

NEW DATA COLLECTIONS USING TOUCHTONE DATA ENTRY

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1. INTRODUCTION

Two programs at the Bureau of Labor Statistics (BLS) have recently introduced Touchtone Data Entry (TDE) into their data collection processes. Developed at BLS in the mid-1980s, TDE is currently used in large-scale collection of monthly data by one BLS survey. The two programs now implementing TDE are the Job Openings and Labor Turnover Survey (JOLTS) and the Annual Refiling Survey (ARS) component of the ES-202 Covered Employment and Wages program.

JOLTS is a new BLS survey that began publication in July 2002. The survey measures job openings, hires, and separations in private and government establishments in the United States. The JOLTS survey compiles data on a monthly basis from non-farm businesses using a sample of 16,000 establishments. This long-needed indicator has been developed to guide economic policy-makers in deciding national economic issues, and to measure U.S. labor demand, parallel to the unemployment rate (also a BLS product).

JOLTS data are collected at a BLS data collection center located in Atlanta, Georgia. The JOLTS program began collecting data in April 2000 using Computer Assisted Telephone Interviewing (CATI) procedures. Interviewers enroll units and collect data from the respondents each month. After reporting via CATI for six months, units are given the option to report data via facsimile (fax). In addition, beginning in early 2001, units are also given the option of reporting data via touchtone. Touchtone Data Entry, or TDE, as it is popularly known, became operational in the JOLTS program in February 2001.

During JOLTS TDE development, each testing stage was accompanied by a respondent contact procedure assessing critical features such as the length of the interview, the ease of use of the system, and the respondent's preferences versus the existing process. Recontact interviews were especially useful in the first usability tests of use of TDE when there was

little proven path for this automated self-reporting methodology. This usability testing and interviewing approach provided assurances that respondents would be willing and able to use the system.

The Annual Refiling Survey (ARS) component of the ES-202 Covered Employment and Wages program also introduced touchtone into the data collection process. Rather than monthly contact as in JOLTS, units in the ARS survey are contacted only once every three years. Respondents are asked to review and/or update industrial classification information for their establishment.

In 1995, BLS conducted a small pilot test of touchtone in the ARS in three test states: Nebraska, Pennsylvania, and Virginia. In this test, respondents with no changes to the data on their ARS forms could convey that fact with a simple phone call, rather than mailing back the completed form. The touchtone system required respondents to identify themselves to the system, and to answer a yes or no question. While the test focused on technical aspects of the system, overall results were inconclusive. The pilot test was discontinued two years later, in 1997, when the ARS form was redesigned for the conversion of BLS industry codes from the Standard Industrial Classification (SIC) system to the North American Industry Classification System (NAICS). The TDE system in the short run did not lend itself to the conversion to NAICS. Redesigning the touchtone system to work with the new form was not considered economically feasible; therefore the ARS survey was returned to all mail collection.

When the NAICS implementation was complete, BLS decided to restart touchtone data collection for the Annual Refiling Survey. The new "Touchtone Response System" (TRS) was pilot-tested in five states in fiscal year 2002. With respect to hardware and infrastructure, this system is similar to the one used for the JOLTS survey. The new TRS system was integrated with the mailed questionnaire design in ways that previously had not been possible. As in earlier tests, the goal of TRS was for respondents with no changes to make one phone call and notify the system that their data were correct. In the pilot test, touchtone was offered only to establishments that BLS deemed eligible to respond via touchtone.

The test used newly developed respondent materials, and included a systematic study of the effects of different mailing packets on touchtone response rates. The different packets included a flyer with instructions on how to use TRS, a touchtone-specific letter, a combination of flyer or letter, or merely advising the respondent of the availability of touchtone on the questionnaire.

2. WHAT IS TOUCHTONE DATA ENTRY?

Implemented at BLS in the mid- 1980s, Touchtone Data Entry has been in use by the Current Employment Statistics (CES) survey for 16 years. The CES program uses TDE in large-scale collection of approximately 400,000 units each month. The success and efficiency of TDE in the CES program made it an easy decision to apply this same technology to the new JOLTS survey. Then, with electronic data collection techniques gaining favor with survey management, the ES-202's ARS program considered it a logical step to offer touchtone reporting to the States. (The ES-202 program is a Federal-State cooperative in which the states collect data for their establishments and submit the data to the National Office.

"TDE" refers to the system that provides users the convenience of picking up a touchtone phone and calling a toll-free number to access the system any time of the day or night, seven days a week. The call activates an interview session. The questionnaire resides on a computer in the form of pre-recorded questions that are read to the respondent. Once they identify themselves to the system by entering their appropriate "Respondent ID," the system verifies their ID number against a database of valid IDs. The respondents enter numeric responses by pressing touchtone phone buttons. Each answer is then read back for respondent verification. Upon verification, both systems (JOLTS and ARS) ask the caller to respond to a number of questions. Upon answering all applicable questions, the respondent simply hangs up. JOLTS respondents call TDE to report data each month; no further action is required of them. The ARS callers are divided into two categories: those who respond 'yes' to each question, and those who respond 'no' to one or more questions. The second category of callers (those answering 'no' to any question) are asked to mail in their completed Annual Refiling Survey form.

3. ADVANTAGES OF TDE

TDE is intended to reduce data collection costs; it is a cost-effective alternative to mail and CATI-based

collection methods. Rising labor costs and postal rates, and declining telephone and technology costs offer incentives to redesign collection processes.

The concept of automated systems for gathering data is not new. Institutions such as financial services, polling firms, airlines, and utilities, are moving toward robust implementations of touchtone-based services for their clientele. The IRS even provides touchtone tax filing for certain eligible taxpayers. As mentioned earlier, though even the CES program has been collecting data through touchtone for many years, automated data collection gained popularity only recently. JOLTS and ARS are only the beginning — there are other BLS programs that also may benefit from the use of touchtone collection.

It is quite true that the start-up costs for implementing a TDE system are relatively high. The cost of hardware, software, communications infrastructure, reliable backups, and labor must be borne, but the operational cost over the life of the system is marginal. The savings realized by process automation alone may justify the adoption of a touchtone system. These savings are in terms of cost as well as efficiency and accuracy.

For the federal government, the savings are particularly high. With the U.S. Postal Service having to quarantine mail addressed to government facilities, touchtone reduced both the data collection time and the quantity of mail handled by government agencies. Waiting for re-delivery of quarantined mail created a dilemma for both the sender and recipient. Also, because the government pays postage for survey forms mailed back by respondents, the cost savings is substantial.

4. HOW DOES TDE WORK?

In the most elementary terms, TDE is the utilization of a touchtone telephone to enter data. As outlined above, the Touchtone Data Entry system works similarly in both surveys (JOLTS and ARS). Making a TDE system operational requires a server computer programmed to accept calls. The server is fitted with a multi-channel voice board. Voice boards are available commercially with a broad selection. Several different types of boards may be found on the market, varying in their degrees of functionality. Some boards accept only voice calls while others accept faxes in addition to voice. Still others provide more options.

The JOLTS and ARS surveys use voice boards that accept voice only. Voice boards are connected to a

Windows NT server at one end and to a T-1 line at the other. Each T-1 line is capable of handling up to 24 calls at a time. The T-1 line is associated with a toll-free number provided to respondents. When a call is placed, it goes through the T-1 line to the TDE voice board in analog form (phone companies provide only analog signals). This is where the voice board does its work. Since a computer only understands a digital language (zeros and ones), the voice board converts the analog signal coming through the phone lines into a digital signal the computer can interpret. The computer can then record the transmitted data in a file that can later be accessed by authorized individuals.

a) How does TDE work in JOLTS?

In the JOLTS survey, respondents dial the toll-free number to access the TDE system. After the call goes through, it is “answered” by the initial voice prompt on a JOLTS TDE server located in Atlanta. This initial prompt is the welcome prompt and is followed by a prompt asking the respondent to enter their unique reporting ID number. Once the caller has been positively identified, the system asks him to enter the month that he plans to report data for. Respondents are allowed to call in data through the touchtone system for the three most-recent months. Upon confirmation of a valid month, the caller is prompted for six different JOLTS data elements: employment, job openings, hires, quits, layoffs and discharges, and other separations. Utilizing the power of computers, a flag can be set to prompt some callers for a total separations count rather than for quits, layoff and discharges, and other separations if that is how the respondent reported during CATI collection. Limited editing is also possible under this method; however, JOLTS currently edits the data post-collection and on interviewer follow-up calls for edit reconciliation. After responding to the six data element prompts, the caller is asked to validate their contact information (name, address, phone number).

The TDE system prompts the caller to update the contact phone number if it has changed. The system also asks if the contact person or address has changed. A “yes” reply results in a callback from an interviewer in the data collection center to gather the new information. After checking contact information, the caller is directed to the concluding prompt. This final prompt provides them two choices: hang up if the respondent has provided all the information, or enter additional data (such as data for another unit or data for another month for the same unit).

Not all units report all data elements. A respondent may skip a data element by pressing a designated

key. A caller also may hang up at any time. If they hang up before reaching the concluding prompt, all entered data is recorded in the data file along with an indication of a hang-up.

The JOLTS TDE data file collects management information required to analyze call patterns and reported data. The file contains the caller’s reporting number, the month for which the data are provided, the data values, and the updated contact information. In addition, the file also logs the date of the call, as well as the call start and end times.

b) How does TDE work in ARS?

The ARS TRS system uses infrastructure similar to the JOLTS TDE system. ARS callers are asked to call a toll-free number (different than the JOLTS toll-free number) to access the system. Upon receipt of the call, the welcome prompt leads the caller to enter their State code. This is a 2-digit code assigned to each State by BLS. This code is pre-printed on the ARS survey form in the same area as the toll-free number. Once the system identifies the State code, the caller is instructed to enter their unique identification number. The system attempts to validate this number along with the State code.

In the ARS survey, it is possible to have two or more states with matching identification numbers. This is roughly analogous to an instance of identical 7-digit telephone numbers, but each number having a different area code. Upon receiving the 2-digit State code and the identification number, the system verifies that the identification number is valid for the indicated State. If the State code and identification number match is unsuccessful, the caller is directed to re-enter the information. If both the State code and the identification number match, the caller continues to the next prompt.

After verification of the caller’s identification number, the next prompt asks the respondent to answer a question with either a ‘yes’ or a ‘no’. If the answer is ‘no’, the caller is ineligible to use the TRS system and is instructed to mail back the completed survey form to the appropriate State agency. If the caller responds “yes”, they are directed to the next (and final) question. This second question also requires a ‘yes’ or ‘no’ answer. If the caller’s response to the second question is ‘no’, they are instructed to mail back the completed survey form. If they respond ‘yes’, a prompt notifies them that their record has been updated and asks them to retain the survey form for their files.

The ARS survey's TRS data file identifies all data calls by State code and identification number. The caller's response to both questions is recorded. In addition, the file also logs the date of the call, as well as the call start and end times.

c) What if a caller encounters a problem while using the touchtone system?

Human nature dictates that any deviation from the routine (such as a new data reporting system) is liable to cause surprises or problems. The new JOLTS and ARS touchtone systems are no different. All enrollees into these two systems are mailed instructional materials guiding them through the use of the system. However, from time to time, callers may (and do) run into difficulties while using the system. Both the JOLTS and ARS surveys have help-lines for those in need of assistance. The JOLTS help-line is connected to the data collection center in Atlanta. ARS survey respondents are directed to the state for which they are entering data.

In the event a caller needs to change any entered information, both systems provide three chances per data prompt to enter correct information. After the third try, the systems respond with a message to call the help-line.

In the event of a failure of any of the system resources (hardware, software, infrastructure, etc.), both the JOLTS and ARS TDE systems have contingency plans. If either system fails, all calls are routed to identical systems in Washington, D.C.

5. TDE ELIGIBILITY REQUIREMENTS

Not all participants in the JOLTS and ARS surveys are eligible to use the touchtone system. The JOLTS survey is relatively flexible as to who may call TDE and report data. To report by TDE, JOLTS respondents must meet the following eligibility criteria:

- ◆ A unit should have reported data by CATI for at least six months.
- ◆ A unit can be either a single establishment reporter (one respondent reporting for one unit only) or a multiple establishment reporter (one respondent reporting for more than one unit).

Although the number varies, nearly 3,000 JOLTS units are currently enrolled in TDE.

Similar to JOLTS, the Annual Refiling Survey's TRS respondents are enrolled in the touchtone system only if they meet established criteria. The TRS requirements are more stringent than in JOLTS.

- ◆ A unit (an employer within the State) must be a single, active unit. Multiple establishment units are not eligible.
- ◆ A unit must have a physical location address within the state of enrollment.
- ◆ Only private industry units are eligible for TRS. Government units are not eligible.
- ◆ A unit must have a NAICS code and a county code on file with BLS.
- ◆ In its first year of operation in 2001 (redesigned version), only those units that had previously responded to the ARS survey were eligible for participation in touchtone reporting. Beginning in 2002, the previous response requirement for TRS eligibility was waived.

BLS estimates that over one million units are eligible to report via TRS in fiscal year 2003.

6. THE FUTURE OF TDE

Automated systems such as TDE are here to stay. More and more data gathering programs are likely to adopt systems similar to TDE. Internet-based collection systems are gaining popularity; BLS is considering the implementation of secure Internet-based data collection techniques in the not-too-distant future.

In the context of BLS, these automatic data collection systems are extremely valuable because of the great quantity of data that must be collected and analyzed. From the respondents' perspective, they have busy lifestyles and demanding workloads, and they seek a quick, convenient, and secure alternative to providing data by mail or to a data collector who may call at an inconvenient time. The touchtone system affords respondents the convenience of calling at any time. Respondents are more willing and likely to provide data if the time and reporting method are convenient.

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TDE Network

