



# VALIDITY AND RELIABILITY OF ASSESSMENTS



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## Overview

HireQuotient creates Virtual Interviewers to help organisations assess business skills at scale. We create realistic mini job simulations to test candidates' ability to execute the tasks expected in the role, enabling hiring teams to efficiently screen out unsuitable candidates with minimal time and effort. Just as coding tests have become well-established in tech hiring, HireQuotient plays a similar role for business skills across the organisation.

The benefits of HireQuotient are

- Quality - the content is designed by subject matter experts
- Objectivity - providing consistent assessments and improving diversity
- Scalability - Virtual Interviewers reduce recruiting burden on senior resources
- Customizability - assessments are tailored to the needs of each role

In the absence of reliable, scalable skill assessments, many organisations have had to resort to proxy measures, such as personality tests, psychometric assessments, or General Cognitive Ability or IQ tests.

In this document, we explain why HireQuotient's tests are valid and reliable assessments of candidate skills, and why organisations can rely on them to Assess More, Interview Less, and Hire Better.

## HireQuotient Skills Structure

A HireQuotient Virtual Interview aims to mimic an in-person skill/competency interview conducted by an experienced interviewer with relevant expertise in the role. This is done by compiling a series of questions that test for the skills needed in the role, and can be used for recruiting or for Training Needs Analysis internally within the team.

In this document, Virtual Interview and assessment are used interchangeably to refer to a set of job-specific questions that collectively determine whether an individual can do the key tasks needed on the job.

### Skills classification

As the range of skills and functions that fall under the general umbrella of business skills is very wide, HireQuotient's approach is to first divide the universe into job families and job roles. While there may still be significant variation between project manager roles across firms, they would at least share a core set of competencies and skills.

At the moment, the roles that HireQuotient can test include

- Management consulting and business strategy
- Investment, Private Equity and Venture Capital
- Project management
- Product management
- Sales
- Marketing

We then use the Skills Framework developed by Skillsfuture Singapore (an agency within the Singapore government) to further break down each job role into 3-5 Critical Work Functions, each of which may comprise of a number of Key Tasks. This is then modified based on inputs from our expert team and our client feedback.

<b>Critical Work Function</b>	<b>Key Task</b>
<i>Identify new sales opportunities</i>	<i>Identify new sales opportunities with existing clients</i>
	<i>Evaluate prospect qualification analysis of leads generated by the business development team or insides sales team</i>
	<i>Present new products and/or services to new and existing clients</i>
	<i>Participate in price formulation for product and/or service</i>
	<i>Work with pre-sales teams and other internal stakeholders to meet client needs</i>

For example, an Account Manager working in sales would have “Identify new sales opportunities” as one of their Critical Work Functions. 5 separate Key Tasks collectively comprise this Critical Work Function. We can then create scenarios and questions to test the candidate’s ability to successfully execute each Key Task. We then assess the candidate’s ability to perform the Critical Work Function based on how they perform on a selection of Key Tasks. Note that in most situations it is not necessary, and not practical, to test every single Key Task, and hence a representative sample is usually sufficient to determine overall competency within the Critical Work Function.

This enables us to consistently and systematically break down a job role into its constituent Key Tasks, and provides a starting point for companies to tailor the assessment according to the specific way the role is structured within their organisation.

### **Core competency-driven assessments**

For roles or assessments where specific technical or functional “hard” skills are less important than core competencies, we can also structure assessments that focus on testing these core competencies in a non-specific work context. Such assessments have been used for generalist roles such as consulting, management associates/graduate hiring, or public policy and civil service.

Examples of core competencies include:

<b>Core competency</b>	<b>Definition</b>

<b>Problem framing</b>	Problem framing is the quintessential consulting skill. It requires the ability to get to the heart of the problem and identify the key issues, as well as to quickly structure an approach to get to the answer.
<b>Analysis</b>	Analysis is the ability to break up a big problem into smaller constituent parts. It combines the ability to think critically about a problem with the application of logic and reasoning to work through the constituent parts
<b>Insight</b>	Insight is the flash of understanding that comes after analysis. Insight comes from applying practical business knowledge to the results of your analysis or to make the right assumptions, and using that to guide your prioritisation as you move towards generating solutions
<b>Synthesis</b>	Synthesis is the ability to distil actionable recommendations from the noise and chaos of information overload and uncertainty. This means being able to focus on the key findings while avoiding distractions and red herrings
<b>Quantitative analysis</b>	Quantitative skills are all about working with numbers to come to business insights. This typically involves interpreting data, performing calculations, and translating numbers into insights.

# Why you can trust HireQuotient Virtual

## Interviewers

What makes an assessment a “good” assessment to use when screening and selecting candidates for a job? There are generally 3 properties that collectively enable you to make better hiring decisions

- The test must be *relevant* for the job role under consideration
- The test must be *valid*, which means that it accurately measures what it claims to measure
- The test must be *reliable*, which means that the same person taking the test multiple times should get similar and consistent results each time

## Relevance

HireQuotient addresses relevance by customising assessments according to the needs and context of each role, based on the framework of Critical Work Functions and Key Tasks described in the previous chapter. This ensures that the kinds of questions being asked and the scenarios being posed will be directly applicable to the job role being tested for.

## Validity

For a hiring assessment to be valid, it must accurately predict likelihood of success (or failure) in the job. There are two sub-dimensions of validity that are important here:

- What characteristic/metric is being tested
- How accurately is that characteristic being measured

A test that accurately measures the right characteristics that are essential for success on the job would therefore be a useful yardstick by which to compare candidates and determine who should move forward to the next stage.

HireQuotient focuses on two strategies to build assessments with high validity

- We achieve high **content validity** by creating scenarios that enable candidates to demonstrate their ability to execute key tasks associated with the role. The questions that they are asked are directly linked to the Key Tasks they need to perform, and the common types of situations they will encounter, and hence their answers provide a strong indication of their ability to perform the role
- **Construct validity** comes from the fact that we are directly assessing candidate ability to perform the Key Tasks. Unlike personality or intelligence tests, which need to show how test outcomes correlate with performance, we seek to answer the question “Can the candidate perform a particular Key Task” by giving them the Key Task and seeing how well they perform on it.

### **Example for validation**

In a validity test with an existing client, we analysed the scores of more than 30 thousand candidates, and found a clear correlation between the average scores on our assessment and the competency score they achieved during the in-person interviews. Candidates were rated from 1 (best) to 5 (worst) There was a consistent increase of around 2-3 points (out of 100) for each rating (so a candidate rated 1 in the interview would, on average, have scored 2-3 points higher than one rated 2, and so forth), allowing the client to predict interview outcomes on the competency dimension with a high degree of accuracy.

## **Reliability**

Reliability is a measure of the trustworthiness of an assessment outcome

- Test-retest reliability measures the consistency of scores across repeated attempts at the instrument
- Parallel form reliability measures the consistency of scores across different versions of the test

Given that HireQuotient asks skill/knowledge/application questions that candidates can learn the answer to over time, repeated testing with the exact same question set is not meaningful. Hence we focus on parallel form reliability, where candidates are expected to achieve similar scores when presented with different sets of questions drawn from the same pool.

HireQuotient achieves high reliability through the following:

- Focus on application of skills, e.g., calculation, rather than feelings or abstract thought patterns which might vary from time to time
- Use of structured questions (rather than traditional X choose 1 multiple choice) which increase the number of possible combinations for each question, reducing the likelihood that high scores result from multiple lucky guesses

## Question creation and testing

HireQuotient engages Subject Matter Experts (SME) within each role to create suitable questions to assess each Key Task. The SMEs are trained to write questions that are in line with the HireQuotient testing philosophy, and which conform to the standards expected by clients.

Each question is subsequently checked independently by other SMEs to ensure that the questions meet the high standards we set. The question testing process covers the following areas

- General validity check
- Difficulty
- Expected time taken to complete

The questions are also examined for

- Clarity of intent
- Sufficiency of information
- Reliance on in-depth or specific local knowledge
- Unintended negative messages (which can affect diversity and inclusiveness)

HireQuotient questions are scored based on the expertise of the question creator. The questions are designed to have objectively right or wrong answers, rather than normed (i.e., organisational preference) or subjective assessments. This allows us to definitively assess each candidate's performance based on the answers they give to the questions posed.

Data is collected on candidate performance in the actual assessments, and is used to drive a Machine Learning algorithm that continuously calibrates the expected time and difficulty level/weightage of the questions.

HireQuotient periodically runs online searches for the questions in our database to determine if the content has been leaked, and to take the necessary steps to redress the situation. This helps prevent certain candidates receiving an unfair advantage over their peers. This can include removing the question from our bank, modifying the context and answers, etc.

## Accounting for bias

HireQuotient is firmly committed to improving Diversity and Inclusion for our clients. Our competency-based selection is already a big step forward as the Virtual Interviewers do not factor in demographic data such as race, gender, or socioeconomic background, which human interviewers sometimes unconsciously do.

Furthermore, we work with our clients to monitor the performance of different demographic cohorts in our assessments, including deep-dives by question type to see if there are any patterns or disparities in performance that require further investigation. Based on the findings of these analyses, the assessments can be tweaked to emphasise/avoid certain question types, or to weight them differently in the final analysis.

As part of our question creation process, we scrutinise each question for the following potential areas of concern

- Excessive or inappropriate use of gendered pronouns
- Potentially offensive situations or terms (e.g., racist, sexist or politically sensitive)
- Geography-specific references which would advantage candidates familiar with the area (e.g., questions based on knowing the population of certain countries)
- Use of idioms or other non-literal language which might disadvantage non-native English speakers

We believe that this helps our clients comply with, for example, the US Equal Employment Opportunities Commission, which states that it is “illegal to discriminate against someone (applicant or employee) because of that person's race, color, religion, sex (including gender identity, sexual orientation, and pregnancy), national origin, age (40 or older), disability or genetic information.”