Y-12

OAK RIDGE Y-12 PLANT

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Project Accomplishment Summary
for
Project Number 93-MULT-005-D1-4

C/Y-12-93-0174

ADVANCED SOFTWARE ALGORITHMS

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October 28, 1996

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MASTER

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PROJECT ACCOMPLISHMENT SUMMARY

Title: Advanced Software Algorithms
DOE TTI Number: 93-MULT-005-D1-4
CRADA Number: Y1293-0174
Partner: Citibank

BACKGROUND

Citibank was using a data collection system to create a one-time-only mailing history on prospective credit card customers that was becoming dated in its time to market requirements and as such was in need of performance improvements. To compound problems with their existing system, the assurance of the quality of the data matching process was manpower intensive and needed to be automated. Analysis, design, and prototyping capabilities involving information technology were areas of expertise provided by DOE-LMES Data Systems Research and Development (DSRD) program.

DESCRIPTION

The goal of this project was for Data Systems Research and Development (DSRD) to analyze the current Citibank credit card offering system and suggest and prototype technology improvements that would result in faster processing with quality as good as the current system. Technologies investigated included: a high-speed network of reduced instruction set computing (RISC) processors for loosely coupled parallel processing, tightly coupled, high performance parallel processing, higher order computer languages such as "C", fuzzy matching algorithms applied to very large data files, relational database management system, and advanced programming techniques.

Citibank and DSRD collaborated in the analysis of their system and the application of advanced technologies to selected parts of their system. Prototypes were developed to demonstrate the impact of the proposed changes and to provide insight into the benefits of the newer technologies. Citibank accepted most of our recommendations, applied and/or expanded the software algorithms and concepts into their operational system, and is evolving to the jointly developed, long-range vision for their Credit Acquisition System. The following is an extract from a letter from Citibank dated August 13, 1996:

"The CRADA has contributed significantly to the Credit Acquisition re-engineering effort, and has been instrumental in setting its direction and producing concepts and prototypes, which are driving the initiative. The CRADA has been of critical importance to the Credit Acquisition Department and has provided an impetus for our data processing contractor's technological advancement of our offer processes."

BENEFITS TO DOE

The potential benefits to DOE from the CRADA with Citibank can be substantial. First, the fuzzy matching algorithms can be reused in DOE information systems or in systems in other government (federal and state) agencies through DOE's Work for Others Program. Almost all information systems typically involve some matching activities and some may involve situations

like DSRD encountered with Citibank. The algorithms can be modified and applied to data types other than names and addresses used in this CRADA. Another benefit to DOE is the enhancement of skills of its Oak Ridge Management and Operations contractor in the areas of analysis, design, development, and testing of information systems that must process a very large volume of data (over one billion records). The experience gained in performing this CRADA will enable DSRD to develop similar large systems for DOE and its Work for Others sponsors at less cost and better quality. The third benefit to DOE from this CRADA is the practical demonstration of using inexpensive, small and fast computers on a high-speed network rather than expensive mainframe computers. The economic potential of applying this concept to DOE's sites is very significant. DSRD gained valuable experience in designing and developing software to operate in the loosely coupled and tightly coupled parallel processing modes. These skills will be applied to DOE and DOE Work for Others Program requirements and resources will be saved.

ECONOMIC IMPACT

Improvements to Citibank's Credit Acquisition System occurred throughout the CRADA period and will continue for another 12-24 months to achieve full implementation of the recommendations. Citibank is in a highly competitive market; therefore, there will probably be no industry-wide benefits as a result of this CRADA. However, Citibank should be in a stronger position since their re-engineered system should be more responsive to market demands and the quality of the financial profiles used for making pre-approved credit card offers should improve.

PROJECT STATUS

This project was completed September 30, 1996.

DOE FACILITY POINT(S) OF CONTACT FOR PROJECT INFORMATION:

Project Contact: Keith Berry
DSRD, 1099 Commerce Park Drive
Oak Ridge, TN 37830-8027
Phone: (423) 574-9745
Fax: (423) 574-0792

COMPANY SIZE AND POINT(S) OF CONTACT FOR PROJECT INFORMATION:

Citibank, the largest bank card and credit card issuer in the world, had net income in 1995 of \$3,464,000,000. Citibank reported assets of \$256,853,000,000 and employs 85,300 people.

Point of Contact: Mr. Steve Dayton
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Fax: (718) 248-6912

PROJECT EXAMPLES

There are no appropriate project examples.

TECHNOLOGY COMMERCIALIZATION

Citibank began implementing our recommendations early in the period of the CRADA. Citibank

will definitely employ our concepts and algorithms in the new system being developed by their data processing contractor.

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