

# Experienced C# consultant

Ross Fruen | British citizen | Basingstoke

A quality driven, agile, software developer with over 30 years' experience of designing and creating solutions within the Microsoft ecosphere, the first decade in C++ and later C# with a pragmatic approach to BDD, DRY, SOLID, TDD, etc. Working in diverse industry sectors within varied team sizes has engendered the ability to quickly integrate with new environments and assimilate their underlying business drivers. These attributes coupled with the discipline to deliver solo projects and an ability to both cooperate and share knowledge with others will give positive results for your project.

Flexible on contract duration from single days to multiple years, an average being 14 months with 2 extensions.

## Skills

<b>Collaboration</b>	Azure DevOps, CruiseControl, CVS, Git, Mercurial, Rational Synergy, Source Safe, SVN, TFVC, TeamCity, VSTS	<b>Cloud</b>	AWS API Gateway, Cloud Formation, Cognito, DynamoDB, IAM, Lambda, QuickSight, RDS, S3, SES, SNS, SQS, Step Functions Azure Functions, Message Bus, Monitoring
<b>Frameworks</b>	Angular, ASP.Net MVC, Bootstrap, Flutter, Ionic, RxJS	<b>Programming</b>	C#, C++, Dart, JavaScript, TypeScript
<b>Storage</b>	Dapper, EF, Elastic, DynamoDB, IndexedDB, MySQL, Oracle, SQL Server	<b>Testing</b>	BDD, Jest, Jasmine, MSTest, NSubstitute, NUnit, Specflow, TDD, XUnit

- BSc (Hons.) 2:1 in Computer Science from Portsmouth University
- MCP- Microsoft .NET Framework - Web Applications Development
- MCP- Microsoft .NET Framework - Windows Communication Foundation
- MCP- Microsoft .NET Framework - Application Development Foundation
- MCP- Designing & Implementing Windows Applications in Visual C#
- MCP- Designing & Implementing Desktop Applications in Visual C++
- IBM Certified Specialist in MQSeries Configuration and Installation
- MCP- Microsoft Windows Architecture I
- MCP- Microsoft Windows Operating Systems and Services Architecture I

Full, clean driving licence.

## Experience

<b>Q-Bot, London (remote)</b>	<b>C# contractor</b>	<b>February 2023 to August 2024 (2 extensions)</b>
<b>Skills</b> Angular, AWS API Gateway / Athena / CloudFormation / Cognito / DynamoDB / IAM / Lambda / QuickSight / S3 / SES / SNS / SQS / Step Functions, Azure DevOps, C# 13.0, Docker, Git, NET Core 6, Python, RxJS, Typescript, xUnit		

Introduction of QuickSight reporting and migration of Ionic based website to new Angular front end using dockerised lambdas for the back end. Work areas included:

- Creation of ETL to S3 from disparate sources (DynamoDB via Glue, Salesforce and Stripe using AppFlow, Xero through make.com) and exposure via Athena for use as QuickSight datasets. Generation of QuickSight Analyses for reporting.
- Creation of standardised CI/CD pipeline to build lambdas, analyse with SonarCloud, dockerise and push to AWS ECR before executing Cloud Formation scripts for the services AWS needs (dynamo, lambda, S3, etc.)
- Refactoring and simplification of existing C# lambdas. New lambda functionality developed in Python.
- Angular website with routing to allow deep linking to property, survey and install details from QuickSight.
- Use of Step Functions for ETL between legacy and new system. Python scripts for obfuscation, copying S3 assets, etc.
- Automated generation of deltas for Energy Performance Certificates and their importation into DynamoDB

<b>EMR, Warrington (remote)</b>	<b>C# contractor</b>	<b>August 2022 to February 2023</b>
<b>Skills</b> Angular, Azure MessageBus / SQL, C# 8.0, Dart, Entity Framework, Flutter, Git, Jasmine, MSTest, .NET 6, Typescript		

Extending functionality of Angular and Flutter based websites used to record purchases, sales and perform operational planning for metal recycling centres. Work areas included:

- Addition of new features to Angular app and C# back end that managed routes to market for stocks
- Extension of existing Flutter based tool to track stock levels
- Migration and refactoring of existing stand-alone Flutter application into a new common corporate framework
- Report generation using EPPlus (for Excel) and QuestPDF
- Introduction of queue and event driven architecture for transport booking

#### **Q-Bot, London**

**C# contractor**

**July 2019 to July 2022 (6 extensions)**

**Skills** Autodesk, Angular, AWS API Gateway / DynamoDB / Lambda / S3 / SES / SNS / SQS, Azure DevOps, C# 8.0, Git, Ionic, Jasmine, MSTest, NET Core 3.1, OpenXML, RxJS, Typescript, xUnit

Creation of Ionic based website and associated micro services for the display of information collected by and management of a robot fleet used to apply underfloor insulation. Work areas included:

- Epic, feature and task creation together with sprint ceremony management
- Generation of multiple Azure DevOps CI/CD pipelines using Jasmine, xUnit and SonarQube for quality control
- Ingesting robot data presented in SQS messages into DynamoDB and S3
- Report generation via OpenXML and Kibana. Elastic populated via DynamoDB changes triggering SNS topics
- Provision of offline functionality for website via RxJS, the IndexedDB and service workers
- Use of Pannellum and Autodesk viewers for presentation of panoramas and associated thermal overlays
- Integration with Xero to raise quotes and invoices.
- Equipment management – availability, bookings and fault reporting with TOTP used for device security

#### **myairops, Farnborough**

**C# contractor**

**July 2018 to July 2019 (4 extensions)**

**Skills** Angular 7, AutoMapper, Azure DevOps / Functions / MessageBus, C# 7.3, Dapper, Entity Framework, Frisby, Git, Karma, Jasmine, NET Core 2.2, NUnit, SignalR, SQL Server 2017, Sybase, Typescript

Part of team producing an SaaS flight management system for handling chartering together with aircraft and crew administration. Implemented as Azure hosted RESTful .NET Core micro services using the repository pattern fronted by an Angular 7 website incorporating DevExtreme UI components. Work areas included:

- Created and maintained Azure DevOps build / release pipelines utilising ARM templates for auto deployment.
- Utilisation of Azure Storage Bus message deferral to handle intra-service call failures. Pattern used when porting back-end of existing iPhone app to Azure Functions leading to improved availability.
- Provision of invoice processing system for Gamma Aviation, a leading US jet charter company. Used GemBox to create XLSX reports for human approval and once verified to write CSVs for Sage import.
- Migration of SignalR based chat tool into Angular frontend to facilitate communication between users of the application and existing third party clients (Wheels Up) during aircraft chartering.
- Produced EF based data migration / sync tool for transferring information from Sybase to Azure SQL.
- Design of database schema, creation of stored procedures and performance optimisation.
- Junior developer mentoring, code reviews, SME for invoice functionality

#### **LexisNexis, Woking**

**C# contractor**

**April 2014 to May 2018 (5 extensions)**

**Skills** Angular, ASP.NET MVC, Aspose, AWS, Azure, C# 7.1, Entity Framework, Git, Kanban, MSMQ, MSTest, NET Core, NHibernate, NSubstitute, NuGet, OWIN 3.1, RabbitMQ, SpecFlow, SQL Server 2016, VSTS, Visual Studio 2017, WCF, WiX, WPF

Slashed editorial costs by creating a centralised taxonomy service for the legal commentary systems enabling editors to significantly reduce the time spent classifying documents. Developed in C# within an agile environment with CI facilitated by VSTS, SonarQube, Specflow, MSTest and NSubstitute. Improved test coverage by introducing IOC via Unity with ORM provided by Entity Framework. Resolved build stability issues by replacing network shares with ProGet accessed by NuGet and NPM. Introduced New Relic reporting permitting rapid identification of production issues.

Taxonomy information presented in an Atom feed needed to be ingested into the UK editorial systems. Work areas

included:

- Identified security issues with existing data and liaised with the publisher to resolve for both ourselves and other clients
- Production of .NET Core based proof of concept
- Creation of OWIN based service to parse incoming data feeds and present this information to the taxonomy storage system

Taxonomy data was held in an existing centralised store which editorial systems could update or query via a WCF REST API. Work areas included:

- Resolved fragile inter system messaging through a protocol that ensured recoverable, guaranteed message delivery utilising RabbitMQ
- Extension of API to accommodate hierarchical information
- Modification of existing database schema to support hierarchical information and track taxonomy changes
- Creation of OWIN based service to provide access to previous taxonomy changes
- Support for natural language searches in both schema and service API
- Significantly improved performance through schema optimisations and caching

Modification of ASP.NET based editorial systems to incorporate a common Angular control allowing editors to classify documents. Work areas included:

- Generation of NPM package to ease deployment of control into editorial systems
- Creation of common picker and integration into the system
- Extension of schemas to hold taxonomy information
- Reduced hosting charges by migrating to Azure and then AWS

Updated tool critical for generating Tolley tax training manuals. Work areas included:

- Minimised printing costs with “tree saving” functionality
- Greatly improved performance through parallelisation
- Supported complex XSLT2 transforms via Saxon
- Utilised Aspose for DOCX, ePub and PDF generation
- Updated WPF UI to accommodate new functionality

Modification of web spidering service to support cross domain crawling and presenting this information via REST.

Build script creation and maintenance together with VSTS and agent administration. Migration from TFVC to Git.

NHS Solutions Provider

## C# contractor

August 2013 to January 2014 (3 extensions)

**Skills** ASP.NET, C# 4.0, CSLA, SagePay, SQL Server 2012, SSRS, TFS, VB, Visual Studio 2010

Improved revenue flow from blood analyte testing system by introducing individual subscription periods. Data entry via ASP.NET WebApp, manipulation and report generation though WinForms application. Work areas included:

- Management of AutoTask hosted request queue
- Liaison with end-users to fully understand updates required
- Migration from global to individual subscription periods
- Addition of SagePay based subscription payment mechanism
- Created new and revised existing SSRS templates and stored procedures
- Updated database schema and associated CSLA code for new functionality

DCSL Software, Farnborough

## C# contractor

April 2013 to July 2013

**Skills** ASP.NET MVC, C# 4.0, Entity Framework, SQL Server 2008, TFS, Visual Studio 2010, WCF, WPF, WWF

Created new source of income for Giant (a workforce management solutions provider) by allowing the sale of time recording services to agencies. Work areas included:

- Development of Iron Speed based website
- Integration with SagePay for subscriptions collection
- Generation of RDLC based management reports

- Creation of stored procedures and views
- Automated database and website update tool

Production of anonymous feedback system for healthcare professionals to help satisfy the recommendations made by the Mid Staffordshire report. Work areas included:

- Generation of MVVM WPF client for data collection with installation via ClickOnce from a well-known web location
- Production of ASP.NET MVC based web site for data collection
- Development of WCF based RESTful web service which the data collection applications send anonymous feedback to
- Integration of web service with “text local” mobile messaging service for delivery of SMS
- Design tamper proof database schema for secure storage of anonymous feedback

Extended Workflow Activity Library used by WWF application to communicate with additional insurance broker web service. Modified Workflow used by GHG Loss Adjusters to use this new functionality.

**iMeta Technologies, Southampton**      **C# contractor**      **July 2012 to December 2012**  
**Skills** Castle Windsor IOC, C# 3.5, MSTest, Oracle 10g, ORM, TFS, Visual Studio 2010, WWF, XML, XSL

Part of team customising Assassin, a Standing Settlement Instruction management system, to meet the requirements of specific financial institutions (such as Barclays and Credit Suisse). Work areas included:

- Generation of functional and associated task specifications for customisation tasks
- Mentoring of and code reviews for offshore developers
- Generation of coded server-side WWF rules
- Extended UI to support multi-select combo boxes. Reworked ORM query generator to accommodate multiple query values
- Resolution of issues found during UAT
- Branch generation and release building

**HeathWallace (JWT subsidiary), Reading**      **C# contractor**      **March 2012 to July 2012 (1 extension)**  
**Skills** ASP.NET, Cruise Control, C# 4.0, Hg, JScript, Kayako, SAP, Sitecore, Visual Studio 2010, TRIS, XML, XSL

Part of team developing Sitecore based website for Magnet. Work areas included:

- Extension of Sitecore to provide analysis of user data collected in external database.
- Integration with SAP based CMS.
- Integration with 20-20 kitchen design
- Integration with Kayako Engage LiveChat
- Integration with PostcodeAnywhere post code lookup service

Part of team developing Sitecore based website focusing on emerging markets for HSBC. Work areas included:

- Acted as reference point for integration with data feed mechanism (TRIS) provided by Thomson Reuters.
- Site capacity planning

**iMeta Technologies, Southampton**      **C# contractor**      **September 2011 to February 2012 (1 extension)**  
**Skills** ANTS, Castle Windsor IOC, C# 3.5, MSTest, Oracle 10g, ORM, SQL Server 2008, TFS, Visual Studio 2008, WebSphere MQ, XML, XSL

Part of team resolving issues identified in Assassin, a Standing Settlement Instruction management system used by various financial institutions. Data provided from upstream sources via MQ and web interfaces was cleansed prior to passing downstream. A WinForm client allowed for manual updates to data. Work areas included:

- Fix failing MSTests so that cc.net based continuous build environment functioned correctly
- Modify metaCore (proprietary ORM) to work with parameter limits imposed by underlying databases
- Performance analysis via ANTS and associated database optimisation
- Import / export to xls
- Identify protocol errors in Omgeo Alert connectivity

- Produce PowerShell scripts to assist in log file analysis
- Install and configure MQ environments, analyse and fix connectivity issues
- Customer liaison to obtain information required to generate solutions

**Sony, Basingstoke****C# contractor****January 2011 to June 2011 (1 extension)****Skills** ADO.NET, C# 4.0, Reporting Services, SQL Server 2008, Telerik, TFS, VSTO, Visual Studio 2010

Part of team developing a bill of materials generation system used for outside broadcasting development quotations. Based around an Excel add-in, Sharepoint and Salesforce.com with support for remote working via Sync Framework. Work areas included:

- Maintenance of installer
- Provision of management summaries using Reporting Services
- Data import mechanisms for existing BOM .xls files
- Development of tool to import vendor quotations into database

Design and develop Excel add-in and associated system service to validate, summarise and distribute sales data to other systems. Production of supporting database schema and stored procedures.

**Vertu, Church Crookham****C# contractor****May 2010 to December 2010 (1 extension)****Skills** ADO.NET, ASP.NET, C# 4.0, Cruise Control, LDAP, NUnit, Rational Synergy, ReSharper, SOAP, SQL Server 2005, Visual Studio 2010, WebForms, Web Services, XML, XSL, XSLT

Design, develop and support web service and ASP.NET / Ajax web sites that record phone manufacture, register customers and send relevant information to third party service suppliers. Work areas included:

- Migration of project from Visual Studio 2005 to 2010
- Introduction of continuous build and test mechanism based around cc.net
- Development of several new web services presenting differing data contracts to the same underlying customer registration system
- Development of style sheets (.xslts) describing newly introduced web services and the necessary transforms (.xsts) to populate from existing data
- Rewriting sql stored procedures to return xml documents rather than result sets
- Provision of customer authentication and email services using OpenLDAP accessed via SDSP
- Work on database to resolve deadlocks

**NICE CTI Systems, Southampton****C# contractor****August 2009 to April 2010 (2 extensions)****Skills** ASP.NET, C# 2.0, NUnit, SQL Server 2005, TFS, Unity, Visual C++, Visual Studio 2005, XML

Part of team developing software that captures and organises audio and video recordings made by public safety operations (police, air traffic control, etc.). This covered all areas of the product from the server and database, through to the WinForm client distributed via an ASP.NET website. Work areas included:

- Modified software to support both IPv4 and IPv6 based networks
- Resolution of threading and database locking issues encountered in systems with multiple servers
- Development of mechanism to detect tampering of database tables used within the system
- Implementation of additional system administration functionality requiring updates to database tables, server access mechanisms and client control panels
- Development of multi-threaded test harness to simulate multiple concurrent connections for stress testing of the server. Collection and analysis of performance metrics collected by the test harness
- Resolution of various bugs and performance issues raised by customers

**Momu, London****C# contractor****May 2009 to August 2009****Skills** ADO.NET, C# 3.5, FXCop, NUnit, SQL Server 2008, SVN, Visual Studio .Net 2008, WCF, XML

Design, develop and support WCF based RESTful web service that records payment information for developers of mobile phone applications hosted by O2 Litmus App store. Work areas included:

- SQL Server 2008 database to store information on developers and the accounts earnings are credited to

- C# based web service implementing the payment workflow – i.e. validating incoming data, updating database tables and generating reports from which payments may be made

**Vertu, Church Crookham****C# contractor****August 2007 to January 2009 (2 extensions)**

**Skills** ADO.NET, ASP.NET, C# 2.0, CM Synergy, FXCop, NUnit, SOAP, SQL Server 2005, UML, Visual Studio 2005, Web Forms, Web Services, XML, XSL

Design, develop and support web service and ASP.NET / Ajax web sites that record phone manufacture, register customers and send relevant information to third party service suppliers. Work areas included:

- SQL Server 2005 based database to store information on phones, owners and services subscribed to
- C# based web service implementing the customer registration workflow – i.e. validating incoming data, updating database tables and forwarding information to other systems via web services and SyncML
- Development of XSD describing the data consumed and produced by the web service methods
- Production of customer registration and support web sites utilising this web service
- Writing tools to aid the translation and re-skinning of Java and Flash applications shipped with the phone

**Nokia UK, Farnborough****C# contractor****January 2005 to July 2007 (3 extensions)**

**Skills** ADO.NET, ASP.NET, C# 2.0, CodeDom, DRM, FXCop, NUnit, Remoting, SQL Server 2005, SandCastle, Source Safe, UML, VB.NET, Visual Studio 2005, WinForms, XML, XSL

Part of team designing, developing and supporting .NET based framework enabling test engineers to develop libraries which exercise mobile phones attached over a variety of media. Work areas included:

- Prototyping Windows Workflow Foundation based environment for specifying tests
- Development of executables to host test libraries. Unattended testing was via a service controlling a bank of PCs that would flash mobile phones with the latest software and then execute a series of tests configured via a WebService or Click-Once application. Tests could be run locally using a WinForm.
- Use of CodeDom to produce source files from an XML specification. The generated partial classes represent messages that can be sent to / from a mobile phone and provide byte stream serialisation.
- Development of class framework to simplify common tasks, e.g. Audio capture and FFT analysis, OCR and image comparison / validation, error handling, analyse phone memory leaks, generate and disseminate reports from XML, transfer OMA and WM DRM protected content, control of CMU200, etc.
- Maintenance of multi-threaded C++ communications layer that passes byte streams between test and phone over appropriate media (USB, Bluetooth, IR, FBUS) using relevant protocols.
- Transferring class framework to central group for adoption as company-wide testing mechanism
- Production of PC based SyncML DM User Agent for testing phone SyncML implementation.

**BigHand, London****C++ contractor****December 2002 to December 2004 (4 extensions)**

**Skills** ADO.NET, ASP.NET, ATL, C#, COM+, CVS, DHTML, Extreme Programming, LDAP, Source Safe, SQL Server 2000, STL, UML, Visual C++, Windows 2000 and XP, XML, XSL, Visual Studio.Net

Part of team implementing the successor to LOTIES 2002, 2003, 2004 and SCL 2003 award winning digital dictation workflow software. Implemented using an n-tiered architecture where both windows and web-based clients' record and play back dictations, storing the audio files on centralised clustered servers. Inter application communications took place via XML documents passed over TCP sockets, intra application was based around COM. Work areas included:

- Design and develop in Visual C++, ATL and STL a server for processing dictation workflows and disseminating results to clients.
- Implement authentication process based around directory servers (typically Active Directory), or where unavailable NTLM. Synchronise the list of registered users with directory servers via LDAP.
- Design and development in C# of streaming audio server and ASP.NET based web client using ADO.NET to access a locally held database
- Work on unified real-time access to dictations on various digital recording devices via disparate SDKs.
- Advising on .NET and database issues
- Design, develop and tune server-side SQL Server schema and stored procedures. Initial ports to MySQL and Oracle.
- Custom report generation using XSL to render output in the appropriate formats

- Tuning and bug fixing within all system components, such as the MFC based client, bespoke client-side transactional relational database and streaming recorder supporting Windows, WTS and Citrix

**BBC Technology, Winnersh****C++ contractor****September 2001 to July 2002 (1 extension)**

**Skills** ASP, COM+, DHTML, Digital Rights Management, Real, Select OMT, Source Safe, SQL Server 2000, STL, Windows 2000 and XP, Windows Media, XML, XSL, UML, Visual C++

Part of team designing, documenting and developing a web based-system implemented using C++ as a series of COM+ components called from an ISAPI extension DLL. The purpose was to sell licences for and stream copyrighted media items to the public on behalf of various clients. The system hosted one of the most successful DRM implementations to date, accounting for £60,000+ of sales. Windows Media and Real DRM controlled access to the streams. For resilience the system was hosted within a load balanced web-farm with session data stored in a common database. Work areas included:

- Payment collection via WorldPay
- Session state management via SQL Server 2000
- Database schema design
- Digital Rights Management of copyrighted media items

**The Post Office, Farnborough and Chesterfield****C++ contractor****May 2000 to July 2001 (3 extensions)**

**Skills** ATL, C, ClearCase, COM+, COM/DCOM, CVS, Host Integration Server, MFC, MSMQ, Rational Rose, SQL Server 2000, STL, Visual Basic, Visual C++, Win32, Windows 2000, XML, MQSeries

Provision of COM and middleware consultancy. Tasks included:

- Design and development in VC++ and VB of n-tiered COM+ based web front-end to a Mainframe application. Transaction proxies called by ASP pages used COM+ to populate CICS COMMAREAs. Operation within stateless web farms required the production of a state storage mechanism based around SQL Server 2000. Programmatic access provided through MSMQ, converted by the MSMQ Bridge into MQSeries messages to be processed by the mainframe application.
- Designed, developed in C++ and documented cross platform (HP-UX, Windows 2000) MQ isolation layer insulating both organisation and COOL:Gen application developers from the underlying technology. A COM wrapper catered for VB and ASP developers. Inclusion of hooks for distributed transactions (Encina and MTS).
- Support of Encina COM objects and associated broker.
- Write and review middleware strategy documents on MQ, MQSI and ConstellaHub.

**IBM UK Laboratories Ltd, Hursley Park, Winchester****C++ contractor****September 1995 to April 2000 (5 extensions)**

**Skills** Active Directory, ActiveX, ADSI, ATL, C, CMVC, COM/DCOM, DB2, HTML, Java, LDAP, MFC, NetBIOS, SAP, SecureWay, STL, TCP, UML, Visual C++, Win32, Windows NT / 2000, XML, MQ

Development and support of MQSeries for Windows NT / 2000 from inception to version 5.2.

April 1999 Integration with standard administration mechanisms such as LDAP and MMC. Research, design and development of the following areas:

- LDAP schema for use in Active Directory and Secure Way directory servers. Extensive prototyping in both C and Visual C++ was required to validate suitability of various schema designs.
- Development in Visual C++ of both COM and LDAP update and query mechanisms enabling internal and external administration tools to control MQ installations.
- XML based interfaces using Xerces-C and STL under Visual C++. Permitted administration of MQ to be undertaken using XML rather than the previous proprietary mechanisms.
- Support of the Microsoft Clustering Services (MSCS) development

February 1998 Designed and developed components allowing MQ to exploit Windows 2000 facilities.

- Advised on the technicalities of and implemented the code to extend the MQ COM interfaces.
- Investigated code changes required to support the Active Directory based security model.
- Supported Microsoft's Active Directory Service Interfaces with the introduction of a new namespace. Involved considerable use of DCOM to provide a virtual directory – information held on individual queue managers

being made available through ATL based COM objects.

April 1997 Development of MQSeries version 5.0. Besides advising new team members on MQ and others about using NT for development, the following activities were carried out:

- Produced Internet based administration tools that utilise Java Applets.
- Bringing the security model used by MQ into line with that of NT where possible. Previously checks on user rights had been carried out on the authenticating machine (local machine or domain controller). This changed so that all inquiries were made against local security groups.
- The creation of an installation and service mechanism through InstallShield. To meet complex requirements considerable use of the API was made.
- Generation and appraisal of technical documentation.

March 1996 Acted as interface between development and third line support to ensure speedy issue resolution. This entailed liaising with both customers and support staff across the globe to gather necessary information to provide solutions, whether a fix to MQ or recommended changes to NT configurations. Areas of activity included:

- Assistance in the presentation of the MQSeries for Windows NT porting effort to other members of IBM staff in several educational sessions, both on and off site.
- Support of MQAI (MQSeries ActiveX Interfaces).
- The use and configuration of MQ in a variety of roles, identifying and documenting weaknesses found.
- Network error analysis and resolution – mainly TCP and NetBIOS but some exposure to SNA.

September 1995 Porting the MQ code base from UNIX to NT. The assignment involved extensive work with the Win32 API, using Microsoft Visual C++. Development took place within a team consisting of those knowledgeable in NT or MQ. Cross team knowledge transfer encouraged, providing a solid base for future developments. Work included:

- Provision of NT service to act as interface between the Service Control Manager and MQ components. This had to respond to start and stop requests, activating the appropriate MQ programs.
- Design and development of installation mechanism using the set-up API provided with the Microsoft SDK. Besides the normal “user intensive” method, there was a requirement for unattended installation to be available, where necessary onto remote systems. This program had to be capable of handling product fixes, applying only the patches appropriate to the installed product components.
- Port exception handling from the original UNIX based model to one that could exploit the structured exception handling (SEH) mechanism provided by NT. Besides capturing and logging errors to both the event log and disk file, hooks to error recovery code were made.
- Provision of internationalised messaging services. Text to be displayed was stored within a catalogue with access based on message and language identifiers. Produced code to retrieve these messages and automatically generate the catalogues.
- Addition of COM interfaces to provide access to MQ.
- Generation and appraisal of technical documentation.

**ICL**

**Contract lecturer**

**May 1998**

Produced and delivered NT part of seminar on VME, UNIX & NT internals.

**Eastleigh College**

**Lecturer**

**Sept 1998 to July 1999**

Prepared and presented City and Guilds evening classes on C++.

**MBA Systems Limited, Winchester**

**Software engineer**

**January 1993 to August 1995**

**Skills** Booch, C, Data Feeds (CRS, DOS, etc.), MFC, Rational Rose, Sequence, TOPIC, Win32, Windows NT, Visual C++

Design, produce and support data dissemination and presentation systems for the financial markets, operating under Windows NT, Windows 3.1 and DOS. Assignments included:

- Object orientated design and implementation in Visual C++ of customer-based servers, running under NT. These used real-time data feeds (TOPIC3) from satellite or leased lines to construct databases from which information requests received from existing TOPICplus workstations could be satisfied. The databases were split into two areas (viewdata and instrument prices + volumes) maintained by separate servers. Each had to be self-reliant, performing appropriate activities at pre-set times. Provision of statistical information logs to both and



screen and file to support performance monitoring. Besides coding, there was responsibility for producing large amounts of the server design and acting as a reference point on data feed handling, due to previous experience in these areas. Supervision of contracted employees was required, together with the production of help files – both manually and via packages such as RoboHelp.

- Object orientated design and implementation in Visual C++ of NT based data feed converter that transformed Sequence (a new X.25 based service from the London Stock Exchange) into CRS (a previous format) for use with existing systems. ODBC provided access to a database of instrument information. The converter comprised of several separate applications communicating via IPC mechanisms, each logging statistical information to allow performance tracking to take place. Dialogue interfaces on each application provided control. Although originally intended for use with all Sequence releases the TOPIC3 converter superseded this product. The conversion effort involved considerable liaison with the stock exchange over and above Sequence user meetings.
- Design and implement various servers that construct databases from numerous interactive and broadcast data feeds. The information from these was broadcast to user sites using the TOPICplus protocol via ISDN and satellite links. Support provided to the company operating the system.
- Modification of both workstation and server components of DOS based bond dealing system. This was intended to further system functionality and improve security by DES encrypting the server – workstation link. Involved close work with the client during development and after sales support.

#### **Alphaprint, Alton**

**Junior software engineer**

**June 1992 to December 1992**

Apple Macintosh application development in C++. Assignments included:

- Designed and developed program allowing any retrieval of any address in the UK via the associated postcode.
- Enhancement of package to produce and control web-offset printing of labels for surgical envelopes. The program had to calculate the most efficient layout of irregularly shaped labels to minimise wastage.

#### **IBM Havant**

**Industrial trainee**

**July 1990 to September 1991**

Produced multi-media applications under various languages (including AVC and C) for both internal and external use.

Appraisal of various multi-media packages, particularly in respect to operation over LANs. Trained others in use of AVC a multi-media authoring package. Assignments included:

- Mouse operated front end, written under AVC, for accounting package using both the PC and AS/400.
- Package to enable AVC to interpret word-processed documents with embedded commands. This allowed quick and easy multi-media presentations generation from existing documentation.
- ID-badge generator using C to control image capture card and SQL to access employee details database.

#### **Others...**

- Vacation work as a project assistant for the Archaeology department of Winchester Museums Services. Apart from digging this also involved recording finds and supervision of volunteers.
- Weekend work as a direct sales agent for Kleeneze.