



Candidate Interviewing for Fun and Profit

*Matching the best and brightest
candidates to available positions
yielding happy, productive
employees*



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**Rockwell
Collins**

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Abstract

Over the past decade, Rockwell Collins has perceived a problem with its success ratio of hiring employees from outside the company. Poor planning, inconsistent methods and untrained managers have contributed to a low success ratio of newly hired employees. In many cases the hiring manager was the only person a candidate interviewed with during a plant visit. For better results, human resource professionals tell us team members and customers should also be involved in the interview, when appropriate.

The hiring success ratio can be improved by following a consistent, rigorous interview process, which involves the hiring manager's team and customers. This approach is intended to supplement existing human resource practices.

This paper describes a pilot project that utilized this process and provided lessons-learned for those who wish to use this process in the future. This paper does not discuss issues related to recruiting, phone interviews, final hiring decision and success criteria set by the human resources (HR) department.

Background

The job requisition for this pilot was a software metrics engineering position (see Figure 1). To help establish the goals of the job and characteristics of an ideal candidate, the position was characterized before any of the candidates. When writing a job requisition, consider specific skills needed to fulfill job duties, achieve business goals, and the characteristics needed to fit into the team's working style. Also, try to anticipate future requirements of this position and other potential positions on the team. After a job requisition has been written, team preparation for candidates can begin.

<p>Job Title: SOFTWARE METRICS ENGINEER</p> <p>Software Engineer to assist with the metrics program development and related support activities, especially in the areas of data collection, data tracking, and data management.</p> <p>Specific Requirements:</p> <ul style="list-style-type: none"> • Working knowledge of software engineering • Excellent written and verbal communication skills • Excellent customer interface (people) skills <p>Preferred Knowledge & Experience:</p> <ul style="list-style-type: none"> • Formal software management techniques • Software Quality assurance • SEI Capability maturity Model • Statistical Process Control • Total Quality management or CPI techniques • DO-178 considerations • In-house software engineering experience <p>Minimum Requirements:</p> <ul style="list-style-type: none"> • Undergraduate degree in applicable engineering or science field or equivalent with demonstrated high academic and/or job performance and a minimum of 4 years (normally 5-8 years) of appropriate experience. • Graduate degree in applicable engineering or science field or equivalent with demonstrated high academic and/or job performance and a minimum of 2 years (normally 3-6 years) of appropriate experience.

Figure 1 – Example Job Requisition

Process Description

Establish an interview team

The purpose of the interview team is to make a recommendation to the hiring manager about the interviewing candidates. All team members are potential interview team participants. Other employees participating include internal customers and new-hire employees. Interview team membership is favored because it gives authority and ownership to those with the most to gain from a good hiring decision.

Use prepared questions

Many interviewers inadvertently expose themselves and their companies to legal action by failing to prepare candidate interview questions in advance. By preparing questions in advance, discriminatory or otherwise illegal questions may be avoided. “Shooting from the hip” at interview time is not only legally risky; it can cause a great deal of long-term damage. Hiring a candidate who is unhappy, unproductive or unqualified can cost the unfortunate hiring organization untold losses of time and money. Prevention is the best medicine – prepare in advance or prepare for the consequences!

Commercially - available collections of interview questions are designed to be fair and legal. This pilot used a set of *behavioral* interview questions¹. Behavioral questions are designed to reveal the behavior of a candidate in various business situations. Candidates are asked to explain how they have behaved in past similar situations on the job. This gives the interview team a good indication of how the candidates might behave in the future. This is the same

logic used when asking a candidate about prior convictions. Questions are categorized to simplify selecting questions to reveal the candidates' specific characteristics.

Identify desired characteristics of candidate

Using the job requisition and the planned behavioral questions as guidelines, the interview team selects the most important desired candidate characteristics. The field of potential interview questions then becomes a manageable number. Each team member reviews a separate category from the list of questions and chooses the most suitable questions for the target job. This way a duplication of effort between team members is avoided. The selected categories and characteristics are logged on a candidate score sheet (Figure 2) for comparative evaluation purposes later in the process.

Determine success criteria

The measurement of short-term success using this process, is the recommended degree to which the candidate is suitable for the job. This is admittedly a very qualitative criterion, but to measure a change in success ratio for the pilot, as mentioned in the opening paragraph, would certainly take years to complete. Besides, the HR department at Rockwell Collins measures this success ratio as a standard practice. The candidate score sheet (Figure 2) is used to tally the quantitative results of candidate suitability.

Hold interview

When the actual interview day (plant visit) arrives, the entire interview team meets with the candidate to determine compatibility, ask selected questions and assess the candidate's suitability for the job. Each interview is scheduled to span two hours. Roles of the interview team members are:

- Moderator (to keep interview on schedule and on track)
- Scribe (to record selected questions and candidate responses)
- Interviewers (to ask questions)
- Customers (to assess customer service orientation)

The interview consists of a portion to acquaint the candidate with the team members (30 minutes), a group interview (75 minutes) and a wrap-up (15 minutes). In addition to the behavioral questions, discussion should include the following topics:

- Was the candidate provided information about Rockwell Collins?
- Was the candidate provided information about the team?
- Did the interview team adequately answer the candidate's questions?

Ask Candidate for feedback on interview process

During the wrap-up portion of the interview, the candidate is asked for their impression of the interview process off-the-record. This wrap-up fosters learning and answers candidate questions. The candidate is reassured that these responses are not used to make a hiring decision but to improve the internal process of interviewing candidates. Candidate responses were collected and used to improve the interview process as the pilot project progressed. Some responses are documented in the lessons-learned section of this paper. At this point in the process, the candidate is dismissed from the interview.

Review interview results

The candidate score sheet (Figure 2) is filled out by the interview team immediately after the interview (the same day), so that impressions of the candidate are still fresh in mind. The

answers to the interview questions are quantified into a score from 1 (lowest) to 5 (highest) for each characteristic in the score sheet (or “N/A,” if the behavior was not experienced by the candidate). The team discusses the candidate’s responses with reference to the desired characteristics and makes a recommendation to the hiring manager. This way, the selection process becomes more deterministic and involves the people most effected by the decision. Other resources used to make this recommendation could include:

- Phone interviews
- Resumes
- Reference checks

Category	Characteristic	Candidates			
		Candidate # 1	Candidate # 2	Candidate # 3	Candidate # 4
	Instructions: A. Hold interview B. Ask behavioral questions C. Grade each candidate on each characteristic: 1 = Not at all 2 = To a small extent 3 = To some extent 4 = To a great extent 5 = To a very great extent N/A = Behavior not observed				
Required	Working knowledge of SW Engineering	4	3	3	5
	People skills	4	2	5	4
Preferred	Software engineering knowledge/experience	5	N/A	N/A	N/A
	Software management skills	2	1	1	3
	Software Quality Assurance	N/A	N/A	N/A	5
	Capability Maturity Model	3	1	1	5
	DO-178	3	1	1	1
	Continuous Process Improvement/Total Quality Management	2	1	N/A	4
	Statistical Process Control	4	2	4	5
Leadership	Collaboration	4	1	3	3
	Individual leadership (Influence)	3	2	4	3
	Persuasiveness	3	2	4	4
	Sensitivity	4	1	5	4
	Team influence	4	1	3	3.5
	Teamwork (Cooperation)	3	1	4	4
Planning	Planning/organizing (work management)	3	1	4	5
Decision making	Analysis	3	3	5	5
	Decisiveness	4	4	5	5
	Innovation	4	4	4	5
	Judgement (Problem solution)	5	4	5	5
	Organizational awareness	4	2	5	5
	Risk taking	4	N/A	N/A	N/A
	Troubleshooting	4	N/A	5	5
Performance management	Follow-up	N/A	N/A	5	5
	Maximizing performance	N/A	N/A	3	4
Communication	Oral presentation	3	3	5	5
	Written communication	3	N/A	5	4
Motivational fit	Motivational fit	5	2	4	4
	Work standards	5	2	4	5
	Technical/professional knowledge	4	4	5	5
Knowledge/Skill	Technical/professional proficiency	N/A	N/A	5	5
	Work tempo	N/A	N/A	N/A	5
Personal	Ability to Learn	4	2	5	5
	Adaptability	4	1	5	5
	Attention to detail	4	5	5	5
	Customer service orientation	4	3	5	5
	Initiative	5	2	4	5
	Rapport building	5	1	4	5
Other	Buy-time question(s)	2	N/A	5	5

Average		3.7	2.1	4.2	4.5
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Figure 2 – Candidate Score Sheet

Interview process improvement

After the hiring decision, the interview team and the hiring manager review the interview process. The intent is to determine ways to make the interview process more effective. Candidate and interview team responses are taken into consideration at this point.

After a candidate is hired, the interview team reconvenes with the new employee to discuss the interview process and suggests improvements with specific attention to the impact on the candidate. Conventional continuous process improvement (CPI) techniques are used to discover root causes of problems and implement solutions. Items of particular interest are:

- Was the candidate provided information about Rockwell Collins
- Was the candidate provided information about the team?
- Did the interview team adequately answer the candidate's questions?
- Did the interview team gain an understanding of the candidate (work style, enthusiasm, motivations, personality, etc.)
- How appropriate is the two-hour interview time?

Lessons Learned

Comments from candidates:

- It is good that everyone hears questions and answers together (no repeating)
- Before the interview, I was apprehensive about confrontations from the interview team. During the interview, however, the team made me feel much more comfortable.
- The team-based interview allowed me to better understand the working style of the team.
- This interview process is really a time-saving device.
- A mid-interview break would be appreciated, to clear my head (perhaps after 1 hour of interviewing).

Comments from interview team:

- Use more discussion and fewer prepared questions
- Use all team members for the entire interview
- Keep team member introduction time to a minimum length
- Do not skip over candidate when doing introductions (end with candidate)
- Describe work traits in introductions
- Make the interview more interactive and conversational
- Ask more questions in phone interview
- Train staff in proper interview techniques to avoid embarrassing or illegal situations
- Do not repeat prepared questions that address different characteristics of candidate. Instead, carefully select questions that are not duplicates.

Cost

Figure 3 shows the estimated and actual amount of effort (staff hours) expended to use this process. In actual practice, this process need not cost as much as is noted here, since this cost includes the effort to design and document this process.

Estimated Vs. Actual Effort (in staff hours)						
Process step	Estimated Effort	Actual Effort				Average effort per candidate
		#1	#2	#3	#4	
Design interview process	40	34	0	0	0	8.5
Establish interview team	8	4	0	0	0	1.0
Identify characteristics	6	2	0	0	0	0.5
Choose interview questions	12	6	0	0	0	1.5
Hold interview	2	8	14	18	13	13.3
Review results	3	9	5	8	10	8.0
Make hiring decision	1	0	0	0	0	0.0
Review interview process	3	0	0	1	1	0.5

Figure 3 – Cost Of Pilot

Conclusion:

The interview team and candidates feel this process is well worth the time and effort in terms of qualifying an outside candidate for a position with Rockwell Collins. The team is also in agreement that the hiring decision that utilized this pilot process was a good one.

About the author:

James Heires is a 13-year veteran of the software industry. His current professional interest lies in engineering cost estimation using historical project data. Contact Mr. Heires via e-mail at jtheires@collins.rockwell.com

About Rockwell Collins:

Rockwell (NYSE:ROK) is a global electronic controls and communications company with leadership positions in industrial automation, avionics and communications, and electronic commerce. In late June Rockwell, announced that it planned to spin off to shareowners its Semiconductor Systems business at calendar year end. Rockwell's continuing businesses will have projected fiscal 1998 sales of approximately \$7 billion and 38,000 employees. Visit Rockwell Collins at <http://www.collins.rockwell.com>

¹ Byham, William, *Targeted Selection Administrator's Manual*, Development Dimensions International, Inc., Pittsburgh, PA, 1991.

James T. Heires

James Thomas Heires is a 13-year veteran of the software industry, the majority with Rockwell Collins, Inc. His professional experiences include design of consumer electronics, Electronic Flight Instrumentation Systems (EFIS), Engine Indicator and Crew Alerting Systems (EICAS) and Flight Management Systems (FMS). Five years of software process improvement followed, illuminated by the achievement of SEI CMM Level III in two Rockwell Collins business units. Mr. Heires is currently working to improve the state-of-the-practice of project cost estimation.

Mr. Heires received his bachelor's degree in Electronics Engineering Technology from the University of Nebraska and has pursued postgraduate studies in Software Engineering and Computer Science at the University of Iowa. He received recognition in 1998 from *WHO'S WHO of Information Technology*.

Mr. Heires writes software product reviews for *Application Development Trends* and delivers technical presentations at national conferences.