

Dafydd Walters BSc MIET

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Profile

An enthusiastic freelance senior software developer with a strong academic and engineering background and broad ranging experience in analysis, design, architecture, programming and management. Capable of quickly adapting to changing environments, and leading a development team. Highly versatile developer, with experience ranging from embedded "bare metal" programming to designing enterprise software solutions and professional data-driven web applications. Flexible, committed individual with excellent communication and problem-solving skills, meticulous attention to detail, and strong all-round software engineering skills.

Seeking a hands-on embedded or enterprise software development contract role. Available from January 2013. Willing to undergo security clearance checks as needed.

Key Skills

- Highly proficient C/C++ programmer (17 years) with experience of database programming and GUI design.
- Object Oriented practitioner, with track record of leveraging Design Patterns, the UML and the RUP development methodology. Also familiar with Agile development techniques (including Scrum) and test-driven design.
- Very strong logical and physical database design, and data reporting skills, gained in large-scale mission-critical commercial database environments. Oracle, SQL Server, PostgreSQL and MySQL.
- Linux expert, with sound knowledge of kernel configuration and optimisation, and bash/shell scripting and Python programming.
- Solid, contemporary embedded software/firmware engineering skills (10 years), developing real-time C++, C and assembly language solutions targeting embedded OSES such as Linux (including Lineo Embedix) and SIBO/EPIC (ARM target), as well as programming directly (no operating system) for various microprocessors and microcontrollers (including PIC and Atmel AVR). Experience of using ICs, device programmers, and oscilloscopes in the development of software for resource-constrained devices. Able to understand and design microprocessor and microcontroller-based electronic circuits (see portfolio).
- Adept at designing multi-technology solutions, leveraging an array of diverse technologies to fulfil clients' business requirements.
- Proven ability to competently manage and lead development teams, good time and organisational management skills. Experience of large-scale projects.

Languages and Technical Skills

- *Operating Environments:* GNU/Linux (Red Hat, Debian, Ubuntu, SUSE, Lineo Metrowerks Embedix), Unix (OpenBSD, Mac OS X), Windows, various embedded targets including SIBO/EPOC (16-bit), integration with mainframes.
- *Enterprise Software Development Skills:* C, C++ with STL and Boost, the UML and Rational Rose, ErWin, CORBA (Iona Orbix), Java (3 years), Unix/Linux programming in C, C++, PERL, Python, bash/shell. Experience of several SCM tools including Subversion, Mercurial, CVS, VSS, Rational Clearcase, PVCS.
- *Database Design Skills:* T-SQL (SQL Server 7 and 200x, including DTS and OLAP), PL/SQL (Oracle 8i and 10i), MySQL, PostgreSQL, SQLite.
- *Web Application Development Skills:* HTML, XHTML, CSS, PHP, Perl, XML, XSLT, WML (WAP), DHTML, JavaScript (DOM scripting, JQuery, JSON, AJAX), Apache configuration.
- *Mobile Application Development Skills:* Objective-C targeting iPhone OS 2.x and 3.x, C++/Qt (Qtopia) on Sharp Zaurus (Linux) PDA.
- *Embedded Software Development Skills:* C, C++, Assembler, targeting 68000, 68332, ColdFire MCF5206e, 6809, 68HC11, 68HC05, x86, PIC, Atmel AVR. Linux (creating custom distros with optimised kernels). Microprocessor/microcontroller circuit schematic and circuit-board design using OrCAD, gEDA.

Experience

Over 20 years of experience as an I.T. professional in the UK and USA, applying my skills in a variety of commercial environments, including engineering, airline, financial, medical, manufacturing, retail, defence and leisure.

- Various assignments undertaken, most recently developing software in C++ with STL and Python for the airline industry; involved in all stages of the development lifecycle.
- Expert in the use of Open Source tools and technologies, including Linux, GNU tools, Python, PERL, PHP, MySQL, PostgreSQL, SQLite, CVS, Subversion, Apache.

Career Summary (since 1997)

Jan 10 – present **Software Developer**, Amadeus Services Ltd, UK

Projects

My first project was the development of a tool to assist Amadeus in the migration of airline passenger records to the Amadeus reservations platform. The resulting product won Amadeus's excellence award for 2010.

In this project, I took the lead in the design of the Linux-hosted portion of the tool, while working closely with my colleagues who were developing the TPF-hosted programs that the tool communicates with via new EDI messages, the grammar for which we designed together.

The tool I developed was written mainly in Python, with some performance-critical parts in C++, and encompassed multi-threaded communications, parsing of EDIFACT messages, SQL database storage, and user interfaces (UI). I developed two UIs for the tool; one text-based, and one web-based, each optimised for different use cases.

Due to the performance-critical nature of this application, a considerable amount of time was spent in the instrumenting, testing and tuning of the code to maximise transaction throughput on a multi-core Linux host.

The next large project I undertook was the re-engineering of a part of the reservations system, written in C++, which was previously running on the TPF mainframe system, to run on Linux. This was part of the company's initiative to decommission the TPF mainframe system.

Another major responsibility I held was the maintenance of a portion of a large C++ framework and libraries for manipulating passenger records, and converting them between Linux and TPF-hosted environments.

Miscellaneous tasks and responsibilities

- Liaising with users and product definition teams, analysing requirements, defining solution architecture, writing technical specifications, and conducting code reviews.
- Applying Agile and Test Driven Design methodologies. Scrum Master for the re-engineering project.
- Promoting and supporting product deliveries through progressive test phases (DEV, PDT, UAT) and to production.
- Establishing automated non-regression testing for the team's software.
- Assisting in the setting up of a CVS-backed code review system for our team, based on Review Board. I later converted this to Mercurial.
- Adherence to service level agreements (SLAs) for problem-solving activities.
- Mentoring new and less experience team members.
- Establishing regular C++ seminars for the department covering advanced C++ topics including design patterns, Boost and STL.

Skills: GNU C, C++ with STL (GCC, GDB), Boost, Valgrind, Python, SQLite, SUSE Linux, bash/shell scripting, CVS, Mercurial, Eclipse, EDI (EDIFACT), Review Board (code reviews), Rational Rose, Agile (Scrum), integration with TPF (IBM mainframe operating environment)

Feb 05 – Dec 09 **Senior Software Engineer**, Gamesoft Ltd, Cardiff, UK

During my time at Gamesoft, I successfully developed a multi-game embedded Linux software framework for use in the company's range of video gaming cabinets, as well as a PC-based video games controller. This software framework and the new games controller have been used to launch dozens of games in the UK and abroad, some of which I developed myself. The various facets of this project were:

- Porting the company's existing software libraries to the new hardware platform, and extending them to take advantage of the new hardware capabilities, leveraging third-party libraries and APIs including SDL, OpenGL and FFMPEG to implement high-performance video. Developing custom smartcard-based security using PC/SC and BasicCard.
- The design of a custom embedded Linux distribution, with a 2.6 kernel configured for optimal performance on the hardware platforms, and developing device drivers for touchscreen devices, coin and note acceptors and payout hoppers.
- Developing a multi-threaded game hosting platform and operator console (including GUI design).
- Establishing a completely new Linux development environment (including a complete toolchain with cross-compiler) for the company's team of software engineers.

As the company's expert in Linux, I have mentored the software engineers (previously unfamiliar with Linux) in the new platform, as well as in OpenGL, and other new technologies.

Whilst at the company, I also implemented a custom-designed web application-driven server-build and continuous integration system, backed by Subversion source-code control repositories, using LAMP (Linux, Apache, MySQL, PHP and PERL) and Rich Internet Application technologies including Javascript (DOM scripting, AJAX & JSON), CSS, HTML.

Other projects I undertook were the development of libraries and device drivers for both Linux-based and ColdFire-based ("bare metal") gaming platforms, the design (electronics and firmware) of a PICmicro-based external Random Number Generator, and a PIC-based interface board used for coin metering using a custom communication protocol to communicate with the host gaming controller in real-time.

More recently, I developed a complete server-based gaming platform for the Czech Video Lottery Terminal (VLT) market, enabling operators and government authorities to securely access financial data from the terminals, and allowing the operators to manage all aspects of running the terminals remotely from their headquarters using a secure data-driven web application. This included programming at the Ethernet socket-level in order to facilitate secure communications in real-time between terminals and the servers.

Other markets for which I have developed or adapted gaming systems in compliance with government regulations (covering technical aspects of gaming machines and software) are Germany and the UK (Category-C and Category-B3 gaming machines).

Skills: GNU C, C++ (GCC, GDB, DDD), Embedded Linux, PostgreSQL, MySQL, PIC (assembler and SDCC C), ColdFire, BasicCard, PC/SC, OpenGL, MPEG, SDL, Qt, PERL, PHP, Javascript, Subversion, bash/shell scripting, gEDA, device drivers

Oct 03 – Feb 05 **Senior Developer**, Younger Mfg. Co., CA, USA

Working remotely (after moving back to the UK), with sole responsibility for delivering safety-critical systems that meet the client's needs. In this role I had full autonomy in the design and development of applications in support of Younger's manufacturing operations. The technical tasks involved in these projects were designing and developing web (thin-client) and application (thick-client) user interfaces, and a back-end database and data acquisition code.

Skills: VB, Visual C++, COM/ActiveX, SQL Server, Crystal Reports, ASP, IIS, XML, TAPI, Speech SDK, National Instruments NIDAQ

Apr 01 – Oct 03

I.T. Manager, Younger Mfg. Co., CA, USA

Managing the I.T. department for a 900-employee, \$100M/year manufacturing company. This was a hands-on role, consisting of 50% management and 50% software development. As manager, I was responsible for staffing, managing the \$750K annual I.T. budget, defining the company's I.T. strategy, and taking a technical lead role in development projects.

Major software development projects I led were a touch-screen order entry system, a custom Accounts Receivable system, and a branch sales data warehouse and OLAP decision support system for analyzing sales data. I also developed a safety-critical chemical storage monitoring and alarm notification system. All development work was done using Microsoft tools and technologies, primarily Visual Basic and SQL Server, along with Crystal Reports.

Managed the planning and deployment of the I.T. infrastructure of a new stock office in the Czech Republic, and a new manufacturing plant in Mexico linked with the HQ in California.

Skills: VB, COM/ActiveX, VC++, UML, SQL Server (including OLAP and DTS), Crystal Reports 7, ASP, IIS, OLAP@Work (acquired by Business Objects SA).

Oct 00 – Mar 01

Software Architect and Development Team Leader, Toyota, CA, USA

In this project, which used the Rational Unified Process (RUP), I undertook the dual role of software architect and software development team lead. During my time at Toyota, I successfully developed and documented the complete solution architecture of a mission-critical web-based sales analysis and production planning system as part of a major multi-million dollar project for a large car manufacturer, whilst also managing the team of six developers. I applied the UML while developing the architecture documentation to unambiguously capture the system's design for the benefit of the development team.

My specific responsibilities were defining the architecture and designing the major software components of the system, including the logical and physical design of the Oracle 8i database, and also managing the development team. I worked closely with the analysts in developing and refining the system's Use Cases.

A significant challenge I successfully undertook in this role was ensuring that all members of the development team fully understood the use cases and the architecture of the system. Not all of the development team had UML experience, so some mentoring was required to ensure that everyone understood the project artefacts.

Skills: OOA/OOD, UML, VB, ASP, IIS, Oracle 8i, MTS/COM+, XML, XSLT, Rational tools (Rose, ClearCase, ClearQuest)

Apr 99 – Oct 00

Senior Developer and Team Leader, Younger Mfg. Co., CA, USA

I led a development team in the delivery on-time and within budget, of a mission-critical three-tier client-server ordering, shipping, billing and data warehousing solution for a manufacturing company, making a seamless transition from an aging non-Y2K compliant system. Integrating with a third-party accounting package, the system provides barcode-scanning driven services for warehousing and goods shipping, and customized user interfaces for pricing, customer service, and management reporting.

Skills: Analysis, Design, VB 6, UML, SQL Server (including OLAP and DTS), COM/ActiveX, ErWin, Crystal Reports, GUI design

Jan 99 – Mar 99
(and later)

Software Developer, Dragon Technology Ltd

Developed a database-driven, web-based booking system.

In 2003, the system was enhanced to add an e-commerce back-end. More recently I enhanced this system to enable bookings to be made using a WAP-enabled mobile phone.

I continue to carry out updates to this site on an ongoing basis.

Skills: HTML, ASP, SQL Server, HTML, CSS, WAP/WML (main web application) and Perl, MySQL (e-commerce transaction processing)

Apr 97 – Dec 98

Senior Developer, Sema Group, Nottingham, UK

Senior team member, building high-profile train ticket vending applications. I became involved in several different projects during the time I was at Sema:

Graphical client application for manipulating detailed schematics of the railway infrastructure. The application communicates with an existing railway asset database system hosted on a CICS mainframe.

Multi-user GIS train planning system. The system allows train planners, using graphical client applications communicating with an Oracle database server, to view and maintain rail network links on a geographical representation of the UK railway. In this project I was involved in Object Oriented analysis and design, heavily employing UML to model and document the design. In this system, the data-tier was provided by a large Oracle database.

Developing two types of train ticketing system, and designing a common framework for ticketing applications. The first project was to develop a GUI driven NT-based desktop ticketing machine to be used by counter staff in train stations. My contribution was to design a new OO framework in C++ for ticketing applications, and writing a number of NT system utilities in support of the application. In the second assignment, I undertook a lead role in the development of a new unattended train ticket vending machine. In this project, we used CORBA technology to integrate several software components written in C++ (using Iona's Orbix). As this project involved integrating some software components that were written outside of my team by Swiss developers, the co-ordination of IDL interfaces was critical to ensure the smooth integration of the system. Installations of both of these systems are live, and selling train tickets to the UK general public.

Designing the architecture, and implementing a helpdesk system for managing alarms raised by unattended train ticket vending machines.

Skills: OOA/OOD, Visual C++/MFC, UML, Oracle, SQL Server, CORBA, COM, ActiveX

Portfolio of Other Projects

In addition to the professional work experience listed in the *Career Summary* above, I have also developed a number of other software projects.

- **OTP Generator** (<http://itunes.apple.com/sg/app/otp-generator/id294055241>) - Standards-based one-time password generator for the iPhone and iPod Touch (compliant with RFC-2289, RFC-1938 and RFC-1760).
Skills: Objective-C, iPhone, Mac OS X
- **TimeSleuth** (<http://www.timesleuth.org>) - PDA time tracking system.
Skills: C++, Qt (embedded), Linux
- **MotoRobots** (<http://motorobots.sf.net>) - Embedded real time robotics software library for 32-bit Motorola microcontrollers and microprocessors.
Skills: Motorola 68K Assembler, C, Embedded
- **Open Automaton Project** (<http://oap.sf.net>) - Mobile robot reference design.
Skills: PICmicro Assembler, C, Linux, Embedded
- **JBarcodeBean** (<http://jbarcodebean.sf.net>) - JavaBeans barcode component.
Skills: Java, JavaBeans, JFC Swing, Servlets.
- **Wedding Wishes** (<http://www.weddingwishes.co.uk>) - Wedding directory, budget tracker (web and mobile)
Skills: Python, Django, HTML, CSS, Javascript, jQuery, jQuery Mobile, MySQL, Linux, Apache
- **Open Source Resource Centre** (no longer on-line) - e-commerce web site based on osCommerce, with significant PHP and MySQL customisation
Skills: PHP, MySQL, HTML, CSS, DHTML/JavaScript, Apache, Linux
- **AnnounceList** (<http://announcelist.sf.net>) - Web-based group membership and mailing list system.
Skills: PHP, PostgreSQL, Apache, Linux

Academic and Professional Qualifications

- B.Sc. (Hons) in Electronic, Computer and Systems Engineering, with Diploma in Industrial Studies from Loughborough University, England (1986 – 1990)
- Member of the Institution of Engineering and Technology (MIET)
- Linux Professional Institute Certification (LPIC-1)
- Sun Certified Developer for the Java Platform
- Sun Certified Programmer for the Java 2 Platform
- Microsoft Certified Solution Developer – MCSD (Visual Studio 6.0)
- Microsoft Certified Database Administrator – MCDBA (SQL Server 2000)
- Graduate Enterprise Program (Cranfield School of Business, England)

Personal Summary

My personal interests and hobbies include electronics, and robotics. I am well known within the amateur robotics community, having contributed several technical articles to robotics magazines. I am a fluent Welsh speaker. I hold a private pilot's license (fixed-wing light aircraft).