

PROFESSIONAL PROFILE

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INTEGRATED INFORMATION SYSTEMS

Integrated Information Access

Integrated Information Systems (IIS) provides professional services and software to companies interested in *Rapid Integration and Information Access of highly distributed disparate data*. IIS specializes in using *extended set processing (XSP)* technology to significantly improve the access of information from very large, highly distributed, disparate data sources. For many years, software utilizing an XSP Library of 'low-level data access operations' with a user-friendly interactive interface, and XSP prototyping techniques have proven very useful for solving complex information access, data mining, and distributed heterogeneous data access problems that are not amenable to being solved by conventional methods. Recent developments in XSP research have also produced effective procedures for accessing, processing, and integrating information from fresh sources of both XML and RDM data.

Clients

GM, Delco Electronics, Prudential Insurance, Xerox, Arthur Anderson, Software AG, USDOT, IBM, Fujitsu, Hitachi, Hewlett-Packard, Comshare, New York Life, EDS, Computer Associates.

Commercial Services & Applications

- Rapid Information Integration & Analysis of Disparate Data
- Rapid Interactive Information Extraction from Any Readable Data Source
- Rapid Development & Prototyping Integrated Information Systems
- Analysis and Integration of Legacy Data
- Dynamic Data Restructuring for Data Warehouse Information Access
- Augmenting Existing DBMSs with Improved Functionality and Performance
- Accessing Very Large Distributed Data
- Integrating and Analyzing Heterogeneous Data
- Software Development for Real-Time Information Access from 'Fresh Data'
- Restructuring High Speed Bulk Data
- Developing Data Sharing Capabilities Between Dissimilar DBMSs
- Developing Software for Interactive Exploration and Analysis of 'Raw Data'

Commercial Implementations & Development Successes:

- XSP software has been used in many instances to provide: timely information access from very large heterogeneous data sources, reducing data loading costs, validating data quality, ad hoc querying of 'raw' source data, and data access acceleration for existing systems.
- Under a recent 'open technology' research contract with Fujitsu, XSP technology was extended to provide an 'operation-centric' foundation for the integration and processing of XML data and Relational data in highly distributed environments. Results demonstrated performance potentials not possible with current 'structure-dependent' XML technologies.
- XSP software was compared to DB2 for 'critical information access' performance. Using the TPC-D Benchmark data on identical hardware platforms, DB2 took over 2.5 hours to load the data and complete the initial query suite. The XSP implementation took under 20 minutes. The optimized time for Query 9 was 38 minutes for DB2 and 77 seconds for XSP.
- XSP software was used to reduced the monthly index and loading time for a large commercial DB2 database from 62 hours to under 2 hours.
- GM used an XSP engine as the foundation of their 'Warranty Information System'. Many fraudulent warranty claims and potential equipment failures were discovered.
- An XSP engine supported the University of Michigan's commercial time-sharing RDBMS.

- XSP software was used by Arthur Anderson to support the CFIS network, a nation wide hospital clinical and financial information service.
- IBM, under contract to the FAA, used XSP software to analyze radar data journals.
- Developed and implemented Point Of Sale (POS) algorithm that out performed all other existing commercial products in speed, combinatorial complexity, and number of items.
- Hewlett-Packard supported development of XSP foundation for Object Oriented Databases.
- An XML document analysis, using XSP software, was done for a branch of the armed services that revealed critical errors in equipment repair procedures.
- A subsidiary of XEROX used XSP software to validate integrity of text document tapes of article abstracts for distribution to the nation's libraries. The XSP analysis resulted in the discovery of 800% more errors than prior methods and took 1 week compared to 3 months.
- USDOT used XSP software over a 20 year period for critical information access, information discovery, data mining, data analysis, and data validation projects.
- Delco used an interactive XSP implementation to analyze text data, entered by technicians in their electronic equipment repair facility, to correlate equipment failures. Delco personnel developed a prediction capability which they employed in critical, real-time applications, in one case saving Luftansa millions of dollars.
- XSP software was used to analyzed Petroleum Information Systems customer's data to discover 'covered wells' that were now deemed worth uncovering. An XSP based strategy was developed for finding the most productive wells.
- In 1970 co-founded (along with the ex-president of the Chrysler Corporation and with the Director of the University of Michigan's Computing Center) the STIS Corporation. STIS focused on the design, development and marketing of XSP Backend Database Machines.
- In early 1980, XSP technology was used by STIS to design a 2-Terabyte storage support system for Prudential Insurance to replace their current 100 unit 3380-disk farm. The XSP design was based on a unique usage of Hitachi optical disk platter 'jukeboxes'.
- In 1984 the STIS Corporation was purchased by an affiliate of Hitachi.
- Prior to development of XSP technology, developed and implemented an algorithm for the High Altitude Laboratory using Legendre polynomials and Laplace transforms to predict the path of comets as viewed from earth and from space probe platforms. Also developed an algorithm for the 'Two Sphere Radiation Problem' and implemented its solution.
- Developed an 'in-place' high speed external file sort algorithm requiring no disc storage space other than the file itself.
- Developed axiomatic foundations for Extended Set Processing (XSP) Technology.

Academe:

- Taught Mathematics and Computer Science at The University of Michigan and at Eastern Michigan University. [MS 1965, University of Michigan with Majors in: Logic, Mathematics, Philosophy, Computer Science, Aeronautics, and Electrical Engineering,]

Invited Speaker:

- Advanced Computer Technology Professional Seminar, London
- Cambridge University
- IFIP Congress in 1968
- Massachusetts Institute of Technology
- NATO Advanced Study Institute
- Oxford University
- Stanford University
- University of Edinburgh
- University of Texas
- University of Tokyo
- University of Toronto
- VLDB Conference: 1977 , 1980, 1982, and 1984