

APPLICANT PROFILE



GOVERNMENT OF THE
DISTRICT OF COLUMBIA

APPLICANT PROFILE

FY 2005 Homeland Security Grant Program: Urban Areas Security Initiative	
PROJECT TITLE:	Computer-Assisted Telephone Interviewing (CATI) Capacity
EMERGENCY SUPPORT FUNCTION:	R-ESF 8
PROJECT PERIOD:	3/1/05 to 8/1/06
PROJECT SYNOPSIS:	A regional requirements evaluation and inter-jurisdictional local health department pilot project is proposed to meet management demands of isolated and quarantined individuals and collection of epidemiologic data. The project would implement and pilot a CATI system between two NCR jurisdictions to model task force recommendations and test capacity achievement.
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Proposal Summary

A regional requirements evaluation and inter-jurisdictional local health department pilot project is proposed to meet the demands of management of isolated and quarantined individuals and collection of epidemiologic data.

Public Health emergencies that require isolation and/or quarantine of individuals or large-scale disease investigations would rapidly deplete existing human, telecommunications and technological resources for collection and management of data about affected persons. The Active Daily Surveillance system (ADS) put forward for such management during the SARS outbreak in Toronto required twice daily telephone calls to restricted persons, at one time totaling in excess of 18,000 calls in one day, for administration of a standardized data collection tool to determine whether illness has developed, compliance and threats to compliance. Similarly, interviewing all persons present in a region known to have been affected by an intentional release of a pathogen would overwhelm the existing resources for carrying out epidemiologic interviews using hard copy instruments and subsequent data entry efforts.

These kinds of data collection instruments require sophisticated administration with conditional branching and decision support for activation of specific modules depending on responses given during the previous and current calls. Additionally, it is necessary for the technology solution to provide process management support and on-the-fly summary reporting. In fact, the results of all preceding calls with a given individual will need to be considered so that appropriate questions will be automatically selected and tailored for that individual. Both out-calling and in-calling support will be required.

Development of such capacity in the NCR setting will require careful consideration of existing telecommunications and networking infrastructure in each individual jurisdiction. Policies for access to resources and sharing of information will need to be negotiated and formalized. Evaluation of the current equipment resources available for use of the system within each jurisdiction will be required. For these reasons, a task force must be convened to identify requirements. The task force will be guided by information technology consultants with substantial experience in automated support of interviewing efforts.

Development and implementation of a telecommunication solution to include Computer-Assisted Telephone Interviewing with an interactive-voice response (IVR) interface will allow public health officials to deploy large-scale telephone data collection efforts, with or without human interviewers as the situation requires. Such capacity will be critical not only to the successful management of isolation/quarantine orders but also in launching other large-scale data collection efforts, such as collection of epidemiologic interview data and contact ascertainment.

Standard CATI tools provide the following functionalities:

- Word processing application for creation of the data collection instrument.
- Initiate all calls and routes answered calls to available operators/interviewers.
- Simultaneous access to the instrument by multiple interviewers.
- Simultaneous use of multiple CATI projects.
- Automatically select the proper question sequence in conditional branching environments.
- Random selection of telephone numbers and facilitates the use of random digit dialing sampling when the situation requires that approach.
- Automatically record the disposition of all calling efforts and schedule call backs to unanswered or incomplete calls.
- Store data from interviews ready for statistical analysis by external or add-on software without need for additional data entry effort.
- Retrieve data from previous contacts and pre-populates instrument as required with caller- and call-specific information to tailor questions appropriately.

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- IVR interface would allow for operator-less collection of data for simple survey efforts and/or direct more complicated calls to operator.
- Guided probing when an inappropriate or vague response is given initially.
- Automatically keep track of any survey sample quota requirements.
- Monitor interviewer productivity to increase efficiency by summary or in real-time via supervisor monitoring stations.
- Track the disposition of every single telephone call made during the course of a study.
- Provide reports on the progress of the survey, including marginal tabulations from the data, at any time.
- Application resides on server that could be accessed for data analysis, monitoring from any networked work station.

The proposed project would implement and pilot a CATI system between two NCR jurisdictions to model the recommendations of the task force and test capacity achievement.

The NCR Health Departments of Alexandria, Arlington County, District of Columbia, Fairfax County, Loudoun County, Montgomery County, Prince George's County, and Prince William County will be afforded an opportunity to pilot the developed systems with local data.

Project Goals, Objectives and Implementation Steps

1. **Goal 1:** Form NCR CATI Task Force to facilitate requirements ascertainment *April 05 – July 05*
 - 1.1. Establish contractual relationship with telecommunications and information technology experts to staff Task Force
 - 1.1.1. Develop statement of work for contractual entities, to include facilitation of requirements gathering process, inventory of available resources in each jurisdiction and interoperability/security concerns, identification of required hardware, software and training.
 - 1.1.2. Identify appropriately skilled contractual entities; establish agreements
 - 1.2. Solicit Task Force appointments from all NCR jurisdictions
 - 1.3. Develop and support fulfillment of mission statement for Task Force
2. **Goal 2:** Evaluate possible commercial off-the shelf (COTS) and custom solutions *July 05 – Sept 05*
3. **Goal 3:** Implement pilot CATI system between two NCR jurisdictions *Sept 05 – Febr 06*
 - 3.1. Purchase and install hardware and software
 - 3.2. Identify and train users
 - 3.3. Test remote and local connectivity, security protections
4. **Goal 4:** Evaluate capacity achieved in the pilot *Febr 06 – June 06*
 - 4.1. Plan and execute cross-jurisdictional CATI deployment exercise
 - 4.1.1. Develop outbreak and isolation/quarantine scenario with cross-jurisdictional implications for deployment of the CATI system
 - 4.1.2. Evaluate system performance and adequacy
 - 4.1.3. Report
5. **Goal 5:** Produce recommendations for complete regional implementation *June 06 – July 06*

Organization, Experience, and Qualifications of Applicant

If funds are awarded for this proposal, Montgomery County agrees to serve as the sub-grantee and act as the procurement agent for materials and services to be shared with Alexandria, Arlington County, District of Columbia, Fairfax County, Loudoun County, Prince George’s County, and Prince William County as well as itself. Montgomery County has successfully executed prior UASI contracts for the National Capitol Region. Montgomery County proposes to retain and use 2.5 percent of the sub-grant award for local management and administrative costs.

Staffing Plan

Project management, system hosting – Montgomery County

NCR jurisdictions to provide in-kind support of staff for task force to include telecommunications, information technology and public health personnel.

One additional NCR jurisdiction to implement pilot to be determined within Task Force.

Requirements gathering, system plan, pilot implementation, exercise development and evaluation to be performed by contractual entities whose qualifications will be suitable for the work tasks.

Project Budget

Budget Category	Amount
A. Personnel	\$ -
B. Fringe Benefits	\$ -
C. Travel	\$ -
D. Equipment	\$ 200,000.00
E. Supplies	\$ -
F. Consultants/Contracts	\$ 190,000.00
G. Other	\$ -
Total Direct Costs	\$ 390,000.00
H. Indirect Costs	\$ 10,000.00
TOTAL PROJECT COSTS	\$ 400,000.00

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A. Personnel - List each position by title and name of employee, if available. Show the annual salary rate and the percentage of time to be devoted to the project. Compensation paid for employees engaged in grant activities must be consistent with that paid for similar work within the applicant organization.

Name/Position	Computation	Cost
<i>Total</i>		\$ -

B. Fringe Benefits - Fringe benefits should be based on actual known costs or an established formula. Fringe benefits are for the personnel listed in budget category (A) and only for the percentage of time devoted to the project. Fringe benefits on overtime hours are limited to FICA, Workman's Compensation, and Unemployment Compensation.

Name/Position	Computation	Cost
<i>Total</i>		\$ -

C. Travel - Itemize travel expenses of project personnel by purpose (e.g., staff to training, field interviews, advisory group meeting, etc.). Show the basis of computation (e.g., six people to 3-day training at \$X airfare, \$X lodging, \$X subsistence). In training projects, travel and meals for trainees should be listed separately. Show the number of trainees and unit costs involved. Identify the location of travel, if known. Indicate source of Travel Policies applied, Applicant or Federal Travel Regulations.

Purpose of Travel	Location	Cost
<i>Total</i>		\$ -

D. Equipment - List non-expendable items that are to be purchased. Non-expendable equipment is tangible property having a useful life of more than two years. (Note: Organization's own capitalization policy and threshold amount for classification of equipment may be used). Expendable items should be included either in the "Supplies" category or in the "Other" category. Applicants should analyze the cost benefits of purchasing versus leasing equipment, especially high cost items and those subject to rapid technical advances. Rented or leased equipment costs should be listed in the "Contractual" category. Explain how the equipment is necessary for the success of the project. Attach a narrative describing the procurement method to be used.

Item	Computation	Cost
TBD	Telecommunications & Data Server	\$ 175,000.00
TBD	Software Licenses	\$ 25,000.00
<i>Total</i>		\$ 200,000.00

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E. Supplies - List items by type (office supplies, postage, training materials, copying paper, and other expendable items such as books, hand held tape recorders) and show the basis for computation. (Note: Organization's own capitalization policy and threshold amount for classification of supplies may be used). Generally, supplies include any materials that are expendable or consumed during the course of the project.

Item	Computation	Cost
<i>Total</i>		\$ -

F. Consultants/Contracts - Indicate whether applicant's formal, written Procurement Policy or the Federal Acquisition Regulations are followed.

Consultant Fees: For each consultant enter the name, if known, service to be provided, hourly or daily fee (8-hour day), and estimated time on the project. Consultant fees in excess of \$450 per day require additional justification and prior approval from ODP.

Name of Consultant	Service Provided	Computation	Cost
TBD	Contractual Support		\$ 190,000.00
<i>subtotal</i>			\$ 190,000.00

Consultant Expenses: List all expenses to be paid from the grant to the individual consultant in addition to their fees (i.e., travel, meals, lodging, etc.)

Item	Location	Computation	Cost
<i>subtotal</i>			\$ -

Contracts: Provide a description of the product or services to be procured by contract and an estimate of the cost. Applicants are encouraged to promote free and open competition in awarding contracts. A separate justification must be provided for sole source contracts in excess of \$100,000.

Item	Cost	
<i>subtotal</i>		\$ -

G. Other Costs - List items (e.g., rent, reproduction, telephone, janitorial or security services, and investigative or confidential funds) by major type and the basis of the computation. For example, provide the square footage and the cost per square foot for rent, and provide a monthly rental cost and how many months to rent.

Description	Computation	Cost
<i>Total</i>		\$ -

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H. Indirect Costs - Indirect costs are allowed only if the applicant has a Federally approved indirect cost rate. A copy of the rate approval, (a fully executed, negotiated agreement), must be attached. If the applicant does not have an approved rate, one can be requested by contacting the applicant's cognizant Federal agency, which will review all documentation and approve a rate for the applicant organization, or if the applicant's accounting system permits, costs may be allocated in the direct costs categories.

Description	Computation	Cost
County Indirect M & A cost 2.5%	10,000.00	\$ 10,000.00
<i>Total</i>		\$ 10,000.00
A. through H.		TOTAL PROJECT COSTS \$ 400,000.00

**GOVERNMENT OF THE DISTRICT OF COLUMBIA
OFFICE OF THE DEPUTY MAYOR FOR PUBLIC SAFETY AND JUSTICE**

Certifications Regarding Lobbying; Debarment, Suspension and Other Responsibility Matters; and Drug-Free Workplace Requirements

Applicants should refer to the regulations cited below to determine the certification to which they are required to attest. Applicants should also review the instructions for certification included in the regulations before completing this form. Signature of this form provides for compliance with certification requirements under 28 CFR Part 69, "New Restrictions on Lobbying" and 28 CFR Part 67, "Government-wide Debarment and Suspension (Non-procurement) and Government-wide Requirements for Drug-Free Workplace (Grants)." The certifications shall be treated as a material representation of fact.

1. LOBBYING

As required by Section 1352, Title 31 of the U.S. Code. and implemented at 28 CFR Part 69, for persons entering into a grant or cooperative agreement over \$100,000, as defined at 28 CFR Part 69, The applicant certifies that:

- (a) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the making of any Federal grant, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal grant or cooperative agreement;
- (b) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal grant or cooperative agreement, the undersigned shall complete and submit Standard Form - III, "Disclosure of Lobbying Activities," in accordance with its instructions;
- (c) The undersigned shall require that the language of this certification be included in the award documents for all sub awards at all tiers including sub grants, contracts under grants and cooperative agreements, and subcontracts) and that all sub-recipients shall certify and disclose accordingly.

**2. DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS
(DIRECT RECIPIENT)**

As required by Executive Order 12549, Debarment and Suspension, and implemented at 28 CFR Part 67, for prospective participants in primary covered transactions, as defined at 28 CFR Part 67, Section 67.510—

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A. The applicant certifies that it and its principals:

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, sentenced to a denial of Federal benefits by a State or Federal court, or voluntarily excluded from covered transactions by any Federal department or agency;
- (b) Have not within a three-year period preceding this application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- (c.) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
- (d) Have not within a three-year period preceding this application had one or more public transactions (Federal, State, or local) terminated for cause or default; and

B. Where the applicant is unable to certify to any of the statements in this certification, he or she shall attach an explanation to this application.

3. DRUG-FREE WORKPLACE (GRANTEES OTHER THAN INDIVIDUALS)

As required by the Drug Free Workplace Act of 1988, and implemented at 28 CFR Part 67, Subpart F. for grantees, as defined at 28 CFR Part 67 Sections 67.615 and 67.620—

A. The applicant certifies that it will or will continue to provide a drug-free workplace by:

- (a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in The applicant's workplace and specifying the actions that will be taken against employees for violation of such prohibition;
- (b) Establishing an on-going drug-free awareness program to inform employees about—
 - (1) The dangers of drug abuse in the workplace;
 - (2) The applicant's policy of maintaining a drug-free workplace;
 - (3) Any available drug counseling, rehabilitation, and employee assistance programs; and
 - (4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

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- (c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);
 - (d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will—
 - (1) Abide by the terms of the statement; and
 - (2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;
 - (e) Notifying the agency, in writing, within 10 calendar days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title to: Office of Grants Management and Development, 717 14th St., NW, Suite 1200, Washington, DC 20005. Notice shall include the identification number(s) of each affected grant;
 - (f) Taking one of the following actions, within 30 calendar days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted—
 - (1) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
 - (2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;
 - (3) Making a good faith effort to continue to maintain a drug free workplace through implementation of paragraphs (a), (1), (c), (d), and (e). and (f)
- B. The applicant may insert in the space provided below the sites for the performance of work done in connection with the specific grant:
- Place of Performance (Street address, city, county, state, zip code)
- Dennis Avenue Health Center
2000 Dennis Avenue, Silver Spring, MD 20902
- Montgomery County Department of Homeland Security
101 Orchard Ridge Rd #250
Gaithersburg, MD 20878

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As the duly authorized representative of the applications, I hereby certify that the applicant will comply with the above certifications.

1. Grantee Name and Address:
Montgomery County Maryland
101 Monroe Street, Rockville, MD 20580

2. Application Number and/or Project Name: 8-D: Telecommunications/Computer-Assisted Telephone Interviewing (CATI) Capacity

3. Grantee IRS/Vendor Number: 30001253

4. Typed Name and Title of Authorized Representative: Scott Reilly, Assitstant Chief Administrative Officer

5. Signature

6. Date

**GOVERNMENT OF THE DISTRICT OF COLUMBIA
OFFICE OF THE DEPUTY MAYOR FOR PUBLIC SAFETY AND JUSTICE**

STANDARD ASSURANCES

The applicant hereby assures and certifies compliance with all Federal statutes, regulations, policies, guidelines and requirements, including OMB Circulars No. A-21, A-110, A-122, A-128, A-87; E.O. 12372 and Uniform Administrative Requirements for Grants and Cooperative Agreements - 28 CFR, Part 66, Common Rule, that govern the application, acceptance and use of Federal funds for this federally-assisted project.

Also, the Application assures and certifies that:

1. It possesses legal authority to apply for the grant; that a resolution, motion or similar action has been duly adopted or passed as an official act of The applicant's governing body, authorizing the filing of the application, including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of The applicant to act in connection with the application and to provide such additional information as may be required.
2. It will comply with requirements of the provisions of the Uniform Relocation Assistance and Real Property Acquisitions Act of 1970 P.L. 91-646 which provides for fair and equitable treatment of persons displaced as a result of Federal and federally-assisted programs.
3. It will comply with provisions of Federal law which limit certain political activities of employees of a State or local unit of government whose principal employment is in connection with an activity financed in whole or in part by Federal grants. (5 USC 1501, et. seq.).
4. It will comply with the minimum wage and maximum hour's provisions of the Federal Fair Labor Standards Act if applicable.
5. It will establish safeguards to prohibit employees from using their positions for a purpose that is or gives the appearance of being motivated by a desire for private gain for themselves or others, particularly those with whom they have family, business, or other ties.
6. It will give the sponsoring agency of the Comptroller General, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the grant.
7. It will comply with all requirements imposed by the Federal-sponsoring agency concerning special requirements of Law, program requirements, and other administrative requirements.
8. It will insure that the facilities under its ownership, lease or supervision which shall be utilized in the accomplishment of the project are not listed on the Environmental Protection Agency's (EPA), list of Violating Facilities and that it will notify the Federal grantor agency of the receipt of any communication from the Director of the EPA Office of Federal Activities indicating that a facility to be used in the project is under consideration for listing by the EPA.

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9. It will comply with the flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973, Public Law 93-234-, 87 Stat. 975, approved December 31, 1976. Section 102(a) requires, on and after March 2, 1975, the purchase of flood insurance in communities where such insurance is available as a condition for the receipt of any Federal financial assistance for construction or acquisition purposes for use in any area that has been identified by the Secretary of the Department of Housing and Urban Development as an area having special flood hazards. The phrase "Federal Financial Assistance" includes any form of loan, grant, guaranty, insurance payment, rebate, subsidy, disaster assistance loan or grant, or any other form of direct or indirect Federal assistance.
10. It will assist the Federal grantor agency in its compliance with Section 106 of the National Historic Preservation Act of 1966 as amended (16 USC 470), Executive Order 11593, and the Archeological and Historical Preservation Act of 1966 (16 USC 569a-1 et. seq.) By (a) consulting with the State Historic Preservation Officer on the conduct of investigations, as necessary, to identify properties listed in or eligible for inclusion in the National Register of Historic Places that are subject to adverse effects (see 36 CFR Part 800.8) by the activity, and notifying the Federal grantor agency of the existence of any such properties, and by (b) complying with all requirements established by the Federal grantor agency to avoid or mitigate adverse effects upon such properties.
11. It will comply, and assure the compliance of all its sub grantees and contractors, with the applicable provisions of Title I of the Omnibus Crime Control and Safe Streets Act of 1968, as amended, the Juvenile Justice and Delinquency Prevention Act, or the Victims of Crime Act, as appropriate; the provisions of the current edition of the Office of Justice Programs Financial and Administrative Guide for Grants; and all other applicable Federal laws, orders, circulars, or regulations.
12. It will comply with the provisions of 28 CFR applicable to grants and cooperative agreements including Part 18. Administrative Review Procedure; Part 20, Criminal Justice Information Systems; Part 22, Confidentiality of Identifiable Research and Statistical Information; Part 23, Criminal Intelligence Systems Operating Policies; Part 30, Intergovernmental Review of Department of Justice Programs and Activities; Part 42, Nondiscrimination/Equal Employment Opportunity Policies and Procedures; Part 61, Procedures for Implementing the National Environmental Policy Act; Part 63, Flood Plain Management and Wetland Protection Procedures; and Federal laws or regulations applicable to Federal Assistance Programs.
13. It will comply, and all its contractors will comply, with the non-discrimination requirements of the Omnibus Crime Control and Safe Streets Act of 1968, as amended, 42 USC 3789(d), or Victims of Crime Act (as appropriate); Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973, as amended; Subtitle A, Title II of the Americans with Disabilities Act (ADA) (1990); Title IX of the Education Amendments of 1972; the Age Discrimination Act of 1975; Department of Justice Non-Discrimination Regulations, 28 CFR Part 42, Subparts C, D, E and G; and Department of Justice regulations on disability discrimination, 28 CFR Part 35 and Part 39.
14. In the event a Federal or State court or Federal or State administrative agency makes a finding of discrimination after a due process hearing on the grounds of race, color, religion, national origin, sex, or disability against a recipient of funds, the recipient will forward a copy of the finding to the Office for Civil Rights, Office of Justice Programs.

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15. It will provide an Equal Employment Opportunity Program if required to maintain one, where the application is for \$500,000 or more.
16. It will comply with the provisions of the Coastal Barrier Resources Act (P.L 97-348), dated October 19, 1982, (16 USC 3501 et. seq.) which prohibits the expenditure of most new Federal funds within the units of the Coastal Barrier Resources System.

Scott Reilly
Print Name

Assistant Chief Administrative Officer
Print Title

Signature

Date

Appendix 1: Computer Assisted Telephone Interviewing (CATI)

(see following pages)

4. Computer Assisted Telephone Interviewing (CATI)

4.1 Overview

Traditional method of data collection

Household information is traditionally collected through the “canvasser method”, where field interviewers have to make door to door visits. The information is collected through face to face interviews and the answers are recorded on paper questionnaires.

The “canvasser method” means that transport costs and traveling time have to be incurred. These costs are further increased when field interviewers could not contact the selected household, and repeat visits have to be made. As the number of cases completed per man-day is low, large field forces are required for household surveys. In addition, a data entry team is required to translate the data collected from the field into electronic form.

Under mail collection, respondents return the form sometime after their data become available. Given the very short, two week collection period before the publication of preliminary estimates, any delay in completing the form, or returning it to the state has severe implications for response rates.

It is clear that a more productive approach is necessary for data collection in order to reduce manpower needs, lower costs and speed up the process of data collection. One of the methods in re-engineering the interview process is the Computer Assisted Telephone Interviewing (CATI) system

What is CATI?

Computer Assisted Telephone Interviewing (CATI) is an interactive front-end computer system that aids interviewers to ask questions over the telephone. The answers are then keyed into the computer system immediately by the interviewer. CATI is the oldest form of computer assisted interviewing. Originally CATI would be employed centrally using a minicomputer system. Each interviewer is sitting behind a terminal and asks the questions that appear on the screen. The respondent's answer is then typed into computer by the interviewer.

How CATI works

The interviewer initiates the interview sessions. The computer program controls branching to or skipping among questions, and validates the data as it is entered. The interviews are more personalized, probing questioning are standardized, use of historic data is standardized, and the questions can be more sophisticated than those on paper questionnaires. More complex questionnaire design is possible since the program controls branching and logic. CATI works particularly well in situations where a short implementation schedule exists.

CATI Application

CATI allows the interviewers to perform multiple tasks of interviewing, data entry and simple coding simultaneously. The interviewers key the information directly into the computer system. As a result, data entry as a separate process is no longer necessary. Most of the questions are in multiple-choice format, so that the CATI interviewer needs only to point and click on the right answer. The answer was then translated directly into a code by the CATI system and updated in the database

The application of CATI is usually considered to address timeliness and other quality problems. The computer assists by automatically controlling questionnaire branching, conducting on-line editing for reconciliation directly with respondent, scheduling future calls and capturing a variety of management information about the interview

System Overview

Basically, there are two servers to support the CATI Operation. The first server is the database server, it provides data and storage to the CATI workstation, such as the CATI assignment, the related master files, the log files, etc. The second server is the telephone server. This server is installed with special voice/ fax boards, its function is to manage the telephone line, such as dial out, hang up, voice record, telephone, etc. Many CATI workstations are normal LAN PCs. (See Figure 4.1)

Flexible Design

Since the uses of CATI are expected to be extended to several projects, the program design should be made as flexible as possible so the system can be applied to different surveys easily without any significant modification.

Automatic Branching of Questions

CATI houses what is effectively a smart electronic form. This form tailors the questions for each respondent in the household based on key information given by the respondent during the interview. For example, each respondent was asked the level of education attending and the field of study, the system then skipped questions on economic activity and prompted the interviewer to ask the question on transport mode to school. As a result of this automatic branching of questions, the interview time for each household was much shorter compared with the canvasser method.

On-line Verification Checks

The smart electronic form also performed on-line checks on the responses keyed in and alerted the interviewer of inconsistent or doubtful answers. The interviewer could then verify with the respondent on the spot, and correct any errors immediately. This reduced the inconvenience to respondents to verify their particulars at a later date, and improved the overall quality of data collected by CATI.

Automatic Scheduling and Dialing

The CATI system scheduled and dialed up households by an automated process. To dial a household, the interviewer need only click the dialing button on the screen (see Figure 4.2). The system then searched for the next household to call based on certain priority rules. If the call was not answered, the system automatically scheduled the household to another time. If the interview could not be completed, the system also allowed interviewers to re-schedule the appointment to a date and time favored by the household.

Supervising

Supervisors are needed for quality control and to assist with specific problems.

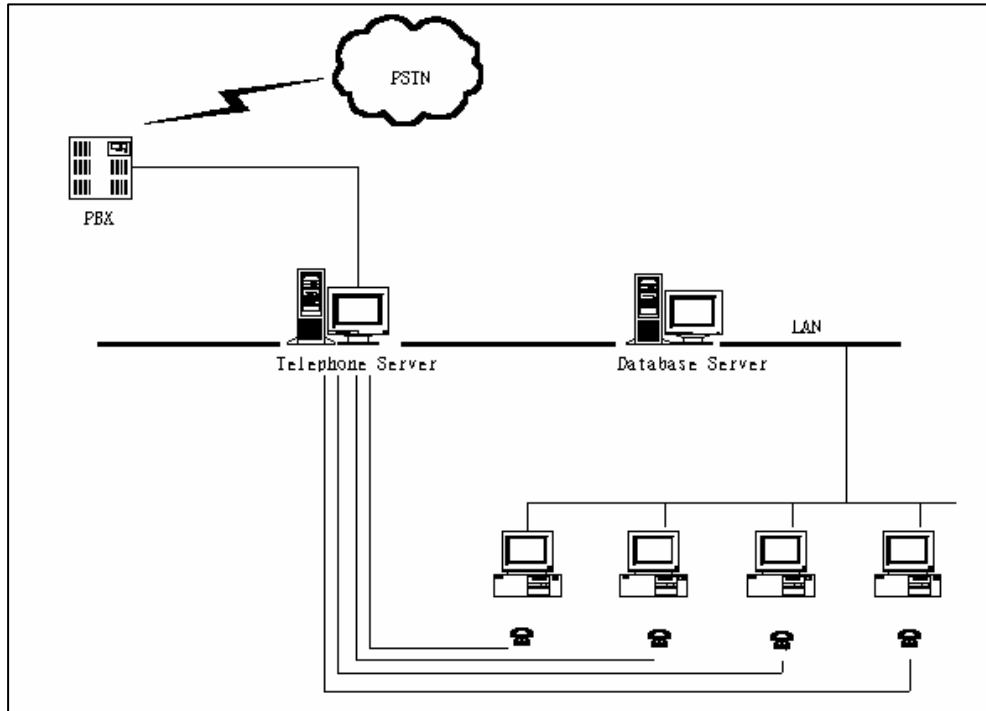


Figure 4.1. CATI System Diagram

4.2 System Requirement

Network Setup

A LAN needs to be set up to provide connectivity between the client PC's and the server. Aside from connectivity, this LAN also allows for the remote administration of tasks like software upgrades and inventory control.

Headsets and Phone Quest Cards

The Interviewers' PCs were not only installed with the CATI software, which enabled them to dial-out to respondents, but also equipped with headsets that enabled hands-free dialing. The interviewers could key-in responses from the interview into the system directly.

Supervisor PC setup

Supervisors could have full access to the CATI interviewers' system from their own PCs. They were also given a simple monitoring module that allowed them to look at various indicators relating to the usage of the CATI system. Their PCs were equipped to pick up any household records from the database to do random checking & verification.

Hotline PC setup

Hotline PCs were available for respondents to make appointments or reschedule their appointments. These hotline PCs could be used to conduct on-the-spot interviews if so requested by the respondents.

Administrative Information

The call-center system tracked administrative information, including the date & time of the interviews as well as the duration of every interview. The information was stored in a log file for generation of management statistics.

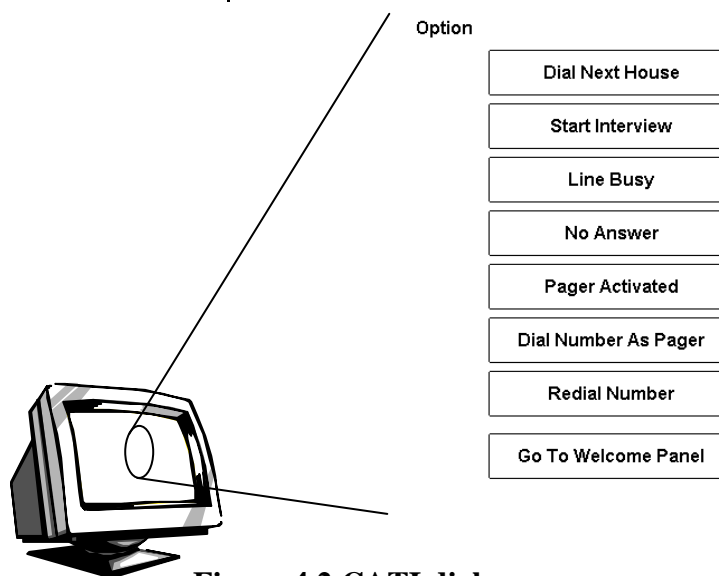


Figure 4.2 CATI dial up screen

4.3 CATI Operation

<i>Approach to respondents</i>	<p>Under conventional method, respondents return the form sometime after their data become available. Any delay in completing the form, or returning it to NSO has severe implications for response rates. Under CATI collection, respondents are called on a pre-arranged date, if possible, the same day as the firms' data available. The data are entered and edited during this call, and next month's call scheduled.</p> <p>The conversion of respondents from mail to CATI includes sending selected units a package of materials with information on the importance and uses of CATI and instructions on reporting by telephone</p>
<i>Dialing respondents</i>	<p>For households with listed telephone number, the date and time of the initial scheduled interview were according to that printed on the notification letter to them. Households with confidential telephone numbers were requested to dial specific number, probably a toll-free hotline number, for assistance on enumeration.</p> <p>The CATI system was programmed to assign the appropriate interviewer of each household. This reduced any language barriers between the respondent and the interviewer</p>
<i>Reporting system</i>	<p>Reports were printed at the end of each operation to highlight the number of records outstanding in the CATI system and the number of records that have been completed. The report helped supervisors in their workload allocation.</p>
<i>Quality issues</i>	<p>More complex questionnaire design is possible since the program controls branching and logic. CATI works particularly well in situations where a short implementation schedule exists</p>

4.4 Impact of CATI System

<i>Effect on the Respondent</i>	<p>The respondent will generally not notice whether a computer is used or not, therefore we may expect little if any difference between traditional telephone interviewing and CATI.</p>
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Effect on the Interviewer

Respondents may occasionally hear keyboard clicks, or be told by the interviewers that a computer issued. No systematic research has been done on the effects of this knowledge, but the general impression is that it makes no difference to respondents if they know that the answers are typed directly into a computer.

Greater standardization of interviewer behavior in CATI and it found that less interviewer variance in CATI. Acceptance of CATI strongly depends on the speed and reliability of CATI system that is employed. Because CATI system are fast and reliable, the interviewers prefer CATI to paper-and-pen methods. Supervisors also preferred CATI.

CATI leads to a greater standardization of the interview, to the extent that interviewers sometimes complain about 'rigidity'. In general, researchers will appreciate this greater standardization, because this minimizes interviewer bias.

Effect on Data Quality

CATI leads to less missing data because it prevents routing errors, especially in complex questionnaires. In addition, experiences show that more errors found with paper-and-pen methods than with CATI. But, there is no difference in respondent induced missing data because respondents do not know or do not answer.

Effect on Cost Efficiency

In analyzing cost and advantage of using CATI, it is found that the investments pay off only in large scale or regularly repeated surveys.

The use of CATI generally vastly reduces or eliminated routine mail handling activities and postage costs. CATI adds new costs in equipment purchase and replacement and telephone charges.

While CATI is very strong method for improving the timeliness, it is currently more expensive than mail collection process.

Effect on Training

Survey organizations tend to spend more time training interviewers for CATI, and sometimes also employ more supervisory staff. Because the trained interviewers do not only learn about the subject of the survey but also how to operate computers.

Case Study 4 CATI in the ABS

Background

ABS CATI trials started in the mid '80s and production use started in the early '90s. It is used in the Retail survey, partly because 50% of respondents preferred to respond to telephone non-response follow-up call rather than complete and post the form. It is very successful for Retail, but its use hasn't spread much further. Some other surveys (such as monthly labor force) use telephone interviewing without computer assistance.

Some issues need attention when implementing CATI. It is extremely important that the CATI system performance matches the pace of the telephone interview. Respondents do not react well to a slow CATI system. Screen designs need to be carefully considered (and tuned) particularly layout, colors, keying, and online help. In addition to data capture facilities, there is a need for call prescheduling, rescheduling, and 'notes' about each respondent. These features assist in reducing the average number of calls made and in maintaining an effective relationship with respondents.

The CATI Methodology

The Retail Survey employs a CATI strategy which is made up of three integral components:

1. A Conversion Interview Program (CIP) which by way of a mixture of field and telephone interviews, establishes precisely the information to be collected and what information is to be excluded, including components of turnover. It also obtains from the respondent the important "best time to call" information, establishes the new telephone procedure and introduces the "Diary Form" (for respondent recording purposes).

2. The CATI Data Collection phase where the interviewers interact with the respondents by phone each month, using a computer to path through a set interview procedure and obtain all relevant details. The procedure incorporates periodic ongoing data verification checks (i.e. checks on business structure, turnover components etc.) designed to ensure correct reporting.

3. A Maintenance Interview Program (MIP), which is identical to the CIP but is designed to maintain the data quality levels established at the CIP. It means that each survey respondent is either visited (usually determined by size) or telephoned and interviewed (i.e. the CIP) using a standard questionnaire.

For further information: Contact Dr Rob Edmondson, Director, Technology Services Division, Client Relations Manager for Population Statistics Group and Methodology Division, Australian Bureau of Statistics (ABS); E-mail: rob.edmondson@abs.gov.au

Case Study 5 CATI in Singapore

CATI was first deployed in the 1995 mid-decade General Household Survey (GHS) covering about 300,000 Singapore residents. In the survey, some two-third of the households were successfully interviewed by CATI. Some 90 CATI terminals were deployed during the 1995 GHS, over a period of about 4 months. Unlike the traditional “canvasser method” where field interviewers were based in various regional offices to carry out fieldwork, the use of CATI meant that the interviewers could all be based in the survey headquarters. This proved beneficial as supervision and logistic support could be better given. A number of 118 PCs at the peak were connected to this network. The database files (Microsoft Access database files) were stored both locally on each PC as well as on a file server dedicated for the GHS operations at that time.

The Department of Statistics has achieved another milestone with the successful deployment of CATI in the 1995 GHS and is planning to adopt CATI as one of the key data collection mode in 2000 Census of Population. The CATI system for Census 2000 will be developed in partnership with a professional call-center, building upon the success of the 1995 system, with additional state-of-the-art features. The components included in the new CATI system is given in Figure 4.4. They include intelligent call distribution, calls tracking and logical scheduling engine. In addition, an even user-friendlier screen would be designed, with comprehensive online help features. Households that have not submitted their returns by Internet will automatically be scheduled and dialed up for CATI interview after a cut off date. Households with unlisted or without telephone numbers could still opt to be enumerated by CATI by calling the Census Hotline.

Like the Internet enumeration system, various help features and explanatory notes will aid CATI operators. The CATI system will incorporate streamlined questioning. It will also feature on-line checks, and prompt the operator to re-enter data that are clearly wrong or inconsistent.

To improve the efficiency of the system and to reduce the backend operation of updating records from PCs to a master database, the system will be redesigned to take advantage of the latest advances in client server technology. Instead of storing a limited list of records in each of the CATI PCs, the records will be stored in a central server. All CATI terminals would in effect draw from this central server or “live database” of household records. This would improve the efficiency of scheduling records for dialing, as all the records will be in one central queue, to be allocated to any available CATI operator according to certain priority rules (See Figure 4.3).

The hotline operations will also be streamlined. Hotline operators will be equipped to select household records and accord them with the highest priority for immediate interview by CATI operators. This will free the hotline operators from the need to conduct actual interviews.

Singapore will be one of the first countries in the world to deploy a state of the art CATI system for a Census Operation. With manpower shortage on the one hand, and excellent Tele-computing infrastructure on the other, the use of CATI would take over the canvasser method as the main method of data collection in household surveys in the foreseeable future (Figure 4.4).

For further information contact: Singapore Department of Statistics:

<http://www.singstat.gov.sg>

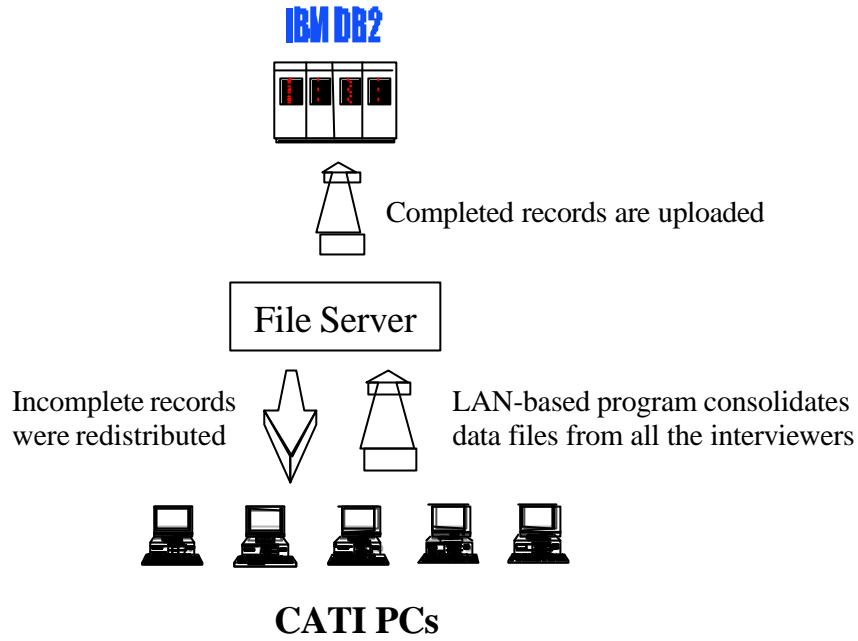


Figure 4.3. Movement of records between CATI PCs and database

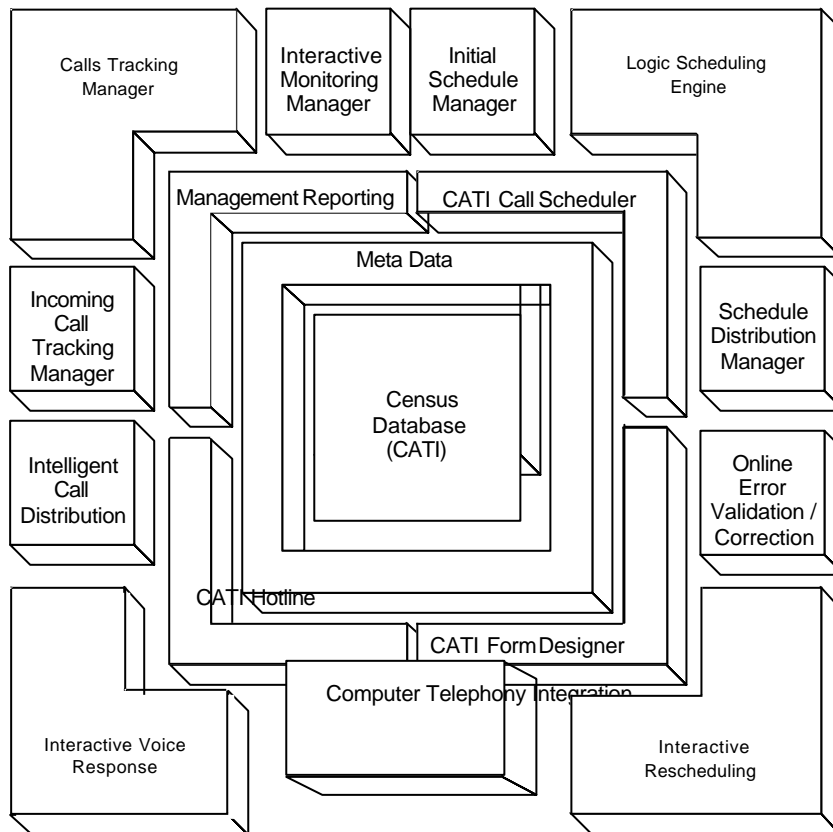


Figure 4.4 Deployment of CATI for a Census Operation

Case Study 6 **CATI in Macao, China**

The Vacancy and Remuneration Survey (D7TR) is the first trial project running on CATI in DSEC. It is a quarterly survey to collect data of labor market with a sample size about 800 establishments. In order to update the central establishment database, this survey also has the function of establishment verification. According to the new plan, all establishments will be interviewed for every 1.5 years. It means a total number of around 4000 establishments will be interviewed each quarter. As the size of the sample has been increased significantly, new method of data collection was studied. Finally, the CATI approach was chosen for this survey.

Questionnaires are first sent to the respondents, and CATI follow-up is started three days after mailing to confirm the receipt of questionnaire. According to the size and characteristic of the establishment, different groups are defined in the CATI assignment list. Some large companies are not included in telephone interview as personal interview conducted by field agent is preferred.

Figure 4.5 shows the data entry screen of the project. The screen is basically identical to the paper questionnaire. Each row and column is marked with a clear identification number to help communication during telephone interview.

Since the CATI workstation has online access to the database, some enhanced validation function becomes feasible: 1. Online coding (Retrieve classification code by filling in a part of the description, such as street code, occupation code, etc.), 2. Range/ Cross check (Multiple range and crosschecks are programmed into the data entry to minimize possible human errors), 3. Correspondence check (Inputted data will be immediately validated with the data collected in last quarter, exaggerated difference will generate warning to the CATI agent immediately clarification).

For more information call: Ieong Meng Chao, Assistant EDP Manager, Statistics and Census Department, Macao, China, email: paul@dsec.gov.mo

D7TR - 人力資源需求及薪酬調查 / 問卷輸入

1. 最近四個月的在職員工數目

參考日期	總數 (0)	1. 全職有新僱員工		2. 兼職有新僱員工		3. 無薪僱員工 (5)
		本地 (1)	外地 (2)	本地 (3)	外地 (4)	
31/12/98 A.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
31/01/99 B.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
28/02/99 C.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
31/03/99 D.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

職業分類

職業分類	總數(0)	1. 全職有新僱員工		2. 兼職有新僱員工				3. 無薪僱員工			
		本地 (1)	外地 (2)	本地 (3)	外地 (4)	本地 (5)	外地 (6)	本地 (7)	外地 (8)	男(9)	女(10)
企業領導人員及經理 E.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
專業人員 F.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
技術員及輔助專業人員 G.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
文員 H.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
服務、銷售及同類工作人員 I.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
漁農業熟練工作者 J.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
工業工匠及工藝工人 K.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
機台及機器操作員、司機及 非技術工人 裝配員 L.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
M.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
總數 N.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

3. 按職業分類的有新僱員工的薪酬於1999年3月

全職員工薪酬 (澳門幣)

職業分類	1. 參考月份的薪酬支出*								2. 其他非定期發放的支出#				3. 支付予兼職員工的薪酬總額@ 男女合計 (9)	
	本地		外地		本地		外地		本地		外地			
	男(1)	女(2)	男(3)	女(4)	男(5)	女(6)	男(7)	女(8)	男(7)	女(8)	男(7)	女(8)		
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Help
ME
下個案 [F2]
撥號 [F4]
預約 [F5]
場所 [F6]
問卷 [F7]
掛線 [F8]
結果 [F9]
重播 [F10]
尋找 [F11]
儲存 [F12]
退出

Figure 4.5 – CATI screen for the questionnaire of the Vacancy and Remuneration Survey