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EDUCATION

Ph. D., Electrical Engineering, Massachusetts Institute of Technology, 1971
MS, Electrical Engineering, University of Illinois, 1967
BS, Electrical Engineering, University of Canterbury, New Zealand, 1965

PROFESSIONAL AFFILIATIONS & AWARDS

Fulbright Scholar, 1965
National Science Foundation – Small Business Innovation Research, 1988
Dept. of Energy – Small Business Innovation Research, 1988
Member Association of Computing Machinery (ACM)
Member IEEE Computer Society

PROFESSIONAL EXPERIENCE - SUMMARY

- Technical Expertise - Computer software design, development & deployment
- Forensic data acquisition and analysis
- Microsoft Visual Studio component and application design
- Web integration of authentication services, streaming media services, ad displays, content feeds
- Implementation of real-time and media streaming systems
- Architecture and design of complex business systems involving database back ends
- Oracle 8i, 9i, SQL Server 2000, and DB2 database technology.
- Java, C, C++, Visual Basic, assembly language programming
- Embedded microprocessor designs
- Network equipment design and manufacture (LAN cards, routers, bridges)
- Security, authentication, networking, firewalls, hacking countermeasures, backups, archives and service level agreements for customer-outsourced data.

Domain Expertise - Client-server and web-based software applications
- ERP systems – financial, distribution, manufacturing, SF automation applications (Platinum Software)
- eCommerce - Secure web transactions, authentication (InfrastructureWorld.com, Syntricity, Inc.)
- Semiconductor manufacturing – yield analysis, semiconductor defect analysis (Syntricity, Inc.)

PROFESSIONAL EXPERIENCE

2003 to Present   Independent Computer Consultant

Independent computer technology consultant since February 2003, offering advisory services for information technology organizations, venture capital groups and the legal profession. Services have been provided for projects in the following areas:

- **Computer software development contracts for Internet and client-**server software implementation.
- Disaster recovery for large scale IT operations.
- Definition of product design and market positioning for a "distance learning" product designed to enable training of employees via a web server application.
- Forensic analysis of computer data and electronic discovery from computer disks.
- Definition of a web-based eCommerce system to provide secure business transactions. Developed architectural plans and database schema for Oracle database implementation.
- Provided technical consulting services regarding the behavior of certain scripts used for a mIRC chat server (Jedi 2.1). Analyzed the internal architecture of the Jedi relay chat system. At issue was the behavior of a Jedi server when a remote user (client) uploaded a file for distribution to other clients. Analyzed the upload scripts and formed a preliminary opinion regarding the functional behavior of the code.
- Provided research on spyware products that are downloaded to a user's client computer while browsing the web. Determined the behavior and installation mechanisms for this class of spyware products, and provided consulting on ways of removing them.
- Provide consulting services to eBusiness clients for the creation of SOAP integration of database services. Provided planning assistance for a large, ASP (Active Server Pages) web site to implement live business information feeds.
- Analyzed web application server prototypes from Apache Software Foundation reference implementations such as the Apache HTTP server project, Jakarta Tomcat Project (J2EE Servlet and JSP Web container), Turbine a servlet based application framework, and the Velocity Template Engine reference designs

2001 to 2003   Syntricity, Inc., San Diego, CA
**   Vice President Technical Operations**

Syntricity is a supplier of application software to the semiconductor industry. Its customers include Intel, Sun Microsystems, Broadcom, Qualcomm and Conexant. Products are installed on Unix and NT 4.0 web servers at the customer site as Intranet solutions (Enterprise), or on Unix servers at the Syntricity data center, which offers an ASP style subscription services.

Developed a large capacity warehouse architecture and deployable warehouse solution to support defect, FBM, lot history, non-lot equipment, and other data storage requirements to support analysis of yield and production forecasts from test data acquired in the semiconductor manufacturing environment. This system was built on Oracle 8i and 9i

commercial RDBMS products. Implemented a comprehensive set of statistical analysis tools including multivariate regression and confidence level testing to facilitate yield trend and production scheduling for semiconductor manufacturers. Developed a messaging transaction system - "Integration Server" for WIP/MES back-end business processes. Various technologies were incorporated including: RMI, JMS input queue and JNDI for naming services.

The design was implemented with Oracle 9.2 loader and schema validation technology, and required user ETL data to be formatted as XML documents. Java 2 SE was the implementation platform language. The web server, based on the Tomcat open source code from the Apache Consortium, was enhanced to provide comprehensive access control according to user class, and included integrated end-user script-based customization (using the open source Python interpreter). XML objects were used extensively to represent web server data structures in the core implementation. High volume datalog insertion (ETL) back-end functionality was implemented for user uploads via FTP. An earlier generation C-coded CGI version was also supported. All products developed were web server solutions, with access via a standard browser. Responsible for creating and managing design teams as well as quality assurance, configuration management, technical hosting operations, and technical documentation groups. Responsible for product functional specifications, source code control, defect tracking, configuration/build management, and application validation.

Responsible for a team of 40 people across four groups that included software engineering, database design, quality assurance and technical operations. Java 2 was the implementation platform language, and Oracle 8.1.6 was used for the warehouse database. All products were designed as web server solutions, with access via a standard browser. Responsible for creating and managing design teams as well as quality assurance, configuration management, technical hosting operations and technical documentation groups. Detailed understanding of source code control, defect tracking, configuration management and build tracking.

Customers using the hosting subscription center run under contractual Service Level Agreements (SLA). The ASP hosted service is currently implemented on an E4800 Sun application server running Solaris 8, connected to an Oracle database server (Oracle 8.1.6). Storage totaling approximately 1 Terabyte is provided through a combination of the EMC Clarion System 1 storage arrays (Raid-5) accessed via fiber channel, and network attached storage using the Network Appliances NetApp devices. Veritas SANPoint Foundation Suite HA for Solaris is used as the storage management tool.

2000 to 2001 **InfrastructureWorld, San Francisco, CA**
Chief Technology Officer

Infrastructureworld, a spin off from Bechtel Enterprises, offered services through a collaborative web site for large-scale construction projects. Managed development staff of 10, and operational staff of 3 to create, enhance and maintain the live web site. Responsible for a new web server implementation based on NT4.0 and Windows 2000 technologies, to support authentication through certificates, user access control via authenticated account login, SSL extranet connections and document encryption.

Investigated Public Key/Private Key encryption authentication mechanisms before selecting Windows NT integrated challenge/response authentication as the preferred authentication technique.

Each business client was hosted as a separate virtual web site with secure access to content that described the client's projects offered for bid. Functionality included insurance and financing RFP's, document management, and project collaboration. In addition, each web site offered integration of multimedia content for promotion of client projects, including steaming video and audio content. Implemented a secure data access system using native NT operating system authentication services. All documents and files were transmitted via 128-BIT SSL using server side certificates for server authentication to the client browser. Automatic virus scanning and cleaning was implemented for all documents and files uploaded by users to the web server. The operational web server site was implemented with a two-tier server configuration using Raid (redundant) storage.

1999 to 2000   **CareerPath.com, Los Angeles, CA**
                       Senior Vice President, Technology

Management of Operations and Development teams. Lead the company's Web site re-architecture project, providing higher levels of Web server and Oracle database performance. Implementation of methodologies for project management, code review, quality assurance, and defect tracking. Managed the operations group (40) supporting the production Web site, encompassing wide area networking, Unix administration, Oracle DBA support, HTML authoring and quality assurance teams. Managed the software development staff (25) which created new technology infrastructure and dynamic page content using Java middle tier servlets, Java Beans, JSP presentation components, and Oracle technology. Object oriented programming techniques were applied through use case analysis.

Created a feed management system, written using server-side Java parsing technology, to processes Web job postings harvested from Web spider technology. Later enhancements included development of a Content Management system (using XML page representation), vertical affiliate co-branding system, transparent registration and login across a federation of partnership Web sites, and a comprehensive on-line reports server.

1999   **Charles Schwab Online Trading, Phoenix, AZ**
                       Independent Consultant

This project involved disaster recovery cold site planning for the Charles Schwab Online Web Trading facility. The web capability was capable of handling 200,000+ concurrent users, and was implemented with 300 load-sharing IBM gateway servers working behind eight Cisco Catalyst 7500 routers. The traffic was distributed across the front line servers and routed to an ensemble of 200 middle tier servers, which manage the business objects and execute the trades. In the third tier, customer financial and demographic data was maintained on a group of seven IBM mainframes running DB2. A design was formulated that gives the Schwab organization a contingency backup system in the event of catastrophic failure of the main site.

1997 to 1999   **Platinum Software Corp., Irvine, CA**
                                 (Re-named as Epicor Software Corp)
                                 Vice President, Development

Reported to the President until 7/1/98, then reporting to the Executive VP of Product/Marketing. Member of the Executive Committee (top 8 executives in Platinum).

Managed a team of about 100 contributors working on Windows NT-based Client-Server systems. The Department was organized into five functional groups each headed by a Director-level manager, and includes ERP application development, technology/tools development, Windows/DOS legacy systems, QA and documentation teams.

This scope of the development effort encompassed the Platinum ERP client-server product suites, which include financial and distribution applications. These applications, based on Microsoft SQL Server technology, are implemented within a two-tier tool set, and involved 500 tables and more than 2000 stored procedures. Responsibilities also included all ERP integration tools and application content. The ERP integration suite allows remote transaction integration of customer relationship management, sales force automation, distribution, manufacturing, and financial applications, as well as OLAP business intelligence reporting via client-side components and Microsoft DSS.

Direct management of teams deploying MS Message Queue, MS Transaction Server, MS SQL Server 6.5 and 7.0, NT 4.0, XML, and business object technology. Successfully launched a high volume test group to establish performance of the client-server products under stress, and to determine their scalability. Built an architectural team to design and implement 3 tier, thin-client framework, using Java business objects running on an application server. Established effective methodologies for fostering cooperation in development projects requiring the participation of geographically remote design and development teams.

Developed a pure Java client-server system to support an end user form builder application. The objective of this project was to demonstrate an application server-centric 3-tier architecture. Application servers are dispensers of services, and a Java compilation service was the central technology being demonstrated. The pilot development provided building blocks to support a broad variety business object models, forms architectures, and rules engines. (JDK 1.1)

A full-functionality GUI in Java was also developed, along with a Java-based Customization Workbench, built, using the form class metaphor, which is familiar to users of Visual Café, JBuilder, or J++ 6.0. The Java Swing classes were used in the implementation.

Created a prototype OLAP decision support analysis system. The Platinum Info Report pack contained OLAP cubes specific to the Platinum ERA financial, distribution and manufacturing data. OLAP cubes were implemented on top of core Platinum applications to enable multi-dimensional analysis on key business drivers such as sales activity. Reports contained in the Info Report Pack were designed to leverage graphical,

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