

Distributed CAPI Interviewing with Blaise® IS for the Web for the Adolescent Medicine Trials Network for HIV/AIDS Interventions

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1. Abstract

The Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN) has introduced its newest behavioral Computer Assisted Personal Interview (CAPI) via the Internet to multiple clinical sites throughout the United States. The CAPI has been administered by trained interviewers to HIV negative adolescents as part of an HIV/AIDS intervention study. This paper will discuss the ATN's distributed CAPI interviewing experience with Blaise IS for the web, which in its early stages has already been well received by developers, interviewers, and our clients. The wealth of experience that has been gained from the ATN project will undoubtedly be extremely beneficial to future web-based CAPIs.

2. Introduction

For the past five years, the ATN project has developed five different Audio Computer Assisted Self Interviews (ACASI) that have been utilized across multiple protocols in a variety of settings. The ATN project has relied heavily on Blaise and Visual Blaise and has developed detailed standard approaches to coordinate getting instruments out into the field and subsequently, getting the data successfully back to Westat. While these projects have been a success, Blaise IS has offered the opportunity to shift the project to a Web CAPI operations model in which multiple users out in the field can access a single, central instrument through the web. This is possible because of ATN's site based structure in which interviewers are not administering surveys out in the community, but are actually conducting surveys through their existing subject populations within their own clinical settings. Since this particular ATN CAPI only planned to have five participating sites with two users at a time at each site, there would only be 10 total possible users at any given time. In reality, only a few users would probably ever be on at a time because of the clinic locations throughout the country with varying time differences. The limited stress on the system itself as well as the ability to handle technical questions seemed to make the ATN project the perfect candidate. Having received considerable notice ahead of time, a very reasonable development timeline was possible, which allowed ample time to work out any bugs or issues that arose with Westat's new experiences with Blaise IS.

3. Overview

This paper will describe the ATN project and how it shifted from a community laptop based CAPI operations model to a site based Web CAPI operations model.

- What is the ATN?
- The ATN Survey
- The Web CAPI, A New Site Based Operations Model
- Accessing the CAPI via the Web
- A Peek at the Web Survey
- Feedback Report

- Development Issues
- Getting Started
- Help Desk Support

4. What is the ATN?



The Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN) is a collaborative group whose goal is to strengthen the prevention and treatment of HIV/AIDS among adolescents ranging in age from 12 to 24 years old. The collaboration consists of multiple clinical sites throughout the United States, individuals with various areas of expertise, leadership teams, and a Data Operations Center (DOC), which represents Westat's role. The ATN has implemented approximately 40 different protocols covering therapeutic, community based, and behavioral studies. The ACASI projects for the ATN as well as the CAPI that is the focus of this paper have all been behavioral studies where participants are recruited at HIV clinics and then interviewed after they consent to participate. There are 15 key ATN sites throughout the country as well as additional subsites and collaborating sites, so essentially the DOC has worked with approximately 40 sites, five of which were chosen for the Blaise IS CAPI.

5. The ATN survey

The ATN survey was lengthy and consisted of approximately 516 behavioral type questions covering a participant's use of alcohol and drugs, sexual experiences, sexual practices, and medication compliance. The interview was conducted in a clinic setting that allowed for easy Internet access. The survey was administered at a baseline visit and then at 3 month follow-up visits where various rules were put in place to allow (and disallow) visits based on pre-defined time dependent windows. Baseline interviews took approximately 2 to 3 hours to complete and follow-up interviews took approximately 1 hour to complete. A participant's responses to various skip patterns could potentially decrease this number significantly. For example, if one never drank alcohol, then he or she would not be asked subsequent questions relating to alcohol. The ATN project was even more ideal for this initial exposure to Blaise IS. Since the interviewer was actually the one asking the questions, there was not as big of a concern at this point on dealing with the user friendliness of the system and navigational issues; although obviously, these were still somewhat important to keep in line with Westat's exceptional survey standards. At the completion of the interview, a "Feedback Report" was generated which the interviewer would immediately print out and go over with the participant. This real-time feedback gave interviewers the opportunity to suggest specialized centers where participants could seek additional help and support for serious problem areas that were identified during the interview.

6. The web CAPI, a new site based operations model

With ATN's site based structure, the project no longer needed to be under a "household" CAPI type model in which individual laptops were a necessary

component for interviewers administering surveys out in the community. The ATN project was able to benefit from a new operations model, the web CAPI, in which personal interviewing could be done at select site locations by a trained interviewer via the Internet. This new model represents multiple users out in the field being able to access a centralized CAPI from the luxury of their own PC within their office setting. As the project shifted to this new web based model, cost benefits were realized primarily in the areas of laptop logistics, data transmissions, and platform updates. These benefits are described below:

6.1. Laptop Logistics

Identifying optimal laptops for administering a survey, cloning the laptops, and then customizing and shipping each of the laptops to their designated destinations are all critical pieces of the laptop logistics that Westat has mastered across its extensive array of CAPI projects in past years. Each of these steps represents years of refining and tweaking to create efficient and cost effective processes for Westat's clients. Nevertheless, there are costs associated with these logistics. Because of the unique nature of the ATN project in which all surveys are conducted in a dedicated clinical setting with reliable web access, it was not necessary to utilize the household CAPI type of operations model and therefore Blaise IS could be utilized.

6.2. Data Transmission

Previous operations models required that interviewers electronically transmit data from a laptop back to Westat after each interview, but with the new Web CAPI operations model, data are stored real-time at Westat. A single dedicated server along with adequate backup servers was established at Westat to accommodate this new model.

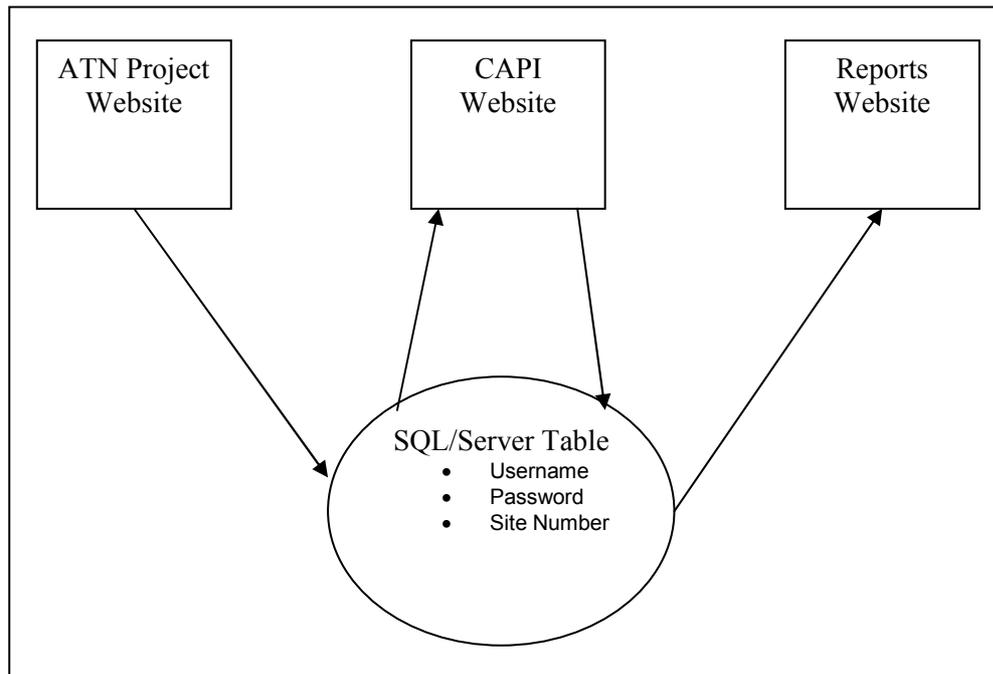
6.3. Platform Updates

As technology evolves and information gathering helps redefine research directions, projects sometimes require updates to either the CAPIs themselves or to corresponding software associated with the CAPI such as word processing and spreadsheet software. Because the CAPI is accessed through the web, it is only necessary to make these updates in a single location, the data center at Westat.

7. Accessing the CAPI via the web

The most obvious difference between CAPI and Web CAPI is that instead of having multiple instruments out in the field for multiple users, there is just one instrument used by multiple individuals. For a large-scale project that represented 100 different sites, one can imagine the decreased logistical complexity involved by having those 100 sites merely access a single centralized instrument for which the data center has complete and total control. The two primary requirements for users of a Blaise IS CAPI are that they must have (1) a PC, and (2) reliable Internet access. An "up to date" browser (preferably Microsoft's Internet Explorer (IE)) is also needed, but functionality may vary. There are actually three separate websites that are interconnected to make the CAPI happen from start to finish including (1) the ATN project website, (2) the CAPI website, and (3) the Reports website. Effort was taken to make the transition from one website to another as transparent as possible to the user and still have the same "look and feel" across websites. To the typical user, it should appear that he or she is within one website. Figure 7.1 on the following page shows how user information is passed across each website so that appropriate access can be authenticated without the user having to perform multiple logins. A user first must log into the ATN project website, and then user information is automatically passed to the CAPI website.

Figure 7.1 – Authenticating a user across websites



During the process, the ATN project website also extracts the user's site number from a centralized SQL/Server database and then passes the site number to the CAPI website to ensure that a site user's data is stored and accessed appropriately. Subsequently, the interviewer enters a Subject ID (SID) number from a pre-defined list of authorized numbers. These numbers are automatically linked to each site such that other sites using the system cannot access these numbers and their corresponding data. Finally, after completing the CAPI, the interviewer is then directed to the Reports website where again, user information is automatically passed. A site is only able to see data and corresponding reports for their own site's participants.

8. A peek at the survey

After successfully logging into the ATN website, one may access the main CAPI screen (Figure 8.1 on the following page) where information is collected for the interviewer ID, the site code, and SID number of the individual who will be taking the survey. The SID number is requested twice to decrease the number of typos that may result in access to an inappropriate survey number. Note that since the user logged into the ATN website first, the system already knows the user's corresponding site number, so entering a different site number will prevent access. It is not possible to reach this main screen of the CAPI without first logging into the ATN website, as necessary parameters must be passed between the two systems to initiate the CAPI.

Figure 8.1 – Accessing a subject's survey

ATN - Microsoft Internet Explorer

Address: <https://www.atn004capidemo.com/ATNCAPI/ATN004ASP/StartATN004.asp>

ADOLESCENT TRIALS NETWORK
for HIV/AIDS Interventions
Prevention and Care for Today's Youth

Interviewer ID:

Site Code:

Enter SID Number:

Enter SID Number again to verify:

In Figure 8.2 below, one can see a sample screen from the ATN 004 CAPI. This particular screen represents questions regarding a participant's use of tobacco, alcohol, and select drugs. Note that multiple questions with varying column responses can be utilized through the web with Blaise IS.

Figure 8.2 – Multiple questions/responses

ATN - Microsoft Internet Explorer

Blaise

ATN 004

Progress:

ATN

104 - 113

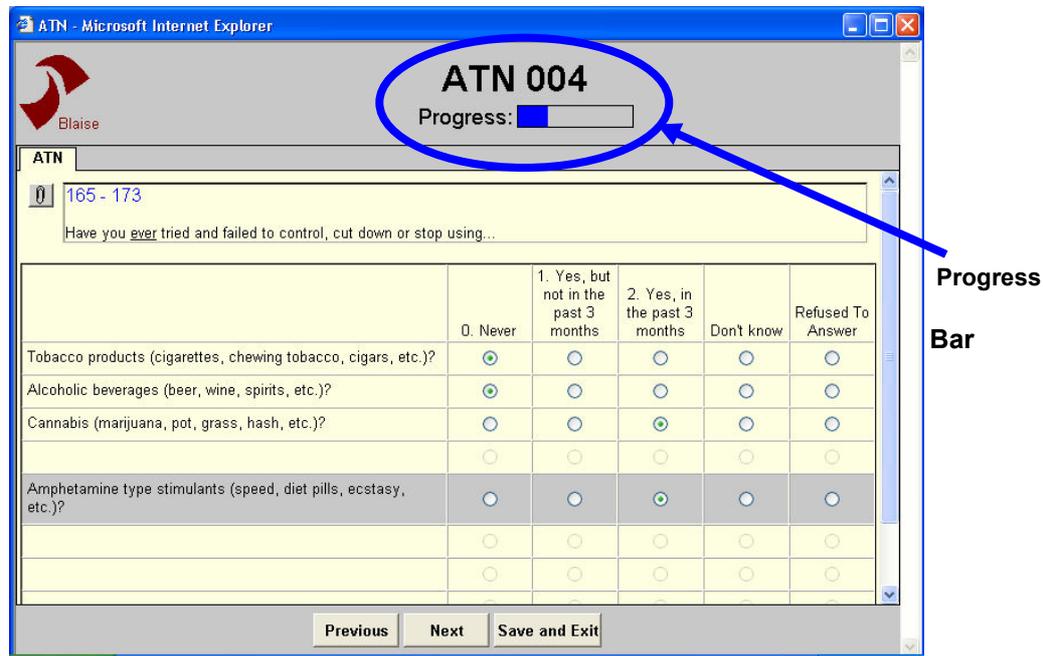
In your life, which of the following substances have you ever used? (NON-MEDICAL USE ONLY)

	1. Yes	2. No	Don't know	Refused To Answer
Tobacco products (cigarettes, chewing tobacco, cigars, etc.)?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alcoholic beverages (beer, wine, spirits, etc.)?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cannabis (marijuana, pot, grass, hash, etc.)?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cocaine (coke, crack, etc.)?	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)?	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Inhalants (nitrous, glue, petrol, paint thinner, etc.)?	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)?	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)?	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opioids (heroin, morphine, methadone, codeine, etc.)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

One of the advantages of administering an automated survey is that skip patterns and edit checks can be built in not only to help manage the data, but to appropriately channel a participant through to only necessary sections of the survey. Note that in Figure 8.2 participants were asked whether they EVER used select drugs while Figure 8.3 on the following page asking a follow-up question on this same topic and excludes irrelevant drugs (i.e., drugs which the user already indicated as “never taken”). A very important component of Blaise IS is also shown in Figure 8.3 as one can now have a much better idea of one's progress

through the survey. The “Progress Bar” gives one a general idea of how far the user has gone through the survey and about how much more of the survey is remaining.

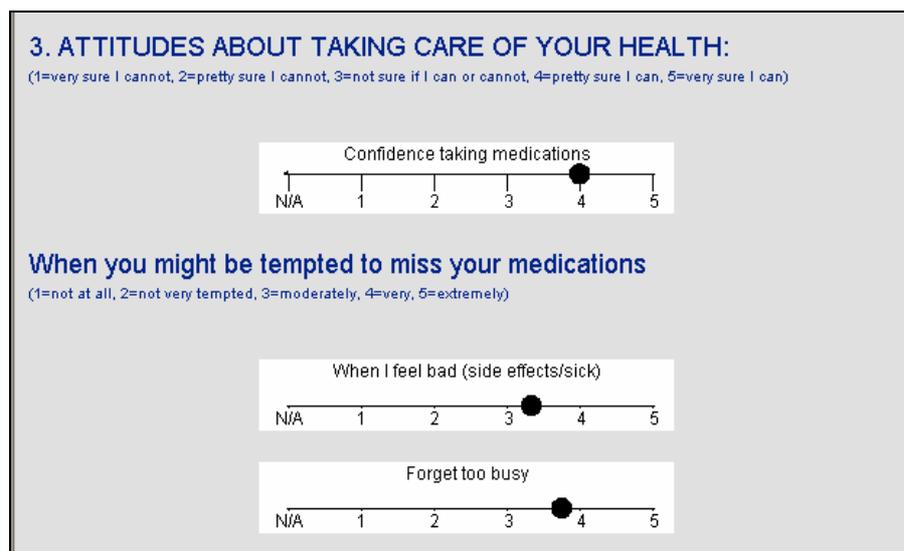
Figure 8.3 – Skip patterns and the progress bar



9. Feedback report

At the conclusion of the survey, it was necessary to generate a “Feedback Report” (Figure 9.1 below) that the interviewer and interviewee could go over together to assess any immediate problems that should be addressed.

Figure 9.1 – Sample section of feedback report



Pre-defined algorithms determined these “problems”, which would indicate where further guidance or counseling for the participant may be needed. For example, if a subject indicated thoughts of suicide, then the coordinator would suggest possible locations in the participant’s community where help could be sought out. This real-time reporting resulted in a 17-page HTML report that summarized and highlighted key topic areas. Because of its complexity in terms of data

presentation and the need for many scales to be calculated with hundreds of variables, SAS IntrNet software was used to program the report. This was achieved by first transferring the data from Blaise IS to a Reports website where the data could be immediately processed and presented to the interviewer and interviewee. As was done between the ATN project website and the CAPI website, user authentication information was again passed between systems as this information was relayed from the CAPI website to the Reports website. The following steps were needed before processing the data in SAS:

- Select data were extracted from Blaise IS
- An XML string was sent to a SQL/Server database accessible by the ATN project website, the CAPI website, and the Reports website
- Data were extracted from the XML string via SAS and then converted and processed for the report
- The final HTML report was then generated by SAS onto the Reports website

10. Development issues

There were several important issues that were either problematic or explored as the development team progressed through the project. A few of these noteworthy issues included performance (speed), stress, and multiple Blaise IS version releases.

10.1. Performance (speed)

The development approach for the survey was modular such that each section of the survey was initially developed and tested individually. It wasn't until the survey components were fully integrated that the development team discovered that the survey slowed down considerably the farther into it that one went. Further investigation showed that several sections in particular involved complex skip patterns and looping where information was gathered for multiple "partners" of each subject. If one had a complex sexual history, then detailed information was gathered on each partner. Similarly heavy drug use over long periods of time also lead to complex looping patterns within the program itself. Programming a more efficient looping process and installing an upgraded version of Blaise IS ultimately solved this problem, fortunately before it went into production.

10.2. Stress

No apparent stress problems were discovered in the system with Blaise IS during its early use. Because of the limited size of the ATN project audience, it is not yet known exactly how much stress on the system by multiple users will cause significant performance problems and/or breakage of the system. However, during testing, multiple users intentionally administered the survey at the same time to look for any potential stress problems, and none were evident.

10.3. Multiple Blaise IS releases

Since Blaise IS is a "cutting edge" software, it is still very much evolving. While it is advantageous to have the "latest and greatest" software, the ATN development project took place during a significant time period of this evolution, and it was necessary to be a part of multiple installations of Blaise IS version releases as they came out. These were very beneficial to the developers in terms of improved functionality and resolved bug problems (a significant number were noted in the early stages), but the process added time and effort.

11. Getting started

The process of getting all of the participating CAPI sites onboard was an initial project concern. A process was developed to slowly phase in each of the sites as they received their IRB approval rather than opening all of the sites at once. This approach allowed time to appropriately train sites (and the data center) as well as deal with any last minute tweaks with the system. Key elements of this approach included:

- Conducting multiple webcast training sessions for off-site users
- Including help desk and study staff in training sessions
- Setting up a demo area for practice
- Requiring users to complete practice cases before distributing production login information
- Phasing in users by one site at a time

12. Help Desk support

One of Westat's strengths is its ability to utilize help desk staff across a wide-range of projects. The projects may be different, but the manner in which a survey is developed and administered is often not so different once it is out in the field. A help desk staff member can be dedicated to multiple projects and thus not create too much of a financial burden on any one given project, but still give adequate support to the project (e.g. a staff member may be dedicated to project X at a 10% effort, project Y at a 15% effort, etc.) by giving "pieces" of time throughout the day to each project. With the introduction of Blaise IS, there will still be a need for help desk support. While some problems from the past may be resolved, other problems may linger on and new problems will undoubtedly be identified as teams gain further experience with Blaise IS. In the shift from CAPI to Web CAPI, help desk support has changed somewhat in terms of content, but certainly not in terms of need. Westat prides itself with being able to effectively "hold a client's hand" and guide he or she through an entire problem whether real or perceived. Getting the user back on track quickly and efficiently is what Westat's help desk does best. Types of help desk support are described in Figure 12.1 below.

Figure 12.1 – Help Desk support

Support NO longer needed:
Laptop navigation and functionality
Power source
Battery replacements
Software updates and upgrades
Lost Data (e.g. stolen or damaged laptop)
Support STILL needed:
Survey navigation
Remembering username and/or password
Entering wrong ID number
Trying to access expired ID number
Support needs that are NEW :
Pop-up blocker
Server down
Firewalls at the site
Trying to work “offline”
Old browser version
Non-compatible browser

13. Conclusions

A wealth of knowledge has been gained in both the areas of Blaise IS development and technical support of Blaise IS CAPI applications via the web. Preliminary feedback of the ATN CAPI has been extremely positive from users in the field. With laptop coordination and support no longer needed for web-based applications, the complexity of many CAPI components has decreased significantly. The collection of data from a single, central location such as the web allows the data center to have full control over the data and the application. The interoperability of multiple websites allows projects to link a variety of website tools with the CAPI. While some new issues have been experienced that are web related, these are certainly not insurmountable and can be dealt with as they arise. The key message delivered in this paper is that Blaise IS has provided the ability to replace multiple instruments used by multiple users with only a single instrument used by multiple users.

14. Acknowledgements

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