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Vishal Kathuria

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Objective	A position involving innovation and advanced development in the areas of database and systems.

Education

M.S. Computer Science	University of Wisconsin, Madison	3.9/4.0	Sep 98 – Dec 99
B. Tech. Computer Science	Indian Institute of Technology, Delhi	9.1/10	Sep 94 – May 98

Work Experience

Oct 2000 –	Senior Software Engineer	Asera Inc.
Feb 2000 – Oct 2000	Software Engineer	Asera Inc.
June 1999 – Aug 1999	Summer Intern	Asera Inc.

Research Experience

Research Assistant with Prof. David Dewitt, University of Wisconsin, Madison (Fall 1999)
Niagara: XML Query Engine Project

Research Assistant with Prof. S.N. Maheshwari, IIT Delhi, India (Summer 1997)
Database and application development for IIT Delhi Library Information System

Projects at Asera

About Asera Inc.
Asera provides a platform and development environment for developing and deploying eBusiness applications. I was part of the server team responsible for building the platform.

Distributed Transaction Support for Asera Platform   **(3 months, 1 person)**
This project enabled Asera platform to participate in a distributed transaction with external applications. The project involved integration of the Asera platform *Transaction Manager* with other J2EE Transaction Managers through the Java Transaction API (JTA). The framework allowed plugging in of any third party transaction manager. Also implemented JTA APIs for allowing applications to explicitly manage transactions.

Security Framework   **(3 months, 1 person)**
Security framework provided infrastructure to applications for secure B2B messaging and secure storage of sensitive data. The JCE (Java Cryptography Extensions) based infrastructure included key management, dynamic security administration, support for non-repudiation, infrastructure for integration with external key repositories, Certificate Revocation Lists, PKI (Public Key Infrastructure) and HTTP based peer authentication.

Integration Framework   **(4 months, 1 person)**
Integration framework provided a generic infrastructure for integration of applications on Asera platform with back-end ERP Systems. It included event-triggered workflow, publisher and subscriber services, APIs for applications to send and receive events and batch integration. The framework also allowed plugging in of connectors to other messaging systems for real-time and near real-time integration.

Performance Improvement of Batch Import   **(1 month, 1 person)**
This project aimed at improving the performance of data import into Asera platform in batch mode. The performance improvements included improvements to the data merge algorithm, batching of updates and deletes, tuning sql statements, parallelizing import and

creating/modifying indexes. Received Asera High Flyer Award for this project.

Other Projects   **(4 months)**

Apart from the above projects, I was involved in projects for integrating Asera's platform with the back-end systems of some key customers. These projects were undertaken by Engineering on request of Asera Professional Services because of complex integration scenarios. The responsibilities included designing, scoping and reviewing integration projects undertaken by the Asera Professional Services.

Plan Object Interpreter   **(ongoing, led 1 developer)**

Batch integration requires execution of a series of tasks and has special requirements for failure recovery. For this, we developed an XML based scripting language, which can be used to specify various tasks and the dependencies between them. The *Plan Object Interpreter* interprets such a plan and it is resumable after a crash. I led a team of two people and was responsible for the design of several enhancements and guiding the implementation.

Webmethods Bridge   **(2 months, led 2 developers)**

This project involved developing a bridge between Asera Platform and Webmethods B2B Server**.**

| **Projects at School** | **Distributed XML Query Engine for XML-QL**   **Spring 99, 2 Students** |

The query engine supported queries with selection, projection, join, path expressions and tag variables. It also handled the more complex cases of self-join and skolem functions. It was a multithreaded pipelined query engine with each operator running as a separate thread. A single query engine could execute multiple queries concurrently and execution of a single query could be distributed across different nodes. The different nodes had identical query engines but hosted different sets of data and the queries could be submitted to any node. The query engine conformed to XML and proposed XML-QL standards for communication, thus ensuring interoperability with other vendor query engines in a distributed query execution.

Niagara: XML Search and Query Engine   **Fall 99**

Niagara is a database research project ongoing at UW. It has a query engine for executing XML-QL queries on XML documents, a search engine for finding relevant XML documents on the internet and a trigger manager to monitor changes in XML documents published on the web. My role was to develop communication infrastructure to integrate these components and fix bugs.

Reliable Multicast over Datagram Network   **Fall 99, 3 students**

The project involved designing and implementing protocol layers for reliable multicast over UDP. We developed reliable multicast transport layer (RMTP), a multicast group management layer (GMP) and a unicast routing layer. It used piggybacked acks, cumulative acks, task scheduler, dynamic sizing of sliding window and pipelining for high performance. The performance of our project was highest in the class.

Memory Management for Critical Load Instructions   **Fall 98, 2 students**

In a program, there are certain load instructions (called *Critical Loads*) on which many subsequent instructions depend and the performance penalty of a cache miss for these loads is high. In this project, we analyzed access patterns of *Critical Loads* in SPEC'95 benchmark and proposed a hardware scheme to identify these loads and decrease their latency.

File System Interface to Web for Linux   **Spring 99, 2 students**

Developed a linux file system module that allows the internet to be mounted as a file system. It enabled applications written to use the local file system to be automatically extended to use files available on the web. We tried to provide a user interface similar to an actual file system, for example, an 'ls' command will parse the html on the remote site and try to derive from the links, the files present in the remote directory. We used a hierarchical cache in EXT2 file system for caching files as they were accessed for better performance.

Development of a Single User RDBMS **Fall 98, 2 students**

Implemented different components of MINIBASE, a single user instructional database. The components developed were Heap File, Buffer Manager, B+tree, Sortmerge Join, Hash Join and External Sorting.

Development of a Library Information System **Summer 97**

As team of two, worked on the Library Information System of the IIT Delhi Central Library. This Information System had its own database and used trie indexes. It provided catalog search and browse, book checkout, book status check, procurement and approval process facilities to the library staff and the students. We worked on the database and the 'serials' module of the system.

Please access my homepage http://www.cs.wisc.edu/~vishal for project papers.

Courses	CS790: Master's Project: Niagara CS764: Topics in DBMS CS564: DBMS: Design and Implementation CS736: Advanced Operating Systems CS752: Advanced Computer Architecture CS737: Computer System Performance Evaluation and Modeling CS640: Introduction to Computer Networks Introduction to Finance Racquetball, Swimming and Ballroom Dancing
Skills	**Languages:** C, C++, Java, Perl, XML, XML-QL, SQL, Pascal, Lisp, Prolog, x86 Assembly, COBOL **Platforms:** UNIX (Linux, SCO-Unix, SunOS, Solaris, HP-UX), Windows (NT,95-2K) **Other:** Web services (WSDL, UDDI), J2EE: JTA, JNDI, JCA, JMS, JCE, JSSE
References	Prof. David DeWitt, Professor, UW Madison, Research Advisor Prof. Jeff Naughton, Professor, UW Madison, Research Advisor Bhaskar Himatsingka, Formerly Consulting Software Engr., Asera Inc Shivani Gupta, Principal Software Engr., Asera Inc. Please contact me for the contact information of the references.
Interests	Hiking, Biking, Skiing, Skating, Physics and Complexity Theory
Awards	• Asera High Flyer Award for excellence • Institute Merit Award 1994-95 for Excellent Academic Performance at IIT Delhi • National Talent Search Scholarship awarded by National Council of Educational Research and Training, Govt of India. • Gold Medal for National Standard Examination in Physics. 25 students out of 27,000 nationwide were awarded this medal
Status	H1B Visa