Curriculum Vitae

PERSONAL DETAILS

Name: Stephen Leslie Early
Address: 16, St. Margaret's Grove,
Great Kingshill,
HIGH WYCOMBE,
Bucks, HP15 6HP

Availability: February 2014

Contact: (Home) 01494-718887
(Fax) 01494-718887
(Mobile) 07971-982693

(e-mail) searly@aztec-data.com
(web-site) www.aztec-data.com

SKILLS SUMMARY (Years of commercial experience in brackets)

Languages:

- C++ (16)
- Tcl (2)
- C (6)
- SQL (2)
- Perl (1)
- Ada (1)
- JOVIAL (US DOD Language) (2)
- Coral 66 (MOD language) (7)

Skills:

- Market Risk (6)
- Market Data processing (2)
- Foreign Exchange (0.5)
- fidessa trading platform(2)
- Multi-threading applications
- Air Traffic Management
- Object Oriented Analysis and Design
- Systems analysis and requirements capture.
- Real-Time Design.

Hardware:

- Sun Workstations (9)
- HP-UX Workstations and Servers (1.5)
- Intel based PCs
- TCP/IP network
- IBM RISC 6000 Workstation (1.5)
- IBM Mainframe (2)
- VAX and microVAX clusters (9)
- Assorted Ferranti computers. (8)

Methodologies:

- Universal Modelling Language(UML) (2)
- Yourdon (3)
- OOD (Object Oriented Design) (5)
- SSADM (1)
- MASCOT (7)

Operating Systems / Software Products:

- Various flavours of unix (Solaris, HP-UX, AIX and Linux) (18)
- Visual Studio 2010 (0.5)
- fidessa trading system (2)
- Exposure to other fidessa products such as OpenAccess, OMAR, EMMA and FDA
- Reuters SFC class library (1)
- CDE, Motif and X-Windows (6)
- Rogue Wave/STL/Boost/Class Libraries (10)
- Oracle (2)
- Sybase (3)
- Rational Rose (1.5)
- Purify (3)
- Select Software Factory (UML and Business Process Modelling tool)
- TeleUSE (GUI Builder for Motif Applications) (2.5)
- VAX/VMS (9)

Certifications:

- Brainbench (www.brainbench.com) transcript Id 4876793

PROJECT EXPERIENCE (In reverse historic order)

Trading as Aztec Data Ltd (Jan 1990 – Present)

Project 1. **FX Trade Capture System**
Client: BNP Paribas, Marylebone
Duration: Aug 2013 – Feb 2014

Description:

FXT is a Foreign Exchange deal management system (covering Spots, Forwards and Swaps), deals may be entered manually (via a GUI application), or via various importer processes. A number of exporter processes are also maintained, so that interested parties can be notified when a deal has been processed. FXT runs in four major financial centres world-wide. Software is based on Visual C++ with Oracle and Sybase databases.

Responsibilities and Achievements:

1) Member of the FXT development team, implementing bug fixes and performing technical testing of issues resolved by other colleagues.
2) Upgraded one of the existing data exporter components to multi-threaded operation, significantly increasing throughput.
3) Refactoring message handling code in a number of components to give a more consistent interface.

Project 2. **Market Risk (VaR) Calculation Engine**
Client: Royal Bank of Scotland, Bankside
Duration: Nov 2009 – Mar 2013

Description:

Over the course of this project, a number of business critical improvements were made to the client's universal Market Risk calculation engine (UniVaR). The central component is a multi-threaded C++ application, that originally ran on Solaris 10 and interfacing to a Sybase database and a FAME time-series database. It has subsequently been successfully ported to Linux. The main VaR engine is supported by a number of other programs and web applications written in languages such as C++, java, shell scripts and perl. The design is exceptionally complex and uses a number of sophisticated techniques and design patterns.

Responsibilities and Achievements:

1) Technical Team Leader for the C++ developers, having overall responsibility for the quality of the C++ code for the unix based components, particularly the main calculation engine.
2) Interviewing and mentoring new starters to the C++ team, based in London and India.
3) Discussing requirements with the business users, preparing functional specifications and estimates. Offered advice and recommendations on alternative implementation strategies.
4) Supporting business users with the acceptance testing and deployment of new functionality, often being called upon to investigate and explain unexpected VaR results.
5) Designed and implemented the Stressed VaR calculation which is a new regulatory addition to the daily Capital Charge Calculation.
6) Designed and implemented improvements to the Scenario and Stress Testing functionality.
7) Designed and implemented a number of enhancements which allow the Market Data team to safely trial a number of proposed changes to reference data, in a production environment, without impacting other production users.
8) Reduced the overall memory footprint by introducing shared memory for storing large data structures needed by multiple processes.
9) Rolled out a number of major and minor code releases into production, with particular emphasis on performance and resilience, as the client base and traffic had multiplied several times over, during the last couple of years.
10) Fault diagnosis and rectification, assisting the Market Risk IT Production Support team on a number of production issues. While interacting with the support team a number configuration and monitoring utilities were created to assist common problems.

Project 2. **Market Risk (VaR) Calculation Engine**
Client: Deutsche Bank, City
Duration: Sept 2008- Nov 2009

Description:

This project involved the maintenance of, and significant enhancements to, the client's corporate Market Risk calculation engine (EDGE). The core began as a single-threaded C++ application, running on Suse Linux and interfacing to a Sybase database and a FAME time-series database. The design was every bit as complex as the RBS UniVaR application although it used a different range of techniques and design patterns, with particular emphasis on XML. In 2009, the main application was redesigned to support a staged migration to a multi-threaded service oriented architecture.

Responsibilities and Achievements:

1) Member of the Methodology team in the Market Risk IT group.
2) Collaborated with members of the Quant team to optimise performance of the in-house library that supported non-normal statistical distributions. Whilst it was mathematically correct, the runtime performance was grossly inadequate for production use. The quants were responsible for the basic mathematical functionality, while I did profiling and tuning of their work. Over a period of time, an approximate 5x speedup was achieved.
3) Replaced a number of bespoke classes and objects with open source equivalents such as STL and boost, as part of the re-architecting process.
4) Converted several of the adapter classes that connected the internal XML structures with the database, to use the new SOAP services rather than the Oracle client interface.

Project 4. **Market Risk (VaR) Calculation Engine**
Client: Royal Bank of Scotland, Aldgate and Islington
Duration: June 2006- Sept 2008

Description:

This is the same as project 1 described above, and had much the same responsibilities. After the original system architect left the project, a shortage of in-house C++ and unix expertise, had caused a growing backlog of fixes and enhancements, some of which had become critical. The client had already deployed some senior developers onto the project but, as their experience was mainly windows based, it was necessary to bring in some external assistance

Responsibilities and Achievements:

1) The same responsibilities as project 1, plus the following:
2) Redesigned the Idiosyncratic Risk processing of the main calculation engine.
3) Re-architected the management of static and reference data within the calculation engine.
4) One of 2 key players that ported the suite from Solaris 8 to 10, and different hardware.
5) Cleaned up the source code repository, as previous lapses in configuration control meant that some executables that had been in production for a number of years, could not be reliably regenerated from the code base.

Project 5. **Tick Data Subscription Processing**
Client: Credit Suisse, London Docklands
Duration: Nov 2004-April 2006

Description:

This assignment had two distinct phases. The first was a speculative project (MAGNI) intended to store up to 3 years worth of market data, in a single unified format, for eventual re-sale. That was followed by ongoing support and development to the existing production application. In the Magni project, data arrived from a number of sources, and over time, it was planned to cover the majority of the world's exchanges. There were

varying levels of coverage and quality, depending on the individual exchanges, so it had to be converted into a common internal format.

This formatted data was then exported to an external data specialist for further enrichment and compression before being ready for sale to a number of internal and external clients. As it was a Greenfield project with very challenging deadlines, the 2 man team were given a complete free hand within the constraints of the externally agreed interfaces, and the spirit of the initial architecture.

The second phase focussed on the production application (THOR), that was the preferred source of tick data for several critical business applications. As well as storing the raw market data, the application attempted to add value, such as matching trades to movements in the order book. The main requirements were to: implement client requests and bug fixes, re-factor and improve the current code base.

Both programs were written in C++, and the processed data stored in an Oracle database with end user access controlled by stored procedures. Perl and PL/SQL was used to write various supporting scripts and utilities.

Responsibilities and Achievements:

1) Designed and implemented various bug fixes and enhancements in response to end user requests, particularly introducing index futures contracts for a number of exchanges.
2) Analysed and re-factored the current implementation, to improve maintenance, performance and future extensibility.
3) Resynchronised the code-base with the production executables after a flawed handover from a previous developer had put an executable into production, without checking in the corresponding source code. As with RBS, the decision was made to go with the known source code, and use regression testing to verify that that the old and new executables were functionally equivalent.
4) Liaised with developers and end users in the Asia Pacific, American and European regions.

Project 6. **Miscellaneous**
Client: Various
Duration: Nov 2003-Oct 2004

Description:

As on previous occasions, this period was spent on self-study training and developing in-house projects whilst looking for the next major assignment. Similarly, further PC support work was also carried out for some local clients.

Project 7. **fidessaNet European Trading Platform (ETP 3.1) Implementation**
Client: **Royal Blue.** Woking
Duration: Sept 2003-Oct 2003

Description:

fidessaNet is the Application Service Provision (ASP) variant of the highly regarded *fidessa* product range, targeted at 2nd tier clients and below. In contrast to the Enterprise product, the server components reside in datacentres which are under the direct control of Royal Blue. This assignment provided short term holiday cover to the implementation team, during a period of client upgrades and rollouts that were overstretching internal resources.

Responsibilities and Achievements:

1) Performed a client rollout which enabled access to the Euronext and Xetra markets, and provided follow up telephone support during go-live.
2) Server support to Royal Blue training staff during a new client's User Acceptance Tests.
3) Participated in various systems upgrades preparing for go-live of the SETSmm market.

Project 8. **Miscellaneous**
Client: Various
Duration: Nov 2002-Aug 2003

Description:

Most of this period was spent on self-study training and developing in-house projects whilst looking for the next major assignment. In addition, PC support work (mainly installations and upgrades) was also carried out for some local clients.

Project 9. ***fidessa* Financial Trading Platform**
Client: **Royal Blue.** Woking
Duration: Oct 2000-Oct 2002

Description:

This project involved assisting the FTS development team, which is responsible for maintenance and enhancement of the TMAR and PMAC core products. These products are implemented as groups of related processes communicating via proprietary database and messaging mechanisms. Most of the work was carried out with C++ under Solaris. However, Tcl was used for testing, and the implementation of suitable components. The workload was split approximately 50% product development and 50% testing. Where possible, test scripts automated the input of test data and analysis of expected and actual results.

Responsibilities and Achievements:

1) Implementation/ testing of various regulatory requirements for the US NASDAQ market.
2) Implementation/testing of trade reporting for Johannesburg and Hong Kong exchanges.
3) Minor enhancements to London Stock Exchange trade reporting and other functionality.
4) Assorted product enhancements and bug-fixing, on an ad-hoc basis.
5) Enhancing the offline test harnesses used for exhaustive testing of complex scenarios.
6) Building and packaging some releases, including writing the FTS product release notes.
7) Liaison with Royal Blue product centre and customer support staff in various offices, to assist in the deployment of new functionality, or the diagnosis of customer problems.

Project 10. **Crew Rostering Management**
Client: **British Airways/ICL.** Heathrow Airport
Duration: Oct 1998-Sept 2000

Description:

This system was to support airline staff responsible for allocating Flight Crew and Cabin Crew to man the airline's services. One major application software component was the rules subsystem. This element verified that potential crew assignments satisfied a myriad of legal requirements and industrial agreements before being committed for publication. Another complex area was the crew annual leave allocation module. This was designed using various UML techniques and diagrams.

The basic architecture was 3-tier client server, running on a mixture of Sun workstations and servers running Solaris, augmented by PCs. The software was built around ORACLE and MQ series packages coupled with bespoke modules written in a mixture of C and C++.

Responsibilities and Achievements:

1) Design, implementation, and test of elements used in allocating crew's annual leave.
2) Design, implementation, test and ongoing support of elements of the rules subsystem.
3) Implement and test of some minor GUI components.

Project 11. **Command Support System for the Royal Navy (CSS)**
Client: **EDS Defence Ltd.** Hook, Hants
Duration: May 1997-Oct 1998

Description:

This project provides command decision support to ships and shore installations of the Royal Navy. The target hardware being a mixture of HP-UX workstations and servers, supplemented by some Windows NT servers. The software consisted of various commercial products, such as ORACLE, together with bespoke modules written in C++. Rational Rose was used for the design and documentation. ILOG Views was used for the GUI components.

Responsibilities and Achievements:

1) Design, implementation, test and integration of the File Manager utility. This performs a similar function to the utility bundled with the Windows family of operating systems, but ported to a unix environment. Basic tape backup and retrieval functionality were also implemented.
2) Designed and implemented classes to abstract parts of the underlying operating systems.

Project 12. **Workstation Display Module (WDM) for the New En-Route Centre (NERC)**
Client: **Lockheed Martin UK** (formerly Siemens Plessey) Christchurch, Dorset
Duration: October 1995-May 1997

Description:

This project provided the operational software for the workstations used in the latest UK air traffic control centre at Swanwick, Hants. Implementation was on IBM RISC workstations using Ada and C. Teamwork was used for the design, and the TeleUSE GUI builder was used for the Motif components.

Responsibilities and Achievements:

1) Design, implementation and test of the MMI elements of the Diagnostics software.
2) Lead implementer for the Workstation Configuration Management MMI suite during the testing and setting to work phases.
3) Seconded to the Radar Situation Display team to assist in problem clearance.

Project 13. **National Airspace System Enhancement Project (NEP)**
Client: **National Air Traffic Services (NATS),** West Drayton, London
Duration: June 1993-September 1995.
Description:

Implementing changes to the current UK National Airspace System (NAS) in order to interface with other related systems in the UK and Europe, particularly the New En-Route Centre (NERC) at Swanwick. The design used Yourdon with the Software Through Pictures CASE tool. Implementation used a mixture of JOVIAL and IBM 360/370 assembler.

Responsibilities and Achievements

1) Design, implementation and test of elements of the Flight Data Processing suite.

Project 14 **Naval Geographic Information System**
Client: **General Dynamics UK** (formerly Computing Devices Ltd), Eastbourne, East Sussex
Duration: December 1992-June 1993.

Description:

A naval Geographic Information System for use in operational planning monitoring and training. Development was carried out on Sun workstations, using C, Ada, and Sybase. Motif and X Toolkit were used for the User Interface, primarily using the TeleUSE tool.

Responsibilities and Achievements

1) Specified the dynamic behaviour ("Look and Feel") of part of the User Interface.
2) Designed and implemented the screens used for preparing NATO standard signals.

Project 15 **Network Management System**
Client: **British Telecom Research Labs,** Martlesham Heath, Suffolk
Duration: June 1992 - December 1992

Description:

This was a computer system to manage large intelligent virtual networks on behalf of Blue Chip clients. The development environment consisted of a network of Sun workstations, using a mixture of C and C++ to link an Oracle database with a Tuxedo TM package.

Responsibilities and Achievements:

1). Defining and managing the development environment used by the rest of the project.
2) Design and Implementation of part of the Motif based GUI, using TeleUSE.
3) Directing a team of 3 engineers in the production of a prototype using Oracle.

Project 16 **Electronic Mail for Windows 3.0 and Netware**
Client: Joint venture with **NetSolve Ltd.** and **Design-In-Time Ltd,** Yateley, Surrey
Duration: May 1991 - March 1992

Description:

Netsolve acted as project lead for a consortium of small companies developing an e-mail system for Windows and Novell Netware. SSADM and OOD were used in the analysis and design phases, a mixture of C and C++ was used for implementation.

Responsibilities and Achievements:

1) Design, Code and Test of the mailing Transport Services using C++ and the Netware MHS API.

Project 17 **Submarine Command Control System**
Client: **Ferranti Naval Systems,** Havant
Duration: January 1990-May 1991

Description:

This project was responsible for porting an operational system onto new hardware. VAX-hosted development was deployed onto a variety of Ferranti processors using CORAL 66 and Assembler.

Responsibilities and Achievements:

1) Design, Code and Test of modernisation of the Operating System kernel.
2) Building, Integration and Installation of systems on and off customer sites.

Employment with SD- SCICON, now EDS (Feb 1983 - Dec 1989)

Project 1 **Accounting and Billing System**
Client: **Proving and Experimental Establishment,** Shoeburyness
Duration: Dec 1989 (in house)

Description and Achievements:

An ORACLE-based system used for ordnance trials.

Responsibilities:

1) Preparation of the SQL* Forms User Manual.

Project 2 **Requirements Analysis for NATO command control system**
Client: **NATO/HASI** (Hughes Aircraft Systems International), Brussels.
Duration: March 1989 - November 1989 (various European locations)

Description:
Analysis and requirements specification for a new generation of NATO C³I systems.

Responsibilities and Achievements:
1) Lead Systems Analyst for Land Operations
2) Interviewing Senior NATO Staff Officers at bases in Germany, Italy and Turkey

Project 3 **Message Switching System**
Client: **SMHI** (Swedish Meteorological and Hydrographic Institute)
Duration: Sept 1988 - March 1989 (in house)

Description:
Porting software, in service with the UK Meteorological Office, for use by Sweden.

Responsibilities and Achievements:
1) Team Leader for the MMI and System Management functions supervising 3 to 6 engineers.

Project 4 **Submarine Command Control System**
Client: **Ferranti Computer Systems Limited**, Portland
Duration: Sept 1984 - Sept 1988 (at customer site)

Description:
VAX hosted development, targeted onto Ferranti processors.

Responsibilities and Achievements:
1) Leader of the Torpedo Guidance and 1553B teams (teams of 5 and 2 engineers respectively).

Project 5 **Frigate Command and Control System**
Client: **Ferranti Computer Systems Limited**, Portsmouth
Duration: March 1983 - Sept 1984 (at customer site)

Description:
VAX hosted development for a FM1600E Target

Responsibilities and Achievements:
1) Module design, code and test of elements of the Database

Employment at Plessey Defence Systems, now Bae Systems (Sept 1979 - Feb 1983)

Summary:
1) Three and a half years in the Diagnostics Group on a mobile Battlefield Communications system (PTARMIGAN). Hardware was Plessey S250 mini-computers, and various Intel processors.

Education and Professional Development

2003 Attended various BEA seminars and workshops at High Wycombe
2002 3 day “Using Select Component Factory” course at Select Business Solutions, Henley
2002 Attended ACCU spring conference at Oxford
2001 Attended ACCU spring conference at Oxford
2000 Attended Oracle iDevelop ‘2000’ conference at Birmingham
2000 Attended various BEA seminars and presentations at High Wycombe
2000 Attended ACCU spring conference at Oxford
1999 Attended Sun Developer conference at London
1999 Attended Oracle iDevelop ‘99’ conference at London

1999 Attended ACCU spring conference at Oxford
1997 Attended inaugural C and C++ European Developers Forum at Oxford
1995 1 week Technical Workshop on the MQ Series of products at IBM, South Bank
1993 4 month course on Air Traffic Control systems at National Air Traffic Services (NATS)
1991 Conversion course to SSADM V4.0
1990 Certificate of Proficiency in SSADM V3.0
1982 One week course on Structured Analysis Structured Design (Yourdon)
1982 One week course on 8051 Architecture at Intel, Swindon
1979 Six month course at Control Data Institute, Southampton, sponsored by Plessey
1976-9 B.Sc. (2nd class honours) Physics at Imperial College, London University
1976 A level grades in Maths (A), Physics (B) and Chemistry (B)

Foreign Languages

French:'O' level, augmented by 8 months working for NATO in Brussels during 1989.

Professional Bodies, User Groups and Other Qualifications

- Registered as a Chartered Engineer (C.Eng.) by the Engineering Council
- Registered as a Chartered Physicist (C.Phys.) by the Institute of Physics
- Registered as a Chartered IT Practitioner (CITP) by the British Computer Society
- Member of the Association of C and C++ Users (ACCU)
- Member of the Federation of Small Businesses
- Private Pilot’s Licence since 1993, with over 300 logged hours