Results of the Initial Stakeholder Test of the eInterview Mobile App Prototype

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Abstract

PERSEREC was tasked with creating and testing a prototype eInterview mobile application that could be used to help expedite the background investigation process. The PERSEREC project team worked closely with stakeholders from multiple Federal agencies to develop a question set and a mobile application to automate the collection of delinquent debt information. Stakeholders also participated in an evaluation of the prototype using dummy data provided by the PERSEREC project team. The test showed the app had utility for gathering adjudicatively relevant information for background checks, even after accounting for minor technical challenges. The test also identified several questions that users found difficult to address. An online evaluation and small group interviews showed that testers found the app easy to use. Although there were some concerns about deployment, users reported believing that the app could save them time and effort, and more than 90% reported they would recommend using the app.

Introduction

Background investigators spend a significant amount of time collecting information that was not provided on applicants' personnel security questionnaires. Automating some information collection early in the process could help reduce the amount of information that would need to be collected through triggered subject interviews, phone calls, or other manual forms of communication. Electronic interviews could facilitate more efficient use of resources by freeing up investigator time to conduct other investigative activities.

Under the Trusted Workforce 2.0 initiative, the Federal Government is transforming the vetting process to better support agencies' missions by reducing the time required to bring on new hires, enabling greater mobility of the Federal workforce, enhancing individual engagement, and optimizing vetting processes through the use of technology (SSC PAC, 2022). As part of this effort, the Performance Accountability Council Program Management Office (PAC PMO) tasked PERSEREC with developing and assessing the utility and usability of a prototype electronic interview (eInterview) capability that automates the collection of applicant information normally collected in the triggered subject interview. In its hypothetical deployment, this mobile application (app) would be accessed by an applicant after submission of an SF-86 that generated a Triggered Individual Interview (TII).[1] The eInterview could reduce the amount of information that would need to be collected via manual investigative processes, such as the in-person interview and provide a more efficient and secure means of communicating and transmitting sensitive information between the subject of the background investigation and the investigating agency. In this study, we specifically evaluated whether or not an eInterview app has the potential to effectively and efficiently collect adjudicatively relevant information in support of TIIs. This report details the development of the prototype eInterview mobile app, the stakeholder test process, results of the user testing, and recommendations for next steps based on those findings.

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[1] A TII is an in-person interview triggered by the presence of one or more adjudicatively relevant items of concern on an applicant's SF-86 meeting criteria specified in the Federal Investigative Standards (FIS) that can be divided into low, moderate, and high importance. The FIS have changed since this study was initiated—the Tier 3 and the original Triggered Enhanced Subject Interview are being phased out. The 2022 FIS permit the use of an eInterview for certain investigative triggers in all investigative tiers.

Prior Related Efforts

In 2019, PERSEREC conducted a study (Ortiz et al., 2019) to determine which security issues are most frequently discussed in the Triggered Enhanced Subject Interview (TESI) or discovered by Continuous Evaluation (CE) in the Tier 3 (Secret-eligible) population. Based on the most frequent issues identified in that study, PERSEREC conducted a subsequent study (Ortiz et al., 2020) to develop, refine, and test eInterview questions designed to collect information from the subject to resolve or mitigate those issues. Project stakeholders selected one question set developed in the 2020 study—delinquent debt— to be the focus of this study.

Goals of the Current Study

The primary objective of the current study was to assess the potential of eInterview to reduce the manual personnel vetting processes by effectively and efficiently automating information collection from applicants for Moderate[2] Tier (Secret-eligible) vetting. A secondary objective was to evaluate the extent to which the prototype app offers a positive user experience.

Methodology

In this section, we describe how the initial eInterview app was designed, developed, and tested with the input of subject matter experts (SMEs) from multiple stakeholder groups. We also describe how we collected and analyzed data from the 29 SMEs who tested the mobile app prototype.

Development Process

We worked with Defense Counterintelligence Security Agency (DCSA) and PAC PMO leadership to identify 21 SMEs to participate in the design and development of the prototype app and the eInterview questions. Participants included background investigators, adjudicators, managers, and vetting policy experts. The SMEs represented the following agencies and organizations:

- DCSA
  - Adjudications
  - Background Investigations (BI)
- Department of Justice
- Bureau of Alcohol Tobacco and Firearms
- Library of Congress
- Department of Energy

We held four meetings with the 21 SMEs to identify functional requirements for the eInterview, which informed the design of the prototype. We then met with SMEs to determine which eInterview question set to implement in the prototype. SMEs selected the delinquent debt question set. We then used the delinquent debt question set (Ortiz, 2020) to develop a conversation workflow—a map of all possible dialogue options—that included conditional follow-up questions and documented all possible interactions between the user and the application. We also created a conversation script including the exact wording and response options users would encounter when using the app. We further refined and revised the conversation script and workflow based on feedback received during meetings and email exchanges with SMEs.

The team used the Agile software development process incorporating the scrum framework to create the app, a process that involved a series of 2-week development sprints. At the end of each sprint, we met with a small group of seven SMEs from four of the participating agencies to solicit feedback on the app's design, features, and user

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[2] Under the Trusted Workforce 2.0 framework, the traditional 5 tiers of investigation will be condensed to 3 tiers; Tier-1 for low-risk positions (previously Tier-1), Tier-2 for moderate-risk suitability (previously Tier-2 and Tier-3), and Tier-3 for high-risk suitability vetting and top secret clearances (previously Tier-4 and Tier-5) (SSC PAC, 2022).

interface. We then incorporated SME feedback into a prioritized list of new features or bug fixes to be addressed in the next sprint[3] and continued this cycle until we began user testing. Last, we conducted a "smoke test[4]" on the app to ensure that all critical functions worked correctly prior to user testing.

User Testing

We invited all SMEs who took part in the design and development of the app to participate in a user test of the prototype app. In order to achieve a minimum threshold of 25 SMEs participating in the test, we asked leaders at DCSA, OUSD(I&S), and PAC PMO to recruit additional participants from within their organizations. A total of 35 SMEs were recruited, and 29 SMEs ultimately participated in testing the app. The test aimed to determine how well the eInterview app could collect adjudicatively relevant information from its users. We were primarily interested in two key aspects of the app's performance—utility and usability. Users tested the application on both iOS and Android mobile devices. Appendix A lists the professional backgrounds of the users who participated in the test and completed the online evaluation regarding their eInterview experience.[5]

App Utility

The eInterview app could be an effective tool if the data it collects from the subject reduces the labor hours expended to complete an investigation or adjudication. Ideally, an applicant would submit enough relevant information via the app for their subject interview to be considered complete without an in-person interview. A partial reduction in the time required to conduct a manual interview could still yield efficiencies if the app collected a sufficient amount of relevant, complete, and error-free information from the subject.

Utility Test Process

A team member with background investigation experience created six fictional user personas that testers could use when responding to the eInterview's delinquent debt questions. Each persona contained a short narrative about a fictional person's background and history, as well as substantiating documentation. These personas included a variety of debt-related background information, including outstanding debt, previously delinquent debt, and collections. These financial issues are all commonly detected in background investigations.

The six user personas included a range of financial complexity—two easy, two moderately difficult, and two difficult.[6] The easy profiles included a few uncomplicated debt history items. The moderate profiles had more debt history and complexity, and the difficult profiles contained the most debt history and involved the most complex reportable items. As shown in Figure 1, user

Figure 1
Sample of User Persona

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[3] Within the scrum software development framework, a backlog is a prioritized list of new features to be developed such as new functionality or bug fixes that a development team may incorporate into a product.

[4] A smoke test is a software testing process that determines if the main functions of the software work correctly and detects critical issues.

[5] The team selected SMEs with personnel security experience instead of the general population of SF-86 applicants to test the functions and limits of the app with a smaller cadre of experienced testers for targeted development feedback from personnel with deep experience on what functionality an app might require to best collect adjudicatively relevant data.

[6] Personas were designed so that nothing would be so complex that they could only be resolved via in-person interviews.

personas contained fictional identification documents and a short narrative for the persona. A short description of the persona's debt history detailed both relevant and irrelevant debt history. Finally, to test the document upload features and the application's directions, each persona also included fictional supporting documents such as letters from creditors, account statements, and bills. Adjudicatively relevant non-debt information was also included (e.g., DUI) to test how well the app could be used to collect other derogatory self-admissions.

Testers were randomly assigned one user persona and given 11 days to complete the eInterview using the app. We gathered outputs from each tester and, using an answer key, evaluated them on the metrics shown in Table 1. To measure timeliness, the app automatically collected the session length, measured by how long it took each user to answer each question.

Table 1

Metrics Used To Evaluate Tester eInterview Responses

Response	Description
Correct	The response matched the expected response in the answer key.
Incorrect	The response did not match the expected response in the answer key.
Irrelevant	The response was unrelated to the question.
Skipped in Error	No response logged when there should be one. Likely a technical error.

Researchers coded certain types of questions as belonging to the Verify-Confront-Ask framework, which was the underlying framework of the eInterview conversation workflow. Verify questions asked testers to review the information on delinquent debt that they previously submitted on their SF-86. Testers could agree or disagree and provide an explanation with supporting documentation if they disagreed. Confront questions displayed delinquent debt found on the persona's credit report that was not reported on the persona's SF-86. Ask questions provided an opportunity for the tester to disclose any new information not already discussed or disclosed.[7] Appendix B presents specific examples of the Verify-Confront-Ask question types.

Next, a two-person evaluation team from DCSA BI reviewed all responses and assigned each tester's responses overall scores according to four key metrics—completeness, relevance, comprehensibility, and follow-up, as shown in Table 2.[8] Completeness, relevance, and comprehensibility were scored according to whether evaluators considered the response to be good, moderate, or poor. We used both evaluators' scores to analyze the utility of the results, which were tabulated by persona difficulty.

Table 2

Key Evaluation Metrics Evaluators Used to Score Tester's Responses

Metric	Scale	Definition
Completeness	Good (1), Moderate (2), Poor (3)	The answer responded to every part of the question.
Relevance	Good (1), Moderate (2), Poor (3)	The answer contained the necessary information to answer the question.
Comprehensibility	Good (1), Moderate (2), Poor (3)	The answer contained decipherable information that was useful to the investigator.
Follow-up Required	None (1), Subject Contact (2), Full in-person interview (3)	Further follow-up efforts required by the investigator to clarify a respondent's answers.

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[7] The full list of questions is available upon request.
[8] Full rubric available in Appendix C.

App Usability

Ideally, a mobile application is easy to use, convenient, requires no special training, and provides users with a positive experience. End users should understand what they are being asked to do and how to do it. The time applicants and investigators spend entering data should be similar or less than the time needed for an in-person interview.

To test usability, we invited testers to complete an anonymous 28-item online evaluation of their experience with the app. The evaluation focused on user experiences such as time taken to perform tasks, errors, completion rate, usability, and satisfaction using the application. We received responses from 21 testers and used them to inform discussion questions for subsequent small group meetings.[9] See Appendix D for a sample of responses from the online evaluation. In these meetings, we gathered additional details on user experience issues such as question wording in the app, comparisons to in-person interview experiences, omitted information, and whether assistance was needed to complete user tasking. We held three meetings involving 7 to 11 participants each. A total of 24 testers participated in these small group meetings.

Utility Results

In this section, we present the results of the evaluations of the eInterview mobile app's utility. We tested utility by (a) comparing the responses participants submitted to an answer key the team developed and (b) having a two-person evaluation team score responses.

Comparison to Answer Key

Table 3 presents the frequency of correct, incorrect, irrelevant, and skipped in error responses for the Verify, Confront, and Ask questions. Per the design of the delinquent debt questions, there are far fewer Verify questions (20) than either Confront (297) or Ask (312). Overall, 58.8% of questions were answered correctly, 6.8% were answered incorrectly, 2.2% of responses were irrelevant, and 32.1% of questions were skipped in error. Analyses indicate that Confront questions had the highest rate of correct responses (61.9%) and the lowest rate of incorrect (3.0%) and irrelevant (2.0%) responses, suggesting that Confront questions were the best crafted and least confusing to users. Ask questions were associated with a higher rate of incorrect information (9.2%), suggesting that they require more refinement or clarification. For example, the Ask question, "On what date did the account become delinquent (over 120 days past due)," was the question most frequently answered incorrectly (see Appendix E for details). Some people were confused by this question and provided the date they became aware of the delinquent account. Verify questions returned the most incorrect (25%) and irrelevant (5%) responses, suggesting the need for further modification to these questions.[10] Most erroneous answers to Verify, Confront, and Ask questions (31% to 35%) were caused by users skipping some questions in error. After the test, we determined that questions were skipped in error due to an undiscovered technical flaw in the iOS version of the app.[11] Given the large proportion of otherwise correct responses, we anticipate that rectifying this software issue would likely improve the correct response rate.

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[9] The evaluation questions and small group interview questions are available upon request.

[10] Five users were marked as Incorrect for the question: "Include a brief description of each debt that was not listed." It was an open-ended question, which may have contributed to the high Incorrect rate. If users are not given targeted and specific questions, they may be more likely to provide partial or incomplete data.

[11] The team is unable to determine the proportion of questions skipped due to technical error versus user error.

Table 3

Performance of Verify-Confront-Ask Questions

Responses	Verify		Confront		Ask		Total	
	n	%	*n*	%	*n*	%	*n*	%
Correct	7	35.0	184	61.9	179	57.37	370	58.8
Incorrect	5	25.0	9	3.0	29	9.2	43	6.8
Irrelevant	1	5.0	6	2.0	7	2.2	14	2.2
Skipped in Error	7	35.0	98	33.0	97	31.0	202	32.1
Grand Total	20	100.0	297	100.0	312	100.0	629	100.0

Table 4 displays the results of our collection of timeliness information. We gathered this information by measuring the amount of time each tester spent with each question. We aggregated the time by tester, then took the average of all users by persona. The Moderate #1 testers took the least amount of time (5.9 minutes) to complete the eInterview because this persona disclosed all of the debt history in the SF-86 and had no Confront questions. The average time for the Easy #2 persona is higher than expected due to the amount of time a few testers spent on the eInterview. We are unable to explain why one tester spent over 28 minutes to answer three questions, and another spent 8 minutes responding to the Verify question. However, the results for the remaining personas show expected results.

Table 4

Timeliness and Skipped Answers

Persona Difficulty	Average Session Time (Minutes)	Total Questions (*N*)	Questions Skipped in Error		Testers Assigned	
			n	%	*n*	%
Easy #1	9.7	185	45	24.3	5	17.2
Easy #2	15.4	195	23	11.8	5	17.2
Moderate #1	5.9	123	13	10.6	5	17.2
Moderate #2	12.1	140	14	10.0	3	10.3
Difficult #1	12.0	305	15	4.9	5	17.2
Difficult #2	16.1	522	100	19.2	6	20.7

Scored Responses

Table 5 displays the frequency of eInterviews SME evaluators deemed as requiring no follow-on action, subject contact to complete, or a full interview. Only three eInterviews were considered fully complete (5.3%); however, the majority of eInterviews (70%) received moderate or good scores for completeness (3 + 37 = 40 out of 57). Evaluators assigned moderate or good scores for Relevance and for Comprehensibility to the majority of eInterviews (78.9% and 80.7%, respectively). Evaluators determined that 27 (47.4%) eInterviews required only contact with the subject to clarify some of the information provided, two required no follow-up (3.5%), and 28 (49.1%) eInterviews required a complete in-person interview.

Table 5

Evaluator Scores – All eInterviews (N = 57) [12]

	Good Score		Moderate Score		Poor Score	
	n	*%*	*n*	*%*	*n*	*%*
Completeness	3	5.3	37	64.9	17	29.8
Relevance	12	21.1	36	63.2	9	15.8
Comprehensibility	13	22.8	33	57.9	11	19.3
Follow-up	2	3.5	27	47.4	28	49.1

Usability Results

We used the results of an online evaluation and small group interviews to determine whether users had a positive user experience with the eInterview mobile app. We analyzed overall performance and noted participants' suggestions for future development.

Table 6 displays how long survey respondents (testers who responded to the online evaluation) reported it took to answer all questions associated with a tester's persona.[13] Of the 21 respondents, nine (42.9%) were able to accomplish all tasks in under 30 minutes; the majority (81%) of respondents were able to finish in 1 hour or less. Only four (19%) respondents took 1 to 2 hours. No one took more than 2 hours. More iOS users (50%, *n* = 6) were able to finish in under 30 minutes than Android users (33%, *n* = 3). This is likely due to the higher number of skipped questions by iOS users.

Table 6

How much time did you spend working on your tasks (across all sessions)? (N = 21)

	Total (*N* = 21)		Android (*n* = 9)		iOS (*n* = 12)	
Time	*n*	*%*	*n*	*%*	*n*	*%*
3 or more hours	0	0.0	0	0.0	0	0.0
2 to 3 hours	0	0.0	0	0.0	0	0.0
1 to 2 hours	4	19.0	4	44.0	0	0.0
30 minutes to 1 hour	8	38.1	2	22.2	6	50.0
Less than 30 minutes	9	42.9	3	33.3	6	50.0

The majority of survey respondents (57.1%, *n* = 12) completed their tasks in one session (See Table 13, Appendix D). Another five finished in two (23.8%) sessions, and four (19.1%) respondents took three or four sessions to complete their assigned tasks. The majority (83.3%) of iOS users were able to finish in a single session, while the majority (77.7%) of Android users required two or more sessions. Table 7 summarizes respondents' answers when asked what tasks were difficult to complete. Seven (33.3%) respondents felt that there were no tasks that were difficult to complete, and another seven (33.3%) found navigating the app was difficult. Four (19.0%) respondents found entering text responses difficult, two (9.5%) found uploading documents difficult, and one (4.8%) found answering multiple choice questions difficult. Four (19.0%) found other tasks difficult. Android users reported more difficulty

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[12] One evaluator missed scoring a persona, resulting in significantly fewer responses than the other two.

[13] In the survey, the question was worded, "How much time did you spend working on your tasks across all sessions?" These tasks were to answer the questions associated with a tester's persona.

with navigation and tasks on the app than iOS users, but Android users reported fewer issues entering text and uploading documents.

Table 7

Were any Tasks Difficult To Complete (i.e., You Were Able To Complete Tasks, but the Process Was Frustrating or Unclear)? Select All That Apply (N = 21)

Task	Total (*N* = 21)		Android (*n* = 9)		iOS (*n* = 12)	
	n	%	*n*	%	*n*	%
Navigating the app	7	33.3	5	23.8	2	9.5
No tasks were difficult to complete	7	33.3	1	4.8	6	28.6
Entering text responses	4	19.0	1	4.8	3	14.3
Uploading documents	2	9.5	0	0.0	2	9.5
Answering multiple choice questions	1	4.8	1	4.8	0	0.0
Other	4	19.0	4	19.0	0	0.0

As shown in Table 8, most survey respondents reported that their experience using the eInterview app was good, and seemed to find value in the mobile approach. They found that the questions were helpful, the progression of questions was helpful, the questions asked the right things, and the app was easy to use and captured the uploaded images well. Given that this was the first test of an eInterview app, there were some technical and user navigation issues—some users reported navigation issues, and others reported login issues. Finally, some users noted that the questions could be clearer and that there was a lack of a defined space to report mitigating information on derogatory items.[14] Testers who participated in the small group interviews also identified these issues as concerns (see Appendix E).

Table 8

User Feedback on User Survey

What did the app do well?	Please list frustrations, concerns, or issues you have with the prototype eInterview app functions
The questions were adequate and helpful. The app asked the right questions.	Navigation could be confusing, and it was not clear how to move about the app.
The progression of confirming the debt, giving the subject an opportunity to respond, then resolving the issue was logical.	Logging into the app was difficult.
The app was easy to use, allowing users to collect supporting documentation in a way one could not do mid-interview.	The questions could be clearer, as some questions were redundant or phrased too similarly.
The app captured the images well and asked the right questions on financial debt.	The lack of a clear space to report mitigating information was a drawback.

When asked if they would recommend the eInterview app to complete delinquent debt questions as part of their TESI, 90.5% (19) of survey respondents agreed, as shown in Table 9. When asked if they think that an eInterview could make their job easier, 16 (76.1%) responded that they thought it would, 4 (19.0%) strongly agreed, and 2 (9.5%) neither disagreed nor agreed. When asked whether the eInterview app would resolve most delinquent debt issues more quickly than traditional TESIs, 20 (95.3%) survey respondents agreed or strongly agreed.

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[14] The app asked for mitigating information on debts. We suspect that some testers either skipped these questions or did not understand them to be questions gathering mitigating information.

Table 9

Respondent Impressions of App Utility (N = 21)

Response	I Would Recommend the eInterview App to Applicants to Complete the Delinquent Debt Questions as Part of Their TESI (*n* = 21)		I Think eInterview Could Make My Job Easier (*n* = 21)		I Think the eInterview Would Resolve most Delinquent Debt Issues More Quickly Than a Traditional TESI (*n* = 21)	
	n	%	*n*	%	*n*	%
Strongly agree	8	38.1	4	19.0	9	42.9
Agree	11	52.4	12	57.1	11	52.4
Neither agree nor disagree	2	9.5	2	9.5	1	4.8
Disagree	0	0.0	0	0.0	0	0.0
Strongly disagree	0	0.0	0	0.0	0	0.0
Not applicable	0	0.0	3	14.3	0	0.0

Small Group Interviews

Small group interviewee feedback largely mirrored what was found in the online evaluation. Five major groupings of comments were captured from the small group participants—the questions and the language used, the utility of the app, its usability, and ideas for future development of the mobile app.

Small group interviewees expressed a mix of both excitement and skepticism over the eInterview mobile app. The excitement tended to revolve around the ease of use, convenience, and the document upload feature. Skeptics tended to cite their lack of confidence that mobile apps could handle complex histories and might miss potentially important details that arise during organic discussions with applicants. There were also concerns over whether a technological solution to the existing process will complicate the process and simply introduce additional work with minimal or no tangible benefits to the investigator workforce. Most seemed to agree that the eInterview process could produce benefits such as improved timeliness, but only if the process is thought through carefully and implemented well. See Appendix F for a summary of all small group interview feedback.

Discussion

Results of this study suggest that the eInterview mobile app prototype could introduce efficiencies into the vetting process by reducing the amount of information that would need to be collected manually from the subject of the background investigation. Results also show that despite some minor issues, most testers' experience with the eInterview prototype was positive. Most testers were able to complete their tasks quickly with no special training. We expect that adding more features to the app and refinements to the question set would further improve the utility and usability of the eInterview.

Utility

Overall, the majority of Verify, Confront, and Ask questions were answered correctly, and the rates of incorrect or irrelevant responses were relatively low, with the exception of the Verify questions. However, the rate of correct responses was diminished because users skipped a large percentage of questions, likely due to a technical software error. We expect the rate of correct responses to improve further after this error is corrected with further testing and development.[15] The Confront and Ask question sets performed better than the Verify question set. In particular, those questions noted to have a high incorrect rate should be given closer scrutiny to ensure that users are clear as to what is being asked, possibly taking a different approach to asking the question to ensure complete information is

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[15] The technical error can be added to development backlog and would likely only require one 2-week sprint to fix.

gathered. The design of the app, which allows developers and researchers to rapidly add, drop, and change questions, will facilitate question testing and refinement.

According to the evaluators' scores, they could conclude the investigation by contacting the subject for clarifying information in 49.1% of eInterviews rather than conducting an in-person interview. In 3.5% of eInterviews, no follow-up would be required. If half of all TIIs that would otherwise require in-person interviews could be concluded via simpler and less resource intensive subject contacts, using the eInterview app could result in a gain in efficiency. In addition, the technical issues allowing users to skip questions likely played a large role in lowering the correct answer rate, which can be rectified through further application development and testing.

Usability

Overall, most participants found the mobile app to be helpful and easy to use. Although some participants reported navigational issues or other technical issues, overall, participants had positive experiences with the app—most testers reported they were able to accomplish all their tasks in less than an hour, and over half accomplished all their tasks in one session. Finally, 90% of testers who provided feedback online would recommend that other applicants use the app, suggesting they had a positive and user-friendly experience. However, a third of the testers, including those who participated in the small group discussions, experienced difficulty navigating the app, and some thought the language in the financial questions should be softened to sound more conversational and less confrontational.

Recommendations

The test of this prototype mobile app suggests that, although there are some technical issues to work out, the eInterview process does hold promise to reduce costs and level of effort in the background investigation process. Based on these results, we make the following general recommendations:

1. In the short term, a function allowing background investigators to collect ad hoc information and documents from the subject of the investigation (e.g., passport data, employment and education records) in a secure manner would be helpful immediately. DCSA should consider developing this secure communications capability between subjects and investigators via the eInterview app and deploying it with a select group of trained investigators for further testing and research. DCSA should track how investigators use the app in order to inform and provide a business case for further development of additional eInterview conversation scripts.
2. Because the efficiency gains of the app are not entirely clear, DCSA should examine the amount of time that is currently spent collecting certain types of investigative information (e.g., debt-related information) during subject interviews. This information could help identify which question sets would provide the greatest return on investment if they were incorporated into the app. As new question sets are added to eInterview, DCSA could compare these findings to time spent collecting this information from applicants using the app.
3. Many of the issues that testers experienced with the app could be addressed through the implementation of additional features in the app (e.g., enhanced navigation capabilities, ability to review and print responses to a PDF, and adding a chat feature for users requiring additional assistance). DCSA should consider building upon this prototype to add those features and others requested by SMEs (the eInterview Functional Requirements Document, available upon request, provides for a complete list of requested features).
4. After testing the app with additional features mentioned in recommendation #3, PAC PMO should fund development of additional conversation scripts and modules to enable automated collection of other kinds of investigative data. Consideration should be given to those investigative areas wherein a subject is required to submit supporting documentation that must be reviewed by the investigator, such as passport data, employment and education records, and citizenship verification, as they could be implemented more readily than complex question sets enabling more immediate return on investment.

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Appendix A: Backgrounds of Users Who Provided Online Feedback

To test usability, we asked users to complete an online evaluation of their experiences. Of the 29 users who took the eInterview, 21 completed the online evaluation. Table 10 displays the relevant professional backgrounds of users. Fourteen (66.7%) had experience as a field investigator, eight (38.1%) had experience as an adjudicator, and the rest had experience in operations, policy, quality control, case reviewers, or management capacity. Those that took the online evaluation have a great deal of experience in personnel security.

Table 10

All Areas of Experience User Had Related to the Personnel Vetting Process (N = 21)

Role	n	%[a]
Field Investigator	14	66.7
Adjudicator	8	38.1
Policy	3	14.3
Quality Control	3	14.3
I have personnel vetting experience that is not listed	3	14.3
Case Reviewer	2	9.5
Operations Manager	2	9.5
Security Manager	2	9.5
I do not have experience related to this subject matter	0	0.0
I prefer not to answer	0	0.0

[a] Sum > 100% as respondents may have experience in multiple roles.

Appendix B: VCA Framework – Sample Questions

Researchers created several types of questions according to what the team termed the Verify-Confront-Ask framework. This framework prompted users to verify information they had submitted on their SF-86s, confronted them with new information if there was a discrepancy, and asked them follow-up questions for additional information. This framework was used to guide the user through the app, and researchers analyzed responses to these different categories of questions to see if certain answers had better responses than others.

Verify questions ask applicants to review the information on delinquent debt that they previously submitted on their SF-86 and give them an option to agree or disagree and to submit supporting documentation if they disagree. This is a Verify question:

- Please tell us what accounts you did not list on your SF-86 based on the criteria above. Include a brief description of each debt that was not listed. You will be asked to disclose detailed account information later in the eInterview.

Confront questions are those that display discovered delinquent debt that was not reported on the SF-86. These are Confront questions:

- Please explain what you used this account for and why it became delinquent.
- Did you appear in court for any reason due to being delinquent on this debt?

Ask questions give the applicant the opportunity to disclose any new information not already discussed or disclosed. These are Ask questions:

- Do you have any additional delinquent accounts to share with an investigator?
- Overall, how would you describe your current financial status?
- Would anyone question your means or ability to pay your debts?

Appendix C: Evaluator Score Criterion

Evaluators were asked to assign scores to tester responses. Evaluators were provided a rubric and asked to use their judgment as to whether answers were complete, relevant, and comprehensible and whether the evaluator believed there was any follow-up needed. Scores for each of these concepts were as follows:

Completeness

- **Good** – The information provided answered the question completely and fully. It provides the who, what, where, when, and why for different financial information. A complete answer is one in which all the relevant questions were asked and the respondent provided a response to all those questions.
- **Moderate** – The information provided did not fully answer the question but provided most of the necessary information.
- **Poor** – The information provided was not sufficient to answer the question.

Relevance

- **Good** – All information provided was fully relevant to answering the question.
- **Moderate** – Information provided was relevant to answering the question but may have included some irrelevant information.
- **Poor** – Information provided was either somewhat relevant to answering the question or not at all relevant to answering the question.

Comprehensibility

- **Good** – The answers provided were easy to understand and comprehend.
- **Moderate** – The answers provided were mostly understandable but required some interpretation.
- **Poor** – The answers provided were not easy to understand and could not be used to make a determination about relevance or completeness.

Follow-Up Required

- **None** – Based upon the information given, there would be no need to re-conduct a TESI, either in person or otherwise, to gather clarifying information.
- **Subject Contact** – Based upon the information given, an investigator would likely need to collect clarifying/additional information via subject contact short of an in-person investigation.
- **Full in-person interview** – Based upon the information given, an investigator would need to conduct an in-person interview to complete their investigation.

Appendix D: Additional Online Evaluation Results

Users were asked whether they encountered technical problems when using the app. Table 11 shows the results of those 10 who answered in the affirmative to encountering problems and whether they were able to resolve these issues without assistance from a team member.

Table 11

I Was Able To Resolve the Technical Problems Without Assistance (N = 10)

	Total		Android		iOS	
	n	*%*	*n*	*%*	*n*	*%*
Strongly agree	3	27.3	2	33.3	1	20.0
Agree	1	9.1	1	16.6	0	0.0
Neither agree nor disagree	3	27.3	1	16.6	2	40.0
Disagree	2	18.2	1	16.6	1	20.0
Strongly disagree	1	9.1	1	16.6	0	0.0
Not applicable	0	0.0	0	0.0	1	20.0

Table 12 shows responses when asked whether they would prefer a desktop computer or a mobile phone or whether they were comfortable with either option. As shown in Table 12, the majority of respondents (70.0%) reported being comfortable with either option, with three (15.0%) preferring a desktop PC or Mac and three (15.0%) preferring mobile phones. iOS users preferred using a mobile phone (15.0%) over desktop (5.0%), while two (10.0%) Android users preferred desktop over mobile.

Table 12

This Prototype eInterview App Was Developed for Mobile Devices. Would You Prefer Using the eInterview on a Website from a PC or Mac Instead of an App on a Mobile Device? (N = 20)

	Total		Android		iOS	
Preference	*n*	*%*	*n*	*%*	*n*	*%*
I prefer using a website on a PC or Mac	3	15.0	2	10.0	1	5.0
I prefer using a mobile phone	3	15.0	0	0.0	3	15.0
I'm comfortable with either option	14	70.0	6	30.0	8	40.0
I'm not sure	0	0.0	0	0.0	0	0.0

Table 13 is described in the Usability Results section on page 7.

Table 13

How Many Sessions Did You Take To Work on Your Tasks? A Session is Considered an Uninterrupted Period of Time You Used the App. Each Time You Stopped and Returned to the App is a new Session (N = 21)

	Total		Android		iOS	
Number of Sessions	*n*	*%*	*n*	*%*	*n*	*%*
1 session	12	57.1	2	22.2	10	83.3
2 sessions	5	23.8	3	33.3	2	16.6
3 sessions	1	4.8	1	11.1	0	0.0
4 or more sessions	3	14.3	3	33.3	0	0.0

Appendix E: Most Frequent Incorrect and Erroneously Skipped Questions

Table 14 shows the questions that were most often answered incorrectly or skipped in error. The most incorrect answers were on the date of delinquency, the lack of a brief description of each debt, the past due amount, when the person became aware of delinquent debt, and the reason for the account's delinquency. The most skipped questions were whether anyone else was party to an account, what actions applicants have taken to satisfy the delinquent debt, an explanation for why debt was not listed on the SF-86, evidence of wage garnishment, and the court date for court actions.

Table 14

Most Frequent Incorrect and Erroneously Skipped Questions

Question	Type	# of Times Asked[a]	Incorrect n	%	Skipped in Error n	%
On what date did the account become delinquent (over 120 days past due)?	Ask	30	10	33.3	0	0.0
Include a brief description of each debt that was not listed. You will be asked to disclose detailed account information later in the eInterview.	Verify	16	5	31.3	3	18.8
What is the amount that is past due?	Ask	30	5	16.7		0.0
When did you become aware of this delinquent debt?	Ask	30	5	16.7	2	6.7
What was the reason for this account becoming delinquent? Supporting documentation includes payment plans; a letter from a creditor saying the account was paid off/charged off and closed; an account summary showing $0 balance.	Ask	30	2	6.7	0	0.0
Were there any other parties involved in this account?	Confront	41	1	2.4	9	22.0
What actions have you taken (if any) to satisfy the delinquent debt? You may upload supporting documentation to share with the investigator showing the action you took to satisfy the debt.	Confront	41	0	0.0	9	22.0
Please explain why you did not list this debt on your SF-86?	Confront	41	0	0.0	8	19.5
Did you have wages, benefits, or assets garnished because of this debt?	Confront	41	0	0.0	6	14.6
What was the court date?	Confront	41	0	0.0	6	14.6

[a] *When a response was required*

Appendix F: Small Group Interview Results

Small group interview findings largely mirrored what was found in the online evaluation. We categorized participant comments into four major groupings—eInterview questions and the language used, the utility of the app, its usability, and ideas for future development of the mobile app.

eInterview Questions and Language

We collected and summarized interviewee comments on the questions and language used in the app:

- The app should have softened language to not sound confrontational.
- In future iterations, there should be clear language on the importance of submitting complete and accurate information because there may be legal consequences for not doing so.
- The questions were very similar to the SF-86 questions; if people struggled to answer the same questions the first time, there should be alternative ways to clarify or ask the question to avoid the same confusion.
- Some questions were very similar, which introduced confusion about what interviewees were being asked.

App Utility

We collected and summarized interviewee comments on the app's utility for collecting debt information:

- The document upload feature added great value to the process.
- The app would be helpful for simpler debt histories but might struggle with more complex histories.
- Four areas where the app might fall short of an in-person interview were noted:
  - The inability to read a person's body language
  - The inability to quickly reframe questions, especially if applicants are unclear about terms or what is expected of them
  - The inability to immediately follow up on information developed in conversations.
  - The potential that the mobile environment might lead people to give shorter responses than they might otherwise do if they were using a keyboard or giving answers in person.

App Usability

The research team collected and summarized interviewees' comments on their experience with the app and their perceptions of its usability:

- The document upload feature lacked several important functions: edit, crop, preview, and the option to switch between landscape and portrait modes.
- The navigation was confusing or frustrating, and there was no back button or menu. There actually was a menu and back button; however, many users seemed not to be aware of it.
- The ability to use the app on their own time instead of in a single session was seen as a positive.
- The app's appearance was professional, pleasing, and modern.

Future Development of the App

The research team collected and summarized interviewee suggestions for future features or improvements for the app:

- Users should be prompted with a list of the questions that they are going to be answering ahead of time so they are prepared when answering the questions.

- Some suggestions to improve navigation were noted:
  - Create a main menu to and from which applicants can move between sections.
  - Build in some way for people to navigate forward and backward through the questions.
- A "review before submission" function could be helpful.
- The following new functionality would be helpful:
  - An archive function that applicants can use to save or download a copy of their submission.
  - The ability to re-enter already entered data (e.g., contact information already entered in one place in the application).
  - A print option, including print to PDF.
- For technical assistance or clarification on questions, a chat function or a more fully built out "Help" function for financial information would be helpful.
  - The average level of knowledge of financial terms among applicants is pretty low, creating a need for additional handholding.
- Language support for Spanish speakers is important.
- The app should save to the database after each section is submitted.
- Push notifications/alerts would help guide or remind applicants about due dates, open items, etc.
- Future apps should prompt applicants with questions on possible steps to mitigate derogatory information.

Recommendations for Future Development of eInterview

The interviewees also commented on the overall effort to create an eInterview process:

- Determine where the app might be most useful.
- Consider using the app for the eQIP instead of using it as a TII aide.
- Consider developing a dynamic process where the future app is able to perform checks as the applicant is filling out the app such as finding or flagging a credit report or other automated documentation that the applicant can then provide comments on or use as a reference.
- Consider creating both a web-based version and a mobile version of this process—the mobile version for convenience and the PC version for security and ease of entering large amounts of data.
- Consider how such a system will be supported. For instance, will investigators, Facility Security Officers, or recruiters be asked to answer technical questions from applicants?
- Consider whether the gains from having such a system justify the backend costs and support costs from both a technical and labor-side consideration.