Stuart J. Lipoff

Mr. Lipoff is president of IP Action Partners Inc, a consulting practice in TIME (telecommunications, information technology, media, consumer electronics, and ebusiness) industries and technologies. He draws upon his 50+ years of experience in a wide variety of technologies and industries to assist clients with knowledge based consulting services involving complex business decisions and problem resolution.

Clients turn to him for his unique ability to combine a deep understanding of industry dynamics with his equal depth in the underlying technologies. Because he is at home in either the board room or the laboratory, the services he provides work across all levels of the client organization from providing consulting advice to lab based R&D of products and services.

Mr. Lipoff was employed 25 years by Arthur D Little, Inc (ADL) as VP and Director of Communications, Information Technology, and Electronics (CIE); 4 years by Bell & Howell Communications Company as a Section Manager, and 3 years by Motorola's Communications Division as a Project Engineer. At ADL he was responsible for the firm's global CIE practice. At both Bell & Howell and Motorola, he had project design responsibility for wireless communications and paging products.

Stuart Lipoff has Bachelor's Degrees in Electrical Engineering and in Engineering Physics, both from Lehigh University. He also has received a Masters Degree in Electrical Engineering from Northeastern University, and a MBA degree from Suffolk University.

Mr. Lipoff is a Life Fellow of the IEEE Consumer Electronics, Communications, Computer, Circuits, and Vehicular Technology groups. He is a officer member of the IEEE Consumer Electronics Society Board of Governors, and was the Boston Chapter Chairman of the IEEE Vehicular Technology Society. He served as 1996-7 President of the IEEE Consumer Electronics Society and served through last year as VP of Publications for The Society responsible for all the general and academic publications of IEEE Consumer Electronics. He is currently VP of Industry Activities and Standards for The Society. He has also chaired the search committee for Sony supported Mazura Ibuka Award in consumer electronics. As Vice President and Standards Group Chairman of the Association of Computer Users, he served as the ACU representative to The ANSI X3 Standards group. For the Federal Communications Commission's Citizens advisory committee on CB radio (PURAC), he served as Chairman of the task group on user rule compliance. He has been elected to membership in the Society of Cable Television Engineers (SCTE), The Association of Computing Machinery (ACM) , and The Society of Motion Picture and Television Engineers (SMPTE).

Stuart Lipoff holds a FCC General Radiotelephone License and a Certificate in Data Processing (CDP) from the ACM supported Institute for the Certification of Computing Professionals (ICCP). He is a registered professional engineer (by examination) in The Commonwealth of Massachusetts and also in The State of Nevada.

Mr. Lipoff holds seven USA patents and has published articles in Electronics Design, Microwaves, EDN, The Proceedings of the Frequency Control Symposium, Optical Spectra, and numerous IEEE publications. He has presented papers at many IEEE and other meetings. In the

fall of 2000, he served as general program chair for The IEEE Vehicular Technology Conference on advanced wireless communications technology. He has organized sessions at The International Conference on Consumer Electronics and was the 1984 program chairman. He conducted an eight week IEEE sponsored short course on Fiber Optics Systems Design. In 1984, he was awarded IEEE's Centennial Medal and in 2000 IEEE's Millennium Metal.

He served as a member of the USA advisory board to the National Science Museum of Israel and has presented a short course on international product development strategies as a faculty member of Technion Institute of Management in Israel. He has also served as a member of the board of directors of The Massachusetts Future Problem Solving Program.

He is involved in several community service projects as a Paul Harris Fellow in The Las Vegas Rotary Club, a volunteer staffing The USO Lounge at McCarren Airport, and as an auxiliary member of The Clark County Emergency Management Agency in The Radio Amateur Emergency Services Corp (RACES). Having earned a State of Nevada Teaching License, he fills in during spare time as substitute teacher in K-12 grades in Clark County Nevada public schools. He also serves as a member of The Advocacy Board of The University of Las Vegas (UNLV) College of Fine Arts.

Mr Lipoff is internationally recognized as an authority and opinion leader in new economy related businesses and technology in the telecommunications, electronics, media, and information technology related manufacturing and services businesses. Citations supporting his recognition can be found on his web site at http://www.lipoff.org .

Some examples of projects he has performed with a security and privacy focus include:

• For The Philadelphia Police Department, he developed a portable wireless panic alarm system that could be provided by the police to retail merchants in high risk areas to allow alarm notifications to be sent directly to patrol vehicles in close proximity to reduce response times to crimes in process

• For The White House Communications Agency, he developed belt worn alarm notification devices for roving guards that allowed notification of alarms and provided information on the device about the specific location and nature of the alarm. This same system was also deployed in several prisons.

• For the U.S. Department of Transportation, he designed an electronic lock for passenger automobiles. The novel design of this lock was in response to a DOT funded research program to develop high technology deterrents to automobile theft.

• For several electric power utilities he was part of a project team that developed a comprehensive region wide communications network linking multiple points in the service area. The design took account of supervisory control and data acquisition (SCADA) support; security monitoring, and building systems automation. The utilities included: Commonwealth Edison

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(Chicago), Florida Power and Light, Duke Energy, and New York State Electric and Gas, Public Service Electric and Gas (PSEG Newark NJ).

• For both the Electric Power Research Institute (EPRI) and the Gas Research Institute (GRI) on behalf of their utility members he studied the use of communications and sensor technology to employ SCADA to monitor the rights of way for security and data acquisition. He also studied and assisted in the implementation of remote metering and load management for both home and industrial end customers.

• For Iridium who was operating a global satellite voice communications network, he assisted a complementary solution provider implement a rapidly deployed emergency load management network to cycle large industrial air conditioning systems during the summer of electric power shortages in The State of California.

• For Honeywell he studied the FCC rules to develop recommendations for using wireless technologies for building automation systems management and monitoring

• For American District Telegraph (ADT) he developed an architecture for home security, fire monitoring, and control that would allow installers to complete an installation in less than one hour. The technologies incorporated in the architecture included wireless communications and power line carrier.

• For the John Hancock tower building in Boston, he developed a distributed alarm monitoring system to sense impending window failures in the 10,384 windows of this high rise office tower. The customer designed system involved microcomputer based sensor on each of the 10,384 windows each of which was monitored by a concentration computer on each of the 62 floors of the building which in turn was networked to a central alarm monitoring computer in the building's operations center.

• For The Cable Television Laboratories (CableLabs) he studied and recommended options for remote status monitoring additions to active amplifiers in the outside plant to report equipment outages to the cable operators network operations center.

• For The Multimedia Communications Network Systems (MCNS) consortium of the five largest cable operators, he lead the project that developed the DOCSIS series of cablemodem specifications now adopted as a global standard for high speed internet services via cable. This project included a set for specification for Operations Support Systems (OSS) that employed Simple Network Management Protocols (SNMP) for remote monitoring and alarm reporting to the Network Operations Center.

• For the Electronics Industry Association (now known as Consumer Technology Association), he participated in the development of the CEbus home automation standards covering electronic locks, power control, and HVAC control.

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• For Symbol Technologies, he worked with the client to develop a MAC layer protocol for a 2.4GHz wireless area network new product. This protocol was contributed to the IEEE 802.11 committee and incorporated into modern WiFi systems.

• For The Cambridge Silicon Radio spin off from Arthur D Little, Inc; he supported the development of 802.15 BlueTooth hardware products and supporting communications protocol software.

• For a project sponsored by ADL Enterprises, he participated in the design of an electronic lock with a wireless key for the slot machine industry.

• For MARS Electronics, a manufacturer of vending machine equipment, he developed detailed product concept specifications for an audit and accounting system that incorporated access control information. In follow-on work related to this project, he shared some of the product design responsibility with the client. The system consisted of a wireless infrared control unit and a microcomputer controlled receiver.

• For a supplier of pay per view movie services to the hotel and hospitality industry, he developed the architecture for revenue accounting and conditional access for guests. This included interfacing this entertainment system to the hotels property management and billing systems.

• For an association of credit card issuers, he has performed several projects related to security properties of card media. This projects have involved the consideration and evaluation of technologies including: RF ID, magnetic watermark, smart cards, optical storage cards, and holographic storage cards.

• For the New York City MTA, he participated in the design of a requirements specification for an automatic fare collection system. A key contribution to this project by Mr. Lipoff was consideration of the security aspects of the media and access control systems used to unlock doors, barriers, and turnstiles.

• For the United State Post Office, as part of a project to automate the retail post office lobby, he developed system specifications for secure vending equipment and the associated alarm requirements.

• In support of a multi-client study of new opportunities for financial industry firms, he studied the security and encryption requirements to support electronic banking. This work involved consideration of counterfeit projection for media, physical security of systems, and the developed for security protocols for home banking videotex terminals.

• For Alarm Device Manufacturing Company (ADEMCO), a manufacturer of alarm devices and data transmission equipment, he performed a technical marketing study to determine the expected market size and performance/feature requirements for a distributed alarm monitoring and control system.

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• For a division of Lockheed Martin manufacturing situation display systems, he performed an extensive worldwide study of the broadly defined "security industry". This project developed a segmentation scheme for the security industry and examined technical as well as market trends within each segment. The study resulted in recommendations for the most attractive segments for our client to target expansion of his business.

• For MARS Electronics, an electronic products manufacturer, he performed an evaluation of an electronic bill (currency) validator and a comparison of competitive products. The scope of this assignment involved the development of meaningful external test procedures and testing to these procedures. Also included in the assignment was examination of the internal differences between the machines to detect longer term possible strengths and weaknesses of the designs.

• Under contract to several trade associations representing the grocery industry, including the: Uniform Code Council, Grocery Manufacturers Association, and Food Marketing Institute; he is researching technology and developing a systems recommendation to permit compatible electronic data interchange between suppliers and retail stores at the store level. This project includes consideration of Smart Card and digital signature technology employing public and private encryption keys to insure message integrity and authorship.

• For a project jointly funded by RIAA and IFPI on behalf of the recording industry, he managed a project which identified and characterized alternative anti-piracy technologies designed to restrict unauthorized copying of "Red Book" standard CD music. The project included discussions with technology providers, evaluation of alternatives, working with a committee of the music industry to develop requirements and evaluation criteria, and preparing recommendations based on the evaluation of alternatives.

• For DataPlay, a startup developing secure optical media and associated digital rights management technology, he managed a project that performed a design review of the security aspects of the technology. The project was funded by DataPlay but involved reporting of the findings with the music industry investors in the DataPlay business. Included in the scope of this project was the development of threat scenarios, testing the robustness of the DataPlay technology to each threat, and recommending changes to the DataPlay technology. During the project we met with senior technical staff within the music industry who provided insights on threats, evaluation criteria, and concerns regarding the DataPlay technology.

• For Mastercard operating a credit card authorization network, he performed a task investigating new card media technologies and their contribution to system security and impact upon operational logistics. This study involved consideration of SMART CARD, optical storage card, card calculators, and other developing technology.

• For Knight Ridder, the parent corporation of a firm developing hardware and software for a home banking/shopping videotex application, he contributed to a project to evaluate both the future opportunity of the business as well as the specific implementation being developed in-house.

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