United States General Accounting Office

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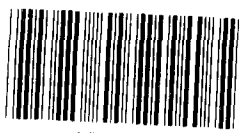
Report to the Commissioner of Social Security

January 1988

DATA BASE SYSTEMS

Observations on Social Security's Data Base Integration Program



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GAO

United States
General Accounting Office
Washington, D.C. 20548

Information Management and
Technology Division

B-226516

January 11, 1988

The Honorable Dorcas R. Hardy
Commissioner of Social Security

Dear Ms. Hardy:

In June 1987, the Deputy Commissioner for Operations asked for our views on the key issues facing the Social Security Administration's (SSA) data base integration program. This program was initiated in 1982 to modernize the storage and management of the agency's automated information files. The Deputy Commissioner indicated that this was an opportune time to evaluate the program's future strategy since he had recently assumed responsibility for SSA's Office of Systems. He also noted that in light of the experience the General Accounting Office (GAO) has had in reviewing SSA's automated systems, he believed our perspective on the program would be valuable.

We met with the Deputy Commissioner and other SSA officials on August 28, 1987. The views we provided were based on information obtained since 1984 in the course of various reviews we have performed on SSA's systems modernization effort. At the conclusion of our discussion, the Deputy Commissioner indicated that the meeting had been helpful and that he would consider our views in evaluating the program and determining whether changes are warranted.

We believe the information provided during our discussion with the Deputy Commissioner can serve as a catalyst for helping the Congress and SSA develop a common understanding of the central issues facing the data base integration program. We are, therefore, sending copies of this report both to you and to the appropriate congressional committees. We would appreciate receiving your response to our observations and look forward to discussing them with you.

We reviewed the support for the requirements underlying the selection of SSA's data base strategy and found no analysis supporting the requirements that all data files need to be integrated and immediately accessible. According to SSA documents, these requirements comprise the primary advantage of SSA's strategy. However, a number of prospective data base contractors noted that (1) SSA's strategy would go beyond the current state of the art for data base technology and (2) it would result in a one-of-a-kind architecture. To the extent that this strategy would

result in a one-of-a-kind system, it would limit SSA's ability to take advantage of technological advances in standard data base design.

Background

SSA is in the fifth year of an effort to modernize its computer operations. As part of that effort, SSA established a data base integration program to upgrade its data base management and access methods. The program has thus far achieved several key initial objectives, such as improving SSA's access to data files and converting its data storage from tape to disk technology. However, a more complex objective has not been accomplished: establishing a state-of-the-art data base architecture capable of integrating SSA's data files to provide immediate access to information, reduce redundancies, and improve the integrity and consistency of data. SSA contracted for a 1983 study to define SSA's target data base architecture and issued a request for proposals in March 1985 for the design, development, and implementation of that architecture. The request for proposals was cancelled in May 1985, however, because SSA judged all of the responses to be technically unacceptable. The Deputy Commissioner is currently studying this program before deciding on a future course of action.

Key Requirements Underpinning SSA's Data Base Strategy

In discussing the key requirements underpinning SSA's data base strategy, we focused on issues affecting the strategy's technical feasibility. In particular, we concentrated on two key requirements that would result in an architecture involving integration of SSA's five major master files containing over 900 million records. Our evidence suggests that integration of this volume of data exceeds the capability of current data base management technology.

The first such requirement is SSA's "whole person" concept. This concept assumes that all SSA data on a given individual is interdependent and that each of its approximately 1,340 field offices should have immediate (on-line) access to these data through a single data base management system. SSA's information on individuals is currently divided among five master files. To achieve the whole person concept, therefore, these files would have to be integrated.

Our review of the studies and documents relating to SSA's data base integration program did not indicate that this requirement had been analyzed from a mission-need or cost-effectiveness standpoint. Specifically, concerning one of the largest master files (the wage earnings file, containing about one-third of SSA's records), we found no historical data or

analyses indicating when and how often interchanges of data between this file and the other master files have occurred. Without this information, it is difficult to evaluate (1) the need for automating these interchanges in an integrated data base and (2) alternative strategies and their associated costs.

The second requirement we focused on is the need to maintain immediate, on-line access to inactive records. This requirement also has a significant effect on the size of the master files to be integrated and maintained on-line. For example, SSA's master file for beneficiaries in the Retirement, Survivors, and Disability Program totals 80 million records, yet the number of individuals currently receiving benefits is approximately 37 million. Thus, under the current requirement, approximately 43 million inactive master file records will be maintained by the on-line data base system. Again, we found no analysis supporting the need for this requirement.

Some Advantages and Disadvantages of SSA's Data Base Strategy

The architecture outlined in the 1983 contractor study would require the development of a one-of-a-kind data base system. In focusing on the advantages and disadvantages of this architecture, we highlighted the views of both SSA and industry experts. The principal advantage cited was the ability to immediately access all information maintained by SSA on over 300 million people.[1] In other words, the data in SSA's master files would be integrated and accessible on-line. Although SSA has made general statements that this approach would result in benefits, we found no analysis quantifying these benefits. For example, SSA has stated that the whole person concept will enable its field offices to improve service to recipients. However, the agency has not quantified its current service level or the incremental benefits to be achieved under this concept. Without this supporting analysis, we could not readily evaluate the reasonableness of SSA's stated requirement.

Concerning the disadvantages, the six data base vendors[2] who provided comments on SSA's request for proposals for the data base integration

[1]This figure exceeds the total U.S. population because it includes both living and deceased individuals.

[2]Computer Sciences Corporation, Contel Information Systems Incorporated, Booz-Allen & Hamilton Incorporated, Planning Research Corporation, Advanced Technology Incorporated, and RGI Incorporated.

program essentially viewed the effort as a high risk research and development project in which SSA was hoping to expand the limits of technology while providing continued high quality service. These vendors indicated that the risk involved in this approach makes it difficult to determine whether it would be successful. In addition, a GAO consultant reviewed the vendor comments and stated that

"Some of the most experienced vendors felt that they were being asked to implement and take responsibility for a system architecture that had not been proved by experience or experiment. The vendor could be implementing a system that proved more expensive than expected, be slow due to the architectural specifications over which the vendor had no control, and have high visibility outside SSA (with the possibility of adversely affecting their reputation)."

A one-of-a-kind system would also limit SSA's ability to take advantage of advances in data base system technology. Such advances are usually intended to work with standard, commercially available systems. As a result, they would not be easily adaptable to SSA's unique system.

Observations

We agree with the Deputy Commissioner that this is an opportune time to reassess SSA's data base modernization strategy to ensure that it is the best approach to meeting SSA's data base management needs. Theoretically, developing a data base to support the whole person concept could facilitate timely service to SSA recipients. Also, the justification for this requirement may become more apparent as SSA develops its 15 to 20-year long-range plan. However, if the current strategy is indeed a research and development effort that will result in a one-of-a-kind system, the cost of developing and maintaining this system may be very high.

In our work to date, we have not been able to readily identify analysis of requirements that either quantitatively or qualitatively establish the need for integrating and maintaining five large SSA master files for on-line access by approximately 1,340 field offices. Documenting and analyzing the incremental benefits, the alternatives for achieving those benefits, and the associated costs are fundamental requisites that provide decision makers with information with which to make informed choices as to the most appropriate economic and technical alternatives available in automating current operations. Such analysis also (1) serves as a reference point to help measure the extent to which automation has

achieved its intended objectives, (2) facilitates the preparation of congressional budget requests, (3) provides the framework for congressional budget deliberations, and (4) helps identify technical issues that need to be resolved and assess policy issues that may arise as SSA's technology needs change.

We hope that this information will be useful to you in your deliberations on SSA's data base strategy and would appreciate receiving your response to our observations. We look forward to discussing them with you.

Sincerely yours,

Ralph V. Carlone
Director

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