

Kenneth J. Hughes

Engineer and Founder
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Objective

Lead organizations to create, extend, or improve document processing systems and services.

Professional Experience

2000 - present: Entelechy Corporation – President

United States and Trademark Office: XML/DOCX Expert
Guided application of XML standards and technologies to the patent application process:

- Served as expert XML and DOCX technology advisor to USPTO eMod Patent Center Project.
- Led design and development of DOCX Conversion Services for USPTO eMod Patent Center.
- Advised management regarding DOCX intake strategies to balance automation and adoption.
- Designed automation of MPEP pre-exam rules, including complex dependent claims checks.
- Built sophisticated conversion of patent documents from DOCX to ST.96/XML4IP.

United States and Trademark Office: XML/DOCX Expert
Guided application of XML standards and technologies to the patent application process:

- Led creation of USPTO XML Design Rules and Conventions Standard, which defines policy and guidelines for XML use throughout USPTO.
- Automated WIPO ST.96 XML Design Rules and Conventions conformance via Schematron.
- Advised on use of XML standards and techniques to meet USPTO business requirements.
- Designed XML representation of forms filed during patent prosecution.
- Developed transformations to reorganize monolithic patent application XML Schema to comply with WIPO ST.96 guidelines regarding modularization.
- Developed prototype proving feasibility of converting DOCX patent applications to WIPO Standard ST.96 for international patent exchange.

Aurora Loan Services - A Lehman Brothers Company: XML Expert
Led design and implementation of many aspects of automated underwriting (mortgage product finder, pricing, full underwriting, and credit retrieval) web services:

- Assisted client in discovery process, existing system analysis, requirements solicitation, requirements authoring, and system design to meet requirements.
- Designed HTTP+XML based and SOAP based interfaces to multiple web services.
- Defined XML messaging formats in XML Schema; defined service interfaces in WSDL.
- Recommended and implemented XML data binding solutions.
- Developed project build environment.
- Designed test harness for regression testing using XPath-based expected value tests.
- Developed interface to third party credit agency for retrieving credit reports.
- Designed and implemented inter-service calling mechanism supporting both local and remote service deployments.
- Applied MISMO loan and credit XML standards.
- Developed module to style Findings reports in HTML and PDF via XSLT and XSL-FO.
- Developed security utility that protects Non-Public Information in credit and loan data.
- Developed utility that creates regression tests in XML from Excel underwriter worksheets.
- Guided conversion of multi-project build environment from Ant to Maven.

The McGraw-Hill Companies: XML Expert/Advisor
Reviewed XML strategic plans and made recommendations for new curriculum publishing project.

Washington Mutual Bank:

XML Expert

Designed and implemented mortgage underwriting Web Service.

- Participated in discovery process, requirements solicitation, requirements authoring, and system design that met requirements.
- Defined data formats and SOAP interface using XML Schema and WSDL.
- Implemented XML-Java data binding using J2EE JAXB.
- Implemented Web Service in J2EE using Web Logic 8.1.
- Implemented Web Service client in Microsoft .Net framework.
- Ensured interoperability between .Net and J2EE Web Service.
- Applied MISMO loan origination XML standards.

American Modern Insurance Group:

XML/XSLT Expert

Developed XSLT-based conversion of legacy mainframe responses for insurance quotes and binds using insurance industry standard XML ACORD format in a B2B system between American Modern and Harley-Davidson Financial Services.

Roche (Pharmaceuticals Division):

Chief Architect

Contributed to thought leader management system planning:

- Solicited requirements from staff Clinical Liaison (PharmD).
- Analyzed business processes and relationships between clinical trials, investigator/speaker management, and new product launch process.
- Recommended application of XML standards and technologies in context of application integration with existing database and Seibel systems.

Morgan Stanley:

XML expert for \$10M B2E financial planning project

Guided application of XML standards and technologies throughout development of an automated financial planning system for 15,000 financial advisors with nationwide intranet access. System includes a web browser interface for the capture of client questionnaire data and the dynamic generation of personalized 200-page financial plans through a custom document production pipeline using XML, XSL, XSLT, XPath, XSL-FO, DocBook, DSSSL, HTML, RTF, and PDF in a J2EE architecture.

- Recommended XML technology and tool selections throughout system.
- Wrote XSLT transformations to DocBook XML from financial information in XML
- Customized HTML, RTF, and PDF stylistic presentations of financial plan.
- Wrote meta-level XSLT transformations to generate a readable English specification automatically from the base XSLT transformations.
- Designed and implemented a flexible J2EE framework for the presentation, editing, validating, and saving of financial information across 70 XHTML GUI pages.

Fannie Mae:

XML Expert/Advisor

Reviewed client's needs and current use of XML technologies. Analyzed client's DTD and identified opportunities for enhancement. Presented overview of current state of standards (XML, XLS, XSLT, XSL:FO, XML Schema, XPATH, XQUERY, etc), tools (XML Spy, TIBCO TurboXML, etc), databases, and relevant industry initiatives (ebXML, DISA, MISMO, IFX, etc). Evaluated current approach and recommended strategic improvements.

Entelechy Corporation (Internal):

XML Expert and Chief Architect

Designed and implemented various tools and components:

- Calendar rendering modules for highly styled PDF using XSLT and XSL-FO
- Mortgage application object model in Java based upon MISMO standards.
- 1003 mortgage application XHTML GUI with full visual fidelity to industry standard form.

1993 - 2000: Lexi-Comp, Inc. – Manager of Authoring Systems

Internal: Managed development and deployment of all XML-based drug information authoring systems.

- Participated in corporate planning and operations as a member of the management team.
- Led design, development, and distribution of an XML-based drug information authoring system.
- Trained and supported drug information specialists at major hospitals across the country in the authoring and editing of dozens of medical publications regularly throughout the year.
- Participated in staffing and recruiting.

- Negotiated the successful acquisition of domain name from third party.
- Designed and implemented a distributed XML document editing system using XML and J2EE technologies on the server side and AJAX on the client side.
- Wrote SGML to HTML conversion software for flat file as well as relational database targets. Also designed and implemented automatic SGML to XML conversion software.
- Developed complex conversion software that translated legacy table-based data into CALS SGML table format.

External Consulting and Partnering: Provided consulting services and managed partnering relationships with healthcare and scientific organizations on projects involving the exchange and publication of XML and database information.

- *Quest Diagnostics:* Negotiated data licensing agreement as a content provider.
- *American Association of Clinical Chemists:* Wrote proposals, negotiated agreements, secured contracts, and managed projects through several publication cycles of three titles. Reworked previous failed development effort and implemented robust system.

1991 - 2000: Entelechy Corporation – President

- Designed and implemented an Internet-based intelligent agent framework. Rule-based, 100% pure Java implementation consists of 192 classes & interfaces.
- Wrote a custom Internet Explorer BHO DLL using Visual C++ and COM interfaces.
- Provided WWW design and consulting service to Empire.Net, an ISP: HTML, CGI programming in Perl, image mapping, and graphic design.
- Implemented changes to Soar, a rule-based agent architecture, to improve its usability to cognitive psychologists.
- Designed and implemented Macintosh OS extension in C that provides a suite of function calls that support multiple global floating windows from multiple clients. Designed and implemented a sample application using this extension.

1989 - 1991: Independent Consulting – Software Developer

- *Engineering Design Research Center, Carnegie Mellon University:* Implemented a variation of simulated annealing on the Macintosh. Designed and implemented complete graphical user interface to the application.
- *Ansoft Corporation:* Adapted their electromagnetic field simulation software to run under the multitasking Macintosh operation system, MultiFinder.

1988 - 1989: Network Development, Carnegie Mellon – Engineer

- Contributed to the hardware design of a multi-port Ethernet bridge.

1986 - 1988: Computer Science Department, Carnegie Mellon – Research Assistant

- Designed COAL, a new computational framework that integrates the analysis of existing systems with the synthesis of new systems.

1985: Computer Science Department, Carnegie Mellon – Research Assistant

- Contributed to the development of an intermediate-level language compiler (written in Common Lisp) for HT Kung's WARP systolic processor.

1984: Hughes Aircraft Company – Engineer

- Designed micro-sequencer that emulated the AMD2910 in 2 micron CMOS gate array technology.

Software Environments

Standards & Protocols: XML, XSLT, XPath, XSL-FO, XSD, Schematron, JSON, SOAP, WSDL, UDDI, SGML, DTD, PDF, HTML, XHTML, DHTML, DOM, SAX, CSS, DSSSL, MISO, ACORD, OOXML, XML4IP/ST.96.

Computer Languages: Java, JavaScript, Python, C, C++, Lisp (Common Lisp, Scheme, elisp), Perl, Tcl/Tk, Prograph, Pascal, OPS5, BASIC (Visual Basic & traditional), Assembly (680x0, 8088/6), uCode.

AI Architectures: Soar (Problem Spaces), OPS5 (Rules), COAL (Objects + Numerical Optimization)

Platforms: Google App Engine, J2EE (servlets, EJB, JSP, etc), WebLogic, Microsoft .NET, Microsoft Windows (Windows XP/2000/NT/95/3.1/etc), Macintosh System 6/7, Unix (Solaris, Linux, BSD, HP/UX), Cocoon, cross-browser compatibility, AJAX.

Frameworks & Libraries: JDK, jQuery, Swing, .NET, Think Class Library (C++ on Mac), OWL (C++ under Windows), Sculptor (Scheme sublanguage for XML editor extension).

Other Tools: UML tools, Emacs, make, Apache Ant, Maven, Visual Studio, XMLC, Apache, IIS, Excel, Microsoft Project, Antler, CVS, PVCS, StarTeam, Subversion, git.

Databases: Google Datastore, Oracle, DB2, MS Access, ObjectStore, FileMaker.

Education

M.S. Electrical & Computer Engineering **Carnegie Mellon University** 1988
 Research in AI and computer language development.

B.S. Electrical & Computer Engineering & Mathematics **Carnegie Mellon University** 1985
 Triple major: Full Electrical Engineering and Computer Engineering curricula plus extensive Computer Science and AI.

Research Experience

Master's Thesis: Evaluation of expert system architecture performance
 Designed and implemented a declarative, Object Oriented, language for the specification and construction of rule-based expert systems. The system, COAL, combined methods from Programming Systems, AI, and Numerical Optimization. Participated in Allen Newell and Charles Forgy's Production System Machine group efforts to analyze and improve the performance of symbolic pattern matching used in Soar, the realization of a problem-solving architecture detailing Newell's candidate for a unified theory of cognition.

Undergraduate Project: Runtime concurrency detection & parallel processing
 Designed logic to maintain the instruction execution records needed in a runtime concurrency detection scheme. Co-authored invention disclosure for instruction-level parallel processing architecture.

Undergraduate in-depth sequence: Cognitive Psychology

Selected Publications

XML and Personalized Financial Plans,
 Kenneth J. Hughes, Karl B. Schwamb, & Hans Tallis, XML Journal, September 2002.

Document XSLT Automatically, Karl B. Schwamb & Kenneth J. Hughes, XML Journal, June 2002.

Professional Affiliations

TAU BETA PI - Engineering Honor Society
 ETA KAPPA NU - Electrical Engineering Honor Society
 IEEE (Institute for Electronics and Electrical Engineers)