Chapter 9
Simulations for Service Roles

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9.1 Evolution of Simulations for Service Roles

9.1.1 Market Forces Driving the Need for Service Simulations

The past several decades have seen a significant shift in the American labor market. There was a time, in the not so distant past, that manufacturing jobs dominated the landscape for job seekers in pursuit of entry-level positions. These entry-level manufacturing roles represented a starting point for workers. American workers could then parlay these roles into lasting careers. These manufacturing careers sometimes presented advancement opportunities in management, sales, or other operational areas within the organization.

Competitive advantage in those days was primarily achieved by product features, benefits, and innovation. Whoever could develop the better mousetrap usually had an advantage in the marketplace that could be sustained, at least for a reasonable amount of time. While it is true that the best organizations always valued high levels of customer service, they could excel with adequate service levels, if they did in fact have a superior product. Well, it is safe to say that those days are gone. Yes, you still need an outstanding product to compete but that is just the ticket to get into the show. If you want to be the star, you need to differentiate yourself in other ways, and the best way is through your people. Not just the technical people behind the scenes, or the executives in the board rooms, it is the people who *are* your company to your customers—your customer service providers. They are the ones that form the corporate image with customers, in each moment of truth, that will make or break the organization. Yes, outstanding products are a requirement, but with the technological

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advancements available today, differentiation based on product alone is short lived. It is the service people who often make the difference between success and failure.

It is also a reality that there are fewer manufacturing positions available (Dymond 2012). Offshoring for cheaper labor, robotics, and automation have reduced the number of manufacturing positions required here in the United States. In contrast, the number of service jobs available remains significant. A plethora of position openings exist in the service sector, in growth industries like health care, retail, banking, and hospitality (Murray 2009). Although entry-level service positions will continue to be available, competition among candidates will be fierce. Hiring organizations are likely to continue to see wave after wave of candidates applying for these entry-level service positions. This will enable hiring organizations to be selective as they strive to fill these positions with new hires who will make a positive impact on service culture and help secure a competitive advantage.

Being selective drives the need for highly accurate assessments that can predict candidate service, skills, and aptitudes. All of these conditions have led to an increased need for service-related simulations.

9.1.2 Automation of Traditional Assessment Center Technology

Simulation technology is not new. For decades it has been used for training and development in the military, transportation, and health care industries, among others. The use of simulations for hiring initially was focused on mid-manager to executive-level positions. These simulations were usually in the form of low-tech managerial assessment centers. These simulations consisted of multiple job-related exercises that required participants to complete work activities that mirrored the responsibilities of the target position. These assessment centers required administrators, role players, and multiple assessors. They also required business travel so participants could reach the location of the assessment center. Although this approach was and still is highly accurate, it is costly and time consuming. Using traditional assessment center methods for a high-volume entry-level customer service role is simply not feasible from a time or cost perspective. The market desire for the accuracy of the assessment center approach at an entry-level assessment price drove the evolution of simulations for service roles. In the late 1980's, we at Employment Technologies Corporation (ETC) began developing some of the first service-related simulations in the industry. We were the founding members of a small think tank charged with finding a way to make the assessment center approach both feasible and affordable for high-volume entry-level service positions.

To accomplish this, we needed to achieve three objectives:

- Eliminate the need for travel.
- Eliminate the need for role players.
- Eliminate the need for assessors.

The solution to all three of these objectives was technology. To eliminate the need for travel, we created the simulation content so it could be electronically delivered to the participant instead of the participant going to the simulation. To eliminate role players, we elected to use video vignettes instead of live role players to depict the work-related situations. To eliminate the need for assessors, we adopted a multiple-choice item format that could be automatically scored without human intervention.

9.1.3 Early Examples of Service-Related Simulations

Our earliest forms of service simulations were created and delivered on VHS video cassettes. These simulations usually included a brief realistic preview of the target position. The job preview would show scenes of the work environment and describe the key responsibilities of the job. The preview would also present the work orientation factors associated with the job and highlight both the pleasant and unpleasant features associated with the job. These job previews help establish clear expectations of the job and help reduce short-term turnover by providing candidates with clear expectations about the job (Wanous 1989). The job previews were followed by in-depth instructions for completing the simulation. We also believed it was important to provide candidates with information about the skills being measured in the simulation and how their performance would be evaluated. Finally, these early simulations included a practice scenario that would enable candidates to gain a clear understanding of how the simulation works before beginning a formal assessment period. The simulation content itself consisted of a series of video vignettes portraying critical situations typically encountered by employees in the target position. At key points in the video, candidates were asked to respond to the situation as if they were actually performing the job. The candidates would review a series of potential responses and select the one they believed to be best. These early video-based simulations were administered at a hiring location using a proctor. The proctor would be required to start the tape and observe candidates complete the simulation. Often, the simulation was administered in a classroom setting with multiple candidates completing the simulation at the same time. Once the tape started, the proctor would ensure that the tape was not stopped or rewound, to ensure a consistent simulation experience for all candidates. In these early days, candidates were provided with paper test booklets that contained a list of the questions and response options, as well as answer sheets to record their responses. These answer sheets were then collected and responses were either entered or scanned into proprietary scoring software. The scoring software would automatically score the responses and provide a feedback report for each participant who completed the simulation.

One example of these early service simulations was our first-generation teller assessment, called the Teller Assessment Program (TAP). TAP was developed and released in 1989. TAP was embraced and successfully used by several of the largest banks in America including Fleet Financial, Huntington Bank, and BB&T. TAP was a video-based simulation consisting of a series of service transactions. Candidates

were required to view these transactions and respond as if they were the teller completing the transaction. This simulation included a basic set of banking policies and procedures for the bank that would help candidates respond to the situations within the parameters of the bank. Another early example was the Customer Service Skills Assessment Program (CSSAP), developed and released in 1992. To develop this service-based simulation, ETC partnered with Saturn Corporation. Saturn was interested in redefining the customer experience within their car dealerships. Their goal was to create a service culture unlike anything associated within the automotive industry at the time. To achieve this vision, they would need to recruit and hire top-tier service providers. Saturn turned to us to develop an accurate service predictor for all dealership personnel who could potentially come in contact with customers at the dealership. To address this need, we created a video-based simulation that depicted service-related scenarios across a series of different service positions within the dealership. Although the service roles and the scenarios differed by position, the service skills that were required and measured by the simulation were universal across the dealership. This enabled us to create a single simulation that proved to be a valid and accurate predictor across all entry-level service positions within the dealership. Saturn used this simulation to launch their entire new dealership network. The success of the simulation was evident based on Saturn's outstanding customer satisfaction ratings related to the on-site dealership experience. This simulation was eventually upgraded for on-line delivery, enabling candidates to enter responses on-screen. A sample screenshot from this simulation is provided in Fig. 9.1.

9.1.4 Ongoing Advancements and State-of-the-Art Examples

These early video-based simulations continued to evolve based on the technology available. VHS-delivered simulations transitioned to DVD and ultimately to computer delivered simulations that provided candidates the ability to respond directly on-screen using the keyboard and mouse. The computerized simulation approach essentially eliminated the need for paper support materials. All of our simulations are now paperless. The instructions, support materials, and help functions are all self-contained within the computer-delivered simulation. This further ensures the consistency of the process across all candidates. The emergence of the Internet and the market's desire for delivering unproctored simulations has led us to design all of our simulations for web delivery. This trend is expected to continue into the future. When creating simulations, it is critical to consider the audience, the technology platforms, and the devices that candidates will use to complete the simulation. Market demand for versatile simulations that can be delivered on multiple platforms including handheld devices will continue to grow.

In addition to technology changes, we must also continue to evolve and advance the simulation experience for candidates. The use of virtual environments and gaming techniques will also be key factors that ensure the ongoing success of simulations

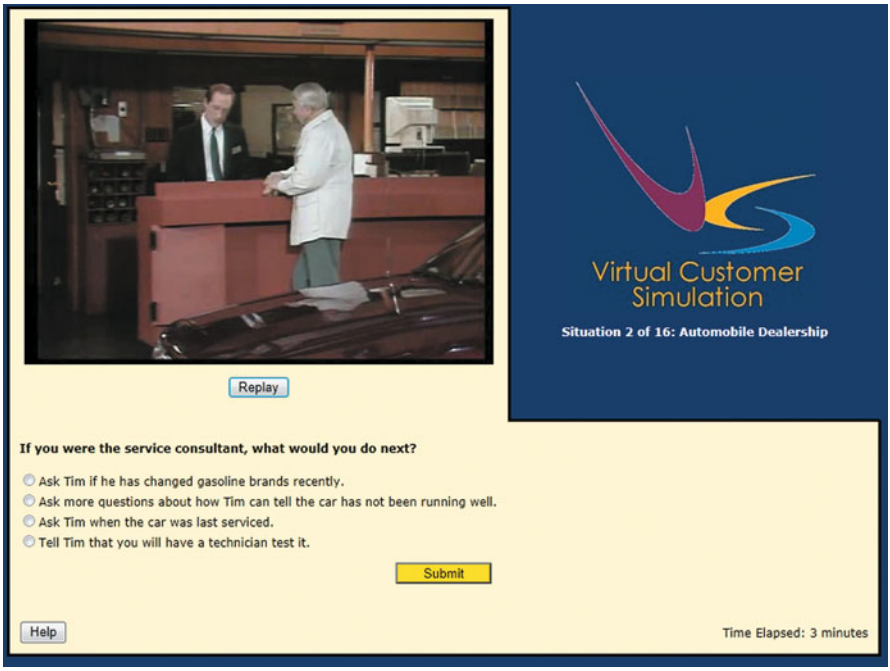

Fig. 9.1 Sample screenshot from early simulation

for service roles. Figure 9.2 provides screenshots from some of our current service simulations that utilize these techniques.

Candidate reaction data that we have gathered indicates that the use of animation and gaming techniques generally improves their perception of preemployment testing, leading to an enjoyable and entertaining experience for the candidate (ETC 2012). This has only positive effects for the hiring organization by expanding recruiting pools and perpetuating a progressive and positive corporate image that is important to young job seekers vying for entry-level service positions.

The technology available to develop and deliver simulations will continue to evolve. As simulation developers, we need to continue to evolve and adapt with it. Expect to be challenged for more mobile delivery options and higher expectations related to the overall sensory experience delivered via service simulations. We can also expect the market to continue to demand accurate, fair, and legally defensible simulations. Hiring organizations want to retain the accuracy of simulations provided, but they will want the simulations to be shorter. This poses new challenges for simulation developers. We will need to leverage all of the lessons learned and blaze new paths in research and development to meet these challenges and continue the expanded use of simulations for hiring service roles.

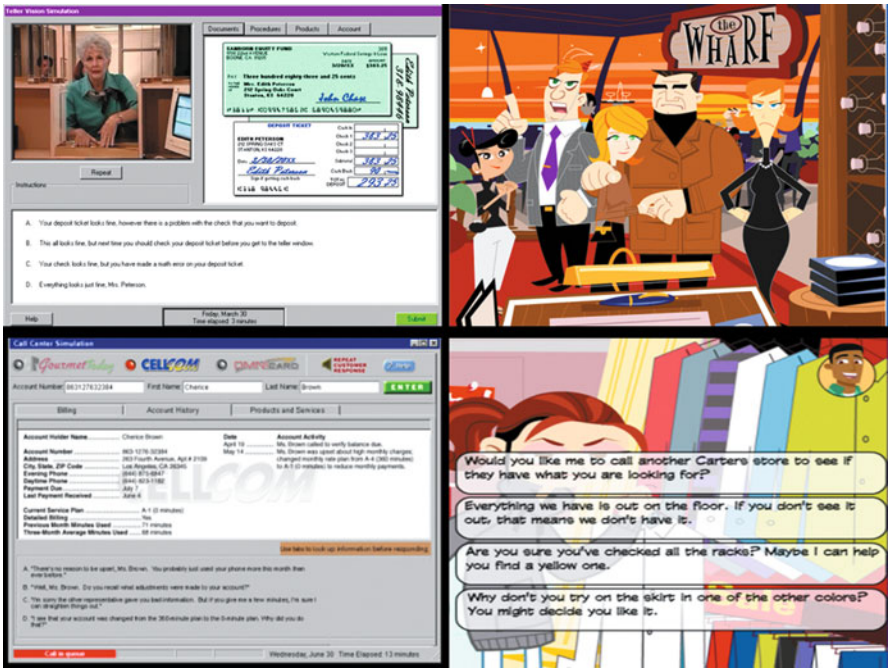

Fig. 9.2 Sample screenshots from current service simulations

9.2 Development Considerations and Processes

9.2.1 Understanding the Target Jobs and the Simulation Audience

When developing simulations for service roles, the first step is to gain an understanding of the target role. To create a realistic and accurate simulation, you must have an in-depth understanding of all the nuances of the job. Our simulation development process always begins with an in-depth job analysis. Our job analysis process employs several data gathering methods. On-site observations are combined with job analysis interviews with current incumbents and supervisors of incumbents in the target role. We use a standard job analysis interview protocol to identify the key elements of the position. The interview is focused on defining the key responsibilities of the target role as well as the specific work tasks performed under each key responsibility. The interviews should also contain questions to identify the knowledge, skills, abilities, and other characteristics (KSAOs) required to successfully perform the work tasks of the target role.

The job analysis effort should also focus on identifying critical incidents experienced by incumbents in the target roles. These critical incidents are the service-related

scenarios that define success or failure in the target role. For service roles, these critical incidents should involve key customer interactions that make or break the service experience for the customer. These critical incidents should be used in developing the subsequent simulation script. Creating a script that is based in truth and contains adaptations of real life situations will contribute to the realism and face validity of the simulation. Completing on-site observations is also critical. On-site observations provide the simulation developer with a rich picture of the work environment as well as the context and tools used when performing the target role.

The data gathering process should result in some form of a job profile that documents the information gathered in the process. The job profile should clearly describe the work performed by incumbents in the target position, as well as the KSAOs required by the workers who perform the target role. It is also a good practice to include a test plan for the subsequent simulation. The test plan should define the key characteristics of the simulation, as well as a listing of the types of situations for inclusion in the simulation. This document should clearly define the competencies that will be measured by the simulation, as well as a description of how these competencies will be measured by the test items. These initial job analysis efforts will lay the foundation needed to create an accurate and realistic simulation of the target role.

Finally, it is critical to gain an in-depth understanding of the audience for your service-related simulation. Take a close look at the demographic profile of the candidate pool for the target position. Consider factors like age, experience, education level, and language proficiency. Be sure that you develop and design the simulation at a level that is consistent with the intended audience. If the majority of your candidates are high school graduates with no postgraduate education, do not create a simulation that requires an advanced reading level. Be sure to avoid any cultural issues that may be misunderstood or misinterpreted by a segment of the candidate pool. Your general guiding principle is to design a simulation that is fair for all candidates, regardless of prior work experience. Simulations measuring general service competencies should provide an equal opportunity for all candidates to succeed if they have an understanding of basic customer service skills and a strong service aptitude. Also, be sure to consider the technology platform and devices that are accessible to the candidate pool. For example, do not create a simulation that can only be delivered on one platform if only a small percentage of the candidate pool has access to that platform. It is always best to develop service-related simulations that can reach the largest potential audience across technology platforms and devices. Current development tools that cut across different operating systems provide flexibility for simulation design and allow your simulation to be experienced by any end user that has high-speed Internet access.

9.2.2 Selecting a Multimedia Approach

One of the key decisions when developing service-related simulations is deciding on a multimedia approach to use when presenting the simulation content. The good news

is that today's technology provides many options. Rolling video, animation, virtual environments, and audio stimuli are all viable options. When choosing a multimedia approach, there are three main factors to consider:

- The nature of the target role
- The target market(s) for the simulation
- The demographics and preferences of the simulation audience

Consider how the target role is performed. Are the service interactions face-to-face or are they performed over the phone? Your multimedia choices should reflect the actual way in which the target role is performed. If the interactions occur over the phone, then use a multimedia approach that features customer voice only. If job incumbents need to identify customer moods and conditions using audio cues only, then only include audio cues in your simulation. If the interactions occur in a face-to-face environment, then depict the customers visually in your simulation. Use live video or animation to depict your customer scenarios. In general, a good service-related simulation should strive to recreate the actual job conditions as closely as possible. You want to provide candidates with an opportunity to experience job-related situations as if they are actually performing the target role. This will increase the accuracy of your simulation as a predictor of job performance and increase the accuracy of the realistic job preview you are providing to candidates.

It is also essential that you consider your target audience when selecting a multimedia approach. Every service simulation has its own look and feel. Consider the industry and potential target markets for the simulation. For example, the banking and financial industry is still fairly conservative in nature. In this industry, it may not be a good idea to create a simulation that resembles an on-line video game chock full of ringing sound effects and humorous animated characterizations of customer interactions. On the other hand, if you are developing a service simulation in the retail or hospitality industry, the organization may be more amenable to a highly visual gaming style approach. Also, consider the candidates who will be completing the simulation as part of the hiring process. Consider their age and their expectations around multimedia. If possible, you should strive to create service-related simulations that are not just accurate and fair but fully engaging to the audience who will experience them. Lastly, make sure the multimedia approach you select does not restrict the delivery of the simulation to your audience. Do not use a multimedia format that can only be displayed on a single operating system or device. Always seek an approach that will enable you to reach the largest potential audience.

9.2.3 Developing Simulation Content

As this book demonstrates, there are many approaches to developing simulation content. Some approaches are more appropriate for certain end uses than others. The approaches described here are most appropriate for service simulations. As mentioned earlier, almost all simulation development projects begin with a thorough and

comprehensive job analysis that includes critical incidents. As you identify critical incidents, go beyond the data gathered from Subject Matter Experts (SMEs). Do not be afraid to rely on your own experience as a source of critical incidents. Unlike a technical or manufacturing simulation, we can call upon personal experience to supplement the critical incidents that are supplied by the SMEs. We have all been customers or clients, and we can all readily recall incidents of good service and poor service. Some of the situations presented in our Virtual Customer—Service simulation are based directly on our test developers' personal experiences with service providers.

During the job analysis, it is essential to identify the competencies that are important for good performance and that underlie effective job performance. Not all competencies are appropriate for inclusion in a job simulation. For example, work ethic is consistently rated by employers as one of the most important qualities in an employee (Hill and Petty 1995). However, it can be difficult to assess this in a 45-minute simulation. This is an example of a competency that is better suited to assessment elsewhere in the selection process.

When considering whether to attempt measurement of a competency in the simulation, be sure that the competency can be specifically defined in behavioral terms. If it cannot be defined in specific behavioral terms, then it cannot be simulated and therefore does not belong in the assessment. Table 9.1 presents an example of general and specific definitions of a competency.

The work performed in service roles varies considerably, but almost always involves interaction with others. Therefore, one basic decision will be how to simulate these interactions. For example, when we developed a simulation for collections agents, the job analysis revealed that the vast majority of these interactions take place over the phone. In this instance, it was particularly important to record realistic audio, using professional voice talent to represent the wide range of emotions and situations that are typically encountered by collections agents in their dealings with consumers. There was no need to employ video- or avatar-based stimuli.

Beyond interacting with customers/clients, service providers may have other unique job tasks. For example, some service providers have to summarize their interactions at the conclusion of a call or visit. This involves accurately recalling and understanding the key issues and effectively and efficiently summarizing them. Be creative with question types and simulation content to capture these responses and measure these competencies. When simulating content, it is important to work closely with the technical team and computer programmers to ensure that design ideas can be effectively translated from a technical standpoint.

Finally, always develop more simulation content than is needed. Some of the content will not work well when the SMEs review it, some may drop out during the validation phase, and some ideas may seem good on paper, but are impossible to simulate.

Table 9.1 Definitions of friendliness

General	Specific
Displays kindness and helpfulness toward others, comes across as amiable and genial, treats each customer with respect, and makes sure they are satisfied with their service	Courteously greets customers, consistently smiles when interacting with customers, uses a pleasant tone of voice and appropriate language when talking to customers, is approachable and easily enters into conversations with customers, displays empathy and consideration for customers' problems, maintains composure in challenging situations, and thanks customers at the end of interactions and lets them know they are valued

9.2.4 Involving Subject Matter Experts in the Design Process

SMEs should be involved during all steps of simulation development. In addition to participating in the job analysis phase, SMEs can be used to review simulation content, specify optimal and preferred/less preferred response options, assist in development of the scoring key, and participate in beta testing the simulation.

Different SMEs will have different perspectives on the service role that is being simulated. SMEs may typically include incumbents (those occupying the target role), supervisors of incumbents, and higher level managers and executives. Each of these SME sources is uniquely positioned to provide important information that can aid in simulation development. Table 9.2 provides a description of SME sources and other considerations.

It is also important to use a diverse mix of SMEs. One obvious goal should be to include a diverse mix of SMEs with respect to gender and ethnicity. But do not forget more subtle indications of diversity, such as SMEs from different geographical settings. During one project when we were working with a large telecommunications organization to develop a simulation for retail store salespeople, we learned that there were several differences between retail sales people in urban versus rural stores. While the underlying competencies necessary for success were consistent across settings, there were large differences in the types of customers, store characteristics, and even the tasks performed.

SMEs, like all of us, are busy, time-challenged professionals. From an SME perspective, time spent working with a simulation developer means time away from his or her "real" job, which could mean lost sales opportunities, delayed responses to e-mails, or time logged out from a work station. Furthermore, in many service roles, there are certain times of the year that are busier than others. During these times, the availability of SMEs may be limited or nonexistent.

SMEs will be much more willing to participate when meetings and interactions are kept as short as feasible. This may require some creative scheduling. For example, a 6-hour meeting may need to be separated into several shorter meetings. Having a large pool of SMEs available will make things easier by decreasing the individual burden on each SME. On the other hand, there is an advantage to having a core group of SMEs who participate throughout the process. An SME who understands the purpose and process of simulation development can be an invaluable partner throughout the project.

Table 9.2 SME sources for simulation development

SME source	Best suited to provide information about	Limitations/considerations
Incumbents	Critical incidents, daily tasks, competencies needed for success, work environment	SMEs for this process should possess good communication skills and be considered high performing in the job
Supervisors	Competencies needed for success, differences between high and low performers, suggestions for simulation content	Supervisors usually provide less detailed descriptions of daily tasks and work activities
Higher level managers and executives	Limitations/shortcomings of current workforce, future changes that may impact the role	This group may be less knowledgeable about day-to-day challenges and work activities
Human resource/training personnel	Technical documentation about the job, training materials	This group may be less knowledgeable about day-to-day challenges and work activities

9.2.5 General Scoring Considerations

The approach to scoring a service-role simulation is inevitably influenced by the fact that service roles tend to be high-volume positions. In many organizations, service employees will account for the largest sector of employment in the organization. Because these types of simulations are typically used early in the selection process as a prescreener, testing volume will likely be high.

Simulation scoring approaches can range from fully automated systems requiring no human interaction or judgment, to work samples that must be individually scored, to a hybrid approach that combines automation with human intervention. For service simulations, fully automated scoring is usually the best choice because of following reasons:

- Results can be available immediately upon completion, thus facilitating shorter candidate cycle times.
- Test administrator training is minimized, and is usually limited to obtaining and interpreting results.
- Scoring consistency is maximized, which can be especially important for organizations with multiple locations.

The simplest automated scoring strategy involves a straightforward scoring of user responses to predefined choices (e.g., multiple-choice questions, extended list questions). However, participant responses do not necessarily need to be predefined to be scored automatically. As discussed in Chap. 5, it is possible to automatically score more complex user-generate responses using sophisticated, decision-based software programs that interpret participants' free responses. Programs utilizing automated voice capture and automated essay scoring are available. In general, utilizing these

types of software programs requires a high degree of technical sophistication. Vendor programs should be approached with caution, as there is a great deal of variability in the sophistication and reliability of commercially available software.

Another option is to combine automated scoring with human scoring. Under the right circumstances, this can be a very successful approach. For example, ETC's SkilTrak™ simulation utilizes user-scored evaluations of participant's free-response e-mails. Users are trained and guided to evaluate participant responses using a predefined checklist. Based on the checklist responses from the evaluators, the system generates an automated score. This approach, although requiring a small amount of time from the evaluator, maximizes reliability and consistency while still allowing for an element of human judgment.

The issue of timing the simulation should be considered carefully and should be based on the time pressures that exist in the target job. Some service jobs (e.g., grocery store cashier) must be performed under significant time pressures. The simulation design for this type of job should include an element of time pressure. Speed, accuracy, and completion percentages can all be factored into the scoring formula. On the other hand, some service jobs (e.g., retail sales associate) do not have substantial time pressures. For this type of job, the simulation should have a generous time limit that will allow most users to complete the entire program before time expires.

9.2.6 Avoiding Common Pitfalls

With more than two decades of experience in simulation design and development, there have been many lessons learned along the way. The following is a brief summary of common pitfalls and suggestions for strategies to avoid them. Simulations are time-consuming and expensive to produce. Be prepared that some end users may expect an exact duplicate of their current working environment and operating systems. This is not desirable or necessary in order to create a realistic, effective simulation that will remain relevant for as long as possible. Information gained during the job analysis phase can guide the content development to ensure that the simulation targets tasks and competencies that will remain relevant now and well into the future. When designing the look of the simulation, it is better to strive for a more generic look and avoid "dating" the simulation by including anything too trendy. Attempt to avoid trendy expressions and colloquialisms in the dialogue. If live actors are used, strive for a classic look by avoiding clothing and hairstyles that may appear outdated in a few years. This is an area in which avatars or virtual characters have an advantage. Older avatars can often be replaced with newer ones without the need to reengineer the entire simulation.

Equal Employment Opportunity Commission (EEOC) regulations caution test developers to avoid evaluating participants on content that can be easily trained or is readily accessible to employees on the job (EEOC 1978). If successful completion of the simulation requires knowledge of a policy or procedure, participants should have ready access to this information throughout the assessment period.

This can be accomplished by including a location for reference materials within the simulation, giving participants time to review the material prior to beginning the assessment period, and instructing participants to rely only on this information during the simulation.

When designing the introduction to the simulation, there are competing considerations. On one hand, the instructions given to participants need to be clear and comprehensive. If participants are confused, then the process will not yield valid results. Participants, especially those in a high-stakes selection context, may be nervous and somewhat distracted. They may not fully comprehend the instructions immediately. It is very helpful to include a practice component to help participants feel comfortable with the interface prior to beginning the actual assessment period. If a practice component is not included, then the first task or interaction will often function as a practice, which is not the ideal situation if discriminant validity is important.

On the other hand, recruiters and human resources personnel want the shortest possible assessment time. In today's fast-paced world, even candidates will become frustrated and lose interest if the assessment period seems excessive. When viewed as a test budget, more time spent in an introduction means less time available for the actual assessment. There is no single best answer to this dilemma, just a caution to consider these competing concerns when designing the simulation.

9.3 Proving Effectiveness

Simulations, unlike many other types of assessments, have a high degree of "face validity." The connection between the assessment of one's ability to perform the work and the actual performance of the work is often readily apparent. A typing/keyboarding test is a classic example of a test with high face validity. If a participant can accurately input 80 words per minute in a typing assessment, then it seems logical that on-the-job performance of this task would be similar.

Simulations for service roles, however, are far more complex than a simple keyboarding test. Successful performance on the simulation requires a combination of skills and abilities. For instance, most service roles require at least some interpersonal skills, including competencies such as building rapport, persuasion, collaboration, and teamwork. Even if the simulation has the look and feel of the target job, it is still one step removed from actual, live interactions with real people. It does not automatically follow that the competencies necessary to be successful in the simulation are the same competencies that contribute to actual on-the-job success in the service role.

Therefore, for both legal and practical reasons, it is necessary to prove that the simulation is effective for its stated purpose. Proving effectiveness can take many forms, including formal documentation of content validity, statistical methods demonstrating criterion validity, and practical approaches that focus on the return on investment

(ROI) for organizations. When practical, a combination of all of these methods should be employed to document the simulation's effectiveness.

All validity efforts should be documented in a technical validation report. The EEOC's *Uniform Guidelines on Employee Selection Procedures* (1978) provides detailed standards for conducting and documenting validity efforts for selection procedures. The following comments are intended to highlight areas that are particularly important in the context of service-role simulations, but are not intended to be an exhaustive description of all the necessary components and considerations in a validation effort.

9.3.1 Content Validity

Simulations lend themselves well to a content validity approach. The primary purpose of content validation is to ensure that the content of the test (e.g., situations, test questions, response items) accurately represents the content of the target job. The Society for Industrial and Organizational Psychology (SIOP) states "When the selection procedure is designed specifically as a sample of important elements in the work domain, the validation study should provide evidence that the selection procedure samples the important work behaviors, activities, and/or worker KSAOs necessary for performance on-the-job . . . this provides the rationale for the generalization of the results from the validation study to prediction of work behaviors" (SIOP 2003, p. 21).

Since service jobs tend to be heavily interaction-based, ensuring content validity starts with a solid job analysis that includes collecting critical incidents of interactions that are typical in the target job. To the extent that these incidents are represented in the simulation, this approach has the added bonus of providing a realistic preview of the job. While many critical incidents will involve dealing with angry or upset customers, it is important to simulate a variety of types of interactions, including customers who present a neutral or positive affect. Candidates who experience a simulation filled with undesirable interactions may be left with an unrealistically negative impression of the target job.

Working closely with SMEs throughout the development of the simulation will contribute to the content validity of the end product. SMEs should be involved in many steps of the development process and their involvement should be documented in the technical report. If possible, try to collect descriptive information on all SMEs who participate, including job title, tenure, and demographic details. Including these details in the technical report will demonstrate the diversity of SMEs who participated and enhance the legal defensibility of the development process.

A key component of the content validity process is to establish a linkage between the work activities that are simulated and the competencies that are being measured. This can involve a simple matrix that links each of the work activities with the competencies required to perform each activity. This can be done by the test developers, by SMEs, or by both groups.

Survey methodology can be used to obtain and document SME feedback on the technical accuracy, realism, and appropriateness of the simulation content. There are existing survey approaches available to capture SME ratings (e.g., Lawshe 1975). Alternatively, surveys can be custom-designed to fit the project needs. Survey results should be summarized and included in the technical report. These results may include a summary of quantitative ratings of content validity as well as SME comments and feedback.

9.3.2 Criterion Validity

In addition to establishing content validity, the legal defensibility of any assessment will be greatly strengthened by conducting a criterion validity study. Criterion studies can be time-consuming and logistically complicated to complete. However, the advantages of a criterion validity study include the following:

- The validation group can be used to establish the norms and performance benchmarks for the assessment.
- Given large enough sample sizes, the data can be examined for any potential subgroup bias and scoring can be adjusted if necessary.
- Participant reactions (e.g., perceptions on engagement, difficulty level, and realism) can be collected in conjunction with the validation study. These reactions can be useful when promoting the assessment, and can also provide insights to test developers.
- When the simulation is deployed with a larger group of participants, occasionally technical problems that did not appear during the beta testing phase will surface, and these can be addressed prior to its final release.

In a predictive criterion validation study, job candidates experience the simulation, get hired (with or without knowledge of simulation results), get trained, and finally become capable of independent job performance. At this point, job performance is measured and compared with the preemployment simulation results. A disadvantage of the predictive approach is that this process can take months, even considering the relatively high-volume, fast-paced nature of service roles. In the service industry, the time to proficiency from the initial hire to independent performance is usually about 3 months. The advantage of a predictive study is that criterion data can be collected during multiple points in this process. Simulation scores can be compared with a number of data sources, including other assessment results that the candidate experienced during the selection process, performance during training and "nesting" periods, and time to achieve proficiency.

It is usually easier to conduct a concurrent criterion validation study, rather than a predictive study. In a concurrent study, incumbents in the target job complete the simulation, while job performance metrics are simultaneously gathered. The use of a concurrent approach allows researchers to gather and compare test data and performance information from a large sample in a short time frame. The disadvantage

of this approach is that simulation scores will be subjected to a restriction of range due to the use of an incumbent population that has already been screened, trained, and coached to perform the target position. There also may be restriction of range in the criterion, due to the attrition of low-performing employees and the reluctance of supervisors to provide low ratings for current employees.

Regardless of whether the study is concurrent or predictive, there are a number of job performance metrics that lend themselves to measurement. Performance measurements can include objective and/or subjective metrics. Objective metrics that are frequently useful for criterion measures in service roles include training scores, average handle time (AHT), call quality monitoring scores, customer satisfaction scores, and quota achievement metrics. The most useful objective metrics will exhibit a range of values and be under the control of the individual employee.

For example, if all contact center agents in the study have availability scores (i.e., percent of time available to take calls) of 96 % or greater, then this metric will probably not be useful in the validation study. Similarly, if an objective metric is largely determined by factors that are outside of the individual employee's control, it is unlikely to show a relationship to the assessment. Although almost all collection agents are tracked on the amount of money collected, this metric is often influenced by so many outside factors that its usefulness in a validation study is limited. For the same reason, team-based metrics that depend on the overall performance of a team are problematic.

Subjective metrics usually consist of performance evaluations provided by supervisors of study participants. Although it is possible to use an existing evaluation, it is often best to develop an instrument specifically for the validation study. The survey should focus specifically on the competencies being measured by the simulation. To increase the reliability of ratings, survey items and response options should be behaviorally based. Finally, supervisors should not have knowledge of the participants' simulation results and should be assured that the ratings will remain confidential and only be used for research purposes.

Raw, uncorrected correlation coefficients from well-designed and well-executed studies are almost always an underestimate of the operational validity of the assessment (Sackett et al. 2008). In order to obtain a more accurate estimate, validity coefficients should be statistically corrected when appropriate. For validation studies that utilize incumbent populations, it is appropriate to correct for restriction of range. For validation studies that rely on a subjective criterion measure, it is also appropriate to correct for unreliability of the criterion. Because the performance measure is typically completed by only one supervisor, this correction estimates the correlation that would be obtained between the test and a composite performance rating of two or more raters.

The U.S. Department of Labor (2000) has provided some guidelines regarding the anticipated usefulness of assessments, given their criterion validity coefficients. Although there are many factors that influence the usefulness of an assessment, these guidelines serve as a useful starting point when evaluating validity coefficients (Table 9.3).

Table 9.3 General guidelines for interpreting validity coefficients

Validity coefficient value	Interpretation
Above 0.35	Very beneficial
0.21–0.35	Likely to be useful
0.11–0.20	Depends on circumstances
Below 0.11	Unlikely to be useful

Table 9.4 Validity results from ETC validation studies

Simulation	Target job	Validity coefficient	*N*
Collection Agent Simulation for Hiring	Collection agent	0.48**	323
Teller Vision	Bank teller	0.47**	370
Virtual Customer—Service	Customer service provider	0.47**	785
Virtual Customer—Sales	Retail sales associate	0.41**	359

**Results significant at $p < 0.01$

Table 9.4 provides some actual validity coefficients from several ETC assessments that target service-related roles. All of these results were obtained from concurrent validation studies involving incumbent service providers, and all validity coefficients were corrected as described previously. These relatively high validity coefficients demonstrate that simulations can be used very effectively in the service sector.

9.3.3 Setting a Minimum Passing Score

A criterion validation study can provide data to assist in the establishment of a minimum passing score for the assessment. Establishing the minimum passing score for an assessment is a complex task that combines both science and experience. In understanding how a minimum passing score is determined, it is first helpful to review the key objectives of preemployment assessments. An effective preemployment tool has three characteristics. It will be valid and show utility in predicting job success, reduce the chance of a legal challenge, and be practical and cost-effective for the organization.

An appropriate minimum passing score will allow the assessment to best meet the above three objectives. If a criterion validity study has shown that the assessment is proven to predict on-the-job performance, then the minimum passing score can be set at a level that best suits business needs and minimizes adverse impact.

9.3.4 Minimizing Adverse Impact

The potential for adverse impact against protected classes is frequently an important consideration when deploying simulations for service roles. There are several strategies during development that can minimize adverse impact. Ensure that the SME group includes a diverse group of individuals who are representative of the potential candidate pool. SMEs who are high-performing incumbents in the target job may be particularly helpful in this regard. For example, SMEs may be able to flag phrases, words, or situations that have the potential for cultural bias.

When collecting demographic information as part of the simulation, it is better to place these questions at the end of the simulation rather than the beginning, to minimize the possibility of stereotype threat. Stereotype threat has been identified as the pressure that a person can feel when he or she is at risk of confirming, or being seen to confirm, a negative stereotype about his or her group (Steele and Davies 2003). Although researchers have found mixed results in support of this theory (Sackett 2003), placing the demographic questions at the end is a prudent and easy step to address this potential concern.

Finally, monitor the reading level of all text-based material that is part of the simulation. This includes policies and procedures, question stems and responses, and background information (e.g., product descriptions, policies, and procedures). The inclusion of text-based information should be directly supported by the job analysis results. While some service roles (e.g., technical help desk associate) rely heavily on text-based information, other service roles (e.g., theme park attendant) may not. As a general rule, the reading level of text-based material should not exceed an 8th grade reading level.

9.3.5 Determining Return on Investment

Return on Investment (ROI), in the context of assessments, is more accurately a form of utility analysis. It is a practical approach to proving the financial impact of using a simulation, and ultimately to proving the simulation's economic value to an organization. Similar to any other financial investment, an ROI calculation considers the costs of using the simulation as compared with the economic gains that can be expected. The goal is to capture the worth to the organization (in dollars) of having higher performing employees who are less likely to be absent, less likely to turn over, and who are more productive.

ROI approaches start with the assumption that the simulation has validity, and many ROI formulas incorporate test statistics (e.g., criterion validity coefficients, descriptive statistics) into the calculations. For this reason, ROI computations are often conducted after the initial validation research has established the simulation's effectiveness from a statistical standpoint.

When compared with validity research, ROI approaches can be accessible to a wider audience. Many people are unfamiliar with advanced statistical concepts

and remain unimpressed with validity evidence, even when the evidence is extremely compelling. Using an ROI approach can translate the statistical evidence into economic terms that present a convincing picture of the simulation's effectiveness.

The cost side of the ROI equation should include the ongoing usage costs of administering the assessment. This can include usage fees, recruiter or administrator time, and equipment/computer costs if the simulation is administered on-site. If the simulation has been developed in-house, these development costs should also be included and perhaps prorated over the expected lifespan of the simulation.

The benefit side of the ROI equation is much less straightforward to calculate. There are vast differences in approaches, assumptions, and formulas that have been used to estimate the "return" component of ROI calculations. However, it can be useful to divide the ROI benefits of simulations into calculations of *cost savings* and calculations of *economic opportunities*.

Calculating costs savings is usually the easier of the two calculations. In the high turnover environment associated with many service positions, a preemployment simulation can select better employees and thereby lower turnover. This can lead to significant cost savings by reducing the following:

- Hiring costs, including advertising, recruiting, testing, and interviewing.
- Development costs, including training and onboarding.
- Dissatisfaction costs associated with customer dissatisfaction or low employee morale. For example, empty seats in a call center can lead to longer customer hold times as well as stressed out employees who are expected to pick up the slack.

Estimating the economic opportunities from increased employee performance is often more difficult than estimating the cost savings from lower employee turnover. There are many formulas available, ranging from simple formulas with few variables to those that are more complex. Nevertheless, a preemployment simulation that identifies better employees can lead to higher productivity (e.g., shorter wait times, more customers served), higher customer satisfaction, and potentially higher revenue for the organization.

Schmidt and Hunter (1998) have developed a utility formula that is relatively easy to apply. The formula takes into account three factors: the difference between the new (presumably more valid) selection method and the old selection method; the difference in job performance between a poor employee and a good employee; and the average score on the selection method of those hired as compared with the general candidate pool. We used this formula to estimate ROI when a large multinational rental car organization began using our simulation, Virtual Customer—Sales, to select rental counter personnel. The organization knew that higher performing employees brought more revenue into the organization through the sale of optional rental services. Using conservative estimates for some of the variables, the formula yielded a projected sales increase of $1,280/employee/year; using more generous estimates for some of the variables, yielded a projected sales increase of $2,560/employee/year. When compared with the costs of implementing the simulation, it was immediately clear that the economic benefits far outweighed the costs.

9.3.6 Organizational Communication Strategies to Convey Results

After being immersed in an effort to demonstrate the effectiveness of a simulation, it is tempting to assume that the positive results will be obvious to everyone else. It can be disheartening when the results are met with confusion, skepticism, or worse, disinterest. This can be avoided by tailoring the results to different audiences. Although those with an Industrial Organizational (I-O) or science-related background will care about validity coefficients, others may greet these results with a big yawn.

It is useful to remember that different stakeholders in an organization care about different things. With regard to high-volume service roles, human resource personnel and recruiters will be most interested in how the simulation will help them fill vacancies quickly and easily. They will care about ease of use, throughput of candidates, and screen out rates. They will be most impressed with results that show them how the simulation will efficiently provide them with higher quality candidates.

Managers want employees who will be successful in training and get up to speed more quickly. They also want reliable employees who will not quit or be absent, which can be a huge challenge for managers of service workers. They will respond to results related to training proficiency, absenteeism, turnover, and satisfaction with hire. Executives, who are focusing on the larger picture, want a better workforce that will give them a competitive edge over their competition. This group will respond to ROI calculations that focus on higher productivity, customer satisfaction, and revenue.

When done correctly, communications that include pictures, graphs, and charts can help convey the message clearly and efficiently. Graphic displays should be streamlined. The message should be immediately apparent at first glance. Charts should be limited to only the most pertinent information that can be easily comprehended. In short, a well-crafted graphic will convey a compelling story of cause and effect using numbers and images. More information on this topic can be found in the landmark series of books by Edward Tufte (Tufte and Graves-Morris 1983; Tufte and Weise Moeller 1997).

An expectancy chart is one example of a graphic image that can quickly convey the relationship between simulation performance and on-the-job performance in a nonstatistical way. An expectancy chart shows a participant's predicted performance on some criterion variable, given the participant's score on the simulation. The underlying relationship is based on a regression equation that has been generated using data from a validation study. However, there is no statistical knowledge needed to understand the results of the chart.

In the following example, ETC conducted a blind predictive study with an organization that was using our Call Center Simulation™ assessment. The new employee assessment results were plotted against call quality monitoring scores that were collected during their first few months on the job (see Fig. 9.3). This chart provides two important messages. First, it is apparent that regardless of simulation score, all employees will likely show improvement in call quality during their first several

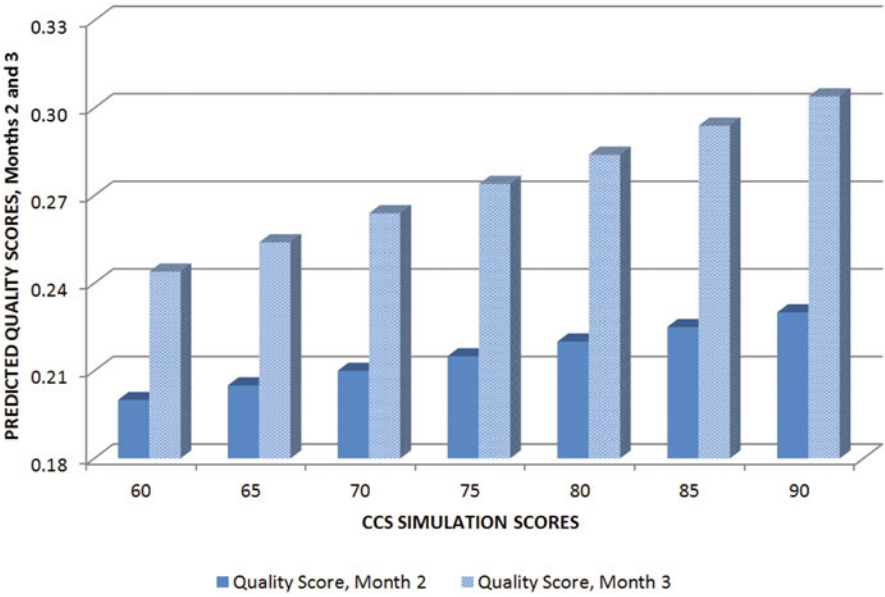

Fig. 9.3 Expectancy chart for Call Center Simulation

months on the job. But more importantly, the improvement will be accelerated for those who achieve higher simulation scores. The chart shows that employees who score higher on this preemployment simulation will get up to speed faster, resulting in positive benefits for the organization.

9.4 Implementation Strategies

9.4.1 Simulation Placement in a Multiple Hurdle Approach

To maximize the effectiveness of simulations as hiring tools for service roles, the manner in which they are used is of great importance. Building a great simulation does not guarantee success if it is implemented incorrectly. There are a variety of implementation strategies to consider, but we will highlight the most common strategies that represent best-in-class practice. These strategies have been honed over more than 20 years of experience with hundreds of hiring organizations, both large and small. A quality simulation will always provide some value regardless of implementation strategy, and there is no one best way. However, we will describe some guiding principles that should be considered. In most cases, a service simulation will be used in conjunction with other assessments as part of an overall selection process. Many times, these selection processes use a multiple-hurdle approach. A multiple-hurdle approach requires candidates to perform at a certain threshold on

each assessment to progress to the next step in the process. This is an attractive approach when the hiring organization needs to screen large numbers of candidates to fill the available job openings. Many service roles such as call center agents, retail clerks, bank tellers, and food and beverage staff are high-volume positions. In these examples, the hiring organization will have many openings to fill and a large number of candidates to choose from. Given these conditions, a multiple-hurdle approach is both a practical and fair approach. These multiple-hurdle approaches typically utilize a series of different types of assessments, each designed to measure a unique part of the criteria that define success in the target role. The most effective multiple-hurdle process employs assessments that each contribute to the overall predictive power of the process as a whole.

Each component of the process should be targeted to different aspects of on-the-job success in the target role. Since simulations are often competency-based assessments, they are often combined with résumé and application reviews, prescreening assessments containing minimum qualifications questions, values assessments, personality inventories, and screening interviews. Each of these types of tools provides unique value. The subsequent decisions involve 1) how to best configure these tools to maximize the effectiveness of the process and 2) where should the service simulation be placed?

We will make the assumption that each of the tools in the selection process is valid and predicts some facet of job performance. We will also assume that the service simulation has demonstrated criterion-related validity, based on one or more validation studies. Over the years, we have discovered that simulations for service roles are consistently among the most accurate predictors available (see Table 9.4). In addition, the validity evidence of simulations was supported in a meta-analysis conducted and presented by Frank Landy at a recent SIOP conference (Landy 2008).

These high validity coefficients suggest that in best practice, service simulations should be placed early in the overall selection process. The fact that simulations are computer scored, objective, and unbiased suggest that early placement in the selection process is most beneficial. We suggest a service simulation be placed directly after a résumé/application review and a minimum qualifications prescreening assessment. If a value or personality inventory is part of the process, the simulation can be placed directly before or after such an inventory.

Consider issues like accuracy, cost, and completion time when deciding on the placement of the simulation. A general guideline is to leverage the most valid and unbiased instruments earlier in the process before the candidate comes into direct contact with a recruiter or hiring manager from the organization. Interviews, whether conducted by phone or in person, are still subject to bias and rater error. Our experience suggests that once someone in the hiring organization forms an opinion about the quality of a candidate, there is no turning back. Using these more subjective methods early in the process will ultimately undermine the effectiveness of the simulation. If the simulation is used after candidate contact, recruiters and hiring managers will expect the simulation to confirm their perceptions, however inaccurate those perceptions may be. You will be better served to let the highly valid and objective simulation work for you to screen out unqualified candidates. Using the simulation to prequalify

candidates before they speak with recruiters and hiring managers will minimize the likelihood of making bad hires.

This approach is also highly efficient. Much time is still wasted interviewing unqualified candidates. If you can provide interviewers with only prequalified candidates, then you will save significant time and money. This will enable your interviewers to focus their energy on only the most qualified candidates. This will also encourage more in-depth interviewing and better results. Initially, interviewers may be reluctant to embrace this approach, fearing that they are losing control of the hiring process. Be patient and in the long run your interviewers will thank you.

Not all hiring organizations elect to use a multiple-hurdle approach. Some organizations prefer to administer an entire test battery, including a simulation, to all candidates regardless of individual scores on each instrument. Organizations may adopt this approach if their candidate flow is less intense. They may also want their recruiters to maintain more control over the hiring process. In these cases, a service simulation will provide key information that, when combined with other tools in the process, provides a robust picture of each candidate's likelihood for success. When using this approach, hiring organizations should consider all of the information gathered in the process and make hiring decisions based on the totality of the information. To ensure consistency and legal defensibility, the hiring organization should still develop standard written guidelines on using the assessment information to make hiring decisions. This approach still leverages the data gained by service simulations, while providing the hiring organization with more flexibility than a standard multiple hurdle approach.

One of the advantages of service simulations is the wealth of data generated based on candidate performance. A well-designed service simulation should provide an overall score that can be used to make employment decisions. This overall score is based on a total of the cumulative responses across the entire simulation. This score is the most reliable score because it is based on the largest number of items. However, well-designed simulations should provide more than just an overall score. In addition, a service simulation should provide feedback on the various service dimensions that are measured across the simulation. Our service simulations provide information about candidate performance at the service competency level. Most service-related roles can be defined by a set of competencies that includes some form of building rapport, discovering needs, problem solving, and ensuring customer satisfaction. Since these subscores are based on fewer items, they should primarily be used to diagnose the developmental priorities for those candidates who are ultimately hired.

9.4.2 Access to Simulation Results

An important consideration is determining who should have access to simulation scores and when access should be granted. Service simulations are commonly used to make hiring decisions for entry-level service employees. These hiring decisions are usually made jointly by recruiters and hiring managers. In high-volume hiring

situations, recruiters are tasked with sourcing candidates, screening them, and then passing qualified candidates to the hiring managers to make final decisions. In our 20 plus years of experience designing and implementing service simulations, we have seen organizations employ many different approaches to disseminating and managing simulation scores. Most of these approaches fall into two categories: limited access to results and open access to results.

Organizations that elect to use a limited access approach do this by carefully managing and controlling the release of simulation scores. They limit the scores that recruiters and managers are allowed to see and when they can see them. Some organizations elect to only share pass or fail results with both recruiters and hiring managers. This approach has some advantages. If candidate flow is heavy, a simple pass or fail result is all that is needed to determine if job candidates should proceed past the service simulation to later parts of the selection process. Limiting access to only pass/fail results also ensures that there is no bias in later parts of the selection process based on simulation scores. Some hiring organizations fear that the release of full simulation scores that usually range between 0 and 100, as well as service dimension subscores, will bias both recruiters and hiring managers in subsequent stages of the hiring process.

Other organizations prefer allowing more open access to service simulation results. An open access approach provides recruiters and hiring managers with total access to service simulation scores. These organizations allow recruiters and managers to review overall numerical scores (e.g., between 0 and 100) and the subscores for each service competency measured in the simulation. This approach enables the hiring organization to use all of the available information to help make accurate hiring decisions that align with the organization's specific needs and hiring objectives. Some of these open access organizations also advocate using the simulation results to drive the content of subsequent interviews in the selection process. These organizations look at the simulation results to identify potential red flags related to competency performance and then target these areas in the interview process. Of course, other hiring organizations use a hybrid approach that may provide total access to recruiters but only pass/fail information to hiring managers (or vice versa). In almost all cases, job candidates do not receive any overall simulation scores.

If hired, some organizations will share the subscore results with candidates as well as hiring managers to identify developmental opportunities and customize the initial training and onboarding process to increase efficiency. Unfortunately, most organizations do not leverage the service simulation data posthire. This is a common mistake. Service simulations can provide a great deal of developmental feedback that can be very useful in the early developmental cycle of an employee. Simulation scores can identify developmental priorities based on simulation results and provide developmental suggestions for improvement. More organizations would benefit from leveraging prehire simulation data for posthire developmental purposes.

In reality, there is no one best way to use and manage the access and reporting of service simulation results. Both limited and open access approaches have their respective advantages. The key is to design service simulations that provide flexible reporting. Flexible reporting will enable the hiring organization to support a variety

of approaches. Creating reports that display different types of scores designed for different audiences is beneficial. Also, consider the timing of when results will be shared and with whom. Posthire reports designed for new hires or hiring managers should have a developmental tone that is focused on performance improvement, rather than an emphasis on specific scores used in the hiring decision. In summary, the best practice is to provide options. Options will allow the organization to adopt and implement the strategy that best meets the needs of its business.

9.4.3 Ongoing Consultation and Support to Optimize Results

As simulation developers, our job does not stop once a hiring organization implements a simulation. Our job really begins after implementation. In order to ensure that hiring organizations receive the maximum value from our service simulations, we need to provide ongoing consultation and support to optimize results. There are several areas that require ongoing attention. The first is passing rates of the candidate pool. Hiring organizations look to service simulations to help them screen out unqualified candidates who have limited opportunities for success on the job. We use normative data gathered during the validation and subsequent benchmarking processes to help hiring organizations set minimum passing scores.

Most hiring organizations expect a service simulation to screen out somewhere between 20 and 35 % of the candidate pool. Initial minimum passing scores can be set to accommodate this goal as long as the validation data supports this approach. The validation data should reflect that candidates who score below the minimum passing score are unlikely to achieve satisfactory performance ratings on the job. Of course, EEOC considerations should also be taken into account when setting minimum passing scores so that the potential for adverse impact is minimized. Once set, the performance of the service simulation should be monitored to ensure it is performing as expected. We recommend periodically review passing rates at least once every 6 months. Look for meaningful trends in the data that may impact the ongoing use of the simulation, including

- Are the passing rates similar to the initial expectations established at the time of implementation?
- Are there regional differences in passing rates?
- Are there score differences based on recruiting source, prescreening method, or administration approach?

Service simulations should also include an optional demographics section requesting candidates to identify their race, gender, and age categories. This information will enable you to monitor passing rates by demographic subgroup to monitor the potential for adverse impact. Monitoring simulation scores over time to discover trends provides added value to hiring organizations and will extend the usefulness and impact of the simulation.

Since service simulations are generally among the most accurate predictors of job performance when compared with more traditional screening methods like applications, résumé reviews, and prescreening interviews, an organization may want to use the same simulation across multiple position titles and business units. In these circumstances, you should use a consistent process to determine the suitability of a simulation for additional job titles. If a localized validity study is not feasible, you can use a transfer of validity approach. At ETC, we employ a job match process to ensure the work activities performed by incumbents in the target position match the work activities of the population in the job analysis and original validation study. A short job match survey can be used for this process. The job match survey should include items related to the work activities performed and competencies required for success on the job. A suitable degree of similarity should be established before recommending a service simulation as a hiring tool for any target job that was not included in the original scope of the job analysis and simulation development efforts. Selecting a sound implementation strategy and monitoring simulation performance will ensure success when using service simulations for the hiring of service roles.

In recent years, it has been exciting to see the growing acceptance of computerized simulation technology for hiring. As we began our early work in this area, it was hard to imagine a book of this kind with so many respected authors representing various facets of simulation technology. We are pleased to be a part of it. We hope this chapter has provided some insights based on our collective experience in developing and implementing service-related simulations.

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