

TECHNOLOGY DEVELOPMENT AND MANAGEMENT WIRELESS TELECOMMUNICATIONS

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Summary of Qualifications

I have been involved in innovative wireless telecommunications network, product, and service development for over thirty-five years. My primary interests and expertise lie in the areas of strategic analysis, management, and engineering of wireless technologies, networks, and systems. I have a proven record of successful product and network design and optimization. As a result of my work with some of the industry's most innovative companies and my published articles, I have developed an international reputation as an expert in a wide range of wireless technologies and their applications.

Throughout my career in the wireless industry I have been at the forefront of product, system, and network development. Along the way, I have been awarded several patents for technical innovations. Most recently, my work has included optimization and analysis of fourth generation ("4G") wireless networks and applications. I am completely familiar with the technologies and industry standards that define current and legacy wireless networks.

Career Experience

1992 - Present: President, Drucker Associates (<http://www.drucker-associates.com/>)

Drucker Associates is a consulting firm providing world-class technical expertise to a variety of telecommunications industry clients. Drucker Associates specializes in providing strategic technical direction, product and service development, system optimization, and specialized training for carriers, manufacturers, and others in the wireless telecommunications field. Since 1998, I have written a column on technology that appears in the trade journal *Wireless Week*.

Client Services

In my role as president of Drucker Associates, I have provided a broad range of services to an extensive and diverse group of clients. Following are representative examples.

- For **Space Data Corporation** I developed feasibility analyses and architectural strategies for a novel approach to providing broad area 3G and 4G wireless voice and data communications services using high altitude balloon platforms.

- I have undertaken several engagements for providing consultation and **expert witness services in litigation matters** dealing with wireless technologies. Among these was the patent infringement case *ISCO v. STI et al.* In expert report, deposition, and trial testimony I demonstrated that the patent in suit was invalid due to prior art that should have been disclosed by the applicants. The jury unanimously agreed and found for the defense, a ruling that was upheld on appeal.
- I have provided representation for several clients in **wireless industry standards-making bodies**.
- For **regional wireless operators in the U. S.** I have provided guidance in network development, including technology and vendor selection, strategies for network design, evolution, and optimization, and core business development. Most recently I have assisted with analysis and strategies for 4G network deployment and integration.
- For **Motorola, Inc.** I assisted in development of technical strategies for evolution of pioneering cellular networks in mainland China and Thailand. These networks subsequently emerged as principal service providers in their respective countries.
- For **Pele-Phone (Israel)** I conducted an extensive evaluation of their nationwide cellular network and recommended several critical changes in their evolutionary strategy. Subsequently, the client was able to deliver improved service quality while lowering capex and opex.
- For the **Electric Power research Institute (EPRI)** I conducted extensive analyses of wireless communications requirements for the emerging “Smart Grid.” I delivered three detailed reports of findings and recommendations which are expected to be instrumental in development of industry standards for Smart Grid wireless data communications.
- For **Leap International** I undertook a comprehensive evaluation of designs for CDMA networks in several large markets in Mexico, resulting in performance and efficiency gains and paving the way for successful transition to 4G technology.
- For **Schema, Inc.** I provided extensive strategic guidance in the development of several software tools used for wireless network optimization. My services included design of the basic architecture for the industry’s first tools aimed at data network optimization.
- For **an emerging wireless network operator in a former Soviet republic** my associates and I undertook an extensive evaluation of strategic technology and business plans for the launch of a pioneering nationwide CDMA-450 voice and data network. As a result of our efforts, the new network delivered substantially improved performance and capacity within the original capex budget. This in part led to the acquisition of the client under highly favorable terms.

- For a **venture capital funded start-up manufacturer of wireless products** I provided extensive consultation in product development, application engineering, and interfaces with carrier customers. My efforts were instrumental in the client mounting a successful public stock offering.
- For **Centennial Puerto Rico** I undertook a study of their nationwide CDMA network, making several recommendations resulting in performance and capacity improvements.
- For the **Clear-Com division of Vitec Group** I worked with associates on extensive technical analyses of client's current and proposed new wireless intercom products. Our efforts assisted client in identifying and correcting several problems, resulting in improved performance and customer acceptance.
- For various **venture capital and investment banking firms** I have provided due-diligence evaluations of emerging and proposed wireless technologies.
- For the **Jet Propulsion Laboratory** I undertook an extensive study of potential technical relationships between terrestrial wireless networks and satellite-based mobile wireless services. I subsequently presented the findings of this study at the 1993 International Mobile Satellite Conference.

Publications

I have written numerous articles for publication in leading wireless industry trade publications. On several occasions I have been invited to make presentations to industry gatherings.

Since 1998, I have written a column on technology that appears regularly in the trade journal *Wireless Week*.

1984 - 1992: Director of Research, U S WEST NewVector Group

As Director of Research, I headed the group responsible for strategic technical direction of NewVector, a major cellular telephone service provider. While at NewVector, I:

- Had a major role in resolving technical difficulties involved in launching the first commercial cellular systems.
- Performed detailed analytical, laboratory, and field evaluations of second generation digital and advanced analog air interface technologies, including TDMA, CDMA, and NAMPS, and did pioneering work on microcellular technologies.
- Represented NewVector on various industry technical committees and standards-making bodies, and was called upon to present papers at several industry gatherings.
- Was responsible for development of the world's first cellular pay phone.

- Was responsible for development of one of the first practical cellular "boosters" (cellular repeaters).
- Developed a number of innovative techniques for improving performance and efficiency of cellular system designs, including several for which patents have been granted.

1979 - 1983: Engineering Manager, E. F. Johnson Co.

As Engineering Manager at the US Communications subsidiary, I had responsibility for numerous product development programs involving land mobile radio telecommunications technologies. While at US Communications, I:

- Helped lead the company in substantial growth, making it an attractive takeover candidate.
- Participated in development of mobile unit logic and signal processing equipment for AT&T's Chicago cellular trial system.
- Managed development of highly successful first generation commercial cellular mobile equipment.
- Developed one of the first practical single chip cellular baseband processing systems, including several patented innovations.
- Was cited by the company president for outstanding achievement.

Other Career Experience: Boeing Electronics, Physio-Control Corporation, Data I/O Inc., and Data Link, Inc.

Staff and project engineering positions involving development of communications and biomedical products and systems.

Education

Bachelor of Science, Electrical Engineering: University of Washington
 Master of Science, Electrical Engineering: University of Washington