

## CV - JOHN MARTIN WEHLOU, MD, CISSP, CSDP

HEALTHCARE APPLICATION ARCHITECT, MEDICAL SOFTWARE CONSULTANT

### I. PERSONAL DATA:

- Born in Stockholm, January 21, 1951.
- Citizenship: Swedish.
- Address: Flintstenvägen 10, SE-752 67 Uppsala.
- Phone: 070-558.12.17, 018-46.88.73. E-mail: martin@mitm.se.
- Home page: <http://www.wehlou.com/cv> , [www.mitm.se](http://www.mitm.se).
- Current employment: MITM - Man in the Middle AB (proprietor, CEO).

### II. EDUCATION:

- 1969–71: University of Stockholm. Mathematics and anorganic chemistry.
- 1971–78: Medical school, University of Ghent, Belgium. Graduated with honors.
- 1978–83: Surgical residency under Professor Derom, University of Ghent, Belgium.
- 1983–85: additional courses for general practitioner; GP-specialization in Belgium (and in EU) in 1985.

### III. CONTINUED (MEDICAL) EDUCATION:

I participated three times in congresses organized by EASD (European Association for the Study of Diabetes):

- March 1993: 12th International Workshop, Immunology of Diabetes; Orlando, Florida.
- Sept. 28th – Oct. 2nd, 1999: 35th Annual Meeting of the EASD; Brussels, Belgium.
- September 17–21, 2000: 36th Annual Meeting of the EASD; Jerusalem, Israel.

### IV. PROFESSIONAL TITLES:

- 1978: MD (from University of Ghent, Belgium).
- 2004: CISSP (Certified Information Systems Security Professional, ICS2).
- 2005: CSDP (Certified Software Development Professional, IEEE/CS).

### V. PROFESSIONAL MEMBERSHIPS:

- SLF Sveriges Läkarförbund (Swedish Medical Association)
- SLS Svenska Läkaresällskapet

### VI. LANGUAGES: Swedish, English, Dutch.

## VII. SOFTWARE EXPERIENCE:

- C: fairly extensive experience.
- 80×86 assembler: fairly extensive experience.
- C++: extensive experience.
- C#: extensive experience.
- T-SQL (MS SQL Server): extensive experience.
- Pascal/Delphi: extensive experience.
- Cocoa, XCode on iOS and Mac OSX: extensive experience.

Familiar with at toy project level:

- Swift, Ruby, Ruby on Rails
- Javascript, ExpressJS, NodeJS, ReactJS, ReduxJS, Webpack, mocha, should, AsyncJS, supertest, coffee, JadeJS, sass
- DevOps: Vagrant, Docker, Puppet
- Tools: Webstorm, WallabyJS, Postman, Charlesproxy
- MongoDB with Mongoose
- Heroku

## VIII. HARDWARE EXPERIENCE:

- Care and feeding, including repairs, of HP 2100 and to lesser extent the HP1000 series of mini's (late 1970's).
- Fair experience of using and understanding logical analyzers for service and driver development.
- Designed and built interfaces for A/D systems to connect both pressure heads and Pt100 and NTC probes.
- Repair and modifications of any number of microcomputers during the 1980's.
- Installation and maintenance of networks ranging from mmmOST, Network-OS (CBIS), InfoShare/M to Netware 2.0 to 4.x. Based on RS-422, ArcNet and Ethernet.
- 1992–94: custom assembled a number of stand-alone and network computer systems ("clones").
- 1995–98: misc companies, took care of Novell systems on PC hardware, Sun Sparc 5 and Netserver, Siemens Unix ("Sinix") system, HP Unix workstation, and many types of Intelbased servers and workstations. Took care of Bay networks routers, bridges and switches for a large mixed LAN system.
- current: extensive experience with Juniper, Junos firewalls, HP MSM and Aruba networks.

## IX. RELEVANT PROFESSIONAL EXPERIENCE:

During medical school I had the occasion to work extensively in clinical laboratories. My surgical residency included general, abdominal, thoracic, cardiovascular and orthopedic surgery. I was extensively trained in intensive care and trauma surgery. 12 years of general practice in Belgium. Licensed as general physician in Sweden (EU), have been working 2006–2016 in health centers (vårdcentraler) in both Uppsala (Svartbäcken, Nyby,

Fålhagen, Årsta, Heidenstam, Ingrid Marie, Uppsala Hälsomottagning, Sammariterhemmet, Näarakuten) and other places in Sweden (Alunda, Länna, Knutby, Mora, Malung, Grangårde, Bollnäs, Grängesberg, Öregrund). During the period 2012–2016, I was the principal investigator on clinical studies at Uppsala Hälsomottagning:

- Obstipation
- Psoriasis
- Overactive bladder

My second and parallel career is this of software architect, designer and developer. I have extensive experience with most modern computer technologies, certified as security specialist (CISSP) since 2004 and software development professional (CSDP) since 2005. Worked for software companies in both Belgium and Sweden, involved often in informatics for healthcare, wrote several pieces of software for healthcare. I have also been observer in TC251 at the EC for a while. In Sweden I did the complete architecture, design and development of medical message transmission and conversions PMI (Profdoc Medical Interchange) v2 client and server.

I founded three software companies: in Belgium *Cactus Computing Bvba* (1982–2003), in Sweden first *Secure System Design* (2003–2008), then *MITM - Man in the Middle AB* (2008–onwards).

#### X. SOFTWARE WRITTEN BY ME:

- 1980: A non-invasive cardiac output calculator, using bidirectional doppler measurements of aortic arch diameter and blood flow. The flow curves were divided into one wave complex per beat and then allocated into up to 12 wave classes based on template matching. These were then separately integrated for flow and added. Fortran on HP 2100 under RTE-II.
- 1981: Simple medical procedure database for use on intensive care. Used my own string indexing routines accessing disks by track, sector and byte for performance. HP2100 under RTE-II, Fortran.
- 1981: Clinical study management package for printing questionnaires, entering results and doing interactive correlation analysis using t-test and chi-square on the resulting database. HP2100 under RTE-II and Fortran.
- 1983: A custom pre-compiler with screen tools for basic and termcap-like abilities for MPM-II terminals (everyone wrote one of these back then...).
- 1984: A multitasking data collection package, including graphics output and thermodynamic calculations. Running under CPM-80.
- 1985: Process control, central heating system in a mall in Belgium, using a Merlin Systems (UK) process computer with embedded special purpose Basic. Also designed and built the amplifier circuits for the interfacing. A second similar installation in a technical school in Belgium.
- 1985: Utilities for precalculating dimensioning of central heating systems, including heat pumps.
- 1986: A package for calculations, including simulation, of airconditioning systems for office suites and computer rooms.
- 1988: Insurance broker package.

- 1990: Accounting package. Including a recursive-descent expression parser for template driven balance generation.
- 1990: a medical telecommunication system consisting of a server side application running on three workstations and a client side application. Both of these written in a mix of Clarion and assembler. The package assembly/disassembly routines, the handshaking protocol, file exchange protocol and the CRC routines I wrote in assembler (I didn't invent the CRC routines, of course). The communication driver was a standard fossil-5 driver. This system ran for four years serving a small number of GP's and labs in the western part of Belgium between 1991 and 1995 and was definitely one of the first such applications in Europe.
- I was also listowner ("DIABETES") on Bitnet from 1989 or so, which can count as very early Internet experience. (Wasn't this before the Internet was the Internet? I have these flashbacks about the Arpa net and stuff.)
- Assistant sysop on CompuServe for a limited time around 1990, diabetes forum.
- 1 Apr 1995 — 30 Sep 1996: external consultant at The University of Ghent. Designing an object based message structure allowing medical "episode of care" information to be exchanged between medical care providers, conformant to existing european standards and adapted to the Belgian situation. Participating as observer in EEC CEN/TC251 workgroups on medical messaging. Advising on information security technology in several Belgian government sponsored projects.
- 1 Jan 1995 — 31 Dec 1995: external consultant for MediBridge NV (Belgium). Setting up and technically managing an electronic document distribution system for medical use. Installation and maintenance of SunOS and Solaris systems. Installation and maintenance of telecommunication software and hardware subsystems. Supervision of software development in C and Pascal.
- 1 Sep 1995 — 31 Dec 1996: external consultant at Administratief Centrum Caritas, Leuven (Belgium). Hospital information system and medical records (AZIS-2000). Requirements and analysis for medical records, pharmacy distribution, nursing. Presales technical meetings leader.
- 15 May 1997 – 15 May 1998: Manager of Information Systems at the Ministry of Health, Belgium, Department of Epidemiology. Setting up of a number of information systems infrastructure components, such as:
  - advising on design of epidemiological applications
  - managing switchover from Win 3.x and DOS systems to NT4, department-wide,
  - selecting and installing NT servers,
  - maintaining and installing Netware servers,
  - installing and maintaining a Unix based firewall system,
  - maintaining TCP/IP networks and routers (Cisco IOS),
  - installing and maintaining Web servers (IIS3 and 4), including simple web sites,
  - managing software development using Visual Studio (VB, C++).
- 15 May 1998 – 15 Nov 1998: software developer at Real Software NV (Belgium). ERP implementation:
  - triggers and procedures in T-SQL for synchronizing separate databases and optimizing access (extensive),

- customization of pre-existing ERP software in MS Access VBA (medium),
  - development of user interfaces, reports, utilities in MS Access VBA (medium),
  - customization of pre-existing Lotus Notes applications (minor).
- 15 Nov 1998 – 15 June 1999: Software Developer, Project Manager at Real Software NV (Belgium). Encryption and transmission of medical assessment data.
  - Parsing textfiles for errorchecking and separation of id-data from assessment data.
  - Encrypting and signing files using the PGP SDK, including key database.
  - Sending and receiving over SMTP and POP3 using 3rd party COM components.
  - Dialling and phonebook connectivity using the Win RAS API.
  - Providing automation (COM) interfaces on the modules.
- 15 June 1999 — 30 June 2001: Software developer, contractor at C3 NV & Quadrat NV (Belgium).
  - COM based scripted calculation engine: ActiveX scripting.
  - XML exporter and other database utilities for an Intensive Care patient management system, mainly based on ATL, STL and to a lesser degree on MFC.
  - Notification server: multithreaded sockets based (MFC).
  - Parsing of database scripts to XML, XML to C++ code via scripting.
  - Exporting Oracle based data in XML (using MSXML), reimporting, editing.
  - Executing recursive database calculations with Python and windows scripting host from C++.
  - Developing COM based system architecture and base objects for intensive care systems.
- 1 July 2001 — 30 Sep 2001: my own project **x2c** - xml-to-code template based scripting language and interpreter.
- 1 Nov 2001 — 31 Mar 2005: Software architect and developer at Profdoc Link AB, Sweden. Architecture, design and development of medical message transmission and conversions (PMI v2 Client and server). Operating systems & tools: W2K & XP, PGPsdk, OpenSSL, TurboPower Sleuth QA, SQL Server 2000, Indy, VS.NET, Vault, TestTrack, StreamSec-II, DXSock, Finalbuilder. Languages: Delphi 6, C#, C++, T-SQL.
- 1 Apr 2005 — 31 Dec 2007: Developed a SOAP client for oil commodities traders in C# and worked as a GP in a number of Swedish health centres to get to know the local health system. During this period I also did an in-depth evaluation of Cosmic from both a technical and a medical perspective for a Swedish provincial authority, due to perceived problems with the rollout of the product.
- 2008–2009: Architecting and developing a medical system for use in health centres for a major Swedish vendor. Technology: *n*-tier C# with an SQL Server backend. Emphasis on scalability, security, and code structure as a basis for future projects at the same company. Advisory function for methodologies and coding guidelines.
- April 2010 – current: Working on a new medical record *iotaMed*. Technology: iOS, Objective-C, Cocoa.

## XI. PUBLICATIONS (in paper journals):

- Surgical treatment of oesophageal carcinoma. Experience between 1965 and 1980. Anne T., Berwouts L., Wehlou M., Berzsenyi G., Derom F. *Acta Chir. Belg.* 1982 Jul–Aug; 82(4):359–66.
- Peritoneal lavage after abdominal trauma: indications, technique, results. Pattyn P., Vossaert R., Noterdaeme P.M., Wehlou J.M., Eeckhout C., Berzsenyi G., De Roose J., Derom F., *Int. Surg.* 1989 Jan–Mar; 74(1):17–9.
- Printer filter language extension module, *Clarion Tech Journal* (3) 6, Nov/Dec 1991, pp. 44–48.
- Merge printing and user editable forms, *Clarion Tech Journal* (4) 1, Jan/Feb 1992, pp. 36–38.
- A structured approach to opening Clarion data files, *Clarion Tech Journal* (4) 4, July/Aug 1992, pp. 17–21.
- Multi-disciplinary electronic medical records: a real-world development experience, *Medical Informatics Conference (MIC)*, Brussels 1996.
- Reference counted pointer templates, *Windows Developer’s Journal* (12) 6, June 2001, pp. 32–40.

## XII. PUBLICATIONS IN DAILY PRESS AND IN PROFESSIONAL MAGAZINES:

- *Dagens Medicin* 20/2009 (May 13th) Debatt: “Skärp kraven vid köp av IT-system”.
- *Läkartidningen* 18/2011 (May 3rd) “Kvalitetsregister är inte EBM” (debatt, endast på webben).
- *Allmänmedicin* 3/2011, p.22: IT: “Det förhatliga konferensbordet”.
- *Allmänmedicin* 4/2011, p.43: Ordbyte (debatt): “Kvacksalvare är vi allihopa - ?”, Saskia Bengtsson, Martin Wehlou, Catarina Canivet.
- *SvD (Svenska Dagbladet)* September 4th 2011 “Känsliga uppgifter skyddas inte”, A. Bard, F. Federley, L. Morfeld, H. Sjöholm, M. Wehlou.
- *Allmänmedicin* 1/2012: “Vårdprogram, riktlinjer och våra journaler”.
- *Allmänmedicin* 4/2013, p.39–40: “Journalerna. Så mycket som är fel”.

## XIII. RECENT PUBLIC PRESENTATIONS ON HEALTHCARE IT:

- December 4th, 2009: “Martin on health informatics”, a pre-iotaMed presentation at Karolinska Institute [KI] (for the SPD-group of Professor Ingvar Krakau).
- October 8th, 2010: “Presentation of iotaMed prototype live on an iPad”, the first official presentation of iotaMed. KI (for the group of Professor Ingvar Krakau).
- December 6th, 2010: 3.5 hours of invitational lecture for International Master Programme in Health Informatics at KI (I was invited by Professor Vasilis Hervatis from Health Informatics Centre at Karolinska).
- December 8–9, 2010: poster on iotaMed presented during the *Kvalitetsdagar* in Uppsala University Hospital.
- December 10th, 2010: “iotaMed, now with national registries! Live on iPad”. KI (for the group of Professor Ingvar Krakau).

- April 7th, 2011: “iotaMed: medical record, decision support and national registries, all in one”, presentation of iotaMed during Vitalis, the most important Swedish exhibition on health informatics.
- May 27th, 2011: “iotaMed with MyIota”. KI (SPD, Professor Ingvar Krakau).
- December 8th, 2011: 3 hours of invitational lecture for International Master Programme in Health Informatics at KI (on invitation of Professor Vasilis Hervatis from Health Informatics Centre at Karolinska).
- April 17th, 2012: “iotaMed, quality registries, and Snomed CT” (joint with Hania Uscka-Wehlou), presentation of iotaMed during Vitalis, the most important Swedish exhibition on health informatics.
- June 15th, 2012: “An update about iotaMed in the context of quality registries and Snomed CT”. KI (SPD, Professor Ingvar Krakau).
- August 30th, 2012: “iotaMed: medical record, decision support and national registries, all in one” a lecture during a study day for general practitioners in Orbaden, Sweden.
- September 6th, 2012: “iotaMed: medical record, decision support and national registries, all in one” a lecture during a study day for general practitioners in Orbaden, Sweden (the same as on August 30th, but for a different group of general practitioners).
- January 15th, 2013: 3 hours of invitational lecture for International Master Programme in Health Informatics at KI (on invitation of Professor Vasilis Hervatis from Health Informatics Centre at Karolinska).
- December 16th, 2013: 3 hours of invitational lecture for International Master Programme in Health Informatics at KI (on invitation of Professor Vasilis Hervatis from Health Informatics Centre at Karolinska).
- November 15th, 2014: TEDxUppsalaUniversity conference in Uppsala. Subject: “Rethinking clinical thinking”.
- March 27th 2015: book presentation (“Rethinking the Electronic Healthcare Record”) for the SPD-group at Karolinska Institute (on invitation of Professor Ingvar Krakau).

#### XIV. INTERNET ACTIVITIES FOR HEALTHCARE IT:

- blogging on software and security: <http://ursecta.com> since June 2005,
- blogging for *IT i Vården*: <http://itivarden.idg.se> since June 2007 (defunct),
- blogging on health IT: <http://vard-it.se> since June 2007,
- I have started a forum for health IT in December 2009 (<http://vard-it.se/vi>),
- I am working (since April 2010) on an open-source project *iotaMed* (a new medical record on iPad, based on standard medical guidelines), documented on <http://iota.pro>.

#### XV. BOOKS:

- “Rethinking the Electronic Healthcare Record” (September 2014). This book explains why the Electronic Healthcare Record (EHR) failed so hard, and how it should be redesigned to support doctors and nurses effectively in their work.

## XVI. REFERENCES:

- Jerker Green, ex CEO of Profdoc AB; jerker\_green@telia.com, tel. 070-536.94.13.
- Anders Nordström, Senior Advisor in Business Development at Uppsala Innovation Centre AB, anders.nordstrom@uic.se, tel. 070-546.38.06.
- Anders Westermark, MD; awestermark@hotmail.com.
- Erik Lundström, MD; erik.lundstrom@gmail.com.
- Cecilia Wänéus, Owner and CEO at Encia AB; cecilia.waneus@encia.se, tel. 072-742.44.49.