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Career Capsule Extensive communications industry experience in engineering and marketing management as well as product planning and project management.

Qualifications and Skills

Education BSEE, Louisiana State University, 1978
MBA, Nova Southeastern University, 1994

Skills **Experienced manager.** Knowledgeable in almost all aspects of a communications business, including marketing, engineering, finance, and VLSI fabrication. Successfully lead both engineering and marketing teams. Experienced public speaker, have appeared on many industry panels and made presentations at major trade shows.

Creative – able to visualize new product opportunities and gain acceptance for them in the corporation. Initiated the 56Kbps and the splitterless DSL modems at Rockwell. Invented the concept of the “Personal Web Server” used with residential gateways. Inventor on thirty issued patents, including a fundamental patent on splitterless DSL operation used in G.992.2.

Knowledgeable in a wide variety of communications technologies, including SONET/SDH, G.709 digital wrapper, IEEE 802.17 resilient packet rings, Ethernet, analog modem modulations, DSL, ISDN, ATM, cable modems, TCP/IP, speech processing, and optical networks.

Good Communicator – have the ability to explain complex technical ideas in layman’s terms. For examples, see my public papers at <http://members.cox.net/michael.henderson>

Good interpersonal skills – work well with people from all areas of the business.

High Energy – Maintain a high level of activity in both business and personal life.

Work History

2003 to Present **Private Consultant**
Consultant specializing in Communications Marketing.

My assignments over the past year have involved preparation of marketing plans for a startup company, presentation material for a performance analysis company, and preparation of technical marketing collateral for a DSL communications company.

I have consulted for two private investment companies to better understand the market potential for VOIP and a multi-line DS3 communications technology.

2001 to 2003 TDK Semiconductor, Tustin, CA**2001 to 2003 – Strategic Marketing.**

Reporting to the Vice President of Marketing, my responsibilities were to develop the product roadmap for the TDK broadband product line, develop strategic relationships, and to manage the startup and licensing of an innovative Ethernet based product, “The Personal Web Server,” which I conceived.

Broadband product areas are DS3 LIUs and OC-1 through OC-48 SONET/SDH transceivers. In the broadband area, I focused primarily on the DS3/E3 LIU area – increasing the number of ports and adding new features such as digital jitter attenuators and a desynchronization function.

I negotiated a strategic relationship with PMC-Sierra for our DS3/E3 LIUs, including contract negotiations and the joint announcement.

After I conceived the Personal Web Server concept, I built the business case, and wrote the product requirements document. I identified potential licensees and began negotiations with three companies to license the technology.

I previously investigated the market opportunity for DS3/E3 framer and mapper products, voice over IP products, 10Gigabit Ethernet over copper, Ethernet over in-home cable system coax, and enhanced telephony for the home products.

I also taught classes within TDK Semiconductor on communications and authored a paper on DS1/E1 and DS3/E3 line codes and framing.

1996 to 2001 Mindspeed Technologies, Inc., Newport Beach, CA**1998 to 2001 – CTO Organization.**

Responsible for product definition in the area of SONET/SDH, optical communications, and the emerging optical transport network (OTN). Very knowledgeable in SONET/SDH – have taught classes in this area within Mindspeed. Attend ANSI T1X1.5 and ITU-T meetings for SONET/SDH and optical communications related work.

Led a multidiscipline team investigating “**The Future of the Network**” to anticipate how the data network will develop over the next five years. Two major areas of investigation were 1/10Gigabit Ethernet and metropolitan area networks, including resilient packet rings.

Previously investigated opportunities, and did product definition, in the Voice over DSL (VoDSL) and voice over IP (VoIP) markets, especially the opportunity to increase the number of telephone circuits which could be carried over a DSL line by exploiting silence suppression. Developed queuing models to do simulations of various alternatives.

1996 to 1998 – Marketing, Network Access Products.

Managed a six person marketing team responsible for Rockwell’s \$130 million central site product business, providing modems and other communications products to access concentrator manufacturers who supplied over 70% of the ports shipped each year.

I initiated Conexant’s 56Kbps modem project, which is now V.90, and managed the marketing efforts for the central site chip set products. I defined and managed the market strategy and business relationships which allowed us to achieve over 50% ISP port market share against US Robotic’s X2 technology.

I developed the concepts for and initiated Conexant’s innovative splitterless DSL

technology. This work resulted in a fundamental technology patent on splitterless DSL operation, on which I am named as lead inventor (patent number 6,101,216). Concurrent with my central site marketing responsibilities, I guided the development of this technology within Conexant while defining the launch strategy.

When it became clear that the industry was focusing on DMT DSL technology, I helped identify potential technology partners and assisted in the creation of an alliance with Pairgain to obtain rights to their Falcon DMT processor.

1978 to 1996 AT&T Paradyne, Largo, FL

1992 to 1996 – Engineering. Management of a development organization of 24 engineers, including hardware, software and DSP engineers, in the development of an innovative voice and data communications system.

Worked closely with Microsoft and Novell to integrate this product into Windows NT and Novell NetWare NetConnect, and with a T1/ISDN PRI board manufacturer to develop drivers for these operating systems. Responsible for a development budget of \$3 million.

1987 to 1992 – Software Development. Managed a group of software engineers in the development of leased and dial modem products. Championed the company's entry into the dial modem business and managed the development of the first product offering, the DataPort dial modem product.

I later championed the development of a simultaneous voice and data modem, based on an innovative modem concept, called VoiceSpan, developed by two AT&T Paradyne Engineers. Announced at Comdex in November 1993, the DataPort 2001 Multimedia Communicator won "Best of Comdex" and was featured in Popular Science's "100 Best Products of 1994."

1985 to 1987 – Product Planning. Responsible for three product areas: Response (a minicomputer product), PIX/PIXNET (a specialized packet switch product), and CRT terminals. Developed an overall product strategy and was the architect of two new products, PIXNET XL, a high performance packet switch for IBM mainframes, and PDX, a multifunction workstation capable of emulating multiple different terminals.

1978 to 1985 – Engineer. Helped design a real time transaction processing operating systems, initially assigned to the file management system. Was promoted to supervisor after one year, heading up development of the file management system.

Patents and Papers

Patents – Thirty US patents

- 6,975,585 "Slotted synchronous frequency division multiplexing for multi-drop networks"
- 6,754,233 "Method and apparatus for transmitting data between a central site and multiple data subscribers"
- 6,731,653 "Method and apparatus for handling multiple data subscribers at a central site"
- 6,724,870 "System and method for distributing enhanced telephony service to customer premises equipment"
- 6,711,138 "Digital subscriber line/home phoneline network router"
- 6,694,125 "System and method for extending the range of a base unit"
- 6,686,755 "Methods for wireless testing of integrated circuits"

- 6,683,888 "Method and apparatus for establishing modem connections over a packet network"
- 6,678,375 "Efficient use of wire for data communication systems"
- 6,647,109 "Network telephony"
- 6,546,098 "System and method for distributing enhanced telephony service to customer premises equipment"
- 6,531,982 "Field unit for use in a GPS system"
- 6,493,355 "Method and apparatus for the flexible use of speech coding in a data communication network"
- 6,424,441 "Method and apparatus for sensing an audio signal that is sensitive to the audio signal and insensitive to background noise" (continuation of 6,072,882)
- 6,400,968 "System and method for extending the range of a base unit"
- 6,353,666 "System and method for providing an enhanced audio quality telecommunication session"
- 6,353,413 "Multi-function universal controller and locator system"
- 6,331,782 "Method and apparatus for wireless testing of integrated circuits"
- 6,272,681 "Cable modem optimized for high-speed data transmission from the home to the cable head" (continuation of 5,986,691)
- 6,212,227 "Constant envelope modulation for splitterless DSL transmission"
- 6,192,134 "System and method for a monolithic directional microphone array"
- 6,184,696 "Use of converging beams for transmitting electromagnetic energy to power devices for die testing"
- 6,151,335 "Modulation switching for DSL signal transmission"
- 6,101,216 "Splitterless digital subscriber line communication system"
- 6,072,882 "Method and apparatus for sensing an audio signal that is sensitive to the audio signal and insensitive to background noise"
- 6,037,743 "Battery charger and power source employing an environmental energy extractor and a method related thereto"
- 5,986,691 "Cable modem optimized for high-speed data transmission from the home to the cable head"
- 5,983,271 "Method for processing asynchronous low level protocols in a communications device to offload the main processor"
- 5,537,441 "Controlled simultaneous analog and digital communications"
- 5,444,704 "Dial restoral method and apparatus"

Papers – Publicly Available at <http://members.cox.net/michael.henderson/>

- "The Personal Web Server"** 2003. Describes a way of enhancing a residential gateway to include a web server function. This product would allow residential broadband customers to host their personal web sites without the disk space limitations of most broadband service providers.
- "DS1/DS3 and E1/E3 Framing and Multiplexing"** 2002. Describes how digital communications signals are multiplexed. Specifically this paper looks at the North American DS1 through DS3 and the European E1 through E3 frame and multiplexing structures. These are not plesiochronous signals so multiplexing requires a technique to handle the different clock rates of the signals being multiplexed. The line codes used for each rate are described in an appendix.
- "Differential Equations for High School Students"** 2002. Provides the mathematical background for a high school student to understand the basics of differential equations. Starts with a discussion of the natural number e , then gives a detailed

explanation of complex numbers, the complex number plane, and algebraic manipulation of complex numbers, leading to Euler's equation. A short review of differential calculus is given leading to the actual discussion of differential equations. Written for a young friend who plans to study EE at Georgia Tech starting in 2002.

- “**Fundamentals of SONET/SDH**” 2001. Gives a detailed explanation of SONET and SDH, down to the octet level. Also discusses SONET rings and recovery from fiber and node failures.
- “**Forward Error Correction in Optical Networks**” 2000. Explains the forward error correction techniques now standardized in ITU recommendations G.707 and G.709. The paper was written about the time G.709 was first approved and does not include the changes to G.709 since February 2001.
- “**Introduction to Optical Networks**” 2000. Starts with the basic physics of light, then uses these principals to explain how lasers and photo detectors operate. Discusses optical fiber and the various operating bands. Explains how optical communications is used in the network. Gives a basic introduction to SONET and digital wrapper. This has been a very popular paper, with almost 750 downloads during one peak month. Averaged several hundred downloads per month on the Mindspeed web site.
- “**Voice over ADSL**” 2000. Extends the analysis done in “Eliminating the Last Mile Bottleneck” to ADSL circuits.
- “**Eliminating the Last Mile Bottleneck**” 1999. A queuing analysis of voice over HDSL, assuming that silence suppression is used on the voice channels. A closed form M/M/1 analysis is provided, along with a non-closed form simulation.
- “**56Kbps Data Transmission across the PSTN**” 1997. This paper was written during the “56K War” before the V.90 standard was developed. It explains how modems work and how 56K technology differs from traditional modems. This paper received very wide circulation and was posted on many ISP sites during the early days of 56Kbps modems.