

NAME: ROBERT ADAMS
ADDRESS: *****
PHONE: *****
EMAIL: robert.adams@whatifwe.com

1.0 SUMMARY

I, Robert Adams, have been a hardware engineer since 1961 and a software engineer since 1966. I spent 14 years at Lockheed, 16 years at Ocean Technology. I was a home-based employee after 1980. I received a B.A. Physic degree in 1961 from the University of California at Berkeley, Ca. My most recent and highest security clearance was “Secret” from 2001 to 2004.

In 1992, I became a home-based software development business. I specialize in the development of Error-Free software and use a hardware design philosophy to accomplish this goal. To develop methods that were economically successful, I performed a long-term Independent Research and Development effort which resulted in a number of software development tools.

Free open-source Win32 and Linux tools for the development of software in strict compliance with the principles of ISO-9001 can be downloaded from my web-site, www.whatifwe.com and the Programmable Software Development Environment Project in www.codeplex.com

These tools prepare software source files from software definition files and a set of software parts libraries.

The development process consists basically of two steps: 1) The development of the libraries, and 2) the development of product exclusively from these libraries. These libraries contain the standard processes and methods required by ISO-9001.

A Programmable Monte-Carlo test sub-system is also provided. It can thoroughly test all work products used in the development process. It is fully capable of evaluating the error handling capabilities of executable modules. It can also evaluate the error-prevention capabilities of the software parts libraries. Its capabilities greatly facilitate the development of a comprehensive test plan as required by ISO-9001.

All of the Input files are prepared by a standard text editor and can be easily prepared by the user of the tools. There is no implicit design philosophy; Robert Adams is not a “silent partner”.

The development process is strictly portable between Windows and Linux operating system. The files defining a particular development project can be designed to operate on either operating system without change. Furthermore, with the proper set of libraries, the same source definition files can be used to develop a Linux and a Windows product.

The libraries that implement strict portability between C++ and C# are currently being developed. Also, the current set of tools are being updated to be able to economically certify that a specific set of libraries were exclusively used in the development process; that is, no patches were inserted in the product source files at the last moment.

These tools have enabled Robert Adams to develop software using a hardware design philosophy. This has resulted in well defined and orderly development programs and error-free software products. It has also facilitated strict compliance with the principles of ISO-9001.

You are invited to visit my web-site, www.whatifwe.com, for further information and to down-load the well-documented tools.

NAME: ROBERT ADAMS
ADDRESS: *****
PHONE: *****
EMAIL: robert.adams@whatifwe.com

2.0 LOCKHEED – 1961 TO 1975

2.1 TRANSISTORIZED SHAKER AMPLIFIERS (1962)

Developed the first fully transistorized 3000 watt vibration shaker amplifier with 48 germanium transistors in the output stage. Parasitic oscillation were solved experimentally by reducing its frequency range. Developed a second fully transistorized vibration shaker amplifier which was unconditionally stable.

Determine the cause of the Parasitic Oscillation in the first amplifier by performing a stability analysis using a simple mathematical model of the power transistors.

2.2 SAMPLE BASED VIBRATION SERVO

Developed a prototype analog sample-based vibration servo system in which the measured vibration amplitude for each cycle was used to correct the vibration amplifier output for the next cycle. The response of the vibration servo system was coupled to the vibration frequency as required for controlling the vibration level in a test environment.

The power sequence defining a sampling servo system is much easier to stabilize than the equivalent differential equation defining the conventional analog servo system.

2.3 MARKOV SIMULATION ATOMIC BOMB

Developed a matrix-based statistical mechanics simulation of a sphere of fissionable material (atomic bomb). The critical mass was estimated by running various diameters. This, my first computer program, was prepared on my own time and run at the Scientific Computer Services Division. I was subsequently transferred to Scientific Computer Services Division. *The Markov Simulation ran very much faster than the equivalent Monte Carlo Simulation.*

2.4 PICARD INTEGRATION EXPERIMENTS

Upgraded the Markov-base Atomic Bomb experiment with a Picard Integration method using a Partial Spline approximation to the probability functions. The results were far superior to those obtained in the discrete Markov Simulation. *The Partial Spline was found to be a very effective numerical approximation to continuous functions.*

2.5 FUNCTIONAL ANALYSIS COMPUTING LAB

Developed a comprehensive computing system for the manipulation of multi-dimensional functions approximated by the Partial Spline. This system included the development of a simple precedence based preprocessor for extending PL/I computing language. *The requirements of simple precedence was found to be very important in the development of error-free software.*

2.6 BAYESIAN NORAD FEASIBILITY STUDY

Developed Bayesian methods for the NORAD mission using the Functional Analysis Computing Laboratory. Using a single Synchronous satellite (fly eye), the probability of threat to Los Angeles for various trajectories was computed. The program was successful in evaluating single and multiple threats faster than real time *A practical time-dependent Bayesian Instrument was developed with the Numerical Functional Analysis Computing Laboratory.*

2.7 STRUCTURED PROGRAMMING TRANSLATOR

Found that the structured programming rules, recommended by IBM in the early 1970's, satisfied the requirements of simple precedence. Developed a translator between a structured programming language and Fortran. Used this translator to develop critical components of a graphics application. *The referenced translator rigorously enforced the use of structured programming as a standard method.*

NAME: ROBERT ADAMS
ADDRESS: *****
PHONE: *****
EMAIL: robert.adams@whatifwe.com

3.0 OCEAN TECHNOLOGY – 1975-1989, 1991-1992

3.1 MONITORING SUB-SYSTEM DATA CONVERSION

Was the responsible engineer on the NVM (Noise and Vibration Monitoring) sub-system of the MSDC (Monitoring Signal Data Conversion) system for the Trident submarine. This sub-system provided digital samples of analog audio over five frequency bands ranging from 10 Hz to 50 kHz.

Included in this sub-system was a digitally settable AC-Coupled Variable Gain Amplifier (VGA). Improve a previously developed VGA to be band specific such that a change in gain would minimally excite its transient response. As a consequence, the VGA satisfied both the frequency response and maximum transient time specifications for each band.

Intimate knowledge of the differential equations defining AC coupled circuitry provided the means of satisfying the band-specific transient response specifications.

3.2 EXPORTABLE CRYPTOGRAPHY

Developed an exportable equivalent of KY-58 wideband voice encryption system. 16 kilobit/sec CVSD digitized voice was encrypted by a multi-level pseudo-random generator defined by 128-bit cryptographic key and a 32-bit session-key. Developed a custom bit-slice processor for this application. This system successfully was used in the first Saudi War (1991 and it is still being sold to new international customers.

Developed the cryptographically secure control system for the Arabsat satellite (a television satellite for an Arab consortium). This control system used a cryptographic algorithm that was roughly equivalent to the Wide-Band Secure voice algorithm. Developed a custom bit slice processor for deep space operation. *Counting processor clock cycles was needed to accomplish the required real time programming.*

3.4 INDEPENDENT RESEARCH

3.4.1 SUMMARY

A personally funded independent research effort was made during my employment at Ocean Technology. The goal was to continue my research in statistical mechanics simulation started at Lockheed. To this end, I attempted to develop methods of performing statistical mechanics simulation of a highly disturbed gas on my personal computer, a Heathkit-H89 personal computer.

I performed this research effort on my own time and with my personal funds.

3.4.2 IMACS CONFERENCE - 1986

The results were presented in Oslo, Norway while on vacation. The results tended to indicate that not enough points were used to represent the functions. More research was promised. *This effort clearly demonstrated the power of the personal computer, even the Heathkit H89.*

3.4.3 IMACS CONFERENCE - 1987

The numerical approximation used to represent the functions in the statistical mechanics experiment presented in Oslo was explored for adequacy in the number of points. Found that the discrete time-dependent representation did not converge to the continuous representation as required by the definition of a continuous function. The results of this effort were presented in Prague while on vacation. *Serious questions were raised relative to the use of continuous functions in this kind of analysis.*

3.4.4 IMACS CONFERENCE – 1988

Found a potential “Goedel’s Incompleteness Theorem” explanation of the findings presented in Prague. Specifically, demonstrated that one can prove that you can not prove that time is either continuous or discrete. Presented these findings in Paris while on vacation. *This fact renders the use of time dependent differential equations of motion potentially invalid.*

NAME: ROBERT ADAMS
ADDRESS: *****
PHONE: *****
EMAIL: robert.adams@whatifwe.com

4.0 HOME BASED BUSINESS – 1992-2003

4.1 OVERVIEW

In 1992, Ocean Technology was sold to Whittaker, a salvage company which completes the current billable projects and dismantles the company. The Wide Band Secure Voice project developed a continuing marketplace and is still being sold today to new customers.

Robert Adams became a home-based software development business which eventually specialized in the development of error-free software.

4.2 CUSTOM MEDICAL PROGRESS NOTE EDITOR

The goal of this effort was to be able to prepare a custom Medicare Progress Notes Editor in about 10 minutes at the customer's site. A program that wrote this program was developed and successfully used in preparing several custom editors.

Using a program to write the program at the customer's site raised serious questions regarding the quality of the delivered product. More research was needed.

4.3 “HOW SOFTWARE BREAKS” RESEARCH

Software “breaks” irretrievably when it makes an erroneous write. Formal error detection methods to anticipate an erroneous write, prepare a report, and terminate execution were developed. These bits of code are often added informally during checkout and then removed before delivery.

The “How Does Software Break” analogy enabled the application of the well-developed Performance Monitoring and Fault Location hardware technology to software error detection and prevention.

4.4 PROGRAMMABLE CODE GENERATOR

Developed the basic *Programmable Code Generator* for both Windows and Linux operating systems that implemented a two step software development process consisting of: 1) the development of a project library of standard software parts and 2) the development of product exclusively from the library.

The Programmable Code Generator was successfully used to update the Wide Band Voice Encryption System for use with the the Half-Quick Radio. The bit-slice assembly language instructions were converted into software parts that generated the code to burn the prom and simulate real-time operation.

4.5 EXPORTABLE ELINT

Developed the Tuner-Antenna Controller and IEEE488 Interface for an exportable ELINT system. A carefully prepared program plan was made and strictly implemented, Extensive memory cycling methods and self-documenting state machines were used in the product. Monte-Carlo methods were used to rapidly and thoroughly test the software.

The preparation of a well defined plan, the aggressive use of error detection methods, and the use of a Monte-Carlo simulator / stimulator test system to thoroughly test the product under all conditions resulted in the delivery of an error-free software product.

NAME: ROBERT ADAMS
ADDRESS: *****
PHONE: *****
EMAIL: robert.adams@whatifwe.com

5.0 HOME BASED BUSINESS – 2003-Present

5.1 INTRODUCTION TO ISO-9001

During the Exportable ELINT project, I became acutely aware of the fact that I had been unknowingly adhering to the principles of ISO-9001. It was also quite apparent that The Programmable Code Generator by developing product exclusively from the software parts library provided a practical means of developing software in strict compliance with the standard methods and processes requirement of ISO-9001.

A major Independent Research and Development Effort was required to make this methodology and tools usable to other software engineers and organizations.

5.2 PROGRAMMABLE MONTE-CARLO TEST SYSTEM

Developed software test system for measuring the resistance of software parts and modules to use-related programming errors for both Windows and Linux operating systems. This system, based on the principles of the Programmable Code Generator, prepares, compiles and links, and runs a test program for each set of test conditions. The use of two Programmable Code Generator steps, one producing the files required by the other, tests the strength of the software parts library in resisting errors in it use.

The Programmable Monte Carlo Test System provided a practical means of satisfying the test and evaluation requirement of ISO-9001. All four steps of the defining Deming Cycle could now be strictly applied to software development.

5.3 PROGRAMMABLE SOFTWARE DEVELOPMENT ENVIRONMENT

It became apparent to me that the *Programmable Code Generator* and *Programmable Monte-Carlo Test System* were not adequate for significant size projects. A new integrated system that addressed the following capabilities was developed:

- **FILE PORTABILITY:** To render the project definition files rigorously portable between operating systems and machines, the capability of using command line parameters to specify drive and operating system specific elements in the various project definition files was provided.
- **MARKETABLE PRODUCTS:** The ability to combine Software Parts Libraries to form a library provides the opportunity of selling a software parts library as a product.
- **ERROR PREVENTION:** Multiple assignable user-stacks provides the opportunity of managing and restricting the use of each Software Parts Library. Combining libraries does not in any way degrade the error prevention capabilities of each library.
- **PRODUCT MAINTENANCE:** The ability to combine Software Parts Libraries to form a library provides the opportunity of developing system and versions specific libraries to provide an easy product modification for various operating systems, applications and product source languages.
- **SOURCE CODE INDEPENDENCE:** The ability to communicate between development tasks eliminates the need for the #define statement in the C++ header files. The post-office instruction set provides the opportunity of a development process that is rigorously portable relative to the output source language.
- **CERTIFIABLE STANDARDS:** The longitudinal parity capability of cryptographic instruction set provide the capability of certifying that the agree-upon collection of Software Parts Libraries were exclusively used and that no patches were added to the product source files.