ABSTRACT
In an era dominated by ever tightening budgets, how does a company ensure they’re effectively hiring the right statistical programming candidate without the expense of a face-to-face interview? The Technical Phone Screen (TPS) is one tool used by most companies to gauge the skills of an individual applying for a position. This paper explores best practices in the use of the TPS in today’s challenging environment.

INTRODUCTION
The paper is written from the perspective of a consulting company hiring statistical programmers to work on clinical projects for pharmaceutical and biotech clients. Most of the ideas and concepts here are also applicable to recruiting, hiring and training permanent employees for other industries which use SAS programmers.

WHAT IS A TECHNICAL PHONE SCREEN?
The Technical Phone Screen is an interview conducted via the telephone, involving a statistical programming candidate and one or more interviewers, used to gauge how well the candidate fits a defined need. Today’s economic realities are such that in-person interviews are not as prevalent as they were just a few short years ago. In cases where money is not a consideration, the TPS can still serve as an effective qualifying step prior to a face-to-face interview.

The TPS can be a great way to hear how a candidate presents themselves over the phone. It includes a defined set of questions that could address concepts such as Base SAS, macros, clinical programming, and SQL, as well as open ended questions about the Software Development Life Cycle and the drug development process. The answers give the interviewer(s) a good sense of not only what the candidate knows, but also a glimpse into their thought process. Are they a self starter? Will they take ownership of their assignments? Do they ask good clarifying questions?

The TPS Compared to “Other” Phone Interviews
So, why not just throw in a couple technical questions during other phone conversations with a candidate? Why make such a big deal of a “technical” phone screen?

In order to best qualify a candidate as a good consultant in general, and as a good fit for a client-specific need, there are a variety of qualifications that need to be checked . . . does the candidate represent their resume well? Are they willing to relocate if necessary? What are their salary considerations? Combining the collection and review of all of this “human resources” information with a specific review of SAS skills would be overwhelming for both the candidate and a non-technical interviewer.

The audiences that need (or can best assess) the different types of information are often evaluating the candidate from different perspectives. Assuming the candidate meets basic screening requirements of the position, they can proceed to the technical portion of the interviews. If not, there is no need to take time away from a production programmer performing billable duties.

The TPS should be conducted by programmers or programming managers currently working with the client (and potentially working with the candidate). The resume review and other personnel-type qualification interview work are best handled by a recruiter or (again) a programming manager.
**The TPS Worksheet: the TOOL**

The following figures show the templates for a cover sheet and one question category for a Microsoft® Office Excel workbook that could be created for use during a technical phone screen. In our case, the categories and questions were compiled by a team of experienced programmers. The goal in choosing both the categories and the number/type of questions was to cover a variety of topics at a reasonable depth while providing some flexibility to the interviewers. Knowing the client that the candidates would be presented to and the fact that all of the candidates would be doing clinical programming work were significant factors influencing the design and development of the tool.

<table>
<thead>
<tr>
<th>Category</th>
<th>Avg Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base SAS</td>
<td>&lt;Base SAS score&gt;</td>
</tr>
<tr>
<td>Macro</td>
<td>&lt;Macro score&gt;</td>
</tr>
<tr>
<td>SQL</td>
<td>&lt;SQL score&gt;</td>
</tr>
<tr>
<td>SAS/Graph</td>
<td>&lt;SAS/Graph score&gt;</td>
</tr>
<tr>
<td>Tools &amp; Methodology</td>
<td>&lt;Tools score&gt;</td>
</tr>
<tr>
<td>Clinical</td>
<td>&lt;Clinical score&gt;</td>
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<tr>
<td>SDLC</td>
<td>&lt;SDLC score&gt;</td>
</tr>
<tr>
<td>Leadership</td>
<td>&lt;Leadership Score&gt;</td>
</tr>
<tr>
<td>Overall</td>
<td>&lt;Composite Score&gt;</td>
</tr>
</tbody>
</table>

The rating scale shown above indicates that the possible scores for the question responses are 1-5. However, <blank> is also a valid response and it is used to indicate that a question was not asked.

The “General Comments” section is a very important part of the composite report. The interviewer will use this section to provide an overall impression of the candidate and their ability to respond to the questions. This section is also used to explain or justify any blanks or low scores on the assessment. Finally, the interviewer is expected to provide a recommendation (or not) regarding presenting the candidate to the client.

Figure 1. Tab 1 - Template for a TPS worksheet cover sheet (Microsoft® Office Excel)
Figure 2 shows a template for one section of the body of the TPS worksheet. During the interview, a printed copy of the category sections, or body, of the TPS worksheet make an excellent tool for taking notes. In the actual workbook, the last three columns (“Question”, “Possible Solution”, and “Comments”) are much wider and taller to provide room for notes. Providing possible solutions on the worksheet is an aide to the interviewer, not necessarily an indication that the questions being asked are extremely difficult. Over time, or to someone not involved in compiling the questions, the questions that are so clear when initially written can become a little fuzzy. By having the answers available, it allows the interviewer to make sure they are asking the question correctly. The answers also establish a grading standard encouraging all interviewers to assess the candidates using the same criteria rather than to apply their own individual expectations for the depth and quality of responses.

The valid values for “Score” (described above as the “rating scale”) include: <blank>- to indicate that the question wasn’t asked, and 1-5 to allow the interviewer provide an indication of how well the candidate answered the question.

The “Comments” column can be used to make notes about the quality of the candidates answer, their skill at asking clarifying questions, the reason a question was skipped, etc.

Looking For a REAL Example With Actual Questions?
The templates provided above were intentionally left blank for a variety of reasons:

- While the TPS has served as an effective tool in our interview process, it is important to emphasize here that there isn’t a “one TPS fits all” solution available. Identifying categories, and compiling the questions and answers needs to be done to ensure that it fits your environment.

- By not including sample questions, the authors have removed any bias regarding what constitutes a good Technical Phone Screen tool. You will thank us in the long run 😊

- There is a tremendous wealth of ideas for technical interviews available on the internet. A simple Google request for “SAS programming interview questions”, “technical phone screens”, or the like will quickly arm the eager TPS creator with an abundance of resources.

ELEMENTS OF A GOOD TECHNICAL PHONE SCREEN

In addition to deciding what your goals are for using a Technical Phone Screen (i.e., what are you trying to learn about, or get out of, the candidate?), the following items are worth consideration:

- *Structured format.* The Technical Phone screen should be a scheduled event with a defined length (recommended length would be 45-60 minutes). It should be relatively formal, with some introductory conversation to put all parties at ease in the interest of a good productive experience.
• **Standardized questions.** There should be a standard set of questions (assuming that similar types of candidates are being sought to fill similar types of positions). The questions should vary in difficulty. The TPS results are used both to assess general knowledge/skill level of the candidate and to gauge the candidate’s ability to ask qualifying questions and seek clarification.

• **Scoring system.** On the interviewer’s side, there should be some kind of scoring system in place. We have developed an Excel spreadsheet that can be printed and used as a worksheet (and score sheet) during the phone screen. When the scores are entered into the electronic version of the spreadsheet, a score is calculated for each section of the TPS along with an overall composite score. The spreadsheet also provides room for comments, so that the interviewer can make notes to support the given score.

  The scoring is on a scale of 1-5, with 1 being the worst (the candidate did not answer the question correctly or has never used the statement/procedure before), and 5 being the best (the candidate included all expected components of the answer). A blank is allowed in the case that the question was not asked. Our worksheet includes suggested answers to the questions to encourage consistent results when the tool is used by different interviewers.

• **Provide guidance to the candidate.** Since we are using a standard set of questions and are doing the interview over the phone, we usually introduce each new section as we work through the tool. Other than the section on Base SAS, it is helpful to qualify that the candidate has had experience with the given aspect of SAS (Macros, SQL, SAS/Graph, etc.) and the extent of their experience. If they have not had any experience with SAS/Graph, for instance, there wouldn’t be any value in asking them the questions in that section of the tool, and notes can be added to the General Comments section of the cover sheet.

• **Flexibility.** We have multiple questions within each area to give the interviewers some flexibility during the TPS. The number of questions asked from a given section can vary based on the time the candidate takes to respond, the interviewer’s comfort with the candidate’s knowledge level, etc.

**THE TECHNICAL PHONE SCREEN AS PART OF THE RECRUITING PROCESS**

A possible sequence of events for the recruiting process could be:

1. Recruiter identifies and has initial contact with a candidate (or vice versa)
2. The recruiter refers the candidate to a manager based on
   a. potential fit with client(s) supported by that manager, or
   b. needs expressed by the manager that fit skills identified in the candidate’s resume
3. Initial interview by the manager
4. Technical Phone Screen
5. Review of feedback from recruiter, manager, and TPS interviewer(s)
6. Presentation to the client
7. Interview by the client
8. Welcome aboard!!

Including a technical phone screen as part of the interview process not only helps to identify the best candidates, it complements or enhances the other recruiting steps. By having programmers currently on your staff conduct the TPS, you get the objective information from the use of the tool as well as subjective perspective and insight regarding the candidate and their qualifications from the additional contact(s).

**IT ALL SOUNDS GOOD – SO WHAT’S THE CATCH?**

As much as we have been focusing on the benefits and values of the Technical Phone Screen, we must also acknowledge that it is certainly not foolproof. The concerns enumerated below are by no means an exhaustive list, but will (hopefully) provide some food for thought.

• You have lots of resources available from which to compile questions and create a useful TPS tool. Remember that the candidate has access to most, if not all of those same resources (especially anything
available via the internet).

- **RECOMMENDATION:** Do your homework and design the TPS very carefully. If you use the internet as a resource, choose questions from the sites/web pages that don't provide answers. Then, to the extent possible/reasonable, check to make sure a question you choose from one location (without an answer) doesn't appear someplace else (among those with answers provided).

- How can you be sure that you're actually talking to the candidate (and not Cyrano de Bergerac?)
  - **RECOMMENDATION:** While it's not a guarantee, asking a few questions from their resume as an introductory stage of completing the TPS might give some "identity assurance". Collaborating with other participants in the recruiting process (recruiter and/or manager) might also be necessary or helpful. The TPS is not a substitute for due diligence!

- How do you ensure that the candidate is not using manuals or online documentation to get information during the interview?
  - **RECOMMENDATION:** Be aware of how quickly the answers are given. A stalled response may lead to concern about the use of reference materials. Another red flag would be "perfect" or "text book" answers. Unfortunately, the saying "if it seems too good to be true, it usually is" can ring true in an interview.

- What about all the insights that can be gained in an interview by observing body language and just seeing how a person presents him/her self?
  - **RECOMMENDATION:** Look at the positive side of this situation. The PHONE screen aspect of the TPS provides a certain advantageous level of objectivity. It allows you to assess the candidate solely on the skills they are able to convey with the tools that they will need to use (SAS knowledge and communication skills). It also removes some of the bias that may result from a subconscious perspective influenced by appearance or nervous habits, etc.

**CONCLUSION**

The Technical Phone Screen is one of many interviewing tools that organizations can use for the critical task of hiring the right/best employees. While supporting the recruiting and hiring process, the TPS also serves as a precursor to the current work environment where phones, e-mail, and Instant Messaging are the primary means of conducting day-to-day business. In this sense, the Technical Phone Screen has gained significance as a method for identifying good candidates and predicting success as a consultant or a full-time staff member of a clinical programming team.

**REFERENCES**


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CONTACT INFORMATION
Your comments and questions are valued and encouraged. To contact the authors:

Dave Polus
Engagement Manager
COMSYS Clinical
5220 Lovers Lane Suite #200
Portage MI 49002
O: 269-553-5100
F: 269-553-5101
dpolus@comsys.com
www.comsys.com

Rosie Grzebyk
Senior Statistical Programmer
COMSYS Clinical
5220 Lovers Lane Suite #200
Portage MI 49002
O: 269-553-5100
F: 269-553-5101
rgrzebyk@comsys.com
www.comsys.com

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