Harnessing Tech Talent:

The Science Behind Selecting Top Software Sales Representatives

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Introduction and Where to Begin

As I-O psychologists at a leading software company, our objective is to develop a robust selection model that not only identifies potential candidates but also ensures their success in meeting high quarterly sales goals. This document outlines our strategic approach to constructing a selection model equipped with adequate criterion-related validity, ensuring it effectively screens and selects candidates poised for high achievement in software sales. To construct this selection model, several foundational steps must be adhered to. First, we completed a comprehensive job analysis to examine specific tasks, responsibilities, and necessary competencies of a sales representative; this step was critical in informing the selection of appropriate tests and predictors as well as their role relevance (Sanchez & Levine, 2009); next we'll identify the appropriate predictor variables (a test(s) or selection model(s)) and criterion variable (a standard against which the test is compared) (Kaplan & Saccuzzo, 2018, p. 138).

Identifying Predictor and Criterion Variables

With a complete job analysis, the next step involves identifying suitable predictor and criterion variables that are indicative of job success. A predictor variable should be grounded in core competencies identified during the job analysis. For sales positions, particularly in high-stakes industries like technology, cognitive abilities, personality traits (such as extraversion and empathy), and behavioral judgement tests are highly predictive of job performance (Salgado et. al., 2003). A criterion variable typically includes measures of job performance, such as sales figures, customer satisfaction ratings, and retention rates. These are critical for evaluating the effectiveness of the selection process and provide a benchmark for assessing predictive validity of selections and refining the selection criteria based on actual job outcomes (Pulakos et al., 2005). Our criterion variable is "achieving high quarterly sales" and our predictor variables

(based on our job analysis) are: a cognitive ability test (for learning aptitude and problem-solving abilities), a personality test (for interpersonal sensitivity), and a structured interview (for sales strategies and techniques, and adaptability), assessed via the multiple hurdle approach.

Selection Model Proposal

We will use a multiple hurdle approach whereby predictors are administered in a pre-determined order and candidates may only move to the next step in the process if they have scored above a cutoff score on the previous predictor, see *Appendix, Table 1: Sample Multiple Hurdle Model Scoring Sheet* for sample sheet and cutoff scores. The predictors will be 1) the Wonderlic Personnel Test (WPT) to assess cognitive ability; 2) the Hogan Personality Assessment (specifically the scale for interpersonal sensitivity (social awareness and empathy) on the Hogan Personality Inventory (HPI)), and 3) a structured behavioral interview to assess past behaviors in the workplace. The WPT consists of 50 multiple-choice questions to be answered in 12 minutes and assesses abilities such as verbal reasoning, numerical reasoning, and problem-solving capability. In validity studies, the WPT has been found to be a reliable predictor of job performance in roles such as sales, where understanding and conveying complex product information is critical (Dodrill, C.B., 1981). The Hogan Personality Assessment assesses seven scales of personality (adjustment, ambition, sociability, interpersonal sensitivity, prudence, inquisitive, and learning approach) and is widely recognized for its strong predictive validity regarding job performance, especially in roles that require effective interpersonal interactions and leadership qualities, such as sales (Hogan & Holland, 2003). The structured interview will use 10 questions with clearly defined rubric and instructions, see *Appendix, Form 1: Sample Structured Interview Scorecard*. Studies on structured interviews have shown validity

coefficients as high as .70 (the range being from -1.00 to +1.00) when ensuring that all candidates were asked the same questions (Levy, P., 2020, pp.189-190).

Determining Criterion-Related Validity

To determine the effectiveness of the selection model, it is essential to validate it through empirical testing. The validity of the model is assessed by correlating the predictor scores with the criterion measures of job performance. This validity coefficient (*r*) provides a quantifiable measure of the model's predictive accuracy (Schmidt & Hunter, 1998), for example, validity coefficients in the .30 to .40 range are generally considered adequate (Kaplan & Saccuzzo, 2018, p. 141). This approach guarantees that the sales representatives selected will be well-equipped to meet the demands of their roles.

To ensure the selection model works and possesses criterion-related validity, several considerations must be taken into account. First, we'll monitor whether changes in predictor scores reliably predict changes in sales performance over time to assess whether there were any *changes in the cause of relationship*. Then, to ensure employees *understand the criterion*, we'll clearly define what "high quarterly sales" means. Additionally, we'll *review the subject population* and *review our sample size* regularly to ensure our initial study population matches any changes in demographics of applicants or that our sample size isn't too low to be significant to represent our candidates. Clearly *separating the predictor and criterion* allow for clear distinction and avoids circular reasoning, while ensuring there is enough variability in both the predictor variables and the criterion to *avoid having a restricted range*. Lastly, *validity generalization* and *differential prediction* evaluate whether validity evidence from one context can be generalized to this specific context, and whether the model predicts equally well across different subgroups within the candidate population, e.g., different genders, ages, or ethnic

backgrounds (Kaplan & Saccuzzo, 2018, pp. 144-148). See Appendix, Table 3, *Validity Considerations and Hypothetical Examples* for additional details.

Conclusion

In conclusion, the selection model developed offers a robust framework for identifying and selecting the most capable sales representatives for the tech software industry. Through meticulous job analysis and the careful identification of relevant predictor and criterion variables, we have laid the groundwork for a multiple hurdle approach that is both systematic and grounded in empirical evidence. The Wonderlic Personnel Test, the Hogan Personality Assessment, and structured behavioral interviews serve as our chosen instruments to gauge a candidate's potential for success in a highly competitive field. As we implement this model, our ongoing evaluation of its criterion-related validity—taking into account the changing relationships between predictors and performance, the clarity of the performance criteria, demographic representation, and the avoidance of range restriction—will ensure its efficacy and fairness. We will also keep a keen eye on validity generalization and differential prediction to confirm that our model's effectiveness holds true across different candidate subgroups. By following this structured selection process, we aim to not only enrich our sales force with top talent but also to bolster the overall performance and productivity of our organization in the dynamic landscape of tech software sales.

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Appendix

Table 1

Sample Multiple Hurdle Model Scoring Sheet

Candidate Name	WPT (Max 50)	Cutoff >= 25	Pass / Fail	HPI: Interpersonal Sensitivity percentile	Cutoff >= 50%	Pass / Fail	Structured Interview (Max 50)	Cutoff >= 25	Pass / Fail
John	42	Yes	Pass	62%	Yes	Pass	45	Yes	Pass
Alex	30	Yes	Pass	48%	No	Fail	-	-	-
Samara	47	Yes	Pass	76%	Yes	Pass	35	Yes	Pass
Aisha	23	No	Fail	-	-	-	-	-	-
Marcus	38	Yes	Pass	55%	Yes	Pass	40	Yes	Pass
Jennifer	26	Yes	Pass	60%	Yes	Pass	27	Yes	Pass

Form 1

Sample Structured Interview Scorecard

Candidate Name: _____
Interview Date: _____
Interviewer Name: _____

Instructions for Interviewers:

Scoring: Assign a score from 1 to 5 for each question based on the candidate's response according to the established rubric criteria below.
Comments: Provide brief comments on each score to justify the rating and note specific strengths or weaknesses observed.
Final Score Calculation: Sum the scores for each question to get the total score.

Interview Question Scoring:

	Question	Score (1-5)	Comments
1.	Describe a time when you had to explain a complex product to a non-tech savvy client.		
2.	Provide an example of a challenging sale you closed.		
3.	Tell me about a long-term client relationship you managed.		
4.	Describe a situation where you handled a customer's objection.		
5.	How do you stay updated with trends in the technology sector?		
6.	Tell me about a time you missed a significant sales target?		
7.	Describe a time when you collaborated to achieve a sales goal.		
8.	What strategies do you use to manage your sales pipeline?		
9.	Give an example of how you handled a dissatisfied client.		
10.	What are the most important skills in software sales, and how have you demonstrated these?		
		Total Score	**Recommendation (Hire/No Hire)**

Interview Question Rubric

Rating	Rubric
1 – Poor	The response is unclear or irrelevant, showing little to no understanding
2 – Fair	The response is somewhat relevant but lacks detail; demonstrates only basic understanding
3 – Good	The response is relevant and adequately detailed; shows a good understanding
4 – Very Good	The response is detailed and insightful; demonstrates a strong understanding
5 – Excellent	The response is exceptionally detailed and insightful, demonstrating expert understanding

Table 2

Validity Considerations and Hypothetical Examples

Validity Consideration	Hypothetical Example
Changes in the Cause of Relationships	A study comparing predictor scores from the selection process with sales performance every quarter over two years shows a consistent positive correlation, indicating the reliability of the predictors.
Understanding the Criterion	"High quarterly sales" is defined as achieving sales targets that are 15% above the regional average for similar tech products.
Reviewing the Subject Population	Demographic shifts in the applicant pool are monitored to ensure the selection model is updated and remains predictive for the current applicant profile.
Adequate Sample Size	The validity study includes a sample of 500 participants, exceeding the number required by power analysis to detect a medium effect size, ensuring the results are statistically robust.
Separation of Predictor and Criterion	The process involves separate committees evaluating the predictor variables and the criterion measures to avoid any potential bias or overlap.
Checking for Restricted Range	The selection model includes a broad spectrum of cognitive and personality scores, as well as a wide range of sales performance outcomes to ensure a full range of variability.
Validity Generalization	Findings from similar selection models in the tech industry are reviewed to ascertain if these can be generalized to the current company context.
Differential Prediction	The selection model's predictability is analyzed across subgroups based on gender, age, and ethnic background to ensure it predicts sales performance consistently for all groups.

Note. Adapted from Psychological testing: Principles, applications, and issues (9th ed.) by Kaplan, R.M., & Saccuzzo, D.P., 2018, pp 144-148. Cengage Learning.