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Electronic Reporting Initiatives at the U.S. Bureau of the Census

Paper submitted by the United States Bureau of the Census[1]

INTRODUCTION

1.   The U.S. Bureau of the Census provides businesses, governments, and other consumers of economic statistics a broad range of economic information. We present timely data on key barometers of economic activity such as monthly retail sales, housing starts, and trade with other nations; quarterly data on corporate profits; comprehensive annual information on capital expenditures by businesses; and hundreds of other economic statistical products available monthly, quarterly, and annually. Every 5 years an economic census provides encyclopedic information about our economy. Census results profile 1,100 different industries, show the materials they consume, describe their products and services, and identify many of the markets they serve. Detailed census geographic information also is available for the Nation, states, metropolitan areas, counties, and places; less detailed information is available for individual Zip Codes.

2.   However, making all of this information available imposes a cost on businesses that provide the data. To minimize these costs, the Census Bureau is working in partnership with the business community to reduce burden, simplify reporting, and improve the usefulness of economic statistics. Providing businesses with an enhanced capability of reporting data electronically is one strategy that has proven successful in reducing reporting burden, while also improving data quality, and Census processing efficiency.

3.   This paper describes Census Bureau initiatives to reduce business reporting burden and facilitate reporting through electronic reporting. The paper begins by summarizing the annual reporting burden Census Bureau economic surveys and censuses impose on U.S. businesses. Next, the paper briefly describes previous Census Bureau electronic reporting initiatives, highlights some of our successes and problems, and discusses organizational

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responsibilities related to electronic reporting. The primary focus of the paper will be on new electronic reporting initiatives with special attention given to enhanced Computerized Self-Administered Questionnaire (CSAQ) applications that we are developing. We also will discuss briefly several initiatives related to Internet-based electronic reporting and research activities. The paper concludes by briefly summarizing the lessons we have learned over the past five years.

ANNUAL REPORTING BURDEN

4.   Census Bureau economic surveys impose a significant reporting burden on U.S. businesses. Table 1 summarizes the reporting burden imposed in FY 1997 by Census Bureau monthly, quarterly, an annual economic surveys. The table also shows the top 10 surveys or data collections that impose the heaviest reporting burden annually as well as the burden associated with each of the 1997 Economic census program components.

5.   The filing of export declarations is by far and away the most burdensome program. While large, this burden has been significantly reduced over the past decade. The U.S./Canada data exchange has relieved U.S. exporters of approximately 800,000 hours of reporting burden each year since 1990. Under this historic agreement, the U.S. and Canada exchange import data monthly in lieu of collecting and compiling documents on cross-border export trade; Canadian imports from the U.S. are used to measure U.S. exports to Canada and U.S. imports from Canada measure Canadian exports to the U.S. Because of this agreement, Shipper's Export Declarations no longer need to be completed and filed by U.S. exporters for shipments to Canada. Non-Canadian export declarations remain a major target for further automation but are not described in this paper.

6.   The quinquennial Economic Census also imposes a heavy reporting burden on the business community. In total, almost 8 million report forms will be used to collect data in the 1997 Economic Census. Of the core census program components, the Census of Retail Trade et al imposes the largest burden. We are developing an enhanced CSAQ instrument for this sector which will be described later in the paper.

7.   The Economic Census presents numerous challenges for electronic reporting. First, the censuses are conducted once every 5 years, collecting data for years ending in "2" and "7"; the core census programs employ over 460 different report forms, tailoring each form to a specific industry or group of industries facilitates reporting; the censuses collect detailed information on inputs and outputs, the census of manufactures will collect data on some 1,500 materials consumed in manufacturing and some 12,000 different manufactured products; the 1,000 largest enterprises operate over 700,000 establishments, often operating in different industries and economic sectors. The census periodicity, program and industry diversity, and sheer volume of requested information make it difficult to convince large enterprises to invest resources in electronic reporting. Offering electronic reporting capabilities in the economic census also requires substantial Census Bureau resources to support electronic reporting capabilities for such a large and diverse statistical program. Because of these challenges, for the censuses we have generally concentrated our electronic reporting resources on the census of retail trade where we have a significant number of enterprises with a large number of establishments operating in a limited number of industries. Compared to manufacturing, the census of retail trade also collects much less detailed information on inputs and outputs.

TABLE 1 **CENSUS BUREAU BUSINESS REPORTING BURDEN HOURS***

Current Economic Surveys -Fy 1997

	# forms/documents	# Hours
Total hours for all surveys	**7,152,492**	**1,951,774**
Top 10 Collections		
Shipper's Export Declaration (3 forms)	6,057,057	1,127,200
Annual Survey of Manufactures	63,000	197,000
Company Organization Survey	85,000	144,500
Annual Capital Expenditures Survey	46,000	114,000
Quarterly Financial Reports	39,100	79,524
Current Industrial Reports (68 surveys)	71,882	55,872
Construction Project Report (3 forms)	142,800	35,700
Survey of Plant Capacity	17,000	34,000
Building Permits (2 forms)	119,300	31,508
Monthly Retail Sales & Inventories (2 surveys)	173,076	21,263
Economic Surveys (17)	**338,277**	**111,207**

1997 Economic Census -Fy 1998

	#forms/documents	# Hours
Total for all components	**7,710,871**	**5,156,495**
Core Programs	**4,959,171**	**4,514,973**
Census of Retail Trade, Food, Drinking & Accommodations	1,291,000	993,000
Census of Services	1,443,072	900,349
Census of Transportation, Utilities Communication, FIRE, Rental & Leasing	625,099	766,054
Census of Manufactures	210,000	762,000
Census of Wholesale Trade	540,000	634,400
Census of Construction	130,000	286,000
Census of Mineral Industries	17,000	59,670
Classification Surveys	655,000	79,500
Auxiliaries Form	48,000	34,000
Related Programs	**2,751,700**	**641,523**
Survey of Minority-Owned Business Enterprises	2,500,000	416,666
Truck, Inventory & Use Survey	140,000	103,257
Outlying Areas	54,000	49,500
Business Expenditures Survey	57,700	72,100

* Excludes Governments Division Surveys

OVERVIEW OF PREVIOUS ELECTRONIC REPORTING INITIATIVES

8.   Over the past decade the Census Bureau has introduced a number of initiatives aimed at automating the collection of economic statistics. This section describes electronic reporting initiatives associated with the quinquennial economic census program and selected current economic surveys.

Electronic Reporting in the Economic Census

9.   The 1987 Economic Census was the first census where we permitted a limited number of large companies to report economic census data on magnetic tape. As part of a pilot program, we targeted large retailers with at least 1,000 establishments. We provided them with a specific format (the format was identical to that used in our data entry operation) and extremely detailed specifications describing the format along with a listing of specific establishments. Each company was required to submit a test tape with data for 20 establishments; after tapes were checked by us the companies submitted the final tape. Ten retailers participated in the 1987 pilot program and reported data for some 25,000 individual establishments. Even though the 1987 electronic initiative generally was successful, it was a manually intensive and time-consuming process for both the Census Bureau and the participating companies.

10.   In response to demands from large companies for expanded electronic reporting capabilities in the 1992 Economic Census, we broadened our magnetic tape reporting program and developed an Electronic Data Interchange (EDI) capability for use by large retailers. We developed an EDI transaction set or message in a little over 18 months. The key to the rapid message development was our decision to contract with an EDI expert who was familiar with ASC X-12 EDI procedures and methods. The resulting ASC X-12 EDI transaction set 152, was generic and was developed to satisfy all requirements associated with statistical reporting to the U.S. Government.

11.   We met with a number of large retailers during the year preceding the 1992 Economic Census, attempting to convince them to use the EDI transaction set. While the retailers applauded our efforts and initially were quite responsive, we had only one company actually report in the census using EDI. Most companies cited scarce EDI resources and higher priority corporate EDI applications as primary reason they were unable to report using EDI. The accounting department generally could not make the business case for investing scarce EDI resources in the quinquennial Economic Census.

12.   As part of 1992 Economic Census promotion efforts targeting large companies, we provided the companies with a single point of contact at the Census Bureau and asked that to provide us with a single contact. As our contact managers communicated with these large companies prior to the census mailout, many inquired about electronic reporting, but were unwilling to commit to EDI. The heavier than expected workload required substantial customized programming preparing the files for the tape reporters. We permitted interested retail companies to report on magnetic tape, but did not have the processing system in place to facilitate electronic reporting. In addition, we had to implement a separate procedure to report new locations electronically. As a consequence most of these tape reporters were not "mailed" materials until the end of March 1993, almost 3 and half months later than report form mailing. Not unexpectedly, the delayed mailing inhibited timely response. Nonetheless, we ended up with 81 companies, accounting for 125,000 establishments filing 1992 census information on magnetic tape.

Current Economic Surveys

13.   The hundred-plus current economic surveys conducted by the Census Bureau are designed to provide broad measures of economic activity. These surveys generally collect much less detailed information than the economic census, are more frequent and timely, and make extensive use of sampling. The annual Company Organization Survey (COS) is one of the largest current surveys with approximately 63,000 companies reporting employment, payroll, classification information, and for over 1 million establishments. The COS also is the primary vehicle for maintaining and updating the organizational units of large multi-location enterprises on the business register in the years between the economic censuses. All multi-location enterprises with 250 or more employees are included in the COS with certainty. The concentration of enterprises with thousands of establishments, the stable content, and the relatively limited amount of information collected on each location, makes the COS a prime candidate for electronic reporting.

14.   The COS currently provides four modes of automated reporting: magnetic tape, spreadsheets (on diskette), EDI reporting using ASC X-12 transaction set 152, or Computerized Self-Administered Questionnaire (CSAQ). In the 1996 COS, we had 615 companies accounting for over 260,000 establishments reporting electronically. Nine companies reported using EDI, 14 used spreadsheets, 130 used magnetic tape and 472 chose the CSAQ vehicle.

15.   Magnetic tape reporting remains a popular choice of many companies. This is not especially surprising given once computer programs are developed to satisfy the required format, it requires minimal corporate resources to continue reporting. However, the Census Bureau is finding that the tape reporters are requiring significantly more Census Bureau resources than the CSAQ reporters. The tapes require substantial amounts of human intervention to assure that the tapes are readable, formats are followed, and that information is provided for all locations. We estimate that each magnetic tape reporter requires at least 12 hours of validating and editing, with the largest, most complex companies requiring considerably more resources.

16.   We have had limited success with EDI reporting in the COS. For the 1994 COS through the 1996 COS the number of EDI reporters has stayed constant at nine to ten. In terms of data quality our experience with EDI reporters has been good. All the companies using EDI are transmitting data by VAN or by modem, using our toll free number. Just as in the 1992 census, convincing companies to invest their scarce EDI resources in statistical reporting, remains a difficult undertaking.

17.   We have experienced our greatest success with the COS CSAQ. Since introducing the CSAQ for the 1993 COS, the number of companies reporting via CSAQ has grown from 89 companies (18,000 establishments) in 1993, to 150 companies (and 32,000 establishments) in the 1995 COS, to the present 472 companies and approximately 200,000 establishments reporting in the current 1996 COS. Several large companies have claimed that the CSAQ has reduced their reporting burden by 25% and in several cases have helped us convince other large companies of the benefits of CSAQ reporting. The quality of the CSAQ reporting has been superior to paper report forms primarily because built in edits identify potential problems as the company is entering the data. We also have built in additional software features that ease and facilitate reporting by the companies. For example, we found one of the most useful things we could provide the companies was a manipulatable file of all of their locations with associated information; our contacts in the corporate

accounting departments of large companies often do not have this information easily accessible.

18.   The monthly principal economic indicators also lend themselves to automated data collection. Our advance estimate of monthly retail sales, released 9 calendar days after the close of the calendar month, canvasses 3,363 retailers a month. Approximately 36% report by FAX, 49% by CATI, and 15% by mail. This year the Survey of Construction program, which produces estimates for Housing Starts, New Single-Family Houses Sold, and Housing Completions was converted entirely from paper-based personal interviews to computer-based personal interviews (CAPI) residing on laptop computers. Also, the sampling of building permits in some 800+ permit issuing office was automated along with the collection of data associated with the start of construction, characteristics of the building, and information related to completion and sales. The sampling of building permits in some 19,000 permit issuing places also was automated along with the collection of data associated with the start of construction, characteristics of the building, and information related to completion and sale. In our monthly Manufacturers Shipments, Inventories, and Orders Survey, known as the M3, we have implemented computerized self-interviewing systems which permit companies to enter information using Touchtone Data Entry any time day or night. Currently, 1,200 companies use TDE monthly. We also have introduced fax reporting in a number of our current surveys and have almost 1,000 companies reporting via fax each month in the M3. During the government shutdown from mid- December 1996 to mid-January 1997 many companies continued to report data by TDE and fax even though government offices were closed.

19.   The foreign trade statistics program has been especially innovative in automating reporting by importers, exporters, and freight forwarders. For example, the Automated Broker Interface (ABI), a joint cooperative effort of the U.S. Customs Service and the Census Bureau, has automated the collection of information on imports into the U.S. In 1996, 23,500,000 of the 24 million import transactions were reported electronically. The Census Bureau developed and promoted the Automated Export Reporting Program (AERP) in the late 1980's and early 1990's. Under this program, information can be reported on tape, diskette, or by modem. By 1996, over 300 major exporters, freight forwarders, or carriers report data electronically for 500,000 export transactions, about 30% of the monthly total.

Organizational Responsibilities for Electronic Reporting

20.   Currently, responsibilities related to electronic reporting and automated data collection are shared among several Census Bureau organizations. Overall coordination of survey modernization and automation, including electronic reporting is the responsibility of the Computer Assisted Survey Research Office (CASRO). In terms of electronic reporting, CASRO insures that electronic reporting initiatives are consistent with corporate automation plans and strategic goals, conducts research related to new methods and procedures, and responds to issues and problems raised by the program directorates. Actual implementation of electronic reporting initiatives remains with the program divisions. In the case of the Economic Directorate, Foreign Trade Division and Governments Division have responsibility for electronic reporting implementation in their respective divisions, while the Economic Planning and Coordination Division is responsible for coordinating and implementing electronic reporting in the three other subject matter divisions: Services, Company Statistics, and Manufacturing and Construction. Within EPCD, we established an electronic --

+reporting branch which manages reporting by magnetic tape, CSAQ, and EDI for the economic census and most current economic surveys.

NEW AND FUTURE ELECTRONIC REPORTING INITIATIVES

21.   Our experiences over the past five years have shaped our future strategic plans and priorities regarding electronic reporting. In brief, our focus will be on developing instruments that provide businesses with functionality that facilitate and ease their reporting requirements. We believe enhanced importing capabilities that make it easier for businesses to link to their internal databases is the key to rapidly expanding electronic reporting and truly reducing reporting burden. For most of our surveys, development of improved CSAQ instruments will be a priority, though we also will initiate several Internet data collections and related research.

22.   In terms of our strategic priorities we will continue to focus on those surveys that impose the heaviest burden on businesses. This approach makes optimal use of our limited electronic reporting resources while maximizing the tangible benefits accruing to business. The following sections will describe our electronic reporting initiatives related to the 1997 Census of Retail Trade, the Annual Survey of Manufactures, the Company Organization Survey and the Quarterly Financial Reports program. We also will briefly describe some planned Internet activities related to electronic data collection.

1997 Economic Census

23.   Electronic reporting initiatives for the 1997 Economic Census, like previous censuses, will focus primarily on large retail, food service, and hotel chain enterprises. Over a year ago we contracted with Fenestra Technologies Corporation to develop an enhanced Windows-based CSAQ to facilitate electronic reporting in the 1997 Economic Census. Benefitting from our experiences with the COS and ASM CSAQs, we established challenging requirements. The Economic Census CSAQ must be able to: handle reporting for multiple establishments within an enterprise, cover reporting for 21 different report forms with content varying by form, handle a variable number of data items within a form, and perform selected interactive editing. Additional requirements included: the ability for the enterprise to export and manipulate information provided by the Census Bureau, such as establishment identifier, name, address, report form; multiple import capabilities that provide the enterprise or an establishment within an enterprise the capability of linking to internal corporate spreadsheets and databases; and self-contained communication software that would permit modem transmission of the census data. The software does not provide the capability of spawning the CSAQ instrument to other establishments within the company, though the export feature can be used to distribute census provided information within the enterprise. Most retailers plan to use the import feature and did not identify spawning as a high priority.

24.   Fenestra has designed a simple survey exchange format based on a concept familiar to Microsoft Windows programmers: the initialization settings file, also known as the "Ini" file. Ini files offer a powerful and flexible way to model irregular document-based data, making the format ideal for survey data sets. The Ini files have a simple structure composed of three tokens: Keys, Values, and Sections.

●   Keys and Values appear together on the same line in the Ini file, separated by an equals sign ("="). For example,   <Key>=<Value><crlf>

Where <Key> is an identifier, <Value> is the actual Key's actual data value and <crlf> is the carriage return and line feed that terminates the Key-Value pair. For example, Name=Big Corporation where "Name" is the Key identifier and "Big Corporation" is the Value.

- Sections are made up of Key-Value Pairs. Sections appear alone on a line and are denoted with brackets, like this: [<Section>]<crlf> where <Section> is an identifier. An example of a Section with one Key-Value Pair:

    [Company Info]
    Name=Big Corporation

- Key-Value Pairs are associated with the Section which precedes them in the Ini file. Key identifiers must be unique within a Section and Section identifiers must be unique within an Ini file.

- The data structure allows each Value to be unambiguously located within the Ini file. Taken together, the Section and Key represent a globally unique primary key for a particular value: no two values have the same Section and Key. Consequently, the order of Sections within an Ini file is insignificant, and the order of Keys within a Section also is insignificant.

- The survey exchange format also enforces the following guidelines:
    Every Survey Exchange Format files must contain a "Formatinfo" section containing two mandatory Keys identifying the survey and the version of the software
    Key-Value Pairs must not appear before the first Section
    Each Key must have an associated Value
    Sections and Keys are optional by default, though they may be mandatory or conditional per the Survey Definition Document
    Each Section must have at least one Key-Value Pair
    For readability, each Section must be followed by one blank line <crlf>

- Since Ini files treat all Values as strings, the Survey Exchange Format defines a number of specific data types including five fundamental types (Boolean, Date, String, Integer, and Real) and sub-types (such as StateCode, Phone, Percent, etc.) to more precisely model data elements. This strongly structured typing of the Values permits extensive syntactical validation of imported response data.

25. A separate Survey Definition document defines the Survey Exchange Format for a specific survey. The Survey Definition includes information on permissible Sections, permissible Keys, Section and Key requirements (mandatory, optional, or conditional), Key Data Types and Properties, and Code Sets used to verify code-type values. The Formatinfo section in the Survey Exchange Format links the format file to the appropriate Survey Definition document, providing all the information needed for editing. Copies of the Survey Exchange Format and the Survey Definition document are available upon request.

26. The survey exchange format and the related survey definition document provide a structured approach for importing data from internal corporate databases. Retailers have embraced this approach because Windows-based programmers are available and the application is straightforward. Another unexpected benefit of this approach is that it makes it relatively easy for us to permit companies to file data electronically for additional report

forms not included in the CSAQ. For example, many large retailers have asked to file data for their auxiliary establishments electronically. We plan to develop a survey definition document for the auxiliary form and companies will be able to transmit auxiliary data using the survey exchange format even though the auxiliary form is not included in the CSAQ.

27. In June 1997, we began testing the economic census CSAQ instrument with a number of large retailers and the response has been extremely positive. Currently, we have commitments from 500 of the largest companies to use the CSAQ instrument for reporting data in the 1997 Economic Census. We expect these companies to file data on over 200,000 different locations.

28. Besides developing an improved CSAQ instrument for the census, we also have invested significant resources in upgrading the processing infrastructure that supports electronic reporting. This is a vital step that is sometimes overlooked. In contrast to prior censuses, we can accept electronic reporting commitments even after census mailout because we have completely re-engineered the mailout processing system. In previous censuses, our mailout processing system was designed to handle the distribution of paper report forms to enterprise headquarters. Special mailing arrangements requested by the enterprise or electronic reporting arrangements required customized programming. Our new system has completely automated this process and parameter files can be easily modified so we can be completely responsive to special handling requests or easily add new electronic reporters. In addition, our two new Rimage disk duplicating systems permit us to generate all of the Economic Census CSAQ disks within a couple days. These systems not only mass produce diskettes with individualized prelisted data and the CSAQ software, they also can "read" and check-in returned disks and organize their data on our server.

1998 Company Organization Survey and 1998 Annual Survey of Manufactures

29. In September of 1997, we contracted with Fenestra Technology Corporation to develop enhanced CSAQ instruments for the ASM and the COS, the number two and three surveys in terms of business reporting burden. Current CSAQ instruments being used in these surveys are DOS-based and provide limited export and spawning capabilities, but do not provide enhanced import features. The redesigned CSAQ's will incorporate all the functionality included in the 1997 Economic Census CSAQ plus new features that may be identified during economic census data collection. While we have been relatively aggressive in promoting CSAQ reporting in the COS (472 companies in the 1996 COS), we have been far less aggressive with the ASM (45 CSAQ reporters in the 1996 ASM). For the 1998 ASM we plan to aggressively market CSAQ reporting and with the added functionality should be able to at least triple the number of CSAQ reporters in the ASM. Successful implementation in the 1998 ASM will also serve as a bridge to offering electronic reporting for the 2002 Census of Manufactures.

30. The redesign of the COS CSAQ also provides the unique opportunity to work with our colleagues at the Bureau of Labor Statistics to determine whether we can develop an instrument jointly that could significantly reduce reporting burden on some of the largest companies. Currently, the BLS Multiple Worksite Survey covers multi-location enterprises with more than 10 employees and collects employment and payroll data for each of their locations every quarter. The Census Bureau annual COS collects almost identical information from large enterprises. A redesigned CSAQ instrument could potentially satisfy both agencies reporting requirements. Companies could file quarterly, transmitting data to both BLS and Census; Census, in

turn, would excuse them from filing in the annual COS. BLS and Census already have a MOU in place that permits us to compare enterprises and their affiliated establishments as identified on each business register and we will be working with each other over the upcoming months to explore this collaborative effort.

Quarterly Financial Report (QFR)

31. During the coming year we also plan to begin designing an electronic reporting instrument for use in the QFR program, the fifth largest survey in terms of reporting burden and a program under some Congressional scrutiny related to burden. Quarterly the QFR collects income statement and balance sheet information (covering only domestic operations) from approximately 10,000 enterprises. Currently, the data are collected on paper report forms, with about 50% of the questionnaires returned by fax.

32. In October 1997, we will contact all enterprises with assets greater than $250 million (certainty cases) to determine their interest in electronic reporting. We will describe the functionality we can provide and expect significant interest among these companies. Most QFR companies have to derive income and balance sheet data from numerous internal databases so software that includes enhanced importing capabilities should be extremely valuable. Under the present reporting system, almost every report form is reviewed by an accountant and errors are common. Development of a CSAQ instrument permits us to build in interactive edits making it possible to identify possible reporting problems at the data source, eliminating the need for additional follow up while also improving data quality.

Internet Initiatives

33. The Internet's tremendous growth and popularity, low cost, expanding functionality, and incredible versatility make it an attractive option for electronic data collection. Census Bureau Internet initiatives, however, have been modest and deliberate. Over the next year, we will be expending significantly more resources on Internet related research, will conduct several Internet collections, and begin designing a processing system that can deliver an instrument with CSAQ-like functionality over the Internet. We also will begin exploring the feasibility of exploiting the Internet/Intranet technology in our monthly retail trade program. While it is far too early to make predictions, it may turn out that the real benefit of the Internet may not be so much the ability to deliver an instrument quickly, though this could be very important for a monthly survey, but rather the capability of establishing real time communication links with our business respondents.

34. Our Computer Assisted Survey Research Office (CASRO) has responsibility for coordinating all Internet data collections, identifying critical issues associated with Internet collection, and finding satisfactory solutions to perceived or real problems. In 1997 CASRO designed and conducted a pilot test of Internet reporting with our annual Research and Development survey. Fifty companies agreed to report data via the Internet. The instrument was developed for the R&D short form so editing requirements were minimized, nonetheless the instrument written in JAVA script and HTML did contain some interactive edits and performed well. Data were encrypted and enterprises raised minimal concerns regarding security.

35. Nonetheless, we are concerned about Internet security and confidentiality. While we are confident that we can provide a secure and confidential reporting environment, we know little of enterprises concerns

and attitudes regarding Internet reporting. During this upcoming year, CASRO will lead research efforts aimed at quantifying business concerns regarding Internet reporting and ensure we have not overlooked any special requirements or features. Assuming a sample of COS enterprises express interest in testing Internet reporting capabilities, CASRO will lead an inter-divisional team that will identify the functional requirements associated with offering Internet reporting in the Company Organization Survey. We selected the COS because the requirements are demanding, companies have been receptive to electronic reporting, and we will be introducing an enhanced CSAQ vehicle in the 1998 COS. An instrument will be designed specifically for the Internet to take full advantage of Internet functionality and maximize performance. Implementation of a COS instrument designed specifically for the Internet will permit us to test its functionality and business acceptance relative to the COS CSAQ. Currently, we are uncertain whether we can develop an Internet application with identical functionality, performance, and acceptance of the CSAQ instrument; this test will help answer that question. The test also will permit us to compare software development time and costs for an Internet and CSAQ instrument.

36. In parallel with the development of a pure Internet application, our Electronic Reporting Branch will develop the requirements associated with delivering a COS CSAQ instrument via the Internet. We will contract with the same firm that developed our 1997 Economic Census CSAQ. Our interest in this initiative is probably obvious, we want to avoid having to develop separate software for CSAQ and Internet instruments, if possible. If we can deliver a CSAQ instrument efficiently via the Internet we will reduce our application development, testing, support, and maintenance costs significantly.

37. We also plan to begin exploring the possible use of the Internet in our monthly retail sales program. The Monthly Advanced Retail Trade Survey (MARTS) is a principal economic indicator, which collects sales and inventories data from 3,363 enterprises each month. Advanced estimates of retail sales are released nine working days after the close of the month. Currently, 36% of the responses are by FAX, 49% by telephone, and the remainder by mail. Given the tight processing deadlines, Internet collection is an attractive option. The sales and inventories data, of course, are very sensitive, especially given their currency, so security is a major concern. Besides MARTS, we also conduct a monthly Retail Trade Survey that collects sales and inventories data from an additional 11,000 enterprises each month with results released 6 weeks after the close of the reference month. In this survey, 21% of the cases report by FAX, 36% by telephone follow-up, and 43% by report form. As described earlier we are offering large retailers much improved electronic reporting capabilities in the 1997 Economic Census and we plan to use our census contacts to open discussions regarding their interest in reporting monthly sales numbers through the Internet.

38. The monthly retail sales program uses multiple collection modes including FAX, telephone, and mailout/mailback. Within the next two years we need to replace our aging CATI instrument. We can convert this application to CASES, which is not forms-based, write our own system which is not feasible given programming shortages, or reengineer the entire retail sales data collection system in an Intranet/Internet environment. While our thinking is only in its earliest stage, we are toying with the concept of forms-based software residing on the Census Bureau's Intranet that could provide paper report forms through links to our new Docuprint electronic printing technology (the technology marries an electronic version of the form with name/address and other control information), provide our telephone unit in Jeffersonville with a forms-based CATI-type instrument for telephone

collection, and permit automated collection through the Internet. Much work remains to be done related to establishing requirements and identifying issues that need to be addressed, but we are beginning to think of ways to incorporate the power of the Internet into our internal processes.

Lessons Learned

39.   As we look towards the future we must keep in mind the lessons we have learned over the past five years.

- Reducing business reporting burden is critical to the future well-being of our current economic statistics programs; we can not take the continued cooperation of the business community for granted. The Census Bureau must be perceived as being proactive in reducing business reporting burden. This requires that we publicize burden reducing efforts, including electronic reporting.

- We need to market and sell electronic reporting. The key to successful marketing is focusing on the benefits that will accrue to the company. If the business community can assist in the marketing effort, the message is even more credible.

- The intelligent application of technology is an important tool in facilitating reporting and reducing reporting burden; however, the focus should be on programmatic objectives and benefits, not the technology. All too often we become enamored of technology and sometimes apply it indiscriminately.

- Focus electronic reporting initiatives on the programs which impose the greatest reporting burden on large enterprises. It is much easier for the accounting department in a large enterprise to make the business case for electronic reporting if they are reporting data for hundreds and possibly thousands of establishments, rather than only for a handful. This approach also makes optimal use of scarce agency resources by getting the "biggest bang for the buck".

- We have not been able to convince businesses to adopt EDI reporting standards. While we have a EDI transaction set, it is not widely enough used to generate much software development. Consequently, enterprises must develop the EDI software themselves or contract for software development. EDI reporting requires the enterprise to redirect corporate EDI resources to statistical reporting and generally the accounting department can not make the business case for this reallocation of valuable resources.

- A generic, structured approach for organizing and formatting data is critical for a robust electronic reporting program. While we have had little success with strict EDI reporting, we have adopted a very EDI-like data format, based on Windows-based programming concepts. Our Survey Exchange Format and the associated Survey Definition document are described in paragraphs 24 and 25.

- CSAQ is becoming the preferred electronic reporting instrument of large companies. CSAQ implementation requires minimal corporate programming resources, provides value added software features, and is easy to implement.

- Electronic reporting software must provide enterprises with features and functionality they currently do not have. This approach minimizes the corporate investment in programming resources while also providing the company with tangible benefits.

- Contract out the software development and system design to take advantage of private sector expertise. Our contractors have expertise that we do not have in-house and are better able to keep current with changing technology; this approach also permits our small electronic reporting staff to concentrate on promotion and implementation activities.

- The Internet offers tremendous possibilities for facilitating electronic data collection. Our experience using the Internet to collect shipper's export declarations has been encouraging and a small scale test involving 50 companies in our annual Research and Development Survey also been promising. However, there is a long list of issues we need to research before we significantly expand collection using the Internet.

CONCLUSION

40. The lessons learned over the past five years have reshaped our strategic plans and priorities regarding electronic reporting. We will focus on those surveys that impose the heaviest burden on the business community and will increase our efforts to deliver instruments with ever more powerful functionality. Table 2 below compares the four electronic reporting options we offer and compares the functionality associated with each.

TABLE 2

ELECTRONIC REPORTING OPTIONS AND FUNCTIONALITY

Functionality	Tape	EDI	CSAQ	Internet
Software provided by collection agency	No	No	Yes	Yes
On-line data entry	No	No	Yes	Yes
Automated question flow	No	No	Yes	Yes
Interactive editing	No	No	Yes	Yes
On-line help	No	No	Yes	Yes
Importing capability	No	No	Yes	Yes, if download
Exporting capability	No	No	Yes	Yes, if download
Communication/transmission capability	No	Yes	Yes	Yes

41. We believe that presently the CSAQ instrument with export and import functionality offers the best value to both the enterprise and the Census Bureau. The ability to provide software that permits enterprises to link easily to internal corporate databases is the key to real reductions in reporting burden and a significant expansion in our electronic reporting

program. Marketing this feature and enhancing the importing functionality
will be a top priority for the next year. Finally, we can not afford to
ignore the capabilities and potential of the Internet. If the Internet can
effectively deliver fully functional software in a secure environment it
could significantly change the way we collect and process data. We recognize
the power of the Internet but will expend significant resources determining
whether we can design software that would permit us to deliver a fully
functional CSAQ via the Internet. If successful we could develop an
instrument once, but deliver the software by disk, modem, or the Internet.
This approach minimizes development, testing, support, and implementation
costs. We also will be expending significant resources on Internet related
research, we plan to initiate several smaller scale Internet data
collections, and we will be monitoring other agencies experiences.