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This document contains a cover page (this page) and

[A] Summaries on pages 2 and 3 of this PDF (page numbered as 1 and 2, at the bottom right)

[B] Complete CV on pages 4-21 in this PDF (page numbered as 3-20, bottom right numbers)

[C] Combined with – *Supplemental Narratives* – see PDF pages 22-34 – <http://bit.ly/SD-CV-2017>

[1] Leading Change

[2] Leading People

[3] Catalyzing Results

[4] Catalyzing Business

[5] Building Coalitions

[6] Building Futures

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2013 - present MIT Auto ID Labs ▪ Research Affiliate, Dept of Mechanical Engineering, MIT <http://autoid.mit.edu/people-2>

2017 - present MDPnP Scientist ▪ <http://mdpnp.mgh.harvard.edu> ▪ Massachusetts General Hospital, Harvard Medical School

2017 - present NSF Center on Robots and Sensors at Purdue ▪ <http://web.ics.purdue.edu/~rvoyles/RoSeHUB.contact.html>

2013-2016 Senior VP, Industrial Internet Consortium (www.iiconsortium.org) (10/2013-7/2016) • <http://bit.ly/MIT-IOT>

2013-2016 Senior VP, Object Management Group (www.omg.org) (10/2013-8/2016) • <http://bit.ly/IIC-2013-2016-SD>

• <http://bit.ly/IIC-2015-REVIEW> → created global coalition of technology, business, industry, academia and governments (foreign and domestic) to promote economic growth via standards and solutions through convergence of IT/OT, data, communications, intelligent software, industrial IoT • <http://bit.ly/SD-IIC-1-100>

• 300 companies, 25 countries, 3300 members in pursuit of digital strategy, applications of IoT in machine to machine intelligence, industrial systems, healthcare, energy, smart cities, cybersecurity, education, wireless networks, RFID, data science, big data, data analytics, intelligent decision support, financial tech, aviation, automotive, transportation, agriculture, supply chain, robotics, automation, information administration, embedded artificial intelligence transforming computing at edge devices.

• Established strategic test beds through industry coalitions, public and private partnerships (government funding) to help catalyze solutions, tools, test applications, innovative entrepreneurship for new lines of business to create new jobs, reform education (MOOC) for high skilled workforce development and contribute to \$6 trillion economic growth by 2025 (<http://bit.ly/6-TRILLION>) • <http://bit.ly/SD-IIC-1-100>

• IIC related funding from EU €57million (see page 18) • Also see report <http://bit.ly/IIC-2013-2016-SD>

2000-2010 Research Scientist, Engineering Systems Division, Massachusetts Institute of Technology
MIT Auto ID Center (Technology Board Member for Standardization of RFID)
MIT Forum for Supply Chain Innovation (Co-Founder, Executive Director, Research Director)
MIT Sloan School of Management (Executive Education in Strategy and Management, Supply Chain)
MIT Data Center (2003-2006) - http://web.mit.edu/edmund_w/www/DATACENTERpeople.htm
MIT Energy Initiative (2008-2009) - <http://energy.mit.edu/>

- I helped to lead change in business, technology and education by creating organizations that did not exist before. I also contributed to economic growth through global innovation due to radio frequency identification (RFID) of objects and the pursuit of internet of things (IoT) as a result of the ecosystem created by RFID and its integration with software and ERP for real-time data and analysis coupled with artificial intelligence algorithms for decision support systems.
- I was involved in leading people and the management of the various organizations involved management of technology which had applications in almost every vertical including energy, healthcare, manufacturing, retail, logistics, aviation, automotive, food, farming, agriculture, spare parts management, ordnance maintenance, etc.
- I developed models of operational transparency which could generate new business models and created tools (published ground breaking ideas and also collaborated with Nobel Prize winning economists) which I also helped to disseminate through management executive education programs related to strategy, innovation and entrepreneurship including supply chain operations management, predictive analytical data models (before advent of big data), security risk analysis and value network optimization relevant to business, industry, government and security of global goods movement (DHS-CBP, WCO)
- I acted in advisory capacity to Fortune 500 companies, various US government agencies, organizations, foreign governments and global academic institutions to articulate, communicate and educate strategic nodes and points of influence with respect to [a] new tools to create new dimensions of socio-economic growth, [b] technologies that may benefit from tech transfer systems, [c] creation of intellectual property (IP) due to advances that may stem from some of these fundamental proceedings, [d] integration of this wealth of knowledge with community college and secondary education (necessary to maintain the supply chain of talent to continue to reap the harvest from future innovation).

EDUCATION

1989 PhD – RUTGERS UNIVERSITY School of Medicine [Molecular Bio, Biochemistry, Genetics, Microbiology] • UMDNJ
1985 MS [eq] • Molecular Biology, Cell Biology, Virology, Molecular Genetics • University of Pittsburgh (PA, USA)
1980 BSc [Honours] • Medical Physiology & Biochemistry; [Minors] Physics & Chemistry • Presidency College, India

TRAINING

1989-1991 Harvard University, Harvard Medical School, Massachusetts General Hospital (Fellow in Medicine)
1991-1994 Massachusetts Institute of Technology, Whitehead Institute (Human Genome Project)
1994-1995 University of California San Francisco School of Medicine and UCSF School of Pharmacy
1995 University of California, Berkeley. Communications Network [Audit] • Electrical Engineering / EECS
1998 Pharm D (award) University of California San Francisco School of Medicine • UCSF School of Pharmacy

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Aut inveniam viam aut faciam

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Connect <http://bit.ly/S-Datta> • <http://autoid.mit.edu/people-2> • <http://mdpnp.mgh.harvard.edu>
Concepts <https://dspace.mit.edu/handle/1721.1/111021> • <https://dspace.mit.edu/handle/1721.1/107893>

2013 - present MIT Auto ID Labs ▪ Research Affiliate, Dept of Mechanical Engineering, MIT <http://autoid.mit.edu/people-2>
2017 - present MDPnP Scientist ▪ <http://mdpnp.mgh.harvard.edu> ▪ Massachusetts General Hospital, Harvard Medical School
2017 - present NSF Center on Robots and Sensors at Purdue ▪ <http://web.ics.purdue.edu/~rvoyles/RoSeHUB.contact.html>

2013 – 2016 Senior VP, [Industrial Internet Consortium](http://www.iiic.ac.in) (10/2013-07/2016) • Summary - <http://bit.ly/IIC-2013-2016-SDGE>, Intel, Cisco, AT&T & IBM initiative for connectivity of data, time, process • <http://bit.ly/IIC-2015-REVIEW>
External government funding for IIC for global coalitions for large scale test beds • <http://bit.ly/SD-IIC-1-100>
Senior VP, Object Management Group • Standards for software design, development and evolution.

2000 – 2013 MIT Affiliate, School of Engineering • Massachusetts Institute of Technology, Cambridge MA (www.mit.edu)
Research Affiliate, Laboratory for Manufacturing & Productivity, School of Engineering, MIT (2014 - present)
MANAGEMENT CONSULTING • MANAGEMENT OF TECHNOLOGY • ENERGY • EXECUTIVE EDUCATION
RFID • REAL-TIME DECISION SYSTEMS • INNOVATION • ENTREPRENEURSHIP • GOVERNMENT ADVISORY
INTELLIGENT PREDICTIVE ANALYTICS • SUPPLY CHAIN STRATEGY • VISTING PROFESSOR OF MANAGEMENT
MATHEMATICS AND SCIENCE FACULTY • UNIVERSITY • COLLEGES • PUBLIC EDUCATION • K-16 • TEACHING

2000-2010 MASSACHUSETTS INSTITUTE OF TECHNOLOGY • MIT → <http://esd.mit.edu/WPS/author.htm#datta>
RESEARCH SCIENTIST • ENGINEERING SYSTEMS DIVISION • MIT FORUM FOR SUPPLY CHAIN INNOVATION
MIT DATA CENTER, MIT AUTO ID CENTER, MIT SLOAN SCHOOL OF MANAGEMENT, MIT ENERGY INITIATIVE
CO-FOUNDER, MIT FORUM FOR SUPPLY CHAIN INNOVATION • LECTURER in STRATEGY and MANAGEMENT

1999-2002 SAP • SOFTWARE SYSTEMS • MANAGEMENT OF INNOVATION • REAL TIME DATA • MIT AUTO ID CENTER
ENTERPRISE RESOURCE PLANNING SYSTEMS • GLOBAL SUPPLY CHAIN MANAGEMENT • HIGH TECH IBU

1996-1999 PUBLIC EDUCATION • STATE OF CALIFORNIA • NATIONAL TASKFORCE • WORKFORCE DEVELOPMENT
CALIFORNIA STANDARDS IN MATHEMATICS & SCIENCE • SAN FRANCISCO UNIFIED SCHOOL DISTRICT

1996-1996 UNIVERSITY OF CALIFORNIA, BERKELEY
NETWORK ENGINEERING • NETWORK COMMUNICATIONS

1994-1995 UNIVERSITY OF CALIFORNIA, SAN FRANCISCO • UCSF SCHOOL OF MEDICINE • UCSF SCHOOL OF PHARMACY
RESEARCH SCIENTIST • MOLECULAR PARASITOLOGY • INFECTIOUS DISEASES

1994-1995 UNIVERSITY OF CALIFORNIA, SAN FRANCISCO • UCSF SCHOOL OF MEDICINE
INSTRUCTOR • MEDICAL GENETICS

1991-1994 MASSACHUSETTS INSTITUTE OF TECHNOLOGY • MIT HUMAN GENOME PROJECT • WHITEHEAD INSTITUTE
RESEARCH SCIENTIST • MOLECULAR BIOLOGY OF TRANSCRIPTION • YEAST ARTIFICIAL CHROMOSOMES

1990-1993 HARVARD MEDICAL SCHOOL • HARVARD UNIVERSITY
INSTRUCTOR IN MOLECULAR MEDICINE, PHYSIOLOGY, BIOCHEMISTRY and METABOLISM

1989-1991 HARVARD MEDICAL SCHOOL • HARVARD UNIVERSITY • MASSACHUSETTS GENERAL HOSPITAL
RESEARCH FELLOW IN MEDICINE • MOLECULAR ENDOCRINOLOGY • THYROID & NEURO-ENDOCRINE LAB

1985-1989 RUTGERS • UMDNJ • NEW JERSEY MEDICAL SCHOOL • GRADUATE SCHOOL OF BIOMEDICAL SCIENCES
PhD • MOLECULAR BIOLOGY • BIOCHEMISTRY • MICROBIOLOGY • VIROLOGY

1980-1984 UNIVERSITY OF PITTSBURGH
MS eq • CELLULAR & MOLECULAR BIOLOGY • BIOCHEMISTRY • GENETICS • MICROBIOLOGY • VIROLOGY

1976-1980 PRESIDENCY COLLEGE • UNIVERSITY OF CALCUTTA
BS • PHYSIOLOGY • BIOCHEMISTRY • PHYSICS • CHEMISTRY

1964-1975 UNIVERSITY OF CAMBRIDGE • CALCUTTA BOYS SCHOOL
GCSE • ISC [MATHEMATICS • PHYSICS • CHEMISTRY • BIOLOGY • LANGUAGE ARTS • HUMANITIES]

2013 - present MIT Auto ID Labs ▪ Research Affiliate, Dept of Mechanical Engineering, MIT <http://autoid.mit.edu/people-2>
 2017 - present MDPnP Scientist ▪ <http://mdpnp.mgh.harvard.edu> ▪ Massachusetts General Hospital, Harvard Medical School
 2017 - present NSF Center on Robots and Sensors at Purdue ▪ <http://web.ics.purdue.edu/~rvoyles/RoSeHUB.contact.html>

2013 – 2016

Senior VP, OMG and Senior VP, Industrial Internet Consortium • *Next generation of the industrial internet of things and evolution of ambient intelligence* • <http://bit.ly/IIC-2015-REVIEW> • www.iiconsortium.org • <http://bit.ly/IIC-2013-2016-SD>

2000 – 2013

MIT Affiliate • Consulting – Internet Futures • Energy and Intelligent Systems (GE Global Research, Government of Taiwan, Sannerwind, EBMS) Management MBA • Chalmers University of Technology (Sweden), Bordeaux Ecole de Management (France), NCKU (Taiwan) • Entrepreneurship & Start-ups in Energy, Health, SCM • CatConGlobal • KEDGE Business School Education • K-12 and Colleges • Teaching (Adjunct) Mathematics, Chemistry, Biology, Anatomy, Physiology, Biotechnology

2000 – 2010

MIT Affiliate, Visiting Research Scientist, Engineering Systems Division, Dept of Civil and Environmental Engineering, MIT
 Co-Founder and Executive / Research Director, MIT Forum for Supply Chain Innovation, School of Engineering, MIT

- ✚ Intelligent Decision Systems; Forecasting; Real-time technologies; Sensors in Energy and Healthcare
- ✚ Academia-Industry-Government Liaison; RFID Systems; Healthcare Informatics; Energy Efficiency
- ✚ MIT Sloan School of Management Executive Education in Strategy and Management • MIT Auto ID Center

1999 - 2002

Principal Investigator, Strategic Innovation Projects, Global Strategic Initiative and Global Management, SAP AG / SAP Labs

- ✚ Supply Chain Management; E-commerce; Semiconductor Industry; Strategic Technology Advice
- ✚ Executive Consulting; Innovation in Adaptable Business Networks via Agents & RFID Technology

1996 - 1999

President and Co-Founder, Associated Scientists

Founder & Executive Director, Glenn T Seaborg Endowment for Excellence in Education

- ✚ Association for rigorous mathematics and science standards; Foundation to improve teacher training
- ✚ Seaborg, Glenn T (Archives - Library of Congress) <http://hdl.loc.gov/loc.mss/eadmss.ms006039> (Box 276)

1998 - 1999

Director, Office of Public Understanding of Science; Member, Senior Advisory Council, Eagle Alliance

Department of Nuclear Engineering, Texas A&M University, College Station, Texas

- ✚ Public literacy of the looming energy crisis and the under-utilization of safe nuclear energy

1997 - 1998

Visiting Fellow, Cisco Systems (Cisco Networking Academy) San Jose, California

- ✚ IT workforce development and US government programs

1997 - 1998

Chairman, National Information Technology Task Force

US Departments of Commerce; Labor; Education; White House Council of Economic Advisors and ITAA

- ✚ Policy advisory task force; global economic impact of IT; US initiatives for workforce development

1995 - 1997

Special Assistant [Title XV], Superintendent of Schools, City and County of San Francisco

Director of Development and Strategic Technology, San Francisco Unified School District, San Francisco, California

- ✚ Management and administration of technology infrastructure, hiring, science curriculum & development grants
- ✚ Co-founded Cisco Networking Academy at Thurgood Marshall Academic High School, SFUSD (San Francisco, CA)
- ✚ Interactive University Project (MOOC) with UC Berkeley & SFUSD supported in part by US Department of Commerce

1994 - 1995

Research Scientist, University of California at Berkeley and UCSF School of Medicine (San Francisco, California)

UCSF - UC Berkeley Program in Molecular Parasitology and Infectious Diseases

- ✚ Research in infectious diseases
- ✚ Instructor in Human Genetics, UCSF School of Medicine

1991 - 1994

Research Associate, Whitehead Institute, Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts

- ✚ Molecular genetics of transcriptional regulation in yeast; cancer research (<http://web.wi.mit.edu/young/>)
- ✚ Human Genome Project; artificial chromosomes (<http://www.broad.mit.edu/about/bios/bio-lander.html>)
- ✚ RNA Polymerase II dependent gene expression in vitro (www.hms.harvard.edu/dms/bbs/fac/buratowski.html)

1990 - 1993

Instructor in Medicine, Harvard Medical School, Boston, Massachusetts

- ✚ Teaching medical (MD) students [molecular medicine; biochemical physiology; metabolic regulation]

1989 - 1991

Research Fellow, Harvard University, Cambridge, Massachusetts

Research Fellow in Medicine, Harvard Medical School, Massachusetts General Hospital, Boston, Massachusetts

- ✚ Molecular endocrinology; endocrine tumors; molecular medicine; transcriptional regulation by thyroid hormone
- ✚ http://www.ups.upenn.edu/news/News_Releases/2010/09/dr-j-larry-jameson-to-lead-penn-medicine/

Education

BASIC EDUCATION

- PhD • Molecular Biology, Biochemistry, Biomedical Sciences • RUTGERS – UMDNJ School of Medicine (New Jersey, US)
- MS • Molecular Biology, Cell Biology, Virology, Molecular Genetics • University of Pittsburgh (Pennsylvania, US) • MS eq
- BS • Physiology & Biochemistry (Physics and Chemistry) • Presidency College, University of Calcutta (India)

CHRONOLOGY

- 1998 Pharm, D. (awarded) University of California San Francisco School of Medicine and UCSF School of Pharmacy
- 1995 University of California, Berkeley. Communications Network [Audit], Department of Electrical Engineering and CS
- 1989 PhD [Molecular Biology, Biochemistry, Genetics, Microbiology] UMDNJ <http://en.scientificcommons.org/4645561>
Research Collaboration: Department of Molecular Biology, Princeton University, Princeton, New Jersey 08544
www.molbio.princeton.edu/index.php?option=content&task=view&id=233
- 1986 Visiting Student, University of Cambridge, Cambridge, UK (Program in DNA Tumour Viruses)
- 1983 Visiting Student, University of Paris VI, France at ICIG (Institut de Cancerologie et Immunogenetique)
- 1980 BSc [Honours] Medical Physiology & Biochemistry; [Minors] Physics & Chemistry. Presidency College, Calcutta, India
- 1976 ISC – GCSE School Leaving Certificate, University of Cambridge (Local Examinations Syndicate) Cambridge, UK

Datta, S. (2017) *Digital Transformation* • MIT Libraries - <https://dspace.mit.edu/handle/1721.1/111021> (in preparation)

Datta, S. and Goldman, J.M. (2017) Healthcare - Digital Transformation of the Healthcare Value Chain: Emergence of Medical Internet of Things (MIoT) may need an Integrated Clinical Environment, ICE (World Health Strategy e-book • www.fhti.org) Listed as (pdf) "Healthcare" - MIT Libraries - <https://dspace.mit.edu/handle/1721.1/107893>

Datta, S. (2013) *Conscience and Common Sense* • <http://bit.ly/Book-by-S-Datta> • ISBN 978-1492857242

Datta, S. (2011) Future of Healthcare: Bio-Informatics, Nano-Sensors and Emerging Innovations (Chapter 8 in *Nanosensors: Theory and Applications in Industry, Healthcare & Defense* ed TC Lim) CRC Press <http://dspace.mit.edu/handle/1721.1/58972> <http://www.crcpress.com/product/isbn/9781439807361> and <http://esd.mit.edu/WPS/2008/esd-wp-2008-17.pdf>

Datta, S., Graham, D.P., Sagar, N., Doody, P., Slone, R. and Hilmola, O-P. (2009) Forecasting and Risk Analysis Supply Chain Management: GARCH Proof of Concept (Chapter 10 in *Supply Chain Risk and Vulnerability: Tools and Methods for Supply Chain Decision Makers* editors Wu, T. and Blackhurst, J.) Springer-Verlag <http://dspace.mit.edu/handle/1721.1/43948>

Datta, S., et al (2003) Adaptive Value Network (Chapter 1 in *Evolution of Supply Chain Management: Symbiosis of Adaptive Value Networks and ICT* (Information Communication Technology). www.wkap.nl/prod/b/1-4020-7812-9?a=1

MIT Working Paper Series MIT Engineering Systems Division

Datta, S. (2008) Auto ID Paradigm Shifts from Internet of Things to Unique Identification of Individual Decisions in System of Systems (ESD-WP-2008-09) MIT Library <https://dspace.mit.edu/handle/1721.1/57508>

Datta, S. (2008) Will Nano-Butlers Work for Micro-Payments? Innovation in Business Services Model may Reduce Cost of Delivering Global Healthcare Services (ESD-WP-2008-17) Published by CRC Press

Datta, S. (2008) A Portfolio Approach for Purchasing Systems: Impact of Switching Point (ESD-WP-2008-07)

Datta, S. (2007) Decision Support and Systems Interoperability in Global Business Management (ESD-WP-2007-24)

Datta, S. (2007) Unified Theory of Relativistic Identification of Information in a Systems Age: Proposed Convergence of Unique Identification with Syntax and Semantics through Internet Protocol version 6 (ESD-WP-2007-17)

Datta, S. (2007) Advances in Supply Chain Management: Potential to Improve Forecasting (ESD-WP-2006-11)

Datta, S. (2006) Advances in Supply Chain Management Decision Support Systems: Potential for Improving Decision Support Catalyzed by Semantic Interoperability between Systems (ESD-WP-2006-10)

PAPERS – ARTICLES – ESSAYS in IoT • ENERGY • HEALTHCARE • RFID • SUPPLY CHAIN • INDUSTRIAL INTERNET IIoT • SYSTEMS

E. S. McLamore, **S. Datta** and D. Jenkins (2017) Convergence of nanobiosensors and machine learning for mobile health of humans, animals and the environment (*in preparation*)

Y. Rong, A.V. Padron, K. J. Hagerty, N. G. Nelson, Song Chi, N. O. Keyhani, J. Katz, **S. Datta**, C. L. Gomes, and E.S. McLamore (2017) Open source *post hoc* SVM learning for biosensors based on weak protein-ligand interactions (*in press*)

Datta, S. (2017) DEX 2.0 (Digital Enterprise X.0) in *CHAPTERS* • <https://dspace.mit.edu/handle/1721.1/111021>

Datta, S. (2017) Digital in 4D *in Healthcare and Medical IoT* • <https://dspace.mit.edu/handle/1721.1/107893>

Datta, S. (2017) Digital Transformation • <https://dspace.mit.edu/handle/1721.1/111021>

Datta, S. et al (2017) Technology Assessment – Internet of Things • www.gao.gov/products/GAO-17-75

Datta, S. and Goldman, J.M. (2017) Healthcare - Digital Transformation of Healthcare Value Chain: Emergence of Medical IoT (World Health Strategy ebook • www.fhti.org) See "Healthcare" MIT Library <https://dspace.mit.edu/handle/1721.1/107893>

Datta, S. (2016) Digital Diffusion • in *CHAPTERS* • <https://dspace.mit.edu/handle/1721.1/111021>

Datta, S. (2016) Cybersecurity • in *CHAPTERS* • <https://dspace.mit.edu/handle/1721.1/111021>

Datta, S. (2016) Digital Twins • <https://arxiv.org/ftp/arxiv/papers/1610/1610.06467.pdf> and in *CHAPTERS*

Datta, S. (2016) Intelligence in Artificial Intelligence • <https://arxiv.org/ftp/arxiv/papers/1610/1610.07862.pdf>

Datta, S. (2016) Medical Errors in an Age of Ubiquitous Computing and Connectivity • <http://bit.ly/Primum-non-nocere>

- Datta, S.** (2015) The Commencement • in **CHAPTERS** • <https://dspace.mit.edu/handle/1721.1/111021>
- Datta, S.** (2015) L'Internet des Objets : la troisième révolution industrielle. *Logistique and Management* **23** n°3 29-33
DOI: 10.1080/12507970.2015.11742760 • <http://www.tandfonline.com/doi/abs/10.1080/12507970.2015.11742760>
- Datta, S.** (2015) Dynamic Socio-Economic Disequilibrium. *Journal of Innovation Management* **3** 4-9 [French, Spanish and Mandarin (Chinese interpretation) available in "CHAPTERS" from MIT Library <https://dspace.mit.edu/handle/1721.1/111021>
ENGLISH publication – <http://feupedicoes.fe.up.pt/journals/index.php/IJMAI/article/view/190/133>
FRENCH publication – <http://www.tandfonline.com/doi/abs/10.1080/12507970.2015.11742760>
SPANISH publication – <http://journal.poligran.edu.co/index.php/puntodevista/article/view/845/688>
- Datta, S.** (2014) Humanity Needs Dreamers - *L'humanité a besoin rêveurs* • <http://dspace.mit.edu/handle/1721.1/86935>
- Datta, S.** (2012) Unified Theory of Relativistic Identification of Information in a Systems Age: Convergence of Unique Identification with Syntax and Semantics through Internet Protocol version 6 (IPv6). *International Journal of Advanced Logistics* **1** 66-82 MIT ESD <http://dspace.mit.edu/handle/1721.1/41902> and in **CHAPTERS**
- Datta, S.** (2011) BIO-INSPIRED ENERGY FUTURE – QUEST FOR INTELLIGENT MITOCHONDRIA AND LIQUID FUELS. *International Journal of Electronic Business Management* **9** 1-10 <http://dspace.mit.edu/handle/1721.1/59804>
- Datta, S.** (2011) Energy Self-Sufficiency: Catalyst for Energy Agnostic Global Economy. *International Journal of Novel Materials* **2** 39-45 <http://dspace.mit.edu/handle/1721.1/62217> and <http://dspace.mit.edu/handle/1721.1/62251>
- Datta, S.** (2011) Hydrogen in the Energy Economy. *International Journal of Novel Materials* **2** 47-52
<http://dspace.mit.edu/handle/1721.1/62217> and <http://dspace.mit.edu/handle/1721.1/62251>
- Datta, S.** (2011) Carbonomics : Trinity of Elements 6, 92 and 94 May Re-Define the World Economy. *International Journal of Novel Materials* **2** 53-56 <http://dspace.mit.edu/handle/1721.1/62217> and <http://dspace.mit.edu/handle/1721.1/62251>
- Datta, S.** (2011) Being Digital – Business Services in Emerging Technologies <http://dspace.mit.edu/handle/1721.1/62251>
- Datta, S.** (2011) Paradigms Driven by Paradoxes – Vertically Integrated Health <http://dspace.mit.edu/handle/1721.1/62251>
- Datta, S.** (2011) Neuro-Sensory Networks in SoS – Analytics of Big Data http://www.mediafire.com/shoumen_datta
- Datta, S.** (2011) Micro-Scale Renewable Energy Manufacturing – Photo Bio Butanol (C4) and Photo Bio Glucose (C6)
http://www.mediafire.com/shoumen_datta
- Datta, S.** (2010) Entrepreneurial Innovation as a Catalyst for Change <http://dspace.mit.edu/handle/1721.1/54837>
- Datta, S.** (2008) WiFi Meet FuFi: Disruptive Innovation in Logistics Catalyzed by Energy. *International Journal of Electronic Business Management* **6** 117-119 <http://dspace.mit.edu/handle/1721.1/41897>
- Datta, S.** (2008) Identification of Information in Decision Systems (CIDS) <http://dspace.mit.edu/handle/1721.1/41910>
- Datta, S.**, Lyu, J. and Chen, P-S. (2007) Decision Support and Systems Interoperability in Global Business Management. *International Journal of Electronic Business Management* **5** 255-265 <http://esd.mit.edu/WPS/2007/esd-wp-2007-24.pdf>
http://140.114.54.215/IJEBM/IJEBM_static/Paper-V5_N4/A01.pdf and <http://dspace.mit.edu/handle/1721.1/41917>
- Datta, S.**, Granger, C. W. J., Barari, M. and Gibbs, T. (2007) Management of Supply Chain: an alternative modeling technique for forecasting. *Journal of the Operational Research Society* **58** 1459-1469 <http://dspace.mit.edu/handle/1721.1/41906>
- Datta, S.** (2006) Charlie's Skypeout Strategy (TEKES Report, Govt of Finland) <http://dspace.mit.edu/handle/1721.1/56251>
- Datta, S.** (2006) Risk in the Global Supply Chain <http://dspace.mit.edu/handle/1721.1/419162>
- Datta, S.** (2005) UWB and UWB+NB with SDR as an LPS Solution <http://dspace.mit.edu/handle/1721.1/57508>
- Datta, S.** (2004) Adapter, optimiser, prévoir - La convergence des concepts, des outils, des technologies et des normes peut-elle accélérer l'innovation? *Logistique and Management* **12** n°2 (<http://dspace.mit.edu/handle/1721.1/41907>)
- Datta, S.** (2002) Agents: Where Artificial Intelligence Meets Natural Stupidity <http://dspace.mit.edu/handle/1721.1/41914>
- Datta, S.** (2001) RFID: An Incomplete Saga <http://dspace.mit.edu/handle/1721.1/41915>
- Datta, S.** (2000) Why Supply Chain <http://dspace.mit.edu/handle/1721.1/41919>

Datta, S. (1989) Transcriptional Activities of the 289 amino acid Adenovirus 2 E1A Protein in vitro (PhD thesis) Rutgers University School of Medicine, UMDNJ Graduate School of Biomedical Sciences, Rutgers University, New Jersey, USA

Datta S, Soong CJ, Wang DM, Harter ML. 1991. Purified Adenovirus 289R E1A Protein Stimulates Pol III Transcription in vitro by altering transcription factor IIIc. *J. Virology* **65** 5297-5304 (<http://jvi.asm.org/cgi/reprint/65/10/5297>)

Datta S, Magge S, Madison L, Jameson JL. 1992. Thyroid Hormone Receptor Mediates Transcriptional Activation and Repression of Different Promoters. *Molecular Endocrinology* **6** 815-825 <http://dspace.mit.edu/handle/1721.1/42834>

Putlitz J, **Datta S**, Madison L, Jameson JL. 1991. Human Thyroid Hormone Receptor Produced in Recombinant Baculovirus-infected Insect Cells. *Biochem & Biophys Research Communication* **175** 285-290 <http://dspace.mit.edu/handle/1721.1/42901>

Chatterjee VKK, Nagaya T, **Datta S**, Madison L, Rentoumis A, Jameson JL. 1991. Thyroid Hormone Resistance Syndrome: Inhibition of Normal Receptor Function by Mutant Thyroid Hormone Receptors. *J. of Clinical Investigation* **87** 1977-1984 <http://dspace.mit.edu/handle/1721.1/42900>

Rentoumis A, Chatterjee VKK, Madison L, **Datta S**, Gallagher G, DeGroot LJ, Jameson JL. 1990. Negative and Positive Transcriptional Regulation by Thyroid Hormone Receptor Isoforms. *Molecular Endocrinology* **4** 1522-1531 <http://dspace.mit.edu/handle/1721.1/42902>

PRESENTATIONS

MOLECULAR MEDICINE

Datta S, Spangler R, Bruner M, Harter ML. Activation of viral and non-viral promoters by the Adenovirus 289R E1A protein in cell-free extracts. ICRF Tumor Virus Meeting, 1987. Cambridge, UK.

Datta S, Chatterjee P, Losada MC, Flint SJ, Harter ML. An E. coli produced E1A 289R protein and a synthetic E1A 49R peptide variably regulates Pol II and Pol III transcription in vitro. Tumor Virus Meeting, 1988. Cold Spring Harbor Lab

Datta S, Wang DM, McGrath M, Westerdahl C, Harter ML. Bacterially produced E1A 289R activates Pol III transcription through TFIIC. ICRF Tumor Virus Meeting, 1989. Cambridge, UK.

Chatterjee VKK, Madison L, Rentoumis A, **Datta S**, Gallagher G, Jameson JL. Negative regulation by thyroid hormone receptors. American Association for Cancer Research, 1990. San Diego, CA.

Jameson JL, Nagaya T, Madison L, Chatterjee VKK, **Datta S**. Transcriptional activation and repression by thyroid hormone receptors. Abstract. ICN-UCLA Symposia, 1991. Keystone, CO.

Nagaya T, Chatterjee VKK, Madison L, **Datta S**, Rentoumis A, Jameson JL. Generalized Thyroid Hormone Resistance. MGH Symposium, 1991. Boston.

Datta S, Magge S, Putlitz J, Jameson JL. Transcriptional activation and repression by thyroid hormone receptors: Development of an in vitro transcription assay. MGH Symposium, 1991. Boston, MA.

Datta S, Magge S, Putlitz J, Jameson JL. Repression of a-TSH promoter activity by thyroid hormone receptor in an in vitro transcription assay. Endocrine Society Meetings, 1991. Washington, DC.

Nagaya T, **Datta S**, Madison L, Ahlquist JAO, Magge S, Hwang YT, Jameson JL. Structural determinants of thyroid receptor interactions with DNA. American Thyroid Association 1991. Boston.

Summer Research in Chemistry – Transition Metal Nano-Clusters

C. Lampropoulos, K. A. Johnson, A. Javed, J. M. Cain, **S. Datta**, A. M. Mowson, C. Papatranta-fyllopoulou, D. Alexandropoulos, A. J. Tasiopoulos, T. C. Stamatatos, G. Christou (2013) *The search for new molecular magnetic materials*. Poster. ACS, UFL, FL. <http://tinyurl.com/SMM-ACS>

Experienced leader with track record of business innovation and catalyzing profitable growth through product strategy and management of technology • Demonstrated expertise in steering organizational change through strategy, management and leadership of multi-national teams across diverse cultures • Experience in public sector and significant bio-medical expertise.

- ☑ Sales and Revenue Growth ☑ Channel Management ☑ Product Development ☑ Commercialization ☑ Innovation Index
- ☑ Strategic Planning ☑ Change Management ☑ Market Assessment ☑ Bio-medical Research ☑ Partnership Development

1999-2002



SAP Labs (Palo Alto, CA) and SAP AG (Waldorf, DE)

\$10 billion global corporation offering ERP products

High Tech Business Unit - SAP Labs Palo Alto, California

Revenue Growth estimated at \$1 million +

- [a] Development consultant for high tech IBU
- [b] Pre-sales support for semiconductor industry – highest growth vertical included CRM, DRM, PLM, MES
- [c] Global management of liaison with SAP Japan

High Tech Accounts – SAP Japan (Tokyo, Japan)

Revenue Growth estimated at \$10 million +

- [a] Major customers - SONY, HITACHI and MITSUBISHI
- [b] Specifically served as the SAP SCM (APO suite) pre-sales support team for SONY Semiconductors, SONY Electronics, SONY Global Logistics, SONY Computer Entertainment
- [c] Defined SAP-SONY APO needs for sales strategy
- [d] Major sales growth for SAP Japan
- [e] Consulting Revenue for SAP Labs Palo Alto

SCM Business Unit – SAP AG (Waldorf, Germany)

Revenue Growth estimated a \$100 million +

- [a] Introduced RFID innovation for SAP real-time SCM
- [b] RFID SCM partnership with P&G and SONY (Japan)
- [c] Co-created business plan for SAP SCM RFID integration
- [d] Helped SAP adoption of RFID in multiple suites
- [e] Represented SAP at RFID Technology Board at MIT
- [f] Inspired SAP to publish at least 2 books on RFID:
Adapt or Die and *RFID and Beyond* (Claus Heinrich)

2000 - 2010



2000-2003

Revenue Growth estimated at \$1 million +

MIT Auto ID Center, Member of Technology Board

- ☑ RFID Vision - Real-Time Intelligent Data, IoT
- ☑ Strategic and Business Applications of RFID
- ☑ RFID as a Real-Time Data Tool for Supply Chain
- ☑ RFID next generation applications and evolution
- ☑ RFID Consulting with Wal-Mart, US DoD, P&G, Kimberly-Clark, Tesco, UniLever, Gillette, Deloitte, Accenture, PWC, Hitachi, Philips, GlaxoSmithKline, Government of Taiwan

2001-2010

Revenue Growth estimated at \$1 million +

MIT Forum for Supply Chain Innovation, Co-Founder

MIT School of Engineering & MIT Sloan School of Management

1 – Thought leadership for supply chain innovation

2 – Company specific solutions and consulting

- SAP → Revenue Growth estimated at \$10 million +
- Intel → Revenue Growth estimated at \$10 million +
- P&G → Revenue Growth estimated at \$10 million +
- GE → Revenue Growth estimated at \$10 million +
- CapGemini
- Deloitte
- Mitsubishi (Japan)
- Sony (Japan)
- TEPCO (Japan)
- Chi-Mei (Taiwan)
- Volvo (Sweden)
- TCS (India)
- Tata Iron & Steel (India)
- Siam Cement (Bangkok)
- TEKES (Finland)
- Michelin (France)
- Hitachi (USA)
- ITRI & III (Taiwan)

3 – Country specific advising for governments and global organizations

- US Department of Defense (US Army Materiel Command, Fort Belvoir, Virginia)
- US Department of Homeland Security (US Customs, Transportation Security Agency)
- World Customs Organization (Brussels)
- United Nations - UNDP (New York, Shanghai)
- Government of Finland (Council on Science and Technology - TEKES)
- Government of Taiwan (Ministry of Economic Affairs, Industrial Development Board)
- Government of Thailand (Ministry of Science and Technology)
- Government of Ireland (Innovation Ireland, Office of the Taoiseach – Prime Minister)
- Government of India (Customs - Ministry of Finance, Bureau of Energy Efficiency)
- GS1 Hong Kong (China)
- President's Science and Technology Advisory Group (Ministry of Home Affairs, Taiwan)

1999-2002

Global Operations Management

- SAP Labs, Palo Alto, California
 - High Tech Business Unit
 - Software Development Consultant
 - CRM and SCM pre-sales support
 - SCM consulting with SAP Japan
 - SAP internship coordinator
- SAP AG, Waldorf, Germany
 - RFID innovation and university research liaison
 - SCM real-time data leadership with P&G
 - SAP lead at MIT Auto ID Center
 - SCM partnership with Intel and Metro AG
- SAP Japan, Tokyo
 - SCM sales consulting (SONY, MITSUBISHI)
 - SCM pre-sales support and thought leadership
 - SCM presentations
 - SCM public communications

2001-2003

- SCM RFID - MIT Auto ID Center
 - Technology Board
 - RFID Standardization
 - SCM real-time RFID, IoT
 - SAP SCM thought leadership
 - SAP SCM RFID in intelligent planning
 - RFID in public interest communications
 - Intelligent software agents in inventory planning
 - Connecting atoms to bits • networked physical world

Co-Founder, MIT Forum for Supply Chain Innovation, School of Engineering, MIT (Cambridge, Massachusetts)

- Executive Director (2002-2006) and Research Director (2007-2010)
- SCM global thought leadership and major advances in forecasting
- Worldwide consulting – SCM, RFID, Logistics and Intelligent DSS
- Project partnerships for SCM advances, tools and technology
- SCM advising for governments and organizations
 - US Department of Defense (US Army Materiel Command, Fort Belvoir, VA)
 - US Department of Homeland Security
 - World Customs Organization (Brussels)
 - United Nations
 - UNDP (Shanghai, China)
 - Government of Finland (TEKES, Ministry of Science and Technology)
 - Government of Taiwan (Ministry of Economic Affairs, STAG)
 - Government of Thailand (Department of Science and Technology)
 - Government of Ireland (Office of the Prime Minister)
 - Government of India (Ministry of Finance – Customs; Energy)
 - GS1 Hong Kong (China)
 - ITRI & III (Taipei, Taiwan)
- SCM and intelligent data analytics in RFID-SCM decision systems consulting
 - SAP
 - Intel
 - P&G
 - IBM
 - GE
 - CapGemini
 - Deloitte
 - Mitsubishi (Tokyo, Japan)
 - Sony (Tokyo, Japan)
 - TEPCO (Tokyo, Japan)
 - Chi-Mei (Tainan, Taiwan)
 - Volvo (Goteborg, Sweden)
 - Tata Consultancy Services (Mumbai, India)
 - Tata Iron & Steel Co (Jamshedpur, India)
 - Siam Cement Group (Bangkok, Thailand)
- SCM Innovation, Strategy & Management – Executive Education & SCM MBA Courses
 - MIT Sloan School of Management (Cambridge, Massachusetts)
 - Haas School of Business, University of California (Berkeley, California)
 - Chalmers University of Technology (Goteborg, Sweden)
 - Ecole Supérieure des Sciences Economiques et Commerciales (Paris, France)
 - Institut Supérieur de Logistique Industrielle, BEM (Bordeaux, France) KEDGE BS
 - National Taiwan University (Taipei, Taiwan)
 - National Cheng Kung University (Tainan, Taiwan)
 - Indian Institute of Management (Ahmedabad, India)
 - Trinity College (Dublin, Ireland)
 - University College Dublin (Dublin, Ireland)
 - University of Cambridge (Cambridge, UK)
 - Helsinki University of Technology (Helsinki, Finland)
 - Lappeenranta University of Technology (Lappeenranta, Finland)
 - University of Iceland (Reykjavik, Iceland)
 - Indian Institute of Management (Ahmedabad, India)

1980-1994

Molecular Biology • Biochemistry • Protein Chemistry • Genetics • Biotechnology • Microbiology • Virology • Cell Biology • Tissue Culture

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO • UCSF SCHOOL OF MEDICINE
INSTRUCTOR MD PROGRAM • MEDICAL GENETICS

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO • UCSF SCHOOL OF MEDICINE
RESEARCH SCIENTIST • MOLECULAR PARASITOLOGY • INFECTIOUS DISEASES

Unpublished work represents an attempt to study RNA Polymerase specificity of transcription in the parasite *Trypanosoma brucei* which is known to cause Trypanosomiasis (also referred to as sleeping sickness). *T. brucei* cell-free extracts were prepared and transcriptional analyses were performed with RNA Pol I, RNA Pol II and RNA Pol III promoters from parasite, human and DNA virus. Functional *in vitro* transcription systems generated transcripts which suggested that RNA polymerase from *T. brucei* was likely to be less specific in its choice of promoters for initiation of transcription. Use of known transcription inhibitors had a range of concentration dependent effects which suggests that the RNA polymerase in *T. brucei* may use related but different mechanism(s) of action to initiate transcription from promoters.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY • MIT HUMAN GENOME PROJECT • WHITEHEAD INSTITUTE
RESEARCH SCIENTIST • MOLECULAR BIOLOGY OF TRANSCRIPTION • YEAST ARTIFICIAL CHROMOSOMES (YAC)

Unpublished work represents a successful attempt to reconstitute bonafide RNA Polymerase II initiation of transcription *in vitro* using protein complexes of purified transcription factors fractionated from cell free extracts of *Saccharomyces cerevisiae* (yeast). Reconstitution mapped the order of association and sequence of transcription factor complex formation for initiation and elongation of transcription for RNA Polymerase II promoter. Unpublished work from the Human Genome Project (1994) was focused on optimization on packaging of increasingly large pieces of human genomic DNA (>10 MB) in yeast artificial chromosomes and successful transformation to generate viable yeast cells with these YACs.

HARVARD MEDICAL SCHOOL • HARVARD UNIVERSITY
INSTRUCTOR IN MOLECULAR MEDICINE, PHYSIOLOGY & METABOLISM

HARVARD MEDICAL SCHOOL • HARVARD UNIVERSITY • MASSACHUSETTS GENERAL HOSPITAL
RESEARCH FELLOW IN MEDICINE • MOLECULAR ENDOCRINOLOGY • THYROID AND NEURO-ENDOCRINE LAB

Published work which unraveled and identified the molecular mechanisms of the DNA-protein interactions responsible for the initiation of transcription which in turn regulated the steroid or thyroid hormone dependent or independent gene expression profile of the thyroid receptor genes in normal human subjects and in patients with thyroid hormone resistance syndrome or thyroid carcinoma (cancer). Taken together, this work helped to elucidate the clinical anomalies and enabled clinical improvements in the treatment of thyroid malfunctions in humans.

RUTGERS • UMDNJ • NEW JERSEY MEDICAL SCHOOL • GRADUATE SCHOOL OF BIOMEDICAL SCIENCES
PhD • MOLECULAR BIOLOGY • BIOCHEMISTRY • MICROBIOLOGY • VIROLOGY

Published and unpublished research pursued for PhD thesis focused on molecular differentiation of the mechanism of actions by which cancer inducing proteins from DNA tumor viruses influence the rate of cellular gene expression from RNA Pol I, RNA Pol II and RNA Pol III promoters and enhancers in cell free extracts (*in vitro* transcriptional analysis in extracts prepared from HeLa cells). The Adenovirus oncogene E1A was bio-engineered to create a series of overlapping mutants in order to map the active sites of protein-protein or protein-DNA interactions *in vivo* (in the yeast two-hybrid system) and *in vitro* initiation of transcription. Synthetic peptides were generated to represent the minimum segment of the E1A protein (identified by mutational analysis) which could successfully alter (stimulate or inhibit) gene expression from RNA Polymerase promoters in *in vitro* transcriptional analysis (in collaboration with Department of Molecular Biology, Princeton University, NJ, USA).

UNIVERSITY OF PITTSBURGH
CELLULAR & MOLECULAR BIOLOGY • BIOCHEMISTRY • GENETICS • MICROBIOLOGY • VIROLOGY

Unpublished work [1] creating monoclonal antibodies in cell culture. [2] Genetic and DNA sequencing analysis of mutations induced in the cloned large T antigen (oncogene) of the SV40 DNA tumor virus using cell culture assay to detect tumor inducing effect (*in vitro* cell culture). Truncated versions of large T antigen were tested to map and differentiate steps in the progression of the induction of tumor in cell culture. [3] Translational control of protein synthesis in bacteria which identified various types of small RNAs in the translation complex with proteins which could have interfered with the translation of the mRNA in the bacteria. Characterization of the small interfering RNAs were incomplete.

1990-1994

Public Education and Technology • K-12 Outreach • Harvard Medical School • Massachusetts Institute of Technology • Boston Latin School

Activities (below) were undertaken while I was a Research Fellow in Medicine at Massachusetts General Hospital, Harvard Medical School and Research Associate at Whitehead Institute, Massachusetts Institute of Technology.

- Research host for middle school student internship from public schools in Dorchester and Roxbury
- Created partnership programs between middle school and Harvard Medical School K-12 outreach
- Research guide for high school students from Boston Public Schools
- Helped in the formation of Teacher's Program at the Whitehead Institute, MIT
- Secured multi-year funding for Boston Latin School from Edwin Rowland Foundation
- Focused my personal efforts on Boston Latin School to improvement science laboratories
- Created a program to inspire students by organizing talks by Nobel Prize winners (13 participated)

1996-1999

Public Service • K-12 Education • Special Assistant to SFUSD • California Math & Science Standards • National Taskforce Workforce (Federal)

Helped plan Thurgood Marshall Academic High School with mandatory graduation requirements in language, science and mathematics. An instructional success at this school was the cover story of US News & World Report [2 Dec 1996] and this pre-engineering program segued to evolve as the first hands-on Cisco Networking Academy. www.theatlantic.com/issues/97jul/computer.htm and www.cnn.com/TECH/computing/9902/25/schoolwork.idg/

Instituted mentorship and internship program for students as well as teachers with help from Carol Christ, Vice-Chancellor of UC Berkeley and Condoleeza Rice, Provost of Stanford University. Recruited highly qualified teachers in language arts, mathematics, science and technology to uphold academic excellence. Secured funding from Silicon Graphics to supplement teacher salaries in cooperation with and 'blessed' by the local teacher's union.

Professional development partnership to enable teachers to take courses for credit at UC Berkeley at no cost to teacher or SFUSD. Josephine Miles Fellowship funded and sponsored by Carol Christ, Vice-Chancellor, UC Berkeley. Collaboration catalyzed by Charles Townes, Professor of Physics, UC Berkeley.

http://articles.sfgate.com/1996-01-02/opinion/17765856_1_berkeley-pledge-uc-berkeley-regents-decision

Partnership with Pacific Bell to upgrade network infrastructure (\$2.5 million) to enable Clinton-Gore Net Day 1996 and introduce internet in the classroom. Detwiler Foundation donated 1000 computers for students to take home as a part of a collaboration for the school district computer literacy program for students and parents. NASA donated several hundred computers and other scientific equipment for school laboratories (NASA Moffett Field) including an electron microscope (at Burton High School, San Francisco Unified School District, San Francisco, CA).

☑ Established joint venture with UC Berkeley Interactive University Program to benefit students and teachers from UC Berkeley resources that could be accessed remotely and UC students to provide real-time online tutoring to school students (point-to-point systems using remote webcam). Received NTIA-TIIAP grant award (\$650,000) from US Department of Commerce for public school technology innovation in collaboration with the Interactive University Program at UC Berkeley (online education technology).

☑ Worked with UC Berkeley Chancellor Chang Lin Tien and Vice Chancellor Carol Christ to shape Berkeley Pledge activities to help Bay Area students (SFUSD) gain broader access to advanced academic opportunities, inspiration and vision. Catalyzed by Glenn Seaborg, Emeritus Director of Lawrence Berkeley Laboratory at UC Berkeley.

☑ Nominated by US Department of Commerce and Information Technology Association of America to Chair the National Task Force on Mathematics and Science Education and its Impact on Workforce Development. 1997 National Information Technology Convocation sponsored by the US Department of Commerce and White House Council of Economic Advisors. Strategic planning and economic impact of IT workforce. Convened at UC Berkeley.

☑ Formed **ASSOCIATED SCIENTISTS** (co-founded with Glenn Seaborg and Stan Metzenberg) which was catalytic in changing the K-12 mathematics and science standards for State of California. These standards received a perfect score from the American Federation of Teachers [AFT] in their 1998 report **Making Standards Matter**. Review ASSOCIATED SCIENTISTS in Seaborg, Glenn T (2001) *Adventures in The Atomic Age*, pages 293-294 (ISBN 0-374-29991-9) and Seaborg, Glenn (Archives) Library of Congress **Box 276** <http://hdl.loc.gov/loc.mss/eadmss.ms006039>

ARTICLES RELATED TO EDUCATION • <http://shoumendatta.wordpress.com/>

Datta, S. (2011) Ethical Profitability Framework for Economic Growth and Development of Small Learning Organizations. <http://tinyurl.com/ethical-profitability> and <http://tinyurl.com/shoumen>

Datta, S. (2010) Entrepreneurial Innovation as a Catalyst for Change <http://dspace.mit.edu/handle/1721.1/54837>

Waltar AE, Beaumont P, Earl B, Peddicord KL, **Datta S.** 1999. What The Public Wants to Know. Proceedings of the American Nuclear Society. Long Beach, CA.

Datta, S. (1998) National Task Force (US) Report. US Department of Commerce & ITAA, Washington, DC

Datta, S. (1998) Community Colleges as Catalysts for Economic Growth through IT Centers

Datta, S. (1997) Integrated Network for Education [Web-Based Education Commission, US Senate, 1999]

Datta, S. (1997) Science Education and Economic Growth

Datta, S. (1997) Public Education [Interview]

Datta, S. (1996) Good Teaching [Letter] *Science* **271** 1789

Datta, S. (1996) Retrofit Public Education: Science and Technology Education Partnership for Schools

Datta, S. (1996) Standards: The Widening Gulf Between Concepts and Implementation

Datta, S. (1995) Partnership for International Public Health: Molecular Diagnostics and Public Issues

Datta, S. (1995) Art and Education: Value of Public Museums to Science Education

Datta, S. (1995) Interactive Mathematics: Experimental Concept Gone Awry

RESEARCH SUPERVISION and STUDENT ADVISING

Year	Student	Purpose	Institution
1987-88	M. Losada	Junior Thesis	Rutgers University, Merck Research
1989	S. Saha	Research	Harvard University, UCSF
1990-91	S. Magge	Senior Thesis	Harvard University, Yale
1992	T. Galvao	Advising	MIT, University of Cambridge
1992	N. Tang	Advising	MIT, Yale University
1993	S. Magge	Advising	Harvard University
1993	A. Mukherjee	Advising	Harvard University
1994	L. O'Brien	PhD Research	UCSF Medical School
1997	A. Pritikin	Advising	Harvard University
1998	H. Fu	Advising	MIT, Harvard University
2001	Y. Soga	Internship	Oxford University
2001	A. Vora	Advising	Harvard University
2004	H. Fu	Sponsor	British Parliament
2004	T. Shean	Advising	University of Cambridge
2004	D. Graham	Research	Institute for Defense Analysis
2005	K. Phillip	Research	Trinity College Dublin (Ireland)
2007	K. Zukova	MS Thesis	Chalmers University (Sweden)
2008	M. Marchena	PhD Thesis	University of Sao Paulo (Brazil)
2013	T. Peerson	Advising	Johns Hopkins University
2014	A. Boy	Advising	KEDGE Business School (Bordeaux, France)
2015	L. Gorantala	Advising	University of Washington, Seattle, USA

SELECT TEACHING EXPERIENCES

1981 – 1985	Teaching Assistant in Genetics, Microbiology and General Biology, University of Pittsburgh
1985 – 1988	Instructor in Molecular Biology and Microbiology, Rutgers University
1990 – 1993	Instructor in Molecular Medicine, Harvard Medical School, Harvard University
2000	Guest Lecturer, MBA Program, Haas School of Business, University of California, Berkeley
2000	Lecturer, MBA Program, L'Ecole Supérieure des Sciences Economiques et Commerciales (ESSEC), Paris
2001	Visiting Lecturer, School of Engineering, University of Cambridge, UK
2002 – 2004	Guest Lecturer, Logistics and Supply Chain (MIT Graduate Course 1.270 / ESD.273)
2002 – 2004	Co-Lecturer, Supply Chain Strategy and Management, MIT Sloan School of Management, MIT
2003 – 2004	Co-Lecturer, Advanced Logistics and SCM Strategies, MIT-Singapore Alliance, MIT
2004	Lecturer in Strategic Innovation, MIT Sloan Fellows Program, MIT Sloan School of Management
2004	Guest Lecturer, Auto-ID in Supply Chain Management, HEC, Montreal, Canada
2005 – 2007	Visiting Lecturer, MBA Program, Trinity College, Dublin
2006 – 2007	Supply and Demand Chain Design and Management, Chalmers University of Technology (Goteborg) http://www.student.chalmers.se/ka/hp/hp?hp_id=3013 https://www.student.chalmers.se/hp/hp/?hp_id=3013&hp_view=staff https://www.student.chalmers.se/hp/hp/?hp_id=3013&hp_view=link https://www.student.chalmers.se/hp/hp/?hp_id=3013&hp_view=handout https://www.student.chalmers.se/hp/hp/?hp_id=3013&hp_view=archivedHomepages
2006 – 2007	Guest Lecturer, Innovation in Operations Management, Indian Institute of Management, Ahmedabad, India
2006 – <i>present</i>	Innovation SCM, Institut Supérieur de Logistique Industrielle, Bordeaux Ecole de Management, France Visiting Faculty SCM Innovation, Management and Operations • KEDGE Business School, Bordeaux
2010 – 2013	Adjunct Instructor FSCJ, CCF • Chemistry, Biological Sciences, Anatomy and Physiology, Biotechnology Visiting Assistant Professor Chemistry UNF • Instructor in Chemistry JU • Teacher (Chemistry, DCPS)

1995	Berkeley Pledge Steering Committee, Education Outreach, University of California Berkeley
1996	National Net Day Organizing Committee
1996-1999	Eagle Alliance, Advisory Board
2000	Guest Lecturer, Haas School of Business, University of California at Berkeley
2000	Guest Lecturer, MBA Program, ESSEC, University of Paris, Paris, France
2001	Guest Lecturer, University of Cambridge School of Engineering, Cambridge, UK
2002-2004	Lecturer, Supply Chain Management Executive Programs, MIT Sloan School
2002-2004	Guest Lecturer, Logistics & Supply Chain (MIT Graduate Course 1.270/ESD.273)
2002	Keynote Address, Supply Chain Council (SCOR), Mexico City, Mexico
2002	Keynote Address, Supply Chain Summit, Montreux, Switzerland
2002	Executive Program (Future of SCM), Saint Gobain (www.saint-gobain.com)
2003	Chairman, Executive Advisory Board, Telecommunication Summits
2003	Keynote Address, IP Summit, The Hague, The Netherlands
2003	Plenary Address, LogiChem, Frankfurt, Germany
2003	Invited Address, Supply-Chain World of North America, Atlanta, Georgia, USA
2003	Chairman, European Supply Chain Summit, Luzern, Switzerland
2003	Session Chair & Invited Speaker, InterLog Conference, Dusseldorf, Germany
2003	Chairman, Retail Revolution Europe Conference, The Hague, Netherlands
2003	Panelist, 3 rd INTEL Executive Summit, San Francisco, California, USA
2003	Invited Seminar, GE Global Research, New York
2003	Chair and Keynote Speaker, LogiCon Interactive Conference, Barcelona, Spain
2003	Invited Keynote Speaker, LogicaCMG Forum, Amsterdam, The Netherlands
2003	Invited Keynote Speaker, Forum on Automation Technologies, Government of Taiwan
2003-2004	Team Lecturer, MIT-Singapore Alliance (Advanced Logistics & SCM Strategies), MIT
2004	Board of Overseers, MIT-Chile Project (MIT alliance with Government of Valparaiso, Chile)
2004	Keynote Address, Electronics Manufacturers Association, San Jose, California
2004	Keynote Address, Government of Finland Science and Technology Council, TEKES (Helsinki, Finland)
2004	Invited Panelist (AAIA), Technical Excellence in Aviation, Missiles and Space (TEAMS), Huntsville
2004	Invited Speaker, Redstone Arsenal-Huntsville Military Operations Research Section (ORSA), AL
2004	Invited Speaker, MIT-INFORMS Practice Conference, Cambridge, Massachusetts
2004	Invited Panelist, CIO Roundtable, Airline Transportation and Retail Industries, Dallas (TX, USA)
2004	Invited Speaker, National Economic and Social Development Board, Government of Thailand
2004	Invited Keynote Speaker, E-Business Forum, Ministry of Economic Affairs, Government of Taiwan
2004	Keynote Speaker, Fourth SCM Forum (Helsinki, Finland)
2004	Executive Workshop, KONE Corporation (Espoo, Finland)
2004	Keynote Speaker, 4 th SCM CEO Summit, Hong Kong Article Nomenclature Association, GS1 Hong Kong
2004	Guest Speaker, MIT Sloan Fellows Program
2004	Executive Workshop, PoweredCom Inc (Tokyo Power and Electric Company, Japan)
2004	Advisor, TagArray Inc
2005	Keynote Speaker, ICT-RFID Summit, California Polytechnic State University, San Luis Obispo, California
2005	Invited Speaker, École des Hautes Etudes Commerciales of Montreal (HEC, Montreal)
2005	Keynote Speaker, World Customs Organization IT Conference, Istanbul (Turkey)
2005	UN-UNDP Mission to China (Invited Expert Group for South-South Technical Cooperation)
2005	Invited Member, President of Taiwan Science and Technology Advisory Group, Taiwan (ROC)
2005	Visiting Scholar, IIS, Trinity College, Dublin (Ireland)
2005	Advisor, SandLinks Inc
2005	Seminar, Transparency in the Supply Chain, US Department of Homeland Security, Washington DC
2005-2007	Keynote Speaker and Co-Organiser, SCM Forum, Helsinki (Finland)
2005	Invited Speaker, Council of Members, World Customs Organization, Brussels (Belgium)
2005-2006	Advisor to the Secretary General, World Customs Organization, Brussels (Belgium)
2006	Keynote Speaker, Chalmers University Executive Education Program, Gothenberg, Sweden
2006	Invited Speaker, Innovation in Logistics, Ministry of Transport and Communication, Helsinki, Finland
2006	Co-organizer, WCO Education Series in Globalisation and Interoperability, Brussels, Belgium
2006-2011	Advisor, Technical Strategy and Innovation, Decision Systems Lab, GE Global Research, NY
2006	Invited Speaker, 6 th Agribusiness Summit, Lexington (Kentucky, USA)
2006	Member, Advisory Committee, California Agricultural Leadership Foundation (Sacramento, California)
2006	Advisor, State Board, California Department of Agriculture (Advisory Committee)
2006	Keynote Speaker, World Customs Organization IT Conference, Bangalore, India
2006	Invited Speaker, IIS-Intel Conference, Trinity College Dublin, Ireland
2006	Lecturer, Dept of Technology Management & Economics, Chalmers University, Goteborg, Sweden
2006-2007	Co-Investigator, SMART Project (Funded by European Commission, EU), Trinity College Dublin, Ireland

2006 - present	Innovation in SCM, Institut Supérieur de Logistique Industrielle, Bordeaux Ecole de Management KEDGE Business School
2007	Visiting Lecturer, MBA Program, Trinity College Dublin, Ireland
2007	Invited Speaker, Indian Institute of Management, Ahmedabad, India
2007	Invited Keynote Speaker, ELTRUN Supply Chain Innovation and RFID Symposium, Athens, Greece
2007	Visiting Lecturer, Athens University of Economics and Business, Athens, Greece
2007	Invited Speaker and Research Paper, NOFOMA Annual Conference, Reykjavik, Iceland
2007	Guest Speaker, Educator's Day, University of Iceland and Reykjavik University, Iceland
2007	Advising, Pervasive Decisioning Systems Laboratory, GE Global Research, New York
2007	Invited Speaker & Visiting Faculty, Lappeenranta University of Technology (Kouvola Research Unit), Finland
2007	Seminar, US Department of Homeland Security, Washington DC
2008	Member, Editorial Board, International Journal of Electronic Business Management (IJEBM)
2008	Invited Speaker, DRIVE for Growth Conference (Killarney, Ireland)
2008-2009	Research Advising and Entrepreneurship, Institute of Technology, Tralee and Kerry Technology Park
2008-2009	Co-Founder, Centre for Innovation in Distributed Systems (CIDS) at ITT (www.cids.ie → www.imar.ie)
2008	Co-Organizer, <i>Is Connecting Bits to Atoms Sufficient?</i> Centre for Innovation in Distributed Systems, ITT
2008	Visiting Lecturer in International Business, School of Business Studies, Trinity College Dublin, Ireland
2008	Co-Organizer, <i>Is Forecasting Necessary?</i> Centre for Innovation in Distributed Systems www.cids.ie
2008	Co-Organizer, <i>A Sense of Silence in Medicine?</i> Centre for Innovation in Distributed Systems www.cids.ie
2008	Co-Founder and Start-up Advisor, DCS ENERGY SAVINGS PVT LIMITED (www.dcsenergysavings.com)
2009	Invited Speaker, SCM Forum IX, Helsinki (Finland)
2009-2010	Member and Affiliate, MIT Energy Initiative
2009	Start-up Advisor, InGRID ENERGY LLC (Palos Park, IL)
2009	Visiting Lecturer, National Cheng Kung University and National University of Tainan (Taiwan, ROC)
2011	Invited Seminar, Dept of Technology Management & Economics, Chalmers University of Technology, Goteborg, Sweden
2012	Chair, Biofuel Engineering, 2 nd World Congress of Bio-Energy, China
2013	Keynote • Institut Supérieur de Logistique Industrielle, École Supérieure de Commerce de Bordeaux www.kedgebs.com
2014	Keynote • MOOC & Digital Education - Presidents' Forum of Southeast, South Asian and Taiwan Universities (Taiwan)
2014	The Industrial Internet of Smart Things – Institute for Information Industry, Taipei (Taiwan) http://web.iii.org.tw/
2014	Senior Advisor at Catallyst Constellations (www.catconglobal.com)
2014	Invited Speaker and Panelist at the CSC Aspire Conference on IoT
2014	Invited Seminar Speaker on Cyberphysical Systems at ISIS, Vanderbilt University
2014	Invited Keynote Speaker, IoT Forum at MIT (www.iot-conference.org/iot2014/keynote-speakers/)
2014	EU-US Summit Speaker at the IoT Forum at MIT (BILAT USA 2014)
2014	Organizer • IIC Forum – <i>A Sense of the Future</i> (Austin, Texas) www.iiconsortium.org
2015	Invited Keynote – Planning the Future Together – 25th Forum at Institut Supérieur de Logistique Industrielle, KEDGE BS
2015	Invited Speaker - Future Strategies Workshop at Huawei Corporation
2015	Invited Speaker - Future Strategies Workshop at Mitsubishi Corporation
2015	Invited Panelist – STEM Education sponsored by the National Robotics Initiative at The White House (OSTP)
2015	Invited Keynote • NITRD Ontology Summit at NSF • http://ontolog.cim3.net/OntologySummit/2015/schedule.html
2015	Invited Keynote • EU IoT Week in Lisbon, Portugal • http://iot-week.eu/events/iot-week-lisbon/
2015	Invited Keynote • CEA LETI in Grenoble, France • http://bit.ly/GRENOBLE-24JUNE2015
2015	Invited Keynote • Tokyo University of Science, Tokyo, Japan • http://bit.ly/TUS-IOT-DATTA
2015	Invited Keynote • Global Forum , Oulu, Finland • https://www.youtube.com/watch?v=1A2xTluGPiM
2015	Invited Keynote • Tampere University of Technology • www.openlivinglabs.eu/event/global-forum-shaping-future-2015
2015	Invited Keynote • TEKES (Helsinki, Finland) • https://tapahtumat.tekes.fi/event/internationalcollaboration
2015	Invited Speaker • Institute for Information Industry, Taipei (Taiwan) • http://web.iii.org.tw/
2015	International Telecommunication Union Forum on IoT • http://bit.ly/ITU-GENEVA-IoT • http://bit.ly/ITU-GENEVA-SG20
2015	Invited Speaker • Korea Aerospace University (South Korea)
2015	Invited Keynote • South Korea IoT 2015 • http://www.iot-conference.org/iot2015/program/
2015	Invited Speaker • Strategic Advisory Council – Huawei Corporation
2015	Invited Speaker • University of Salamanca (Spain)
2015	Invited Keynote • III – Big Data Conference (Taipei, Taiwan)
2015	Invited Keynote • Healthcare IoT Forum at NCKU (Tainan, Taiwan)
2016	Invited Speaker • Mobile World Congress (Barcelona, Spain)
2016	Keynote and Organizing Committee – Industrial Chair for ILS, Bordeaux, FR • http://ils2016conference.com/committee/
2016	Invited Keynote • Industrial IoT Summit • www.industrialiotseries.com/usa/
2016	Invited Keynote • Future Manufacturing World Summit – Shanghai • www.futuremanufacturingworld.com/
2016	Invited Speaker • Strategic Advisory Board – TE Connectivity • www.te.com/usa-en/home.html
2016	Invited Speaker • Huawei STW (Science and Technology Workshop) Shenzhen, China
2016	Panel Member • US GAO / National Academy of Science / National Academy of Engineering – Expert Panel on IoT Policy
2016	Invited Plenary • Global IoT CESIS (Berlin) • www.vdi-wissensforum.de/en/cesis-global-internet-of-things-conference/


2017	Invited Speaker • CIO/CTO Council • Koch Industries “Translational Engineering” (pdf “Trans Eng” http://bit.ly/IOT-MIT)
2017	Panel Member • ISPIIM Toronto - Smart Cities • https://www.ispim-innovation-forum.com/
2017	Advisor • Advanced Silicon Group • http://www.advancedsilicongroup.com/
2017	Invited Keynote • International Conference on Genetic and Evolutionary Computing (ICGEC), Kaoshiung, Taiwan
2017	Invited Speaker • Kaoshiung University of Applied Sciences, Kaoshiung, Taiwan
2017	Invited Speaker • Tajen University, Yanpu, Taiwan
2017	Invited Speaker • National Dong Hwa University, Hualien, Taiwan
2017	Invited Speaker • Mingshin University of Science and Technology, Xinfeng Hsinchu, Taiwan
2017	Invited Speaker • National Taipei University of Technology, Taipei, Taiwan
2017	Invited Speaker • Daikin - Hotai Development, Taipei, Taiwan
2017	Invited Speaker • Kaison Green Electric Technology Company, Taichung, Taiwan
2018	Invited Speaker • Santo Tomás de Aquino Commencement • https://secretaria.uniovi.es/protocolo/santotomas

GRANTS • PUBLIC CONTRACTS • REVIEW PANELS • STEERING COMMITTEE • ADVISORY BOARDS

1996-1997	Award → US Department of Commerce, National Telecommunications Information Infrastructure Authority (NTIIA) Project → Interactive University Program (online university – high school partnership for students and teachers) Collaborators → University of California, Berkeley and City and County of San Francisco Public Schools
1998-1999	Contract → State of California, Department of Education Program → State Standards for Mathematics & Science Collaborator → Associated Scientists (Co-Founders : Shoumen Datta, Glenn Seaborg, Stan Metzenberg)
2006-2009	Award – European Union (EU) Commission on Intelligent Systems • FP6 Project – SMART • RFID Integration • http://cordis.europa.eu/projects/rcn/80467_en.html Collaborators – Trinity College, Dublin and MIT Forum, Massachusetts Institute of Technology
2014-2015	Steering Committee, Time Aware Applications, Computation and Communication Systems • www.taaccs.org CPS, PWG • NIST (National Institute of Standards and Technology), US Department of Commerce • www.nist.gov
2015	US DoT ITS DTFH6115R00003 – IIC Proposal for Connected Vehicles • http://bit.ly/IIC-2013-2016-SD
2015	Advisory Boards • ICE Alliance (www.icealliance.org) • EU IoT 2.0 (http://www.ict-citypulse.eu) • U-IoT (EU H2020)
2016	Advisory Boards • EU-Japan Horizon 2020 project BigClouT • EU – S Korea Horizon 2020 project WiseloT EU Horizon 2020 Project [a] Healthcare Data (SC1-PM-04) [b] Smart Cities / Smart Living (Scale UP IoT) Coordinated grants and funding relevant to the Industrial Internet Consortium in US and EU (table below) • IIC LSTB Summary Report - http://bit.ly/IIC-2013-2016-SD • http://bit.ly/IIC-SC-NRT • http://bit.ly/SD-IIC-1-100 • IIC Letters of Support (LoS) for EU Horizon 2020 proposals (2015-2016) http://bit.ly/IIC-LoS
2017	US Government Accountability Office and US National Academy of Sciences – Panel on Technology Assessment of IoT requested by US Senate • Technology Assessment – Internet of Things • www.gao.gov/products/GAO-17-75
2017	Cybersecurity for Medical Devices • US Department of Homeland Security and FDA (PI - Dr Julian Goldman, MGH, HMS)

Proposal Related Documentation	Government Agency (submission/preparation)	Funding Approved	Comments / Information
History http://bit.ly/SD-IIC-1-100		<i>includes IIC members</i>	
Autonomous Transportation http://bit.ly/DOT-DOT-DOT	US Dept of Transportation (submitted 3/2015; prep 3/2014 to 3/2015)		Did not receive rejection or funding (\$20 million)
BigClouT EU-JP http://bit.ly/Project-Brief	EU Horizon 2020 (submitted 12/2015; prep 4/2014 to 12/2015)	€3 million	Funding Starts Sep/Oct 2016
WiseloT EU-SK http://bit.ly/Project-Brief	EU Horizon 2020 (submitted 12/2015; prep 4/2014 to 12/2015)	€4 million	Funding Starts Sep/Oct 2016
ACTIV AGE http://bit.ly/Project-Brief	EU Horizon 2020 (submitted 4/2016; prep 4/2015 to 4/2016)	€20 million	Funding Starts Sep/Oct 2016
Internet of Food http://bit.ly/Project-Brief	EU Horizon 2020 (submitted 4/2016; prep 4/2015 to 4/2016)	€30 million	Funding Starts Sep/Oct 2016

WLIVE Wearables http://bit.ly/Project-Brief	EU Horizon 2020 (submitted 4/2016; prep 4/2015 to 4/2016)		Not funded for FY 2016
LSP Scale-up-IoT http://bit.ly/SCPPP-07	EU Horizon 2020 (submitted 4/2016; prep 4/2015 to 4/2016)		Not funded for FY 2016
Healthcare Data http://bit.ly/HCPPP-04	EU Horizon 2020 (submitted 4/2016; prep 9/2015 to 4/2016)		Not funded for FY 2016
Healthcare Robotics	EU Horizon 2020 (submitted 4/2016; prep 9/2015 to 4/2016)		Not funded for FY 2016

	<p>GOALS</p>  <p>Ask me why I chose this photograph to represent my goals.</p>	<p>STRENGTHS</p> <ul style="list-style-type: none"> Academic background in science Analytical capabilities in business Applications in systems and standardization Experience in creating global business forums Experience in public services administration Experience in operations management Experience in advising and consulting Experience in government agencies Experience in software systems Excellence in communications Multiple academic affiliations Broad spectrum of links Entrepreneurial zest A sense of purpose Leadership skills 	
	<p>POSITIVES</p> <ul style="list-style-type: none"> Understanding of global partnerships Knowledge about academic operations Relationships with global academic markets Cultural understanding of emerging economies Innovation of products, services and standards Ideas and concepts short of market maturity Links to global talent pool and think tanks Links to technical HR to catalyze ideas Ideas and models for proof of concept Education as a key economic engine Pragmatic optimism is a driver Building organizations A sense of the future Pursuit of value Altruism 	<p><i>Room to Improve • Capacity for Innovation</i></p>	

Dr Shoumen Palit Austin Datta • shoumen@mit.edu • sdatta8@mgh.harvard.edu • shoumen@alumni.ucsf.edu

Shoumen Datta aspires to help improve lives of people. He is a scientist, bio-medical expert, systems engineer, technology advocate and an enthusiast for education. He is interested in connected worlds, renewable energy manufacturing, preventative healthcare. Since 2000, he has been involved in software applications in Silicon Valley (Palo Alto, CA) and then at MIT (Engineering) to develop decision frameworks applicable to supply chain, healthcare, energy and real time operations using principles of artificial intelligence and systems engineering. He has taught operations research (MIT), strategy and management (MIT Sloan School of Management). He has advised, lectured and consulted with foreign governments, organizations and global institutions on technology, operations management, energy, innovation and intelligent decision systems. In a parallel trajectory, he is passionate about rigor and excellence in public K-12 education, workforce development and entrepreneurship. He was catalytic in major outreach efforts while at Harvard Medical School and MIT which accelerated collaboration with public schools in Cambridge-Boston and contributed to create the Whitehead Institute Teachers Program at MIT. In San Francisco, he was appointed as a Special Assistant to the City and County of San Francisco. He created university liaison programs for teachers (professional development) and students in bio-technology (with UCSF and UC Berkeley). He was instrumental in driving Net Day 1996 and networking in collaboration with Cisco Systems (Cisco Networking Academy). In 1996, he catalyzed outreach efforts and partnerships with Silicon Valley to improve technology in classrooms and helped to re-shape the State of California Standards in K-12 Mathematics and Science. He has decades of research experience in biochemistry, molecular biology of cancer, genetics, microbiology, neuro-endocrinology and the human genome project. He earned his PhD from Rutgers-UMDNJ School of Medicine and was a scientist at Harvard Medical School, MIT and UCSF School of Medicine. He was a Fellow in Medicine at Massachusetts General Hospital (Boston) and Instructor in Medicine at Harvard Medical School. Currently he is at MIT Auto-ID Labs and MGH exploring IoT, medical IoT, industrial IoT, e-services, standards, software platform innovation, remote health monitoring and academic-industry partnerships with potential for entrepreneurship. His only book is a fiction *Conscience and Common Sense* (<http://bit.ly/MIT-IOT>) about the convergence of policy, politics and justice with public education, digital learning, technology, energy and healthcare (as STEAM elements) which may shape economic growth, workforce and global development.

☑ Profile → <https://autoid.mit.edu/shoumen-datta> • <http://bit.ly/MIT-IOT> • <http://bit.ly/IOT-MIT>

☑ Ideas-Opinions → <http://bit.ly/MIT-SD> • <http://mdpnp.mgh.harvard.edu> • Email shoumen@mit.edu or sdatta8@mgh.harvard.edu

Supplemental Narratives – My contributions with respect to

[1] LEADING CHANGE

[2] LEADING PEOPLE

[3] CATALYZING RESULTS

[4] CATALYZING BUSINESS

[5] BUILDING COALITIONS

[6] BUILDING FUTURES

[1] Leading Change

Creative and strategic change leadership to transform trans-disciplinary visions into reality is an integral part of my career, experience and expertise. Leading change is a not a bullet point in my resume, it *is* the journey that spans public service, education, academia, industry, government and business. Some of the challenges that I undertook are summarized in the table below including a brief description of the context and the action(s) followed by the outcome (results). It lists a few firsts and an informed analysis will reveal the depth and breadth of the change that I helped to articulate, communicate and catalyze by converging engineering / technology, medicine and analytics with new lines of business and management. The summary below *excludes* fundamental research advances (my work in biomedical sciences and molecular medicine). Please refer to my resume <http://bit.ly/SD-CV-2016>

	Challenge	Context	Action	Result
Active 2016	Global economic growth due to data, information and intelligent decision support systems.	[1] Connectivity potential of the internet remains vastly unrealized. Connect objects with data, process and decision systems as a seamless tapestry of connected products and services. [2] New lines of business evolution [3] New revenue streams and future earnings potential	[1] Proposal in 2003 predicting potential for future business through strategic convergence of connected objects (Internet of Things, IoT) [2] Helped to create the future of the industrial internet of things (IIoT) 2013 [3] Industrial Internet Consortium (IIC) founded 03/27/2014 www.iiconsortium.org [4] IIoT global potential	[1] Global coalition building / collaboration to organize consortia of 250 companies from 25 countries in pursuit of strategies, solutions, standards and services for every industry. [2] IoT is projected to add \$11 trillion to the global economy 2025. [3] Tsunami of IoT/IIoT related applications in every corner, globally. [4] Strategic vision and collaboration with EU, Japan, China and India
Verify claim - Dr Joe Salvo, Founder, Industrial Internet Consortium, GE Global Research, Niskayuna NY				
Active 2016	Lack of global transparency of operations related to the physical supply chain of goods (which reduces efficiency, creates out of stock, slows manufacturing)	[1] Financial loss due to unanticipated out of stock [2] Lack of visibility of goods movement [3] Risk of security due to unidentified objects in supply chain (SOX) [4] Sparse data for track and trace purposes eg food contamination / recalls.	Integrate radio frequency identification (RFID) chips and sensors to identify and evaluate status of physical objects (things, hence IoT) to create the digital supply chain strategy of the future to face and deal with the volatility of globalization.	[1] Explosion of track and trace through low cost RFID chips. RFID standards (EPC or electronic product code) and billions of goods identified (reducing security threats in shipping). [2] Co-founded the MIT Forum for Supply Chain Innovation which was an industry supported coalition at MIT to help drive innovation to create new business best practices. [3] Consulting with global industry interested to grasp

				digitization of goods in supply chain ops and management. [3] Offered global education and executive training in multiple countries related to operations and supply chain management / innovation. [4] Advised various foreign governments.
	Verify claim - Prof David Simchi-Levi, Co-founder, Forum for Supply Chain Innovation, Engineering MIT			
	Challenge	Context	Action	Result
Active 2016	Object identification (radio frequency identification or RFID)	Trillions of objects cannot be identified if identification cost exceeds value of goods. Economic impact of goods if we lack innovative tools.	[1] Leadership to use internet based RFID data integrated with software and enterprise resource planning (ERP) tools to change classical supply chain operations. [2] Guidance to global organizations, industry, business and governments.	[1] Founding of the MIT Auto ID Center which was a coalition of hundreds of global companies, major retail operators and standards bodies to accelerate the adoption of RFID EPC. [2] Created the basis for Internet of Things or IoT to change global economy. [3] Advisor to Taiwan, Finland, HK, UK (gov).
	Verify claim - Prof Sanjay Sarma, Co-Founder, Auto ID Center & Vice-President MIT (Mechanical Eng)			
	Verify claim - Please explore MIT Library documents uploaded here (MIT DSpace) http://bit.ly/MIT-SD			
	Rigor of STEM education to enable US to compete with workforce from emerging global economies.	State of California science and math standards were poor by comparison.	Co-Founded body of 200+ teachers and 20+ Nobel Prize winners who collaborated to promote the need for rigor in K-12 standards. Action both applauded and derided by the US press and media.	[1] Changed the K-12 math and science standards for the State of California. [2] CA standards de facto yardstick for other states to revise their STEM standards. [3] National movement to create K-12 workforce to bridge evolving skills gap in tech and computer science.
	Verify claim - Prof Stan Metzenberg, Provided Testimony to US Congress, Associated Scientists (CSUN)			
	Verify claim - Public newspapers, media - please request info or explore http://bit.ly/SNAP-CNA-EDU			

	Challenge	Context	Action	Result
	Information Superhighway (public release of internet in 1995) available but school students had few tools or access.	[1] Lack of high speed internet access in public schools in San Francisco [2] Lack of computers in schools for students to use in class / home (disadvantaged) [3] Lack of programs to expose students to prepare for information age jobs [4] Lack of STEM teachers with depth in subject matter [5] Students needed tutoring in math and science (in particular)	[1] Strategic coalition to spearhead NET DAY for San Francisco Bay [2] Pioneered coalition of agencies (NASA) and private foundations to donate hundreds of computers to SFUSD schools & students. [3] First corporate sponsored networking academy for HS students (9 th grade) [4] Program for teachers to pursue any course at UC Berkeley (UCB) at no cost [5] Online program for students to receive tutoring in math and science from UCB	[1] President Clinton and VP Gore “pulled” RJ45 cables in local schools in SF to connect the internet (see Wikipedia photo) [2] Computer literacy [3] Global impact from Cisco’s effort that started as a 9 th grade networking academy in SFUSD (cover of the US News & World Report 2 December, 1996) [4] Teachers thrilled to pursue education at UC [5] Probably the first idea of MOOC through point to point tutoring of SFUSD students by Berkeley students
	Verify claim - Ms Carlota Portillo, former SF City Council Member (Mayor’s Office), City & County of SF Verify claim - Public newspapers, press and media - please explore http://bit.ly/SNAP-CNA-EDU			
	Public school teachers and students in need of inspiration	Interaction with Boston Latin School (BLS founded in April 1635)	Created coalition of Nobel Prize winners in Cambridge and Boston for mentorship, talks and guidance.	[1] Financial support for BLS school lab from Rowland Foundation (Mrs Edwin Land) [2] Teachers program at MIT Whitehead Institute (still active)
	Verify claim – Mr Robert Akeson, Senior Teacher, Boston Latin School, 78 Av Louis Pasteur, Boston MA			

The risks I assumed in these highly diverse initiatives and the resiliency that I needed in order to persevere through the trials, tribulations and turbulence of massive undertakings, with extremely diverse group of individuals, across cultures (which spanned the globe) enabled me to learn and re-learn, develop leadership skills, which were decisive if necessary, diplomatic to strengthen camaraderie and yet disruptive enough to create substantial feasible change for public goods that can stand the test of time.

My vision was not always accepted instantly but my ability to communicate, with lucidity and clarity, with a logical and analytical basis often met with success. Teams/participants appreciated strategic goals and pathways to accomplish such goals yet (my approach) remain open, flexible, adaptable to help us deal with the challenges of uncertainty, volatility or other factors which may demand new roads, turns and twists.

The ability to bridge multiple disciplines and domains (science, engineering, technology, medicine, management, business) as well as different pursuits (academia, industry, government) worked favorably to bring together cohesion, create coalitions, structure strategies and build organizational structure where colleagues and partners were empowered. My lesson from this journey is never to seek credit.

[2] Leading People

BY THE NUMBERS

Industrial Internet Consortium (www.iiconsortium.org)	3300 members, 250 companies/organizations, 25 countries
MIT Forum for Supply Chain Innovation	50 members / 250 participants depending on type of activity
MIT Auto ID Center, Technology Board	200 member companies / standards bodies / global liaison
Chair of Task Force, Education, Economy and Workforce Development	50-100 members / panels / committees
San Francisco Public School System Special Assistant to Superintendent	Staff and 7,000 teachers / 70,000 students / administration
Volunteer (Science Education Partners, UCSF School of Medicine, San Francisco)	50-100 depending on teams / school group participation
Volunteer (Harvard Medical School, MGH, MIT, Whitehead Institute at MIT)	50 - 100 / fluctuating numbers / groups depending on activity

Leading People - Summary

Working with multiple diverse groups on projects (grants, funding) makes it imperative that I deal with human conflicts, conflict of interests and personality clashes between teams. During a 2014 project proposal submission (\$20 million) I had to engage in conflict resolution almost on a daily basis toward the final stages of the proposal when budget line items were being added/deleted. The team was pleased with the final outcome and the proposal was submitted by members of the Industrial Internet Consortium to the US DoT.

My success in leading highly talented and culturally distinct people to collaborate and unite behind common purpose is evident from the teams coalesced (2014-2016) to pursue large projects in US, EU and APAC. The result is the submission of proposals worth about EUR 101 million to the EU Horizon 2020 program in coalition with IIC members from all over the world (<http://bit.ly/IIC-SC-NRT>).

While serving as the Special Assistant to the public school system of the City and County of San Francisco (Special Assistant XIV), I helped change the career pursuits of 100's of teachers by lifting their zeal for public service. My efforts may have rescued 1000's of inner city students through inspirational programs led by Nobel Prize winners who shared their life's failures and their successes, too. Personnel changes that I instituted in various sectors created waves that were not contained within the city but has become a global force for good through education / training programs. Teachers I recruited for SFUSD were a yardstick of enthusiasm and excellence. In my career, helping colleagues and team members (staff) is something that I enjoy and expect of myself. The lesson from above (never seek credit) is a mantra which works best if directed to give credit to the people and partners to build instruments of goodwill.

[3] Catalyzing Results

There was a crystal clear challenge confronting me in the corridor of the 10th floor of the Jackson Building at Massachusetts General Hospital. It was not a patient. They were a few middle school students and my inability to excite them with my findings in molecular medicine related to my research in neuroendocrine cancer. The visitors were a part of the Harvard Medical School (HMS) science outreach program that I catalyzed to sow the seeds of STEM in middle school students in disadvantaged sections of the Boston, MA.

The lesson from that day is still with me in terms of strategies related to advancing education, embedding inspiration and partial solutions to the problems of mentorship. The actions I took following that specific challenge reverberated in many other ways. We had a problem of communication and it required alternative solutions and re-thinking strategies to best serve the interest of the public.

For the task at hand, we got back to the drawing board with our outreach team at HMS and addressed 2 things – [a] the context and circumstance of our outreach effort – it had to change because middle school students from Roxbury were intimidated by the inner halls of Harvard teaching hospitals bustling with hard realities [b] the exclusion of the “natural guides” for the students was a mistake – we must include the teachers in the process if we want our effort to continue beyond the brief interaction we can have with students.

We adapted the outreach engagement model, we changed and we shipped ourselves to the middle school in Roxbury and found ourselves as aides to the teachers and discussion partners with student groups within their “known” environment devoid of the ostentatious surroundings of Massachusetts General Hospital. Parents and guardians were invited, too, to transmit the message farther.

The organizational model that I helped to change not only survived but others took it to greater heights. It evolved as a part of the outreach structure of Harvard Medical School physician-scientist program which led to multiple levels of mentorship efforts. One of my colleagues (then at the Children’s Hospital of HMS) created a mentorship program at the Boston Latin School (across from the HMS plaza) which was featured as a NPR special program (KQED) highlighting the crucial need for mentoring female students.

These efforts produced spectacular results for Timilty Middle School where I started this program. The school and its students were recognized several times for excellence and is a Blue Ribbon Presidential School in a trying neighborhood of Boston, MA (Roxbury).

In education, technology, business and industry, I have taken the initiative to articulate solutions and focus on driving results when I identify a challenge and if my solution has the potential to enhance public service, improve quality of life, create another pathway for jobs or induce general economic growth, locally or globally. I believe in outcome based *modus operandi* agnostic of the domain of the challenge or problem. Hence, as a result, I may have influenced multiple fields which are quite dissimilar.

The formula for driving results is based on my concept of granularity and understanding the nature of the convergence and confluence of context when analyzing the ecosystem and the circumstance where the challenge originates. In industry, this led to global connectivity through the convergence of bits (data) with atoms (goods) which is changing the known world in ways that we know and in many ways which remain unanticipated. In education, the concept of granularity enabled me to communicate solutions necessary for infrastructure, tools and teachers to reduce the chasm between education in principle and practice of education to fuel economic growth.

In creating a mind map of the end to end operation, my priority is on public goods, public service and the economy, taken together, not in silos. I try to run thought experiments with “what if” scenarios pertaining to perceived successes and failures, in addition to feasibility factors, which takes into account the issues and how they might manifest if left unaddressed, unattended and unsolved, albeit, partially.

Summary (only highlights public service in public education)

Challenges	Relevance / Context	Strategic Action(s)	Driving Results
Needed to reach high school students in large numbers	Accelerate STEM	Focus on node/hub (teachers)	Teachers Institute at MIT Whitehead Institute (still highly active)
School labs have little or any equipment for experiments	Hands-on science	Usher in inspiration, create visibility of problem	Endowment from Mrs Land (wife of Mr Edwin Land, inventor of Polaroid)
Teachers lack experimental knowledge in science	If teachers are not excited they cannot inspire students	Science Education Partnership at UCSF School of Medicine	Teacher workshops and new lab curriculum for SFUSD high/middle schools
Expose students to new potential of information age / new job opportunities	NSF releases the internet	Net Day showcased President Clinton “wiring” CA schools	Cisco Networking Academy (first) established at SFUSD 9 th grade classroom to train for a “connected future”
Empower students with rigor in math and science	Cannot build Taj Mahal if we use soggy wet unstable foundation, as the base.	Use the “new” internet and networking to connect school students with college students	UC Berkeley students to tutor SFUSD school students online (first). IUP at UCB funded by NTIA, US Dept of Commerce
Poor STEM standards (math and science, in particular)	Workforce development and the skills gap draining US of our competitive edge	Create national coalition and gain recognition to help tune the engine (not just polish the chrome - for sound bites)	Collaboration with State of California which led to complete change of the K-12 math and science standards
Shortage of skilled technology workforce	Outsourcing of tech jobs	Alliance with academia, national groups, federal government and the ITAA plus corporations	Task force for K-12 policy to improve math and science investment to meet skills gap

[4] Catalyzing Business

What is the \$ value of my contribution to the US and global economy and business based on my skills related to technology and innovation? My association with and contribution to 2 acronyms - RFID¹ (radio frequency identification) and IoT² (internet of things) suggests that the value of my contribution in these domains, albeit, collectively, may exceed \$11 trillion by 2025. As a key member of the groups that nurtured the tsunami of businesses due to RFID and IoT, this is a significant personal accomplishment considering the number of jobs due to applications of RFID and IoT, globally. I have helped to lift many boats, not just a few yachts.

My corporate role in software innovation (SAP Labs Palo Alto, SAP Germany, SAP Japan, Sony Japan) which combined RFID with supply chain management to usher in the digital supply chain created sales of \$100 million or more for SAP³ alone. Consulting with GE over the years on RFID IPv6, data, analytics has influenced GE products and sales of over \$100 million for GE VeriWise⁴ service.

Governments have been keen to consult with me with respect to future of digital supply chain networks, artificial intelligence in decision support systems and educational frameworks to bolster the supply chain of talent necessary to face future challenges. I have created economic value through programs and consultations with government agencies (US Department of Defense, Government of Finland, Government of Taiwan, Government of India, World Customs Organization, UNDP) and Fortune 500 companies, globally.

Business school education for MBA and executives added value by training senior administrators to deploy strategy and management tools in keeping with a sense of the future (for example - MIT Sloan School of Management, MIT-Singapore Program, MIT Sloan Fellows, MIT School of Engineering, UC Berkeley Haas School of Business, Chalmers University of Technology (Sweden), ESSEC (Paris), KEDGE (Bordeaux), NTU (Taipei), NCKU (Tainan), Tokyo University of Science (Tokyo), Indian Institute of Management).

Astute management of budgets and personnel during my tenure as a Special Assistant to SFUSD, City and County of San Francisco created multiple programs to enhance technology infrastructure (grants from industry and US Department of Commerce) and help recruit teachers with exceptional qualifications (highly qualified candidates with advanced degrees who wouldn't choose K-12 jobs).

1 www.aboutsmallcap.com/2012/03/26/market-study-projects-global-rfid-market-to-reach-18-7-billion-by-2017/

2 www.mckinsey.com/business-functions/business-technology/our-insights/the-internet-of-things-the-value-of-digitizing-the-physical-world

3 <http://go.sap.com/docs/download/investors/2000/sap-investor-2000-annual-report.pdf>

4 www.businesswire.com/news/home/20060313005941/en/Wal-Mart-Chooses-GEs-Telematics-Solution-over-the-Road-Trailer

Catalyzing Evolution of Dynamic Business Models - Disequilibrium of Static Business Models

The certainty of change precipitated by the uncertainty of market trends and dynamic integration of technology calls for re-inventing innovative business principles which may, albeit for a short duration, support the identification, evaluation, and commercialization of products and services as relates to digital monetization strategies. The following parameters are a rough guide as a scaffold for dynamic business models / monetization:

Dimension 1 – Identify and differentiate/delineate the attributes of the technology/tools which are influencing your business/industry

- non-linear vs linear?
- an innovation vs invention?
- an incremental development/value-add vs disruption/quantum leap?
- an application vs operation?
- an integration vs configuration?
- a component vs system?

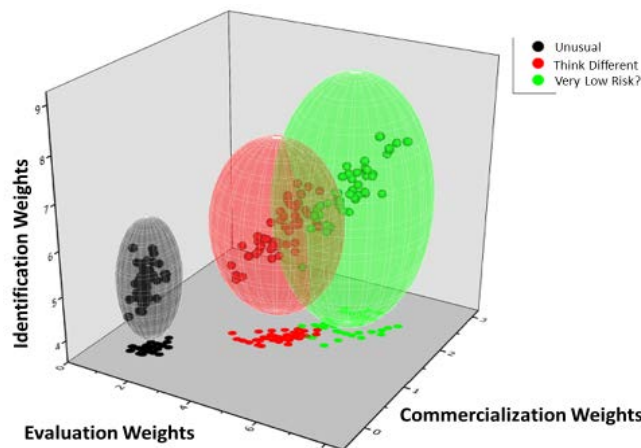
Dimension 2 – Evaluate status as a product vs service or if monetization may draw on **both** the channels. Can it act in only one area or bridge multiple domains / capacities? Relate to principles and practice of these concepts in real world monetization strategies:

- cost
- curate
- catalyze
- converge
- complement
- communicate

Dimension 3 – Business model monetization and commercialization potential lies in the ability to synthesize key characteristics for business profitability. In the development of a dynamic distributed model for new lines of business and revenue / earnings, consider:

- transaction cost influencer
- network multiplier
- cascading effect
- micro-revenue
- disequilibrium
- half-life
- scale

Combinatorial metrics, if developed into a methodology (below), may be indicative but not decisive because of known unknowns vs unknown unknowns. Usually select “unusual” if transformative/disruptive business models are valued. Other categories, generally, reflect obvious relationships but the pursuit of non-obvious relationship analysis (high risk, failure prone and “unusual”) may be significant to generate unique outcomes whose quantification may be elusive (domain of unknown unknowns). Unleash new models?



Catalyzing Business

Integrating crowd-sourced innovation with licensed technology platforms may need new tech transfer strategies

An increasing number of small but intense start-ups / academic labs are generating tools based on one or a few deep ideas for niche applications with great promise but narrow scope. An integrated tapestry of such “golden” nuggets converging on a broad spectrum platform (eg GE Predix) will provide value for the customer. To synthesize this platform, tech transfer will evolve as a key future tool.

The naiveté of *one shoe fits all* is one reason for the usual polarization between tech transfer legalese and its clients (technologists, innovators, scientists). The forced fitting of innovation to legal frameworks by non-scientists often dilutes, diminishes and even destroys the value of ideas, tools and technologies by divorcing the ecosystem. Pathways are good and the practice of pathways applicable to tech transfer may also be automated to remove the uncertainty of interpretation due to the unnecessary inclusion of humans in the loop. Such “pathways” serve “business as usual” for example (a) can opener, (b) can opener with safety cap (c) can opener with “rubber maid” safety latch (d) electric can opener (e) electric can opener with auto-off switch and (f) wireless can opener.

Commercialization pathways capable of making significant strides may not be delivered using the cookie cutter mold. The pathway itself demands agility and adaptability in addition to complementarity and creativity. Dynamic elements in a flexible framework, which can accommodate diverse and often skewed plans, must be developed as a menu of configurable choices (under multiple groups and sub-groups, in a manner similar to the principle of variant configuration used in 3D concurrent systems engineering).

Softwarization of these elements on a scaffold embedded with the appropriate legal attributes (may be opaque to the non-legal user) offers system boundaries (tech transfer wants to impose, enforce, demand) yet enables the scientist/technologist to submit or input values (which may be “flagged” if the values are non-compliant with legal parameters) at will, to test the art of the possible.

Development of this tool as a simulation may allow what-if scenario analysis not only for tech transfer pathways but for exploring the ecosystem to optimize potential commercialization opportunities. For example, using the keyword “terahertz imaging” this tool may reveal [a] previous patents in this domain [b] experts in this technology [c] potential use cases [d] vendors [e] R&D efforts in academic institutions [f] market demand for tertiary screening [g] privacy guide for non-invasive detection of concealed items.

This is a hypothetical proposal but the essential elements exist to synthesize these functionalities (which includes streams of information sub-systems). These are foundational/conceptual semantic building blocks applicable to and are under various stages of development in several other domains, such as, material science, healthcare information technology, fraud detection algorithms and non-obvious relationship analysis (NORA) for security purposes. The modular convergence suggested in the structure of the infrastructure may make this a general purpose tool (80/20 Pareto Principle) and help to influence the current static *status quo*.

Communicating the scope of this tool and its potential is essentially an education about the importance of considering the context and ecosystem when faced with new developments in science, technology and engineering. The legal illiteracy of scientists and the scientific illiteracy of lawyers must be bridged if we are serious in developing such tools. Joint workshops with key stakeholders is one way to shrink the perceived polarization. But, ultimately, creating a working model (albeit limited in capability) which can be virtually accessed and used by a cross-section of the partners in diverse domains may seed the trust and desire to deploy the system.

Institutional support may provide the initial momentum but the strength of this tool may germinate from an open crowd-sourced repository serving different types of information that must be cross-pollinated. A connected fabric must be woven to offer different levels of e-service with broad spectrum applicability and embedded intelligence, in future (consider the crowd-sourced WAZE app). Systemic integration of constantly evolving tools will be a reality for platforms which must rapidly adapt for business profitability.

[5] Building Coalitions – Building Organizations

Throughout my divergent career the convergent theme is that of building coalitions (internal, external, cross-functional) to spawn new collaborations, germinate novel partnerships to map uncharted waters and explore the art of the possible even if it may appear to be impossible, at first. I have founded/co-founded or catalyzed or influenced the creation of 6 major consortia involving academia, industry and governments, foreign and domestic (three of them were at MIT). I have represented and supported the interests of a wide variety of entities including public education, medicine, science, technology, engineering, healthcare, businesses and industries including Fortune 500 companies as well as small or medium enterprises. These activities required a broad array of skills involving verbal and written proficiency in cutting-edge trans-disciplinary science and technology content, multi-factorial analysis, contextual awareness of political/international/regional developments, advocacy, diplomacy, negotiation, mediation and conflict resolution.

At hand, currently, I am interacting with 3300+ members from 250+ companies and organizations from about 25 countries trying to promote the global diffusion of industrial internet and the internet of things (IoT) as a fundamental design metaphor for a plethora of applications (known and yet unknown) in almost all types of industry and business (analytics, data, finance, healthcare, security, oil, gas, energy, manufacturing, retail, logistics, telecom, automotive, agriculture, aviation, aerospace, transportation, automation, service).

I have in my hands the daily challenge of continuous process monitoring and chaperoning multi-company, multi-country coalitions to pursue ideas which may lead to a value network representing the components of an end to end solution, sub-system or a system. The expectation of the coalition is to find a feasible application which is pertinent and proceed to create test beds, large or small scale, to test the convergence of idea or proposed solution. Once a coalition decides on the topic related to the creation of the test bed, it is essential for me to create an action plan which must be guided by availability of funding to pursue the idea(s) which is of interest to the coalition. To that effect, I am perpetually in quest of government or industry alliances and seeking open calls for funding from various agencies in US, EU and Asia-Pacific. My other coalitions and networks with academics and government agencies are essential facilitators in this process. Once funding source is identified, the coalition prepares the proposal and finally submits the proposal to the appropriate authority or agency. I have pursued at least 8 major proposals (2014-2016) and more will follow <http://bit.ly/IIC-SC-NRT>

My next challenge is one of standards and interoperability between standards in IoT and IIoT platforms. The key is to form coalitions between groups and existing standards bodies (OMG, IEEE). This may pave the path toward the economic growth of over \$11 trillion.

[6] Building Futures

- Part A – What’s at Hand
- Part B – What I Wish ...

● Part A – What’s at Hand

The future is not what it used to be – predictable. Creativity surges, almost unlimited investment and rapid diffusion of ideas makes it well nigh impossible to predict what may lie even a year ahead. However, the internet of things may remain with us, at least, in the near future. This concluding section is divided into two parts. One view is about IoT at hand and a few key elements in that ecosystem but more importantly how IoT may be viewed in terms of future policy and guidelines that governments may consider for the socio-economic assimilation of IoT.

IoT is a design metaphor, specifically, it is a digital by design metaphor. In principle, it is a catalyst for convergence of system of systems which may transform IoT and aid the evolution of the Internet of Systems (IoS) as in complex systems engineering.

In practice, IoT weaves a fabric of connectivity and complementarity with objects, data and processes to better inform decision support systems and may enhance performance of “sense and response” models of autonomy.

Softwarization of IoT may decrease transaction costs and the distributed granularity of IoT may facilitate simultaneous penetration in multiple vertical markets both for the consumer IoT and the industrial IoT. Thus, in combination, IoT could lower the barrier to entry for communities and countries seeking a fiscally prudent path to digital transformation.

Fostering alliances for standardization and proactively promoting policies to enable semantic interoperability between IoT standards and platforms may accelerate global diffusion and pervasive adoption of the IoT concept.

Cyber-security for IoT may be improved by active implementation of IPv6.

Taken together, IoT is a potentially robust economic growth engine which may aid to reduce socio-economic disequilibrium. It may fuel the hope for society to pursue the elusive and egalitarian quest for equality and equity.

To harvest the plethora of uncharted IoT opportunities ahead, it is a moral imperative to inculcate policies to strengthen our academic foundation and attract women to be a significant part of the supply chain of talent. Strategic programs to cross-pollinate trans-disciplinary ideas are key and essential for the massive entrepreneurial innovation that IoT demands.

Government policy frameworks must be sufficiently imbued with creative optimism and build organizational tools to harness the power of the IoT tsunami to safely and securely lift many boats, not just a few yachts.

Inclusion of women in the emerging workforce must be at the heart of the policy ecosystem and recognize that reduction of social disequilibrium requires that women are educated to hold professional appointments, capable of pursuing careers that guarantees economic independence and serve as role models, locally as well as globally.

The education of a boy changes the fate of a man. The education of a girl may change the destiny of a nation.

L'avenir de l'homme est la femme (Louis Aragon)

● Part B – What I Wish ...

This will remain largely incomplete and almost certainly a temporary conclusion because I don't know what else I shall wish for with the passage of time. Few elements from my wish list remain personal, others shall be cryptic and many unknowns. Facts and fictions related to my ideas and opinions may be found here <http://bit.ly/4-by-4>

What I do know that education continues to play a central role in my wish list with an eye toward building futures. The weave of education in my mind is not a particle but a wave, it is not analog but digital, it is not discrete but continuous. The following captures my thoughts and attentions. They are manifestations of the education ecosystem which delivers consistent economic value, is strategic to growth and acts as a purveyor of civilization:

[1] Teaching

It is unnecessary to emphasize that I am a teacher. But in principle, I aim not to teach facts or numbers but to teach one how to learn, un-learn and re-learn. It is often very difficult to practice this principle when facing K-12 students in a high school or even during dialogues with CXO's in executive education in an august institution.

[2] Digital Education

The immense potential to unlock the global economic genie is at the hands of education. It may not be the classical approach (subjects, disciplines, course work), it may not be about skills (workforce development, labor re-training), it may not be the driver for excellence (ocw.mit.edu) but it can be a combination of what we know plus what we may need to know in order to disseminate the tools to all corners of the world to trigger creativity, sustainability and a pathway to be included in the resplendent future.

[3] University Entrepreneurship

So many ideas perish because they lack expression, the environment to grow and the global connectivity necessary to nurture young minds. The petri dish of the University uses the antibiotic called grades to drive the outcome expected of the system. GPA. Without demolishing the great things that GPA has achieved thus far, could we create parallel worlds where Universities also actively build and promote entrepreneurial networks that extend far beyond what is known and push the students to visit places where their ideas can germinate (or adapt or die)?

[4] Public K-12 Outreach for Women in STEM

It is as if we trying to work with one hand tied behind our back. The world must unleash the potential of the remaining 50% of the population to join the task of building a better life for all citizens, rich or poor. Poverty of education and failure to use science to benefit society are criminal acts that must cease. Economic independence of women must be a moral imperative for all those who are in a position to contribute, no matter how small.

[5] Corporate R&D through global research alliances

Businesses are the economic factories. Creating bridges between research (university), industry (business) and employment (government) is the task of generalists who can view the global picture, find ways to connect the vision and catalyze diverse groups to collaborate, create and generate new avenues for monetization.

[6] Innovation for social business through science and engineering

Monetization which raises only a few yachts is an unsustainable modus operandi and further drives the nail on the coffin of equity. We must strive to use science as a path to help create social businesses for the masses and help lift many boats.

This is my wish - to be involved in one or a few of these amorphous approaches to build a new sense of the future.