EMVR) analysis
- Product value apportionment analysis
- Analysis of the smallest salable patent practicing unit (SSPPU) and the value of the incremental benefit
- Determining the extent to which a patented feature/claim constitutes the basis for customer demand
- Methodology for computing the value of an infringing feature: Feature valuation analysis and computation algorithm
- Scenarios for royalty computation

Mr. Kaufman has analyzed hundreds of 3G, 4G, CDMA, cellular, GSM, LTE, mobile phone, smartphone, UMTS, WCDMA, and related wireless patents covering technologies, networks, devices, phones, and services.

Specifically, his patent work has encompassed the following standards, systems, and technologies:

- 3GPP: GSM/UMTS/LTE/LTE-Advanced
- IEEE 802.11/Wi-Fi/WLAN
- 3GPP2: IS-95/CDMA2000
- IEEE 802.15.1/Bluetooth

Expert Witness/Subject Matter Expert/Litigation Support

In addition to his consulting, research, publishing, and teaching activities, Mr. Kaufman serves as an expert witness providing testimony, research, and analysis on a wide spectrum of civil and business matters/litigation

⁴ 3GPP (GSM/UMTS/LTE/LTE-Advanced), 3GPP2 (IS-95/CDMA2000), IEEE 802.11/Wi-Fi/WLAN, & IEEE 802.15.1/Bluetooth

involving wireless communications patents, networks, products, and services. He manages all expert witness engagements and the research and production of all expert reports and testimony.

Some of his past expert witness and patent analysis engagements have included:

Case:	VirnetX Inc. et al v. Apple Inc.	
Cause:	Patent Infringement	
Client:	Finnegan, Henderson, Farabow, Garrett & Dunner, LLP for	Plaintiff
Services Provided:	<p>Technical, patent infringement and market/industry consulting and analysis covering various wireless and cellular technologies, networks, standards and markets:</p> <p>LTE, 4G, Femtocells, Interworking WLAN (I-WLAN), ECGI, DNS, Wireless Local Area Network (WLAN), Wi-Fi, Non-3GPP Access, IP Multimedia Subsystem (IMS), Home NodeB (HNB)/Home eNodeB (HeNB), Relay Node (RN), Generic Access Network (GAN), Small Cell, 3GPP system – fixed broadband access network interworking, LTE Interworking, Alternate Access Network, General Packet Radio Service (GPRS), Packet-switched streaming service, 3GPP Evolved Packet Core (EPC), Evolved Universal Terrestrial Radio Access (E-UTRA), and Evolved Universal Terrestrial Radio Access Network (E-UTRAN)</p>	

Case:	In the Matter of the Arbitration Between: ERF Wireless, Inc. Claimant, - and - Schlumberger Technology Corporation, Schlumberger Information Solutions Remote Connectivity, North America Division, Respondents	
Cause:	Breach of Contract/Specific Performance, Quantum Merit, Fraud and Fraudulent Inducement	
Client:	Schlumberger Technology Corporation	Baker Hostetler - Attorneys
Services Provided:	<p>Expert report, deposition, technology and systems analysis and consulting addressing:</p> <p>Wireless (WiMAX, Wi-Fi, Point-to-Point, Point-to-Multipoint) radio systems, service coverage charts/maps and patterns, heat maps, Fresnel zones, software tools and methods used to assess service coverage, omnidirectional and multipoint radio equipment, variances and anomalies in radio equipment performance.</p>	

Case:	Sendo v. Microsoft	
Cause:	Patent infringement, misappropriation of trade secrets, common law misappropriation, conversion, unfair competition, fraud, breach of fiduciary duty, negligent misrepresentation, breach of contract, fraudulent inducement and tortious interference	
Client:	Winston & Strawn for	Defendant
Services Provided:	<p>Patent, technical and industry analysis and consulting addressing:</p> <p>Smartphones and cellular phone technologies, design, manufacture, marketing, distribution, and supply.</p> <p>Smartphone architectures, features, functions, Operating Systems (OS), Graphical User Interfaces (GUI), Web browsers, filters and access controls</p>	

Case:	IPCom v. Apple	
Cause:	Patent Infringement	
Client:	Robins, Kaplan, Miller & Ciresi L.L.P. for	Plaintiff
Services Provided:	<p>Pre-litigation technical and market/industry consulting and patent infringement analysis covering various wireless and cellular technologies, products, networks, standards and markets:</p> <p>Wi-Fi Alliance, WLAN/802.11x, Bluetooth/ 802.15, Universal Mobile Telecommunications System (UMTS), Code Division Multiple Access (CDMA), Wideband Code Division Multiple Access (WCDMA), 3GPP2/cdma2000, IS-95, Core Network and Terminals: User Equipment - Core network General, Interworking with external networks: Bearer, Control & User Plane interworking/Policy & Charging/QoS, Core Network Entities Protocols and Subscriber Management: MAP/CAMEL/GTP/BCH/ SS/TrFO/IMS/GUP/WLAN11, OSA – Open Service Access, Smart Card Application Aspects: SIM, USIM & ISIM Interfaces and Functions, User Equipment - Core network layer 3 radio protocols: MM/CC/SM (lu)10</p>	

Case:	Asian Communications and Tegic Communications vs. Zi Corporation	
Cause:	Breach of Contract	
Client:	Morrison & Foerster for	Defendant
Services Provided:	<p>Expert report, deposition, patent, technical and industry analysis, and consulting covering:</p> <p>Cellular phone intelligent data entry, text and keypad input and prediction technologies and software</p>	

Case:	Rensselaer Polytechnic Institute and Dynamic Advances, LLC v. Apple Inc.	
Cause:	Patent Infringement	
Client:	Skiermont Puckett LLP	Plaintiff
Services Provided:	<p>Expert report, technology, systems and market analysis and consulting addressing:</p> <p>U.S. Patent No. 7,177,798 - A method for processing a natural language input provided by a user</p> <p>Siri's importance to Apple (the value and benefits Siri has to Apple) and how its usage, importance, demand, benefits, popularity and success has affected Apple's business, brand, products, services, customers, and competitors.</p> <p>The mobile OS/mobile device market, drivers of customer demand, loyalty, "stickiness," ecosystem/network effects, and opinions specific to market characteristics/demand drivers for mobile operating systems/devices.</p>	

Case:	Telefonaktiebolaget LM Ericsson and Ericsson Inc., v. WiLAN USA, Inc., WiLAN Inc. and Network Management Solutions, LLC WiLAN USA, Inc., WiLAN Inc. and Network Management Solutions, LLC v. Cellco Partnership d.b.a. Verizon Wireless, AT&T Mobility LLC, Sprint Spectrum L.P., and T-Mobile USA, Inc.	
Cause	Breach of Contract	
Client:	Tensegrity Law Group LLP for	WiLAN USA, Inc. and WiLAN Inc.
Services Provided:	Expert report, deposition, technology, systems and market analysis and consulting addressing: Allegations of infringement of various patents covering lawful intercept, network fault management, alarm alignment and reporting Whether Ericsson's cellular operator customers have a license to practice the NMS patents through a contract between Siemens and Ericsson The technical facts underlying the dispute as to whether Ericsson's cellular operator customers' activities are protected by the Siemens-Ericsson agreement	

Case:	Kristin Reifsnnyder v. Navient Solutions, Inc. f/k/a Sallie Mae, Inc.	
Cause	Violation of the Telephone Consumer Protection Act (47 U.S.C. § 227) (TCPA)	
Client:	Navient Solutions, Inc.	
Services Provided:	Deposition, Expert report, technology and systems analysis and consulting including: Critique of Plaintiff's expert report and applicability/relevancy of information sources Dispute accuracy of Plaintiff's call detail records and logs Analysis of type and conditions of consent Analysis of Navient's call center system to assess human intervention and autodialer/Automatic Telephone Dialer (ATDS) functionality and capabilities (predictive, preview and manual dialing)	

Case:	Thomas Everett vs. Verizon Wireless, Inc. et al. Campbell et. al vs. Airtouch Cellular et al.	
Cause	Cellular phone service billing errors & overcharges; billing, mediation and rating systems, software and methods, Call Detail Records (CDR); Subscriber invoices	
Client:	Murray & Murray for	Plaintiff
Services Provided:	Affidavit, technical and industry analysis and consulting addressing: Cellular phone service billing errors & overcharges; billing, mediation and rating systems, software and methods, Call Detail Records (CDR); Subscriber invoices	

Case:	Barnes & Noble Inc. v. LSI Corporation et al.	
Cause	Patent Infringement	
Client:	LSI Corporation and Agere Systems Inc.	Fenwick & West LLP - Attorneys
Services Provided:	<p>Patent infringement analysis and valuation; technology and market analysis of E-readers and Tablets.</p> <ul style="list-style-type: none"> • Entire market value rule (EMVR) analysis. • Product value apportionment analysis. • Analysis of the Smallest Salable Patent Practicing Unit (SSPPU) and the value of the incremental benefit. • Determining the extent to which a patented feature constitutes the basis for customer demand. • Methodology for Computing the Value of an Infringing Feature: Feature Valuation Analysis and Computation Algorithm. • Scenarios for Royalty Computation. <p>Technical, infringement and claims analysis of patents for:</p> <ul style="list-style-type: none"> • Methods for storing and playing encoded audio files in an audio player device • Storing, selecting, and labeling music files on a music chip • Enhancing spread spectrum technology with variable code techniques • Variable rate coding for wireless systems • A digital modulation system using an extended code set • 802.11 Wi-Fi (WLAN) systems • M-ary orthogonal keying systems • Varying the number of pilot tones in a multiple antenna communication system 	

Case:	United States of America vs. American Society of Composers, Authors and Publishers (ASCAP)	
Cause	<p>Application for the Determination of Reasonable License Fees for Performances via Wireless Transmissions and Internet Transmissions by:</p> <p style="padding-left: 40px;">AT&T Wireless f/k/a Cingular Wireless</p> <p style="padding-left: 40px;">Cellco Partnership d/b/a Verizon Wireless</p>	
Client:	Lovells, LLP for	Defendant
Services Provided:	<p>Expert report, patent, technology, business and industry analysis and consulting covering: Cellular phone and smartphone technologies, standards, protocols, methods, and practices used in the transmission, download (standard, streaming & progressive), use, purchase, preview, storage and playing of digital audio files, music, ringtones and ringback tones. Digital Rights Management (DRM)</p>	

Case:	Shyriaa Henderson v. United Student Aid Funds, Inc.
Cause	Class Action Complaint For Damages, Statutory Penalties, And Injunctive Relief Violation of the Telephone Consumer Protection Act (47 U.S.C. § 227) (TCPA)
Client:	United Student Aid Funds, Inc./Navient Solutions, Inc. f/k/a Sallie Mae, Inc.
Services Provided:	Deposition, Expert report, technology and systems analysis and consulting including: Critique of Plaintiff's expert report and applicability/relevancy of information sources Dispute accuracy of Plaintiff's call detail records and logs Analysis of type and conditions of consent Analysis of USAF's call center system to assess human intervention and autodialer/Automatic Telephone Dialer (ATDS) functionality and capabilities (predictive, preview and manual dialing)

Case:	Martino v. Motorola	
Cause:	Consumer Class action against Motorola relating to consumer purchases of defective cellular phones	
Client:	Maddox, Hargett & Caruso, P.C. Starr, Austen, Tribbett, Meyers & Miller David P. Meyer & Associates Co., LPA	for Plaintiff
Services Provided:	Expert report, technology and product analysis and consulting including: Develop discovery requirements Analysis of related business, competitive and industry practices Product Failure Analysis Develop interrogatories Assess extent of problem & damages Formulate settlement objectives Calculate damages and class relief	

Case:	Unisys Corporation v. L-3 Communications	
Cause	Breach of Contract	
Client:	Pepper Hamilton for	Plaintiff
Services Provided:	Expert report, technical and industry analysis and consulting covering: Networks, systems and technologies for Point to Multipoint Fixed Wireless networks, Fixed Wireless Access, and Wireless Local Loop; Patent License Agreements; Distribution Agreements; Product Development Agreements; Reseller Agreements	

Case:	Brent Underwood, Individually and on Behalf of the Class vs. Cole Haan, Inc.	
Cause:	Class Action Complaint For Damages, Statutory Penalties, And Injunctive Relief Violation of the Telephone Consumer Protection Act (47 U.S.C. § 227) (TCPA) - transmitting text message advertisements without prior express consent	
Client:	Cooley Manion Jones LLP for	Defendant
Services Provided:	Technology, systems and business analysis and consulting covering: SMS (Short Message Service) and Premium SMS systems, services, technologies and business practices including SMS short codes, Automatic Telephone Dialing Systems (ATDS), SMSC (Short Message Service Center), unsolicited SMS Messages	

Case:	Eulardi Tanseco vs. Apple, Inc. and AT&T Mobility, LLC	
Cause:	Class action: "iPhone 3G Marketing Litigation": <ul style="list-style-type: none"> • Capability of AT&T network to support Apple iPhone 3G using the 3GPP 3G radio interface protocol and the ability of the Apple iPhone 3G to reliably operate using the 3GPP 3G radio interface protocol • Violations of the New Jersey Consumer Fraud Act • Misleading and deceptive acts and practices • Violations of the New Jersey Uniform Commercial Code • Common law breaches of contract, fraud, unjust enrichment, and negligent misrepresentation. 	
Client:	Schoengold Sporn Laitman & Lometti, P.C. for	Plaintiff
Services Provided:	Technology, product, product performance, business and industry analysis and consulting addressing: AT&T cellular network 3G radio technologies, coverage and capacities; AT&T cellular network backhaul and backbone connection capacities; Apple iPhone 3G design, capabilities, features, operating systems, hardware and software components and technologies; 3GPP 3G radio interface protocols and standards	

Case:	Mettel v. Sysco Asian Foods and Gerdes	
Cause:	Traffic accident	
Client:	Larson King for	Defendant
Services Provided:	Expert report, technology and systems analysis and consulting addressing: Usage and location of cellular phones at the time of a traffic accident; Calling patterns and behavior; Call Detail Records; Subscriber Invoices; Billing systems and practices; Call and data event timing technologies, systems and methods; location determination and tracking.	

Case:	Morris vs. ADT Security Services, Inc.
Cause:	Class action against ADT relating to consumer purchases of cellular analog alarm systems.
Client:	Lieff, Cabraser, Heimann & Bernstein, LLP for Plaintiff
Services Provided:	Expert report, deposition and technical, regulatory and industry analysis and consulting covering: Cellular network security alarm device technologies, design, and manufacture; cellular network user/terminal equipment interfaces, signaling, technologies and standards; FCC Cellular Carrier and Network Rules and Regulations

Case:	Valerie Hill, et al. vs. T-Mobile USA, Inc.
Cause:	Class Action: redress for T-Mobile's nationwide policies and practices with regard to stolen or lost wireless phones
Client:	Davis & Norris, LLP for Plaintiff
Services Provided:	Expert report, deposition, technology, product and systems analysis and consulting covering: Smartphone and cellular phone SIM (Subscriber Identity Module) and USIM (Universal Subscriber Identity Module) technologies; Cellular carrier's activation processes, systems and business practices

Industry Consulting

Mr. Kaufman's business consulting engagements focus on planning, development, research, and analysis of mobile, cellular, and wireless technologies, systems, markets, companies, products, and services. This includes:

- **Product Planning & Development:** Product and service design and specification, analysis of customer requirements, product analysis, and competitive analysis.
- **Research & Analysis:** Forecasting products and service demand, identifying vulnerabilities in a client's and competitor's product, determining market shares, segmenting target markets to optimize marketing strategies, identifying and evaluating issues and trends that affect a client's products and services, evaluating the potential impact of current and future market trends on a client's market position, evaluating and identifying the buying behavior, needs and product usage of a specific group of customers, appraising the effect of competitor's activities on a client's market position, and assessing a client's strengths, strategies, tactics, market position and market performance.
- **Strategic recommendations and plans:** Development of strategic recommendations and plans over a broad range of issues relating to a client's revenue, profitability and market share including business plan development, sales and marketing programs, market entry and exit, pricing and discount plans, distribution planning and development, and strategic partnerships.

Reports and Publications

Mr. Kaufman is the author of various studies and research reports on mobile and wireless communications networks, markets, companies, products, and services:

- *"Sprint Wireless: A Critical Analysis of Key Financial and Market Performance Issues, Challenges and Successes"*

- *“Opportunities in the U.S. Wireless In-Building Business Communications Market”*
- *“Wireless Local Exchange Services: Opportunities, Competition and Strategies”*
- *“Wireless Business Communications Systems: Customer Requirements and Marketing Strategies”*
- *“Wireless Business Telephone Markets: 1998 to 2003”*
- *“Customer Demand and Requirements for Mobile Internet and Third Generation Wireless Products and Services”*
- Mr. Kaufman’s expert opinions, interviews and articles have appeared in:

<i>America's Network</i>	<i>Information Week</i>	<i>Telecommunications Alert</i>
<i>Arizona Republic</i>	<i>Investor's Business Daily</i>	<i>Teleconnect</i>
<i>Business Communications Review</i>	<i>Los Angeles Times</i>	<i>Telephony</i>
<i>Business Week</i>	<i>Microwaves & RF Technology</i>	<i>TotalTele.com</i>
<i>CFO Magazine</i>	<i>NBC5/KSAS-TV</i>	<i>Wired Magazine</i>
<i>Communications Daily</i>	<i>New York Times</i>	<i>Wireless Data News</i>
<i>Dallas Morning News</i>	<i>RCR</i>	<i>Wireless Week</i>
<i>Forbes</i>	<i>Scientific American Newsletters</i>	<i>Wireless World</i>
<i>Fortune</i>	<i>TR Wireless News</i>	<i>USA Today</i>

Teaching and Lecture Activities

Mr. Kaufman’s seminars and lectures cover a wide variety of mobile and wireless technologies, networks, markets, products and services:

- *“Understanding New Mobile and Cellular Networks, Technologies and Services”*
- *“Understanding RFID Systems, Technologies, Markets & Opportunities”*
- *“New Mobile and Fixed Wireless Networks and Services”*
- *“Wireless Business Telephone Systems”*
- *“Making Money in the U.S. Wireless Internet Market”*
- *“Wireless Local Exchange Services”*
- *“Third Generation Wireless: Promises and Realities”*
- He has been engaged by various organizations to conduct private, on-site executive & technology seminars:
 - Association of Finnish Telecom Software companies, Bellcore, Best Buy, Bouygues Telecom, Christensen O'Connor Johnson Kindness PLLC, Florida Dept. of Management Services, NextiraOne Federal, LLC, (Black Box Network Services), Sprint PCS, Tescoco, and U.S. Dept. of Defense.
- He has organized and produced industry conferences on emerging opportunities in wireless communications:
 - *“PCS and Local Exchange Services Conference”*
 - *“Wireless Business Communications Systems Conference”*
- He has lectured on wireless communications at industry conferences sponsored by:
 - Tele-Communications Association
 - Business Communications Review
 - International Communications Association

- TR Labs
- Multi Media Telecommunications Association.

Career Achievements

- ◆ **President - ALEXANDER RESOURCES 1990 to Present**
 - Alexander Resources is a professional services firm providing consulting, expert witness, patent analysis, research, educational and analytical services focused on mobile, cellular, and wireless technologies, standards, phones, networks, services, and markets. Since its founding in 1990, it has served over 200 of the world's leading mobile, cellular, and wireless carriers, developers, manufacturers, and law firms. Mr. Kaufman founded the company in 1990 and has since served as its president. As president, he directs all research, consulting projects, patent analysis, and expert witness engagements.

- ◆ **President & CEO - INVANCE CORP. 1999 to 2000**
 - Founded and funded InVance Corp., an e-commerce business-to-business startup developing new live, online interactive marketing services. Designed the web-based system to host and produce e-tradeshows: scheduled, live, online interactive, industry focused B2B tradeshows.
 - Formulated business concept, plans, and strategies and designed the system architecture. Recruited the senior management team and developed relationships with potential customers and investors.

- ◆ **President and CEO - ALEXANDER LIFESYSTEMS 1989 to 1990**
 - Designed and developed the world's first active badge, on-premises, wireless Location Information System (LIS) using infrared technology. The system was designed for healthcare facilities and hazardous/high risk environments. In addition to founding the company and securing its initial funding, he had full management and financial responsibilities and formulated the company's business, marketing, product and distribution plans. He also recruited the engineering, product management, and sales teams.

- ◆ **VP of Sales & Marketing - EXECUTONE INFORMATION SYSTEMS 1988 to 1989**
 - Full management and P+L responsibility for sales and marketing of specialized internal communication systems for hospitals and healthcare facilities. Systems sold worldwide through networks of 197 independent and direct sales and service offices. 1988 revenues: \$20,000,000. Directly managed fifteen people responsible for National Sales, National Accounts, Distributor Relations, Customer Service, Product Management, Advertising, Promotion, Product Development, and Technical support. Indirectly managed field sales and sales support staff of 35.
 - Overcame declining sales, re-established Executone as the market leader, rebuilt customer and distributor confidence and increased sales 25%, gross margin 40% and pre-tax 50% by:
 - Instituting market driven pricing
 - Rationalizing product line and lowering product costs
 - Launching new advertising and promotion programs
 - Implementing new discount and incentive programs
 - Reorganizing the field sales organization
 - Correcting product quality, delivery and performance problems
 - Rebuilding and expanding staff
 - Improving customer service and support
 - Redirecting and initiating new product development
 - Reactivating the National Accounts program.

- ◆ **Vice President of Product Development - VODAVI COMMUNICATIONS 1987 to 1988**
 - Responsible for the product development and planning of new wireless and wired business communications systems.
 - Developed specifications (design, performance, functions, and capabilities) for various in-building single-cell, multi-cell, and multi-user (SC/MU & MC/MU) business communications systems, and associated wireless phones.
 - Developed specifications for advanced, private voice and data business communications systems.

- ◆ **President - APPLIED MARKETING TECHNOLOGIES, INC. 1984 to 1987**
 - The firm specialized in product and marketing consulting (product development, pricing, distribution, and promotion) and business consulting (business planning and client audits) for manufacturers and marketers of communication and information based products and services. Mr. Kaufman founded the company, had full management and financial responsibilities, and generated all of the firm's sales in addition to performing specific consulting engagements.
 - Selected client accomplishments:
 - For a leading manufacturer of communications products, he developed strategies to optimize the market position for its consumer telephone products and central office management systems. Included an analysis and forecast of the U.S. Central Office market.
 - Identified and established a \$110 million U.S. market niche for an \$11 billion foreign supplier of communications systems.
 - Formulated plans that resulted in \$17 million in new funding for a communications switching system manufacturer.
 - Evaluated opportunities for Tandem switching systems in the U.S. telecommunications market.
 - Developed guidelines and marketing programs for the marketing of a business communications system in the U.S.
 - Developed product plans and marketing strategies for a line of commercial communications terminals.
 - Developed marketing and distribution plans for an integrated messaging/communications system.
 - Developed product specifications and marketing programs for an integrated switching system.
 - Clients included AT&T, General Electric Co. (England), Rockwell International, C. Itoh & Co. Ltd., Conrac Corp., Dataquest Inc., G.E. Credit Corp., NT&T, Samsung Telecommunications Ltd., Nippo Communications Industrial Co. Ltd., Semicon Industries pte Ltd., Telrad Ltd., and Vodavi Corp.

- ◆ **Assistant Vice President, Market Development – NORTHERN TELECOM (Nortel Networks) 1983 to 1984**
 - Identified and developed changes to the marketing functions of various Corporate, Group, and Division organizations that improved pricing, profitability, customer satisfaction, and market penetration. Identified competitive responses and actions needed to improve Northern Telecom's market position. Responsible for identifying new market opportunities.

- ◆ **Director of Market Management for Integrated Office Systems - NORTHERN TELECOM (Nortel Networks) 1981 to 1983**
 - Responsible for the design and development of the new Meridian business communications systems - a \$100+ million development program. Additional responsibility for business, product, and market plans and strategies. The new system increased sales by 20% and restored Northern's leadership position in the marketplace.

- ◆ **Director of Market Research and Product Planning - SIEMENS CORP. 1979 to 1981**
 - Responsible for design and introduction of Siemens' next generation business communications system. The new system increased overall revenues and restored the company's competitive position. Additional responsibilities included key telephone system development and a major study of market opportunities for private switching networks in the U.S.

- ◆ **Product Manager - COMMUNICATIONS GROUP, INC. 1975 to 1979**
 - Designed, developed, and introduced new communications products and systems that grew the company's systems business from \$0 to \$2,000,000 in three years. Managed the groups responsible for product development, project management, R&D, marketing, administration, and support of communications switching and management systems (PBX, ACD, Networks and SMDR).

- ◆ **Communications Consultant - COMMUNICATIONS GROUP, INC. 1974 to 1975**
 - Responsible for the analysis and design of complex multi-node, private networks for large commercial and government organizations. Developed the first automated and interactive network design and analysis software program utilizing traffic flow, busy hour and grade of service inputs and measures.

- ◆ **Product Manager - COMPUTOLL, INC. 1972 to 1974**
 - Transitioned the company from consulting services to systems supplier by establishing the Product Engineering and Development groups. Responsible for the product design, development, and manufacture of the industry's first Station Message Detail Recorder/Call Detail Recorder (SMDR/CDR) systems and peripheral Least Cost Routing (LCR) system.

- ◆ **Communications Consultant - COMPUTOLL, INC. 1970 to 1972**
 - Responsible for the design of complex multi-node, private voice and data networks for large commercial and government organizations. Analyzed and evaluated client's PBX/Network usage in order to reduce costs, improve traffic capacity and operation.

EDUCATION

Bachelor's degree in Communications from Brooklyn College of the City University of New York, 1970.