Club *of* Amsterdam

the future of **Connectivity**

June 2009
The Club of Amsterdam visits the **Royal Society for the encouragement of Arts, Manufactures and Commerce (RSA)**, in London

You can watch the presentations here:

▶ **Egbert-Jan Sol, part 1**
Billions of people using 1000 Billion connected devices and bandwidth for free
https://youtu.be/RMTVzV52y58

Egbert-Jan Sol, part 2
Billions of people using 1000 Billion connected devices and bandwidth for free
https://youtu.be/RMTVzV52y58

▶ **Peter Cochrane, part 1**
Evolving Connectivity
https://youtu.be/p25sYYDrjoY

Peter Cochrane, part 2
Evolving Connectivity
https://youtu.be/urc_3k-lszc

Hardy F. Schloer
Human Connectivity at the Event Horizon of new AI Technologies
https://youtu.be/9ASNgFB2FmU

The interconnectedness of the world, scarcely imaginable a generation ago, continues to fire our imagination as newer, smarter connectivity inspires and reshapes our lives.

Ever increasing connectivity has been scrutinized by academics, researchers, journalists and hosts of others. Falling between the cracks is the essence of the connectivity itself. Where now for the devices, networks, software, and dynamics which define our patterns of connectivity?

Smarter applications - and more of them – could soon see our social and business associations aided by processes of ever-learning connectivity, guiding us and learning from our habits and preferences.

Collective intelligence directs us through the spaces we move in, defining how we negotiate and interact with our surroundings. Powerful, ever-learning search engines could deeply impact the ways in which we connect with and move in our shared spaces.

These forces are not only changing our lives, but learning and adapting as we increasingly interact with them.

▶**Egbert-Jan Sol**, CTO, TNO Science and Industry, co-founder/1st chairman, DSE
Billions of people using 1000 Billion connected devices and bandwidth for free

From 100 persons working on a mainframe computer around 1980 to one PC and one mobile per person around the year 2000, we are approaching 100 computing devices working for one person by 2020. That is 100B interconnected devices by 2020 and 1T several years later. Volume of cubic

meters mainframes shrink to cubic inches sized computing devices today to intelligent push-pins and tape devices real soon. And extrapolating, not Moore's law for silicon, but this learning curve on volume size of intelligent devices we reach a million devices of one cubic millimeter by 2040 for one person. IP protocols will stumble, Ethernet with physical MAC addresses coupled to virtual service MAC addresses might be needed. But most important how and why are we going to use this connected world of ambient embedded devices in elderly care, in manufacturing, during sports, but also in our cars. Self-driving car, real auto-automobiles, will not happen overnight. It will take 5 generations from a stupid non communicating 1G car, via driver assisted systems as ACC (adaptive cruise control) 2G car, via CCC (connected cruise control) 3G cars able to platoon in a traffic jam lane, to 4G swarm driving (platooning and changing lanes or automative, controlled low speed neighboorhood driving) to 5G cooperative driving at all speed levels. You need 100,000% reliability and that requires multiple computing devices around you in your car and connected with other cars and a smart road. It will also create a big market for off-road tracks for saturday morning driving for those frustrated they can't race on public roads anymore.

▶Peter Cochrane, Co-Founder, Cochrane Associates
Evolving Connectivity

Connectivity is one of those things we depend upon, use every day, and take for granted. Few of us stop to ask; what is it, how does it form, and will we ever have enough? In reality it is an evolutionary quality that binds all life, and increasingly all technologies, across the planet. It is fundamental to evolution and progress, and we are only just beginning to grasp its significance, but it is inherently non-linear, and can result in chaotic outcomes of the unexpected kind.

In its most benign state connectivity helps humans form groups and societies, to solve problems and advance civilization, and at its worst (as we have recently witnessed) it can generate financial collapses on a global scale. And now we are in the process of progressively connecting all machines and people in a global network denoted as Web2.0, 3.0, 4.0 etc. But we are doing so without models, precedents, or any real idea of the impact on society and commerce.

In this presentation we will therefore explore what happened in the past, what is happening now, and what is likely to happen in the future. Our purpose will be to search out and highlight the positives for society and the planet, but with an eye to the unexpected, and an underlying trend toward brittleness and catastrophic impacts.

▶Hardy F. Schloer, Owner, Schloer Consulting Group
Human Connectivity at the Event Horizon of new AI Technologies

The 'future of connectivity' is not about how we connect, or for what purpose, but much rather; it is a question of, what is connecting to what; through what intelligence; and finally, at what consequence. Human cognitive abilities have long reached their limits of competitiveness to manage connectivity on any levels. In an era where the underlying intelligence of global connectivity will be managed by massive supercomputers, and where complex competitive connections are measured in milliseconds; the future of human connectivity is rapidly descending beyond the event horizon of new and powerful artificial intelligence technologies.

19:00 - 20:00
Opening welcome by
Ambassador Pim Waldeck, Embassy of the Kingdom of the Netherlands
Matthew Taylor, Chief Executive, RSA
Erik Driehuis, Vice President EMEA, LogMeIn
Felix Bopp, Chairman, Club of Amsterdam

Introduction by our Moderator
▶James Cridland, Head of Future Media & Technology, BBC Audio & Music Interactive

Part I:

▶**Egbert-Jan Sol**, CTO, TNO Science and Industry, co-founder/1st chairman, DSE
Billions of people using 1000 Billion connected devices and bandwidth for free

▶**Peter Cochrane**, Co-Founder, Cochrane Associates
Evolving Connectivity

▶**Hardy F. Schloer**, Owner, Schloer Consulting Group
Human Connectivity at the Event Horizon of new AI Technologies

20:00 - 20:30
Coffee break with drinks and snacks.

20:30 - 21:15
Part II: Open discussion

Dr Ir Egbert-Jan Sol
CTO, TNO Science and Industry, co-founder/1st chairman, DSE

Born in 1956, August 21 in Sneek, Netherlands, he received his PhD Technical Sciences 1983 and his MSc Mechanical Engineering (Ir Werktuigbouwkunde) 1979 at the Eindhoven University of Technology.

Since 2004 managing director of TNO Industrie in Eindhoven, and from 2005 director Knowledge (CTO) of TNO Science and Industry, a 1000+ large R&D organisation.

Before joining TNO Egbert-Jan Sol was principle system architect at Ericsson. There we were shaping the future of broadband communication networks delivering 1000 times more price/performance for the same dollar a day people paid more then a century with Graham Bell on communication technology. This work is called Public Ethernet and uses a patented approach we developed in combination with programmable filtering bridges

Egbert-Jan Sol was vice president technology at Ericsson Telecommunicatie BV (ETM) at Rijen, Netherlands. Initially as R&D Manager, he became board member of ETM for technology with a focus on research & development, product marketing and strategic business development at Ericsson Telecommunication in the Netherlands. Initially part-time working for LM Ericsson at Corporate Technology in Stockholm/Kista and latter 2 year as expat, while living in Sweden, he was member of the Ericsson Technology Board and the Core System

Management group.

Within the Dutch context Egbert-Jan Sol was member of the board the Telematica Instituut, the advisory council of TNO-FEL, and the SURF foundation, chairman of the Dutch Telecom research funding programs IOP Generic Communication (www.senter.nl) and the Towards Freeband Knowledge Impulse research program and member of the ICT-Forum of the Dutch government and the CELTIC Eureka initiative. Today he is active in the boards of DPI, NIMR, CITT, Be-linked, the SRE steering group and a few more

From 1999-2002 he wrote a monthly column in the large Dutch IT weekly magazine "Computable" and some anonymous public Ericsson whitepapers. Two short versions appeared in the Dutch in the Telecommagazine (sept 2000, nov 2002). He also contributed to the "Ambient Intelligent" paper of the ISTAG commission of the EC (2000) and the ambition formulation around the 4G ambient Internet in the lePair commission of the Dutch government.

Before joining Ericsson he was been software manager at Philips Industrial Electronics (PLC, Real-time Unix), latter he was consultant at BSO-AT/Origin for several large industrial firms in the area of IT-management, embedded software development and data-communication. Finally he was marketing and sales manager at Philips/Origin for Internet services. After his PhD he started to work for Hoogovens Automation Systems as project manager for robotic and industrial automation projects.

From 1990-1998 Egbert-Jan Sol has been part-time professor at the Eindhoven University of Technology at Technology Management. Research topics at the university were architectures and the management of product development

Beside winner of the academy award of the university in the category teacher in 1996 for his experiments with lectures on the Internet, Egbert-Jan Sol is co-founder and first chairman of the Digital City Eindhoven (Digitale Stad Eindhoven) with this web page: http://www.dse.nl/~ejsol.

'It's easy to make something complex, it is very difficult to make something simple. Only the most simple solution works, but what is simple and what is complexity. Why don't we have a formula for expressing a rate of complexity or simplicity". With the telephone system being the most complex man-made system and Ethernet is so stupid simple it is great fun to how "Ethernet always wins". What is left over is for his family and reading magazines on developments in business, new technology and complexity theories.
www.tno.nl
www.dse.nl, a 15 year old digital city eindhoven

Professor Peter Cochrane
Co-Founder, Cochrane Associates

Peter Cochrane is a graduate of Trent Polytechnic and Essex University. He has been a visiting professor to UCL, Essex, Southampton and Kent universities. He was the Collier Chair for the Public Understanding of Science & Technology from 1999 to 2000 at the University of Bristol, and is a Member of the New York Academy of Sciences. He joined BT Laboratories in 1973 and has worked on both analogue and digital switching and transmission studies. From 1988 he managed the Long Lines Division where he was involved in the development of intensity modulated and coherent optical systems, photonic amplifiers and wavelength-routed networks. In 1991 he established the Systems Research Division and during 1993 he was promoted to head the Research Department at BT laboratories with 660 staff. In 1999 he became BT's Chief Technologist and established a new team of Communication Consultancy Group concerned with charting the long-term future of technology, society, BT and it's customers and clients.

At the end of November 2000 Peter retired from BT to join his own startup company, ConceptLabs - which he founded with a group out of Apple Computers in 1998 at Campbell CA, in Silicon Valley. In 2006 Peter left ConceptLabs and moved on to form a new virtualized global operation (Cochrane Associates) to exploit the new business freedoms and opportunities afforded by the latest technologies.

Peter has published widely in all areas of IT, systems, management, and processes. He is also a regular contributor to the international paper and electronic press, radio and TV. He also joined a select group of Apple Masters in 1997.

Peter currently lives in Suffolk UK, and enjoys a wide variety of activities from DIY, swimming and cycling, to sailing, fly-fishing, music and reading.

He led a team that received the Queen's Award for Innovation & Export in 1990; the Martlesham Medal for contributions to fibre optic technology in 1994; the IEE Electronics Division Premium in 1986; Computing and control Premium in 1994 and the IERE Benefactors Prize in 1994; the James Clerk Maxwell Memorial Medal in 1995; IBTE Best Paper Prize and Honorary Doctorates from Essex, Robert Gordon, Stafford, and Nottingham Trent Universities and was awarded an OBE in 1999 for his contribution to international communications. Peter was awarded an IEEE Millennium Medal in 2000 and The City & Guilds Prince Philip Medal in 2001. He also received the CNET Networks Business Technology Award for outstanding contributions to the UK technology industry in 2007.
www.ca-global.org
www.cochrane.org.uk

Hardy F. Schloer
Owner, Schloer Consulting Group

Hardy F. Schloer is a strong team builder, entrepreneur, accomplished scientist and visionary theoretical thinker with extensive people and public relation skills.

For three decades now Schloer has built successful global technology solutions and practical problem-solving infrastructures for clients and partners in the Americas, Europe and Asia. Schloer has extensive hands-on experience in the design and the conceptualization of successful solutions and complex technology architectures on global scale. His strong ability to view problems through their complex layers of context has enabled him to become a highly effective analyst and 'out-of-the-box' thinking problem solver.

Schloer is founder and former CEO of RavenPack AG in Germany and RavenPack International in Spain, a world leader in computational linguistics and real-time financial applications. Schloer is also the inventor of numerous Information and Communication Technology patents and of the Quantum Relation Theory, a breakthrough concept in Artificial Intelligence. The Quantum Relation Theory has been academically reviewed and discussed (see Reviews on QRT). (Read more about the Quantum Relation Technology)

In 2001 Schloer received the award of "One of 25 Best Technologies of the Future" from NetInvestor in Germany for the invention of his Quantum Relation-based technology platform, 'RavenSpace'.

Schloer made also important intellectual contributions to the field of healthcare with his groundbreaking concept 'AlphaMedic', a global approach to modern healthcare that envisions globally standardized, centralized and AI managed patients record keeping, combined with computer assisted real-time medical diagnostics and automated clinical trials in a global 24/7 processing approach. Schloer's AlphaMedic concept to healthcare problems has received a European Grant and has been published and discussed in the press and online healthcare publications

Schloer has developed a strong transdisciplinary and intercultural approach to problem-solving consultancy that is now leading in its field. He is an internationally acclaimed speaker and is frequently invited to international conferences, public discussion panels and other global Think Tank events.
ppt ▶SCG Company Introduction
http://schloerconsulting.com

James Cridland
Head of Future Media & Technology, BBC Audio & Music Interactive

James contributes to the development of pan-BBC non-linear and new media strategy within BBC Audio & Music. He is currently working on the BBC iPlayer for Radio, with a remit of improving both the audio experience and technical workflow. Additionally, he is helping define the product and technology behind the Radio Partnerships work with the commercial radio industry. He is also a Trustee of the pan-industry body The Radio Academy, and is Chairman of its Radio At The Edge conference.

James has worked in radio since 1989 as a copywriter, presenter, and internet advisor. After working at the Metro Radio Group and Emap Radio, he left to concentrate on his own dot-com company, Media UK, for a while before joining Virgin Radio in 2001, where he was Digital Media Director. In 2007 he joined BBC Audio & Music Interactive, the division that looks after new media activities across BBC national radio networks, and music output across the BBC.

James is an award-winning copywriter and radio presenter. In 2005, Virgin Radio's website scooped both judged and people's choice awards in the Webby Awards radio category. In September 2006, under James's direction the station redesigned its website to boast an innovative music-based social-networking system, which delivered record traffic levels and improved audience retention.

James lives in North London with a big black cat, and is a committed member of the Campaign for Real Ale. He blogs about the future of radio, and beer.
http://james.cridland.net