



## Paul B. Silverman

### Curriculum Vitae

#### Profile Summary

With over four decades of senior corporate management, global management consulting, entrepreneurial management experience, and a successful track record managing both private and public companies, Paul Silverman has demonstrated strong proven leadership and management capabilities in a wide range of areas including new venture development, capital formulation strategies, financing, global business development, mergers and acquisitions, and strategic alliances.

Mr. Silverman serves as Managing Partner of the Gemini Business Group, LLC, a global new venture development firm. In early May 2014, Mr. Silverman resigned his position as Executive Chairman of InferX Corporation, (OTC/PK: NFRX), a predictive analytics company. In December 2012, Mr. Silverman was appointed ‘turnaround’ President and CEO of the Company and led the development of several new predictive analytics business portfolios including Financial Analytics Management Solutions (“FAMS”), and new Clinical Data Exchange Services (“CDAX”), a family of transaction-based healthcare analytics services. Mr. Silverman shared the Company’s value creation strategy with the investment community ([Radio Interview Oct, 2, 2013](#)), expanded the executive management team, attracted new capital, and was appointed Executive Chairman starting November 2013.

In the past 10 years, Mr. Silverman has served as CEO or senior advisor to a wide range of entrepreneurial companies in areas of health care, telecom, security, next generation analytics, wireless services, on-line education, information systems, satellite services, e-commerce, M2M networks, imaging technology, healthcare software and systems, homeland security technologies, wireless applications, and many others. In May 2009, the Obama administration invited Mr. Silverman to consider an appointment in the administration to assist in areas of homeland security or health care.

Mr. Silverman’s has successfully developed and executed new strategies to assist problem companies employing a wide range of technologies in diverse markets. From 2006 to 2007, Mr. Silverman served as Chairman and former CEO of Strategic Defense Alliance Corp, a firm acquiring homeland security firms. In 2003, Mr. Silverman assisted in restructuring of MobilePro Corporation (OTC/BB: MOBL), a publicly traded telecom company, and served as founding Chairman of the MobilePro Management Advisory Board from 2003 to 2006, supporting the acquisition of 22 companies during his tenure. In 1998, Mr. Silverman was appointed “turnaround” CEO and Chairman of RFP Express, Inc. (OTC/BB: RFPX), a San-Diego-based, publicly traded, B2B e-commerce company in the travel and hospitality sector (1998-2000). He successfully sold an unprofitable wireless pre-paid card business, closed three funding rounds, increased staff from 8 to 55 employees, secured major strategic alliance partners such as Rosenbluth International, American Express and Sabre, established the company as a leading player in the hospitality sector

providing Internet based RFP services linking global hotel operators, travel agencies, and major corporations seeking to negotiate preferred lodging rates.

From 2001 to 2003, Mr. Silverman co-founded and launched several health care and telecom ventures including AttoTek Medical Imaging Systems, Inc. ("AMIS"). Working with the Mayo Clinic and partners such as TRW, AMIS used new proprietary computer-aided diagnostic imaging technology and automated disease detection algorithms to assist Radiologists in detecting brain aneurysms, with plans to expand this to include automatic detection of pulmonary aneurysms and colon cancer. Mr. Silverman also served as founding Chairman of international venture creating new data centers and Intelligent Building Networks in Tokyo and Seoul.

Mr. Silverman has also provided support to identify and promote next generation Israeli telecom and security technology in the U.S. In December 2008, Mr. Silverman accepted an appointment to serve as Special Representative for the Virginia Israeli Advisory Board ('VIAB') within Governor Tim Kaine's office to identify, review and assist in attracting Israeli-based defense, homeland security and next gen health care companies to Virginia.

Mr. Silverman has more than 10 years senior global management consulting experience, serving in senior management consulting positions with Coopers & Lybrand and Booz Allen and Hamilton. Mr. Silverman led the launch of the EDI practice in C&L and has strong qualifications in the e-commerce and business process re-engineering market. From 1991 to 1996, Mr. Silverman also served as Chief Executive Officer for -James Martin Strategy, Inc. ("JMS"), and co-managed all North American business development, sales and program management activities for this Amsterdam-based, provider of global management consulting and information technology services.

Mr. Silverman also has more than 18 years senior corporate management experience with leading global information industry players including GTE, RCA, Xerox and Satellite Business Systems (division of IBM) primarily in areas of international management and marketing, new service development, strategic planning and international business development. Mr. Silverman has considerable in-country experience negotiating strategic alliances, settlement agreements, and new services development with global PTT's and communication service firms. Within SBS, Mr. Silverman served as General Manager of International Services where he had overall P&L responsibility for \$10.5 million international telephone and data business; managed product planning, engineering, sales and financial staff and established a new VSAT-based voice and data family of services. Mr. Silverman held a Top Secret security clearance in 2008.

Mr. Silverman has also contributed to the education sector since 2002, currently serving as Adjunct Professor in the R.H. Smith School of Business at the University of Maryland, and formerly in the School of Management at George Mason University and the Kogod School of Business at American University. He typically teaches undergraduate and MBA courses in strategy (Capstone), international business and entrepreneurship. Mr. Silverman has taught the Capstone advanced business strategy courses sixteen semesters. In early 2012, he was appointed to also serve as Adjunct Professor in the School of Business at George Washington University in the Center for Entrepreneurial Excellence ("CFEE").

Mr. Silverman is committed to entrepreneurship, helping entrepreneurs launch, manage, and grow their business; developing new financing structures to fuel new ventures; and promoting new government policies needed to promote and support entrepreneurship. You can access Paul Silverman's blog at [www.paulsilverman.com/blog](http://www.paulsilverman.com/blog).

The *Worm on a Chopstick* book series draws upon Paul Silverman's global experience to help entrepreneurs understand how to develop, launch, manage, and successfully grow new ventures.

"Worm on a Chopstick: Understanding Today's Entrepreneurial Age: Directions, Strategies, Management Perspectives," released in May 2011, the first of a three book series, shared perspectives on today's "disruptive" entrepreneurial age changes, and offered strategies helping both traditional and emerging companies address today's challenges and opportunities. The book received positive reviews (<http://paulsilverman.com/books/reviews/>).

The second book in the series, "8 Building Blocks to Launch, Manage, and Grow a Successful Business", released on July 2, 2015, addresses what Paul Silverman defines as *Entrepreneurial Management 2.0*, a portfolio of management tools and perspectives structured within eight Building Blocks. The new book meets the requests from readers and colleagues to develop a more prescriptive "how-to" book for entrepreneurs, based on the author's experience.

A frequent speaker at industry conferences and user groups, Mr. Silverman has published many articles and OpEds on management, entrepreneurship, international business, market trends, policy and business issues and blog posts at [PBS Blog \(www.paulsilverman.com/blog\)](http://www.paulsilverman.com/blog). Mr. Silverman holds a BS in Physics from CCNY and an MS in Management from Polytechnic University of New York. He resides in the Washington, D.C. area.

## Teaching/Education

Mr. Silverman has contributed to the educational sector since 2002 serving as faculty at several leading universities:

**Adjunct Professor – University of Maryland– R.H. Smith School of Business** Spring 2012

- BMGT 495 Business Policies (Capstone Course) (3 classes) Spring 2012
- BUMO 758 Management Consulting (MBA) Summer 2012
- BUMO 756 Industry Analysis (MBA) Fall 2012
- BUMO 495 Business Policies (Capstone Course) (2 classes) Fall 2012
- BMGT 495 Business Policies (Capstone Course) (3 classes) Spring 2013

**Adjunct Professor -- George Washington University-- School of Management Spring 2010  
Center for Entrepreneurial Excellence (“CFEE”)**

- EM 1.0 Entrepreneurial Management  
(Developed new course at request of GWU CFEE – insufficient enrollment– planned for possible future offering)

**Adjunct Professor -- George Mason University – School of Management**

- SOM 498 Advanced Business Strategy and Modeling (Capstone Course) Spring 2003
- MBA 711 Graduate Entrepreneurship/New Venture Development Summer 2003
- SOM 498 Advanced Business Strategy and Modeling (Capstone Course) Summer 2005
- SOM 498 Advanced Business Strategy and Modeling (Capstone Course) Summer 2006
- MSOM 301 Business Strategy and Organizational Management Spring 2007  
(For government agency)
  
- MSOM 305 Managing in the Global Economy (2 classes) Fall 2007
- SOM 498 Advanced Business Strategy and Modeling (Capstone Course) Fall 2008
- SOM 498 Advanced Business Strategy and Modeling (Capstone Course) Spring 2009 (2 classes)
- SOM 498 Advanced Business Strategy and Modeling (Capstone Course) Summer 2009

**Acting Director GMU Entrepreneurial Step Up Program -- George Mason University School of Public  
Policy/Mason Enterprise Center (2007 – 2008 )**

- Appointed to lead the development and management of the new GMU Step Up Certificate Program in early 2008 offering an Entrepreneurial Education Program targeting CEOs of early stage, high growth companies  
[GMU Press Release - Step Up Program](#) [PBS Interview Nov 2007](#) [Step Up Program Website](#) [MEC Step Up Program Home Page](#)

**Adjunct Professor – American University -- Kogod School of Business**

- MGMT 386 Entrepreneurship/New Venture Development Fall 2002.
- MGMT 386 Entrepreneurship/New Venture Development Fall 2003.
- MGMT 386 Entrepreneurship/New Venture Development Fall 2004
- Served as Capstone Honors Project Advisor Fall 2004
- Served on Kogod committee to expand Entrepreneurship curriculum Fall 2004

**Adjunct Lecturer – UMUC Graduate School of Management**

**Guest Lecturer – George Washington University – Graduate School**

- Invited Guest Lecturer in EMSE 212 The Management of Technical Organizations – presented 90 minute lecture “*Perspectives on Entrepreneurship :Implications for Strategic Management*”

(October 2005)

## Representative Professional Activities and Publications

☐ Radio Interview: *Perspectives on Predictive Analytics Directions and Opportunities: InferX Corporation Overview* December 28, 2012 SmallCapVoice.com (<http://smallcapvoice.com/blog/a-new-audio-interview-with-paul-b-silverman-president-and-ceo-of-inferx-corporation-is-now-at-smallcapvoice-com/>)

☐ Accepted invitation September 8, 2011 to provide insights on President Obama's job plan prior to the President's speech. Interview on Rita Cosby's nationally syndicated radio show WOR 710; offered perspectives on the current jobs plan (<http://tinyurl.com/73zfkqv>)

☐ TV Interview (one hour live) on *Inside Scoop Business Program*-November 21, 2011– reviewed entrepreneurial management perspectives and recent book (<http://tinyurl.com/7sx863c>)

☐ Publication of new entrepreneurial management strategy book *Worm on a Chopstick : Understanding Today's Entrepreneurial Age: Directions, Strategies, Management Perspectives* in August 2011; second book addressing global entrepreneurship business and policy issues, *Surviving the Entrepreneurial Age*, planned for release in December 2014

☐ Potomac Leaders Forum ; Alexandria Chamber of Commerce – Presentation “*Perspectives on Entrepreneurship : Managing and Growing Early Stage Companies*” – Mount Vernon Country Club - March13, 2008

☐ “New Ideas Needed as Jobs Shift” - Commentary – Washington Post – March 3, 2008 [Wash Post OpEd 030308](#)

☐ “Empower the Homeland Entrepreneurs” – OpEd – Washington Business Journal --April 20, 2007

☐ CEO Roundtable - Business Alliance of George Mason University , McLean, VA – February 5, 2007

☐ “High Tech Innovators and Homeland Security” – Article – Sunday Washington Times -- December 28, 2003

☐ “Developing a Winning Business Plan,” – Article -- Potomac Tech Journal – October 31, 2002

☐ Interview with Potomac Tech Journal for article on new trends in diagnostic medical imaging systems and Computer-Aided Diagnostic technology – December 10, 2001

☐ "Emerging Third Generation E-Commerce Services – Issues and Opportunities” – conducted presentation at Electronic Commerce World 2000 Conference – Orlando, Florida- October 5, 2000

☐ "New Electronic RFP Solutions- Issues, Opportunities and Outlook,” – conducted keynote presentation at International Business Travel Association (IBTA) Electronic Commerce Seminar – Stockholm, Sweden, September 26, 2000

- ☐ “Three Generation’ Model Helps Define E-Business Trends” – Guest Opinion Article – Potomac Tech Journal– April 3, 2000
- ☐ “E-Commerce Takes Hold” -- Business Travel News – November 1, 1999
- ☐ “The Seduction of Technology” -- Op-Ed article – Communications Week -- April 13, 1996
- ☐ “Information Management -- The Great Schism” -- Article -- Communications Week -- September 12, 1994
- ☐ "Information Superhighway -- Need for New National Vision" -- Op-Ed article-- Communications Week April 19, 1994
- ☐ “EDI -- Applications and New Directions” -- developed, hosted and videotaped a four hour videotape for the James Martin Insight management training programs -- October 1993
- ☐ "Intelligent City Developments in the Asia Pacific Region -- Challenges and Opportunities for Telecommunications Providers" -- Chaired Discussion Group and presentation at Pacific Telecom Conference, Honolulu, Hawaii, January 21, 1993.
- ☐ "Emerging Litesat Developments" -- Chaired session at Pacific Telecommunications Conference, Honolulu, Hawaii, January 22, 1993
- ☐ "Enterprise Networking Strategy: A Critical Perspective" -- co-authored article published in Telematics and Informatics Journal, Pergamon Press, November 1992
- ☐ Conducted 2 days of taped TV interviews and broadcasts from Telecommunications 91 Conference -- Geneva, Switzerland on behalf of Computer Channel Europe -- October 1991
- ☐ “Information Revolution in the Pacific Rim - Implications for the 90’s” and “EDI Applications in the Pacific Rim” - Chaired sessions and conducted presentations at Pacific Telecom Conference, Honolulu, Hawaii, January 15-15, 1990.
- ☐ “The Information Revolution - ISDN’s Evolving Role” and “New Directions in Enhanced Services via ISDN - Opportunities for Users and Suppliers” - Chaired sessions and conducted presentations at ISDN ’89 Conference, St. Louis, Missouri, April 19, 1989.
- ☐ “Emerging Electronic Information Solutions: Challenges for Policy Makers” - Paper published in Policy Conference Proceeding PSSC sponsored Conference - forging A New Telecommunications Strategy: Choices for the Next Administration - National Press Club, Washington, DC, September 27,-28, 1988.
- ☐ “Strategic Perspectives for the 1990’s - ISDN, ONA and Information Services” - C&L Workshop for RBOC MIS Representatives - Chicago, Illinois - March 25, 1988.
- ☐ “Electronic Mail, EDI, and Channel Systems” - chaired and conducted presentation - Communications Manager Association (CMA) Conference, Westbury, New York, October 23, 1987.
- ☐ “Adding Value to the Core Business: Diversification Strategies” - presentation conducted at Coopers &

Lybrand Telecommunications Management Forum - Venice, Italy, June 17, 1987.

☐ “Collaborative Ventures as an International Financing Alternative” - speech presented at International Computers and Communications Forum - Washington, DC, May 14, 1987.

☐ “U.S. Economy and the International Marketplace” - represented GTE Corporation and Presented transborder data flow position paper at CONWEST sponsored panel session, Washington, DC, January 1984.

**NOTE:** More than 100 presentations and papers presented in a wide range of forums throughout the world.

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## Representative Blog Posts

<http://paulbsilverman.com/blog/>

### **Comments- Are Analytics Shifting from Executives to Employees?**

**February 10, 2014** in **Business, Business Intelligence, Health care, Predictive Analytics** by **paulbsilverman** | [Post a Comment](#)

Interesting article in Information Management Feb 6th issue ([Analytics Shifting C Level to Employees](#)) discussing how analytics decisions are being driven by mid-level staff rather than C-level executives. But analytics demands resources- what analytics should be pursued; how should analytics be deployed to increase revenue, decrease costs, and improve strategic position; what are the company’s key competitive peer group metrics? These are C-level not middle management decisions. Analytics, effectively deployed, can provide high ROI, but successful adoption typically demands C-level participation.

My comments noted no question there is a C-level gap in understanding how analytics drives increased revenue, decreased costs, and improved strategic position. The concept of “analytics competitor,” mentioned in Tom Davenport’s writings (*Competing on Analytics, others*) emphasize that “C-level” analytics, creatively applied, helps companies create winning strategies- examples which I have used in MBA courses are Netflix, Progressive, and even Cirque du Soleil which created a new ‘circus/theater’ market sector- if you wonder why you don’t see three circus rings or elephants, analytics played a key role in these and many other decisions. Worthwhile reading. Key point- C-level management teams that understand the

power of analytics driving new business strategy will achieve above average returns and a competitive edge. "Tops-down" thinking and unfortunately missed by many.

Many good insights here. I am pleased to share a full copy of my posted comments.

First, no question there is a C-level gap in understanding how analytics drives increased revenue, decreased costs, and improved strategic position. The concept of "analytics competitor," mentioned in Tom Davenport's writings (Competing on Analytics, others) emphasize that "C-level" analytics, creatively applied, helps companies create winning strategies- examples which I have used in MBA courses are Netflix, Progressive, and even Cirque du Soleil which created a new 'circus/theater' market sector- if you wonder why you don't see three circus rings or elephants, analytics played a key role in these and many other decisions. Worthwhile reading. Key point- C-level management teams that understand the power of analytics driving new business strategy will achieve above average returns and a competitive edge. "Tops-down" thinking and unfortunately missed by many.

Secondly, no doubt there is a 'massive treasure trove of data' available- this is a resource, not a solution. Analytics are the tool to leverage 'big data' to improve key metrics, e.g., revenue, costs, strategic position, and so on. And no doubt analytics supports and improves workforce operational decisions. But all analytics requires resources- which analytics efforts are most important for the organization? Looking at the company's value chain, what are the financial, peer-competitive benchmarks for key value chain components (e.g., manufacturing, inbound/outbound logistics, marketing, etc.); what are critical external market /risk metrics including technology, social, regulatory, and so on. The take-away here: operational analytics add significant value, but must complement a well-thought analytics strategy driven by 'C-level' executives. Again, 'tops-down' driven analytics strategy, is essential.

Thirdly, there is still a real gap in adopting analytics that improve performance. Look at the healthcare sector, where I spend a good deal of time, and today's challenges- accounts for almost 20 percent of US GDP, higher than any other country, and studies show our system quality lags well behind other leading countries. We are seeing the emergence of Clinical Decision Support Systems (CDSS) and Clinical and Business Intelligence (C&BI) using analytics to achieve performance improvements such as reducing misdiagnosis errors (accounts for about 10 to 30 percent of medical errors) and improving operational efficiency (estimated \$17-29 billion annually is spent due to patient misdiagnosis). Current healthcare performance metrics are sobering- the New England Journal of Medicine reported that US adults receive only about half of recommended care based on a nationwide audit assessing 439 quality indicators, and an estimated 98,000 US residents die each year as the result of preventable medical errors according to a US Institute of Medicine study. Clearly need exists to improve our system, and powerful proven data mining/analytics technology exists.

So why is adoption going slowly? In 2011, only 30 percent of US hospitals had a clinical data warehousing/mining solution according to a Healthcare Information and Management Systems Society study (HIMSS). And among these users, only an estimated 35 percent use analytic tools



for predictive modeling and less than 1 out of 5 of these use their transactional systems to capture data. The problem here- no cohesive 'tops-down' analytics strategy to drive the process changes essential to achieve performance improvement. But change is coming here and quickly.

Summarizing, analytics solutions must be a tops-down effort, driven at the C-level, looking at the most relevant key value-chain and competitive benchmarks. Executives must take the lead here, creating the overall strategy and direction to drive enterprise analytics strategy.

Paul B. Silverman is Executive Chairman of InferX Corporation ([www.inferx.com](http://www.inferx.com)) , a predictive analytics company, and teaches at the R.H. Smith School of Business in the University of Maryland. Contact: [paul@paulbsilverman.com](mailto:paul@paulbsilverman.com)

Posted by Paul S | Sunday, February 09 2014 at 12:00PM ET

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## The NextGen Entrepreneurship Forum

A Blog by Paul B. Silverman

Entrepreneurship Perspectives • New Venture Development • Managing Innovation • Management Strategies • Global Entrepreneurship • Emerging Technologies • Government Entrepreneurial Policies • Opportunities • Issues.

### Comments on Article- “Predictive analytics showing the shape of things to come”- The Australian June 25, 2013

August 18 in Business, Business Intelligence, Health care, Predictive Analytics by [paulbsilverman](#) | Post a Comment

The Australian newspaper had an interesting article on June 25, 2013 ([Australian Times Article](#)) describing a number of successful predictive analytics applications, but also making the point that market penetration has been slow noting “... despite the numerous uses of predictive analytics, uptake is limited.” According to Gartner, only 13 per cent of organisations report extensive use,

while fewer than 3 per cent use prescriptive capabilities such as decision/mathematical modelling, simulation and optimisation market.” I posted brief comments today in response to the article and am pleased to share a copy of my comments:

Excellent article and clearly summarizes the challenges we face in educating management on how PA solutions can help companies improve performance and mitigate risk. I am pleased to share the following 3 observations. My comments are based on my position as CEO of InferX Corporation, a publicly traded predictive analytics company, and serving as adjunct professor teaching MBA strategy courses in the RH Smith School of Business at the University of Maryland.

### **No. 1 Analytics complements ‘traditional management’**

Define your mission; assess external environment and competition using PEST, Porter’s 5 Forces model, other tools; assess internal resources and capabilities; develop detailed value chain analysis; analyze product life cycles; develop cost leader/differentiation global strategies based on product, market, competition and other factors. Analytics can make a major contribution throughout the ‘traditional’ management process. Yet market analysis shows about 85% of the total PA market today addresses the CRM sector. We need to view PA within the context of traditional management rather than a separate ‘big data/analytics’ sector. Integrating PA into traditional management processes is a challenge and the real opportunity with high upside

### **No. 2 Analytics costs more**

True. When the e-commerce revolution emerged years ago, we had major push back from companies who preferred to continue to process orders manually, work with suppliers using ad hoc systems, and avoid ‘costly’ new systems implementation and industry standards. Systems costs did increase, but we created process and performance efficiencies that improved profitability and reduced risk. Today’s analytics solutions demand understanding ROI (and how to measure) and clearly communicating this message.

### **No. 3 “Analytics Drives Strategy and Strategy Drives Analytics”**

Properly executed and integrated into a company’s management processes, I see great opportunity to use analytics to drive strategy, particularly in shaping new product and market innovations to increase ROI. Look at Capital One, an analytics driven competitor reportedly doing 300+ analytic scenarios daily to optimize financial offerings. Or Progressive, capturing motorcycle rider clients using analytics to define a segment with both claims and expense ratios providing strong returns. Amazon, Netflix and many others are using analytics to drive ‘micro-marketing segmentation’ which is where we are heading. And these new strategies create new analytics, enabling analytics- savvy companies such as Amazon to continue to excel.

Clearly all 'analytics solutions' providers, a term I prefer to emphasize PA's broader role, have a challenge ahead- to educate clients, particularly at the 'C' level, on the opportunities embracing these solutions and the challenges they will face if they do not. Exciting times lie ahead in the global analytics solutions business for both solutions providers and all companies in all sectors.

Paul B. Silverman President and CEO InferX Corporation (OTC/PK: NFRX)

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**12.20.11**

**Re:** Copy of PBS blog post on Fast Company site in response to Fast Company article "Avoiding Short-Term Thinking In A World of Big Data" [Fast Company Article](#)

<http://paulsilverman.com/2011/12/20/understanding-unknown-unknown-information-drivers-addresses-sea-of-data-issues-and-creates-opportunities/>



**12.20.11**

## **Understanding 'Unknown- Unknown' Information Drivers Addresses 'Sea of Data' Issues and Creates Opportunities**

I posted comments on Fast Company article discussing 'Sea of Data' issues in Fast Company Article "Avoiding Short-Term Thinking In A World of Big Data" <http://tinyurl.com/7gaepbl>

I shared my vision that predictive analytics is 'raising the bar' in how we manage the 'sea of data', and offered comments on new directions I see in manufacturing and health care. Here is a copy of my comments posted on the Fast Company site:

The article makes the point that "...in a sea of data, how can we make sure that we're not just reacting to the information in front of our face, but rather analyzing every possible input."

One solution to the problem, not mentioned in the article, is the need to develop new analytics to identify key drivers which create the data 'outcomes'. Predictive analytics enable us to identify these 'unknown-unknown' drivers that can only be found by analyzing data, looking for relationships and new rules that emerge developed by analyzing the data. Contrast this to today's 'deductive' approach using expert opinion and well-defined rules.

This 'data-driven' analysis to create new rules is an inductive (rather than deductive 'expert opinion' based approach) and from my perspective holds great promise to radically change current business processes, improve productivity and improve our quality of life.

This may sound bold, but as the former CEO of an early stage predictive analytics company and also looking at new opportunities in analytics, I see exciting potential here.

Some possibilities:

Look at manufacturing. If a "supplier's supplier" has a problem, supply chain management ensures quick notification, before it impacts the assembly line. Predictive analytics engines 'raise the bar' here by analyzing historical performance and risk data, often real time, defining future risk and performance drivers, and enabling management to optimize performance and mitigate risk.

Going beyond traditional data mining, these new predictive analytics tools analyze industry reports, government filings, trade press, and other sources to assess supplier "health," pending regulations, and other "unstructured" data sources. Seamlessly integrating with other data, we can use these to more accurately gauge supplier and production line risk and improve performance. Driving new rules, providing real time early warning signs that impact future supplier and business performance are the new management tools to harness 'the sea of data'.

Look at health care, my primary focus, where PA techniques hold great promise to help our current health care system. Consider the benefits of these new capabilities which are only a small sample of what lies ahead here:

- **Tracking Medical Diagnoses, Treatments, Medications, Outcomes, Costs, Reimbursements, and Relationships**

ICD or International Classification of Disease Codes , classifies diseases on health records. CPT or Current Procedural Terminology codes developed by the AMA describe services provided by medical practitioners. Medicare employs a similar system, using 'HCPCS'. Tracking and examining relationships among these metrics, looking at patient data, identifying processes, and key cost and patient health drivers, you can develop 'best practices' to improve the health care process.

- **Identifying Adverse Drug Analyses – assessing underlying drivers to more effectively identify "at risk" patients**

- **Optimizing clinical trials (candidate selection and monitoring) – predicting higher risk clinical trial candidates and assessing the key risk drivers**
- **Developing directional indicators to predict the underlying drivers for treatment of chronic disease to understand how medication protocols impact treatment plans and patient outcomes**

The new predictive analytic-based tools now emerging in all sectors are helping companies cope with the sea of data problem, and “raising the bar” in how leading firms optimize business performance in today’s dynamic global markets.

Paul B. Silverman

Author: Worm on a Chopstick : Understanding Today’s Entrepreneurial Age: Directions, Strategies, Management Perspectives <http://paulsilverman.com/books/>

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**06.15.12**

**Re: Copy of PBS blog post on website: [HealthCompanyCIO.com](http://HealthCompanyCIO.com)(*Helping CIO’s Improve Health Care*) in response to article “A Suggestion About Predictive Analytics” by Dale Sanders <http://tinyurl.com/7nw6twd>**

**THE ‘SUGGESTIVE’ VS. ‘PREDICTIVE’ ANALYTICS ISSUE [HealthCIO.com Article Suggestive Analytics](#)**

I posted comments on the HealthCIO.com site in response to article suggesting ‘suggestive’ rather than ‘predictive’ analytics (“PA”) provides real, demonstrable benefits and that, rather than PA, should be today’s primary focus. My point is with the proper vision and commitments here, PA tools offer powerful, exciting new tools to improve health care, both from patient care and financial perspective, reducing claims fraud and improving processes. And these same tools are spawning exciting new ‘analytics-centric’ ventures which I see as a high potential new venture sector and is one of my focus areas.

You can visit the HealthCIO.com site to see the original article “A Suggestion About Predictive Analytics” at <http://tinyurl.com/7nw6twd> and also see a reply to my comments. Copy of my comments follows:

*Paul says:*

[06/15/2012 at 12:56 AM](#)

**'SUGGESTIVE' AND 'PREDICTIVE' ANALYTICS WILL BOTH HELP IMPROVE HEALTH CARE**

Thanks for sharing your insights. As a former CEO of a predictive analytics company, and currently leading a new 'analytics-centric' leading edge, personal health and wellness company, among other activities, I am pleased to also contribute my perspectives here.

I like your idea of contrasting Suggestive vs. Predictive Analytics- there is obvious proven benefit in using analytics to improve quality at the point of patient care.

With regard to predictive analytics, I am pleased to offer comments:

–Predictive analytics is often muddled in with other statistical tools as you say, it is often difficult to appreciate and understand just how powerful these tools are and what is their specific contribution

–Rather than saying there are two flavors of PA, “easy and hard”, I suggest a better approach is to say there are two PA target opportunity areas in health care (and also in other sectors):

– Using PA to analyze the “known unknowns” – all of the patient treatment enhancements you described fall into this category- addressing known issues and processes, using analytics to improve processes, quality of care, and doing this more efficiently and at lower cost.

–Using PA to analyze the “unknown unknowns” – this is the real and power of predictive analytics and I believe really offers high upside for all health care players, and patients as well

–Look at the magnitude of today’s health care issues. As one example, increasing complexity of medication regimens used by patients, coupled with a fragmented health care system involving multiple prescribers, has made the occurrence of serious drug-drug interactions more likely today than ever before. For example, one study suggests Preventable Adverse Drug Events injure 1.5 million people a year, costs the U.S. healthcare system \$3.5 billion and resulting in an estimated 44,000 to 98,000 deaths every year. Some studies show even higher numbers.

–Our aging population exacerbates the above issues. Studies show 41 percent of seniors take 5 or more prescription medications, and more than half has 2 or more prescribing physicians. And 24 percent- about 1 out of 4 – seniors having 3 or more chronic conditions have not shared information with their health care providers during the last 12 months. No wonder medication errors among seniors on Medicare are estimated at almost \$900 million.

–We can use the real power of PA to better understand the “unknown-unknown” drivers here that are impacting our health care system, and create powerful new tools, improved processes and do this more efficiently while improving patient care.

–The “unknown-unknown” data I would like to see addresses questions such as why do we have adverse drug events; what are the rules we should be looking at and changing to reduce these events save lives, and reduce health costs; what are the underlying drivers and patterns for adverse drug events- do these vary by geography, treatment modalities, user demographics, specific types of medical facilities, maybe how and where medical practitioners are trained.

“Unknown-unknowns” may, for example, identify certain treatment modalities and drug regimens used by select groups of medical professionals which drive adverse drug events.

Predictive analytics, an inductive rather than deductive process, offers a powerful tool to help us identify these and many other critical underlying health care drivers.

I agree there are many PA projects that today may seem academic, but I do see great possibilities to improve our health care system, using powerful new predictive analytics computing tools and platforms coupled with more traditional analytics (both suggestive and deductive ‘rule based’ analytics), to dramatically improve the quality of our health care system. These new analytics and tools will address clinical issues such as the growing problem of adverse drug events, as well as addressing Medicare and other health care claims fraud and errors.

We are making progress, but I still believe we can be doing much more to achieve significant improvement in our nation’s health care system and very clear to me predictive analytics and other tools, with the proper vision and commitments, will play a substantive role.

Paul Silverman, Managing Partner, Gemini Business Group, CEO Sante Corporation, Adjunct Professor, R.H. Smith School of Business in the University of Maryland.

**Reply to my comments from author of the post- Dale Sanders, Senior Technology Advisor & CIO Mentor, Cayman Islands Health Services Authority**

- *Dale Sanders says:*

[06/15/2012 at 8:53 AM](#)

Very thoughtful and appreciated comments, Paul. Thank you for contributing! The unknown unknowns are definitely the most interesting and have the highest potential. I would like to see more predictive analytic attention given to what I call the “small n, high impact” diseases that affect a small population, but have a significantly higher social impact on families and communities– like ALS, for example.

In healthcare, I’ve noticed that we tend to grab “the next big thing” and all follow it without really knowing what we are following– we do it with technology, medications, and half-baked results from clinical trials. I’ve seen three RFPs in recent weeks that make predictive analytics a firm requirement, but when asked to clarify, the authors haven’t a clue– and that lack of understanding opens the doors to snake oil vendors and investments that don’t pan out.

I worked for several years in the USAF, then TRW. At one time, TRW managed more data than any single organization in the world– they managed the CIA data center, including data content; played a significant role in managing the NSA’s databases; and also owned the largest consumer credit data reporting system. In those settings, with what amounted to unlimited budgets, I learned a lot about the overall design concepts, strengths, and limitations of predictive analytics, especially when those analytics try to predict the nature of human nature. The technology is much better today than then, but largely, the concepts remain largely the same. We could predict with all sorts of accuracy the future of hardware and weapons related events, but our batting average

with human beings was pretty bad. The best we could do was correlate past events by analyzing backwards— all these human events led up to this event. Hindsight was definitely 20/20. But we were terrible at analyzing and predicting ahead, prospectively, where human behavior played a major role in the scenario.

So, in closing, smart people like you should continue to push us down the path of predictive analytics because eventually, it will pay off. In the meantime, we should also focus on interventions where the outcome is easy to predict; and take advantage of the suggestive analytic concepts described so well in Nudge which address the tricky issues of influencing human behavior with data.

Thanks again!

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