

## Frank Sauer

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### **Professional Summary**

Application Architect experienced in designing and implementing scalable and expandable application infrastructures using (distributed) object technologies. Domain knowledge includes healthcare, health insurance, supply chain management (distribution planning), B2B and financial services.

Experienced in developing large OO frameworks and applications, Enterprise Application Integration (EAI) using Vitria. Extensive hands-on experience with UML (Rational Rose), Java/J2EE and XML/XSLT/XSD expert. Experienced Eclipse plug-in developer, having worked with almost every major Eclipse framework.

**LANGUAGES:** UML, Java, AspectJ, Smalltalk (Visualworks), PHP, SQL, Tcl/Tk, Ruby, Erlang, XML/XSL/XSLT/XSD, HTML/CSS/Javascript

**TOOLS, FRAMEWORKS AND TOOLKITS:** Eclipse, RAD 6, Rational Rose, Vitria EAI, AWT/Swing, SWT/RCP, Eclipse plugins, EMF/openArchitectureWare, CORBA, J2EE, JAXP, TraX, JAX-RS, JAXB, JDOM, Ant, JUnit, Gemstone/J, JBoss

**DATABASES:** Oracle, MySQL, BerkeleyDB, Postgresql

**METHODOLOGIES:** Agile/XP/TDD/RUP

**PLATFORMS:** UNIX, Windows, Mac OSX

## Experience

### **DST HEALTH SOLUTIONS, BIRMINGHAM, AL**

Principal Architect and Toolsmith, 7/2005 – present

- Team member on the Amisys Advance SOA project, wrapping a legacy system with web services.
  - Wrote frameworks using JAX-RS (JSR311) and JAXB to expose services as RESTful web services.
  - Developed a client side dynamic proxy to completely hide the XML and URI details from Java clients while providing clean XML for non-Java clients.
- Automated a business process involving document scanning (HCFA and UB92 claim forms), OCR and the delivery of both scanned documents and the resulting data files in batches to clients of the BPO department.
- Team member on the ProductDesigner project. ProductDesigner is an ontology based design tool with constraint engine that is used to design insurance product models that drive claim adjudication and enrollment and contracting services.
  - Converted a single-user insurance product modeling tool into a transactional multi-user J2EE application with real time sharing of updates (via JMS).
  - Added various user interfaces and performance enhancements (code and

- database related).
- Developed general architecture, design and implementations.
- As the lead of the Technology Office, responsible for developing new tools, integrating existing tools, evaluating (new) technologies and determining their applicability in DST's health insurance domain. Responsible for:
  - Applying MDSD (Model Driven Software Development) and Domain Specific Languages in order to increase the ease and speed of development of business object models (BOM), web user interfaces (WOM) and services (SOM). I use EMF to define custom meta-models and Open Architectureware to generate code from these models,
  - Introducing Maven and Continuum as a continuous build environment,
  - Building an Eclipse plugin to analyze version dependencies between core assets, product line artifacts, and third party libraries (by mining the numerous Maven POM files and building a dependency model),
  - Building an Eclipse plugin that “forces” developers to enter a JIRA issue in their Subversion commit messages. Abandoned in favor of Mylar when that came of age and we discovered it already does this.
  - Customizing the Protege Knowledge Management tool for our own purposes – including adding a few JMX MBeans to enable remote management of the protege server.
  - Defining development best practices and participating in code reviews
  - Interviewing candidates as part of our hiring process

### **VOLANTEC.BIZ, INC., TAMPA, FL**

Software Consultant, 2004 - 2005

#### **Consultant to IBM, Boca Raton, FL 9/2004 - 7/2005**

- Developed Eclipse plugins for the IBM Voice toolkit, a development toolkit for VoiceXML applications based on the Eclipse environment.
- Worked on editors for VoiceXML, CCXML, LXML, SRGXML and JSV (JSP for VoiceXML), both for a commercial IBM release running on RAD 6.0 as well as the open source voice toolkit (see <http://www.eclipse.org>, the VTP project).
- Became very experienced with the Structured Source Editor (SSE) framework in the Eclipse Webtools project, as well as some voice related technologies such as MRCP over RTSP, and JMX based administration of IBM's WVS voice server.
- Experienced with the latest Eclipse 3.1 APIs since the VTP project had to be made compatible with those while both Eclipse and the Webtools project were going through their prerelease cycles. Experience with Agile processes and affinity for refactoring and adapting to changes played a big role in making this successful.

#### **Consultant to EDS and Veterans Health Administration (VHA), Bay Pines, FL 4/2004 - 9/2004**

- Worked on an enterprise-wide messaging infrastructure based on BEA Weblogic J2EE and JMS, Vitria and HL7.
- Participated in architecture, design and implementation of the client side delegate. The system provides HL7 messaging service to other services and applications and is based on a Service Oriented Architecture (SOA).
- Worked with and extended the open source HAPI library (HL7 parser) to support the correct HL7 XML schemas (group names) and add support for HL7 batch

messages. A major goal of the client side delegate was to provide an application programming interface (API) that was technology agnostic and exposed no details of the underlying technology, e.g. JMS or JTS.

## **THE TECHNICAL RESOURCE CONNECTION, TAMPA, FL**

Infrastructure Modeler and Application Architect, 1997 - 2004

### **Consultant to London Clearing House (LCH) 9/2003 - 1/2004**

- Worked on clearing house system for the European financial markets.
- Participated in the design and implementation of components that receive and validate trade messages.

### **Consultant to Digital Claims 6/2002 - 9/2003**

HIPAA compliant clearing house for the largest health care provider in the country. System received claims in UB92 and other formats, validated them and routed them to Medicare fiscal intermediaries in HIPAA compliant EDI transactions. Validation was a combination of automatic edits (rules) and a workflow based web interface used by the billing experts.

- Created an XML and XMI based metadata driven code generator that generates the entire business object model directly from UML models. The generated code is complete and does not consist of just simple stubs and get/set methods, but fully implemented functionality such as marshalling to/from XML, field level optimistic concurrency control and undo/redo functionality. In addition to the Java code, the generator also emits an XSD XML schema describing the XML format of the marshaled objects.
- Constructed EDI 837 (pre-HIPAA version 3051 and HIPAA 4010) transactions from data in the database using Vitria connection models, process models, custom transformers, and the AXT mapping tool.
- Created XSLT based transformations to export data to external systems in various different XML formats.

### **Consultant to Diamond DDS 2/2002 - 6/2002**

Added HIPAA compliant electronic transactions to the Diamond Claims processing system. Responsibilities included (lifecycle) management of the services using JMX, scalability through clustering and multi-threading and ease of configurability of the services using an XML based configuration service.

### **Consultant to RapidWarranty 2/2002**

Worked on Universal Claim Form data entry for the automotive industry. Contributed to Model-View-Controller Metadata driven XML/XSLT web-based entry system with full support for Vehicle Maintenance Record Standard (VMRS) codes.

### **Consultant to Buildscape - NuContext 2/2001 - 6/2001**

Designed and implemented a Client Server Ontology Manager used for Catalog data purification and Catalog merging.

- Built the Client application using XMLTalk.
- Designed the Business Object Model and Server
- Mentored developers on implementing the server as an EJB Application using Gemstone/J.

### **Bench 6/2000 - 2/2001**

- Worked on an internal project to create a 100% reusable user interface framework based on XML and Java Swing. The framework:
  - Allowed developers to specify the GUI in an XML specification, which was read at runtime by the framework.
  - Dynamically and automatically built the user interface.
  - Was based on the ApplicationModel and ValueModel paradigms originally from ParcPlace VisualWorks Smalltalk. In addition to automatic GUI rendering, the framework allowed for these GUIs to be managed from a central repository since the XML specifications were obtained from a standard URL, not a file. This work is currently patent pending (app #20020149619).
- Researched AOP and AspectJ in particular, and taught a one day course on this subject. Slides can be found here: [http://www.volantec.biz/Untangle\\_AOP.ppt](http://www.volantec.biz/Untangle_AOP.ppt)

### **Consultant to Bestfoods - SLFPlus 3/1999 - 6/2000**

Worked on the (Java) mid-tier using the Gemstone/J EJB application server. This project developed a planning tool that used historical data to determine how the Bestfoods products should be distributed to the stores. The system supports over 100 products, over 50,000 store locations in any region, and 3 years of historical sales data.

- Responsible overall for the infrastructure architecture components that include product selection and integration.
- Evaluated several EJB application servers (Persistence Powertier, Weblogic, and Gemstone/J).
- Developed a simple server side framework for logging and encapsulation of vendor specific features, as well as several of the mid-tier components dealing with aggregate management of this supply chain management and sales forecasting system.
- Responsible for evaluating and selecting the object-to-relational mapping tool, CocoBase from Thought Inc. Most of the server side components use CocoBase to interact with an Oracle 8i database.
- Developed framework that contains a mechanism to asynchronously update Oracle with updates made to objects in Gemstone's persistent cache.
- Technologies used: Gemstone/J, EJB, Swing, Oracle, Sun Solaris, Windows NT, Rational Rose, and CocoBase.

### **Consultant to Vanguard - View2000 3/1997 - 2/1999**

Infrastructure modeler on the project.

- Developed a customer care application that is used by 3000 Vanguard representatives to access mutual fund statistics, market news, market data, and order literature.
- Participated in the definition of the technical architecture and developed a front-end model-view-controller framework in Java (modeled after Visualworks Smalltalk), which allows the Vanguard IT staff to quickly develop and assemble

components for new Java applications.

- Developed the View2000 front end using the framework. The framework and application have been deployed to over 2000 desktops. Technologies used: Orbix, OrbixWeb, Rational Rose, C++, Java, Symantec Visual Cafe, ObjectStore, Sun Solaris, Windows NT, OS/2, and Sybase.
- Developed a prototype user interface based on XML, XSL and Javascript. This project experimented with replacing the Java client developed for View2000 with XML. The goal was to reduce the size of the client footprint and determine if XML, XSL, and Javascript could be used to build the required user interface features.

## **CENTER FOR MEDICAL IMAGING AND MEDICAL INFORMATICS, MIAMI, FL**

Research Associate, 1993 - 1997

- Designed and implemented scalable and expandable infrastructures for the UMHC, Jackson Memorial hospitals, and the radiology department of the University of Miami School of Medicine.
  - The systems participating in this infrastructure dealt with the archiving and communication of images from MRI, CT, NM, and other patient information sources.
  - The architecture was fully object-oriented and used C++, Smalltalk, object broker technology, groupware principles, object-oriented databases, and distributed real-time conferencing applications, such as shared whiteboard, shared medical image viewer, and audio and video conferencing.
  - The groupware was developed using Tcl/Tk, C, and C++ and used CORBA 2.0 (DST) and VisualWorks. Extensively used the CORBA Naming, Event, and Concurrency Services.
- Developed OO frameworks including a document archiving system/patient profiler that archived information from various sources (registration, radiology, fax, scanned documents, email) and used a user-friendly GUI. Responsibilities:
- Taught workshops for colleagues on the basics of VisualWorks. Also taught advanced workshops dealing with domain segregation, sub-canvas techniques, reusability, etc. and afterwards provided mentoring during real projects. Taught a week-long workshop on object-oriented analysis and design using the Martin/Odell methodology and Ptech tool.
- Wrote project proposals and federal grant proposals.

## **UNIVERSITY OF TWENTE, DEPARTMENT OF COMPUTER SCIENCE, THE NETHERLANDS**

Scientific Programmer, 1991 - 1993

- Developed a framework to perform measurements for a research project in storage strategies for complex objects in a distributed operating system (Amoeba).

## **Volunteer Work**

2002 – present, ongoing but somewhat stalled

- Eclipse Metrics Open source project, see <http://metrics.sourceforge.net>. This

Eclipse plugin calculates and presents various code metrics related to the quality of the code, the OO design and packaging. Used widely and was very well received by the community. Still works in Eclipse 3.2.x without changes since the switch to 3.0.

## Education

- 1984-1990 - MSc in Computer Science, University of Twente, The Netherlands
- 2001 - attended several AOP tutorials at the first AOSD conference in the Netherlands
- 2001 and 2002- OOPSLA Conference, Tampa, FL

## Publications

- **Architecture Independent Multi Computing via a Self Distributing Communications Harness**, in proceedings of the first Nordic Transputer Seminar, Turku, Finland, 1992.
- **Design and Implementation of the Amoeba Complex Object Server ACOS**, in proceedings of CSN '92, Amsterdam, Netherlands 1992. Multimedia Technology in the Radiology Department, ACM Multimedia '94, San Francisco, October 15-20, 1994.
- **Applying Design Patterns to JDBC**, Java Report, May 2001, see: [http://www.volantec.biz/Applying\\_Design\\_Patterns.pdf](http://www.volantec.biz/Applying_Design_Patterns.pdf)
- **XMLTalk: A Framework for Automatic GUI Rendering from XML: Specifications**, Java Report, October 2001, see: <http://www.volantec.biz/XMLTalk.pdf>
- **Metadata-driven Multi-Artifact Code Generation Using Frame-Oriented Programming**, OOPSLA 2002 Workshop on Generative Techniques in the context of Model Driven Architecture, Seattle 2002, see: <http://www.volantec.biz/Metadata-driven.pdf>