Università Ca'Foscari Venezia

Ca' Foscari University of Venice

Faculty of Economics

Master's Degree programme in Global Development and Entrepreneurship

Final Thesis

"The Use of Personality Profile Assessments as a Strategic Tool for International Companies"
Business case: KUUL.JOBS

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Matriculation number

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Academic Year

2022/2023

To the one who taught me to face life with determination and stubbornness. Thank you for being my source of motivation and reference point.

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ABSTRACT

The present study aims to examine the impact of personality profile assessment on the recruitment process for identifying suitable candidates. Various psychometric test methods will be compared and analyzed to discern their respective applications and ascertain the most relevant assessment type for the given context. A comprehensive investigation into personality profile assessment will be conducted, with a specific focus on the recruitment procedures of innovative companies and their contribution to maximizing value. The research will center on the employer's ability to leverage the behavioral competencies of each employee to enhance the overall effectiveness of the organization.

In the final chapter, a case study will be examined to propose a concrete implementation of how personality profile assessment can be effectively utilized to establish a profitable and successful business. The study will present a startup idea proposition along with an accompanying analysis, demonstrating the potential benefits derived from employing personality profile assessment in real-world scenarios.

INTRODUCTION

When assessing a job application, applicants are primarily concerned with their fit for the job position and their satisfaction with the company's working environment. Traditionally, applicants present their educational and work experiences through their curriculum vitae (CV). However, CVs may not always provide reliable information as individuals tailor them to showcase an optimal fit for the company and position they are applying to. To mitigate bias and unreliable information, recruiters employ additional selection tools such as verbal interviews, competency tests (e.g., case studies), and logic tests. However, these tools alone may not be sufficient to create an equitable and consistent working environment based on meritocracy, free from discrimination. The younger generation entering the labor market expects higher standards from companies and the labor market as a whole. As a result, organizations are striving to acquire innovative skills and tools to meet these new expectations set by young professionals in their job-related choices.

One of the emerging methods being implemented by organizations is the use of personality profile assessments. Psychometric tests are effective tools for both personal development and maximizing value. By measuring mental and cognitive performance, personality traits, and aptitude, these tests provide quantifiable and scientifically robust analyses, offering comprehensive insights for both organizations and individuals.

This dissertation aims to analyze personality profile assessments as a recruitment tool, with a focus on increasing the level of innovation in human resources management and optimizing its processes. The underlying concept is to provide individuals with the opportunity to improve themselves through psychometric tests, deepening their understanding of their own traits, behavioral styles, interests, and talents. This self-awareness allows individuals to make informed and conscious choices when selecting the best job positions that align with their abilities and interests. This, in turn, leads to increased productivity, efficiency, and well-being in the workplace. By implementing this concept in society, individuals can elevate their personal success, while organizations can boost their profits through the full exploitation of their employees' skills and increased process efficiency.

Additionally, psychometric tests find application within organizations in areas such as cultural fit, idiosyncratic traits, cost and time efficiency, interview independence, and standardized testing. Cultural fit assessments focus on how well newly hired employees align with the organizational culture and the team they will be working with, including the embrace of values, organizational structure, and communication style. This approach aims to prevent employee turnover and conflicts within teams.

The second chapter of this dissertation delves into the implementation of personality profile assessments as a selection tool in organizations. Psychometric tests have proven to be highly useful for optimizing administrative processes, particularly during the recruitment phase. These tests are typically administered on computers under direct supervision in the organization's office, allowing a psychologist to select the appropriate assessment method based on their knowledge, resources, research, and experience. The test parameters are readily available, and the results can be easily transferred to management for evaluation. Recruiters have access to short references, standard tables, and statistical evaluations for making comparisons.

It is important to note that while psychometric testing is an innovative and motivating tool for personal growth and talent acquisition, its implementation requires consideration of potential drawbacks. Organizations must be prepared in terms of innovation to ensure the tool's positive impact. It is also crucial to adopt a broader perspective on corporate culture innovation and the implementation of new tools to drive innovation. Psychometric tests contribute to reduced turnover by ensuring a better alignment of personal characteristics and job fit, resulting in the attraction of high-quality talent.

The second chapter of the dissertation also explores specific business cases for the use of psychometric testing in screening and talent acquisition processes, aiming to make recruitment more conscious and effective. Notably, the "Big 4" companies, including Deloitte, Ernst & Young (EY), PricewaterhouseCoopers (PwC), and Klinfelt Peete Marwick Gelderer (KPMG), utilize psychometric testing to identify intelligence, skills, and the ability to adapt to challenging and competitive environments in candidates. These leading companies offer professional services globally, emphasizing the importance of psychometric assessments in their selection processes.

Psychometrics serve as a tool for attracting and retaining talent, as well as managing organizational change, as discussed in the third chapter of the dissertation. Ratings derived from psychometric testing provide accurate insights into team members' personalities, behavioral styles, preferred work environments, and responses to change. Armed with this information, change leaders gain a holistic understanding of their team's strengths, weaknesses, untapped potential, and how to empower individuals for successful change and overall organizational growth. The third chapter also examines the use of personality profile assessments in different sectors such as finance and private equity. For example, psychometric testing aids financial planning by measuring a client's risk tolerance and psychological resilience, enabling predictions of their behavior under various market conditions. In the private equity sector, these tests are employed during management changes to mitigate the impact of introducing new funds on target companies.

Lastly, the fourth chapter presents a business idea based on psychometric testing. The concept involves creating a groundbreaking innovation in the HR field by establishing a recruitment portal that facilitates an equal and transparent exchange of information between candidates and employers based on psychometric test results. The aim is to build a labor market founded on objective, valid, and truthful data, fostering relationships of trust and transparency. This innovation empowers candidates to shape their career paths based on their interests and talents, leading to personal satisfaction and increased job performance. The chapter analyzes the Human Resource Technologies market, including market segmentation by type, development, enterprise size, industry, and geographical region. It also outlines the business model through a Business Model Canvas, evaluating customer segments, customer relations, channels, value propositions, key activities, key resources, key partners, cost structures, and revenue streams. Additionally, a SWOT analysis is performed to identify the competitive advantage of the proposed business idea, highlighting the value, rarity, and inimitability of KUUL.JOBS' strengths.

In conclusion, this dissertation comprehensively examines personality profile assessments as a recruitment tool to drive innovation in human resources management and optimize processes. It explores various psychometric test models, their characteristics, advantages, and disadvantages, along with their use in different contexts. The dissertation also highlights the importance of

psychometric testing in attracting and retaining talent, managing organizational change, and offers a business idea centered around psychometric testing to promote personal success and job satisfaction.

CHAPTER I: PERSONALITY PROFILE ASSESSMENTS

The paper opening chapter's aim is to provide the definition of psychometric tests and their features, focus on the validity and the reliability of the outcome resulted from the personality profile assessments, and identify the advantages and disadvantages of implementing these tools in business processes. Moreover, there are going to be described and analyzed several assessment techniques along with their methodology and identified the context in which they might be useful to implement.

1.1 What are psychometric tests?

Psychometric tests are personality profile assessments that analyze the individual's personality features by deeply considering its cognitive abilities, which implies the measurement of personal characteristics (the so-called traits), that are different from one individual to another. The aim of personality profile assessment is to define these traits and evaluate them in an objective way in order to individuate the related association to relevant social aspects of behavior. The quantitative aspect of the assessments is necessary to highlight their objectivity and allow comparison between individuals or groups of people[1].

Psychometric tests are efficient tools for both workplace development and value maximization. By measuring aspects of mental and cognitive ability, personality and aptitude, they offer quantifiable and scientifically dependable analyzes that provide a comprehensive insight of the test participants, allowing for a proficient orientation for both the firm and person. But only if they a rightful interpretation is carried out.

To be able to understand and evaluate individual's personality profile, it is necessary to take into consideration a wide range of factors and their interaction to assess an individual's main features. During this assessment past personal experiences are included together with the way in which these are impacted by an individual's body conditions. Personality theorists and scientists

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[1] Encyclopedia Britannica, (2019)

focus on the identification of diversity between human traits, the differences in the way of thinking, perceiving, learning, and expressing emotions.

Personality is characterized by interactional features, which means that personal traits can be defined as the result of interactions among underlying psychological aspects. These outcomes reflect on individual's daily life, and they can either result in a personal asset or liability. In fact, there could be differences in how people react to competitiveness, for example, where pressures given by the situation may be either a distractor and source of anxiety, or the main driver of a successful performance.

One of the main issues in personality profile assessment is defining which of the tools used during the analysis on a specific individual will be successful and which will fail; and which measurement techniques are most effectives and useful for a given purpose. Indeed, efforts to evaluate a specific personality trait and construct might be unsuccessful because of deficiencies emerged during the formulation of the characteristic to analyze and weaknesses in the assessment technique selected. For example, a researcher may wish to investigate on the degree to which individuals are proactive in a competitive environment. The probability of the investigation's success depends on the effectiveness of the theory of proactiveness, which must be thoroughly defined in order to sustain the investigation's hypothesis; on the specific assessment method engaged; and on the adequacy of the investigation to validate the measure which has been decided to implement.

The methods and techniques used during the profile analysis are grouped in several categories that distinguish themselves by the type of information collected and the methodology used to obtain that information. The data collected may come from direct observations of human behaviors, in the case in which they have scientific value, and must vary by underlying assumption, validity, reliability, and consistency.

1.1.1 The fundamental properties of a psychometric test: reliability, validity, and norming

To identify the quality of a personal profile assessment, three fundamental properties must emerge: reliability, validity, and norming. These properties are extremely valuable when considering the appropriateness, usefulness, and meaningfulness of an assessment, and provides the researcher and the participant with evidence of its expected outcome. Some psychometric properties highlight the specific features of a test, others validate its quality, or, moreover, add value to the sections, individual items of which is made up, e.g., it could validate its usability both for men and women (psychometric property of gender equality).

One of the main concerns about personality profile assessments is the validity of the tests. The validity of a test is essential to the test's reliability, since it increases the measurability of the assessment and validates what is expected to be measured. In fact, a test could be reliable but not valid, therefore it is important to notice the differences and their measurements. Validity is measured and regulated by a body of research, not by a single test or statistic. In this regard, the paper decided to highlight one of the main tools used to assess personality profiles: the Extended DISC® Assessments, which are the most highly validated and reliable workplace assessments. In fact, Extended DISC® International carries out a bi-annually validation study to guarantee and ensure the reliability of the results. Important while using Extended DISC® Assessments, is to consider some variances due to different conditions, such as current work environment. Moreover, Extended DISC® Assessments contain two profiles: Profile I evaluate an individual's current or adjusted style, which is expected to change based on the current environment; while Profile II measures an individual's natural or unconscious Extended DISC Style, which is expected to be more stable over a person's lifetime.

The second most important feature of psychometric test is reliability. By definition, reliability measures the consistency of a test, which is defined as the absence of measurement error in the test scores (also identified as test score's accuracy). Thus, the results given by the test should be the same or similar every time it is taken if conditions remain unchanged.

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Test-retest is one of the most common tools used in measuring reliability. This technique evaluates the test by reproducing it twice at two different moments in time, and it assumes that no changes will be involved while measuring the behavior. Test-retest reliability is best used for elements that are stable over time, such as intelligence. Another tool used as a measure of reliability is Cronbach's Alpha and it is a quantification of consistency that shows the extent to which a set of elements are correlated as a group. This technique measures the agreement level on a standardized scale, which has a 0 to 1 range. When implementing the Cronbach's Alpha, the focus should be on the highest result, because it would mean that items are highly agreeing, while 0 means that there is no correlation between them, and therefore they are independent. In the context of consistency and reliability, a test is consistent and reliable when its value corresponds to at least 0.7 on the Cronbach's Alpha scale (Rif. Table 1), which has been used from scientists as the benchmark value.

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Sources: https://bit.ly/3MDi01Z

Table 1: Cronbach's alpha values

To give an example of reliability applied to psychometric tests, the paper decided to consider the former mentioned Extended DISC® Assessments. This assessment method tests reliability using a combination of the test-retest and the Cronbach's Alpha methods, with the aim of finding consistency on all DISC dimensions. For this to be true, each of these dimensions should correspond to a value equal or greater than 0.79, which will indicate the high correlation of the test-retest.

The third characteristic to be considered is validity. Validity is described as the test's ability to measures what it claims to evaluate. The psychometric test's validity heavily depends on the sample set to guarantee that the test is applicable to a vast range of populations and cultures. The validity of psychometric assessments is measured by using other specific methods which are construct validity and criterion validity, which both are used by Extended DISC® Assessments. Construct validity shows that an assessment measures, rather than skills or ability, a construct, which are traits such as intelligence, anxiety, or motivation; however, these characteristics are not directly observable. In testing the construct validity, individuals that carry out the research compare the results of the test taken by two opposite groups of the same characteristic (e.g., if anxiety is tested, then one group will be identified by those individuals that have anxiety, while the other group will be identified by those people that do not suffer from anxiety); the group that scores higher is said to have a high construct validity. In the Extended DISC® Assessments, the constructs are the following: Dominance, Inducement, Submission and Compliance; and have the highest construct validity score, which are confirmed in the bi-annual validation studies. As regards criterion validity, it identifies the test's outcome predictability. In this test, candidates carry out the Extended DISC® Online Questionnaire in order to forecast their behavioral styles[2].

Lastly, with reference to norming, its importance lies in the comparison between total test score of an individual and a representative sample, which are generally based on demographic factors such as gender, education, age, etc. When using relative scores, it becomes more valuable if ability test results is interpreted.

Let us consider an example of personality trait evaluation: a 95th percentile on a trait such as anxiety is generated, this means that compared to a sample group of other participants, the individual that scored on the 95th percentile is evaluated as being more anxious than 95% of the other participants. However, every test is linked to an appropriate norm group, and this must be considered when evaluating test results. Another factor to consider in percentile scores evaluation is the personal style with which the candidate answered, which may affect the accuracy of the responses.

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[2] HR Profiling Solutions, (2019), "How to measure the validity of a psychometric assessment."

1.1.2 Assessment methods

Personality profile assessments evaluate personal traits as emotional states and feelings, such as preoccupations, motivations, attitudes, and behaviors in interpersonal relations. Therefore, there exist several different approaches to personality assessment depending on the desired outcome and the subject of the analysis. Such assessments include interviews, rating scales, personality inventories, projective techniques, behavioral observations, and self-reports.

The interview's primary relevant element is to give way to the individual to "tell his story". Interviews have two types of components: verbal and nonverbal (e.g., body language). This assessment method's aim is to collect information, and the validity of the data collected is depending on the type of questions the interviewer makes, and on the way in which they are asked, in order to gather data with a specific focus based on the research question of the investigation. In this regard, two types of interviews may be outlined: the interview aimed at researching purposes and the clinical interview. The former implies a one-on-one meeting between interviewer and interviewee finalized at gathering information relevant to the specific applications of a general study or to those personality hypotheses being examined. The latter is focused on the evaluation of a particular individual's status (e.g., a psychiatric patient); such an interview is action-oriented (e.g., it may define the proper treatment). Both types of interviews are conducted with the aim of obtaining an individual's life history or its biographical information, but they differ by the purpose and uses to which the information is placed.

Researchers have developed a specific analysis technique to categorize the elements of the interview's content, which is the content analysis. This analysis is based on a general content and involves the elaboration of a system of categories from which analysts and scorers can benefit. Content analysis' worth stands in providing the possibility to use frequencies of given response to outline the verbal behavior and set behavioral variable for a sufficiently precise study in the experimental research. For example, content analysis has been adopted in the valuation of changes in aptitude which occur in an individual across time. To avoid erroneous or imprecise conclusions,

researchers developed several preventive actions. They found out that by conducting multiple interviews to the same interviewee and changing the interviewer each time, the results' reliability could be increased. Also, by standardizing the interview format, the dependability of information collected could be enhanced.

Rating scales are one of the oldest and most multifaceted assessment methods. During these tests, the individual is asked to reply to specific questions by choosing an answer out of several options, which represent the degree of a particular trait. Rating scale is a technique that prevents from subjective judgments, where the scalar dimensions provided in the questionnaire secure such judgement. Subjective judgements are highly risky when working in the field of personality profile assessments because they might deviate the analysis outcome, making it become unreliable and invalid because of biases or also unconscious biases that are inborn in every individual. In order for the rating scales to be successful, it must meet several requirements, among which the reliability, measured by the consistency between the ratings of the same individual by different observers; the cut of sources of inaccuracies in the personality assessment, for which is used the so-called "halo effect", that is the favorably response on a specific trait by the observer because of a general favorable attitude towards the individual being tested.

Self-report tests use a specific strategy, because if only true-false answers were used, it would generate an unreliable outcome, since it is based on convenience because of its easiness during evaluation. Thanks to their accuracy, self-report tests are used for clinical purposes, such as making diagnoses, in deciding if a treatment is necessary, or in planning treatment to use. In addition, self-report is used in human resources processes and in psychological research.

Personality inventories are one of the most common self-report tests. Personality inventories ask individuals questions directly about themselves rather than on general knowledge or specific skills. These questions can be either true-false on personal beliefs, or the individual would need to decide if the statements presented are accurate in the description of his own personality. Several personality inventories require that each of the series of statements be generated in a rating scale in terms of adequacy and frequency with which the person believe that

the statements reflect his habits and tendencies. Regardless of the result of the questionnaire, most personality inventories generate scores aimed at identifying a specific aspect of the personality.

1.1.3 Relationship between personality and intelligence

To understand the relationship between personality and intelligence, it is useful to begin from their definition. The American Psychological Association (APA) defines personality as "individual differences in characteristic patterns of thinking, feeling, and behaving". Whereas APA's 1996 Intelligence Task Force describes intelligence as "individual differences in the ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by taking thought"[3].

To measure both personality and intelligence, there have been designed two different approaches. As regards personality, it is evaluated through endorsements of descriptions of behavioral trait, beliefs, attitudes, and thoughts. As analyzed in the previous paragraph (1.1), descriptions in personality assessments can be either statements or trait terms, which result in endorsements (done by the self or by others) such as rankings, ratings, preference judgments. Whereas, for intelligence assessment, the dominant technique is the standardized test, which involves a problem and response format (through multiple choice questions, short answers, and essay), and results are characterized by a right or wrong answer, or, in some cases, also partially right.

If personality traits are usually considered as summaries of individuals' actions, intelligence is treated as the implicit concept and measure of what people are able to do and is defined as the boundary to an individual's intellectual ability, which borders are the result of person's intellectual performance when is exerting maximum effort. This situation usually arises when individuals are in the condition of being highly interested in the scope of the cognitive test

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[3] Neisser, U., Boodoo, G., Bouchard, T. J., Jr., Boykin, A. W., Brody, N., Ceci, S. J., Halpern, D. F., Loehlin, J. C., Perloff, R., Sternberg, R. J., & Urbina, S. (1996). Intelligence: Knowns and unknowns. *American Psychologist, 51*(2), 77–101.

itself, e.g., personnel selection, university admissions, which should function as motivators to demonstrate their intellectual abilities to the fullest. However, there is a downside: the impossibility of an individual to express it intellectual skills at its maximum extent on a daily basis. It is humanly improbable that an individual would be able to constantly harness his or her IQ to a highly maximized level. Therefore, it is not possible to guarantee the individual's intelligence across the situations that it encounters during its daily life[4].

Since intelligence is considered as the upper limit of a person's cognitive abilities, it is not possible to define it as an activity that can be done in a long-term period; therefore, intelligence tests are conceptualized as samples. On the other side, personality traits are describing as a typical behavior that is observed on a long-term basis, and for this reason they cannot be directly measured in conventional assessments. Consequently, the most used assessment technique is self-report, where individuals are asked to fill out a questionnaire about their personal self with the intention to highlight the personal traits through their identification from the individual itself based on their usual behaviors, and own observations on in the long run. Self-reports identify some shared reality of people's actual behavior.

When the stakes are low, test takers are less incentivized to perform as well as possible. Their motivation to achieve high performance is related to persistence and engagement, which are strongly related to conscientiousness. Given that individuals differ in their motivation to perform well on tests in low-stake situations, it is suggested that the variance in scores in assessments done under low stake conditions can be attributed to both intelligence and personality[5].

1.2 Which are the different types of psychometric tests?

So far, the paper defined what psychometric tests are and their main features, as well as the need to validate the results to maintain a high quality in test's consistency and accuracy, while maximizing the usefulness of the outcomes. In this section, the nine psychometric test models are

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[4] Ackerman, 2018
[5] P.C. Kyllonen, H. Kell, 2018

going to be described, and specifically for some of them, it is going to be highlighted the context in which they might be more useful to implement.

The DISC assessment is based on DISC theory that was developed by Dr. William Marston, which focuses on four different personality traits, which represent four distinct behavioral styles: dominance (D), influence (I), steadiness (S), conscientiousness (C). These traits are used as the fundamental basis to understand an individual's patterns of behavior. Moreover, this assessment contributes to the improvements of interpersonal communication which may be useful in implementing other job-related soft skills such as leadership, executive development, and conflict management. The most used DISC assessment is the Everything Disc Workplace questionnaire by Wiley, which scores generates a profile report in which are described an individual's behavioral style, tendencies, preferences, weaknesses. These traits are located on a scale on which is based the understanding of the priorities that are characteristics of a person (everyone has at least three priorities).

The Birkman Method, developed by the organizational psychologist R.W. Birkman and the statistician Roy Mefferd in 1951, was created with the intent to measure social expectations, stress behaviors, and occupational interests that would result in adding value to both a personal and professional environment. Nowadays, the test is very much used in the organizations to understand employees' strengths and weaknesses, interests, stress management, but also to create leaders through coaching to resolve internal conflicts. The current intensive use of this test in an entrepreneurial environment, makes it of high interest for the scope of the paper, which is aimed at analyzing the use of psychometric tests within international organizations.

The Birkman Method is composed by two main categories of questions: those analyzing individual's behavior while being confronted with others, and those related to its interests. The profile result is categorized in four groups: behaviors, motivations, stress management, and organizational orientation. One of the Birkman Method's outcomes is the Birkman Chart (Ref. Table 2), which is divided in four quadrants, and has two dimensions: the tendency of working best with direct or indirect involvement (represented by the top and bottom quadrants) and the attitude towards being a task or people-oriented person (represented by the right and left

quadrants). Based on the definition of the individual's personality, several symbols are placed: the asterisk represents the interests and will be placed where the individual's interests lie; the diamond is identified with the behavioral style, therefore will be located where the usual style is; the square which indicated the stress behavior; and the circle which symbolize the needs and is located where the individual's needs lie.

Source: Birkman official website
https://birkman.com/birkman-colors-panel/
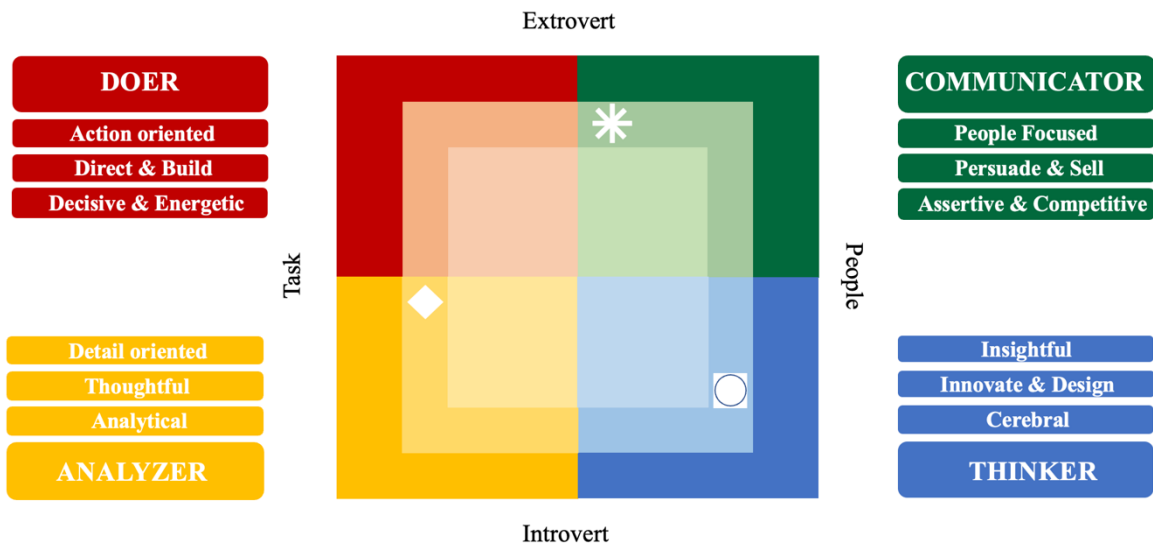
Table 2: Birkman Chart

The following type of personality assessment is called Myers-Briggs Type Indicator (MBTI), and is based on the psychological types theory of Carl Jung and was created by Isabel and Katherine Cook Briggs in 1990. The aim of the women in developing this tool was to make psychology types understandable to each individual in order to exploit them in their personal daily life. In fact, this personality test enables the identification of an individual's preferred ways of doing things, which are categorized in four key groups: decision making, which the person's process in making a decision (whether it is more analytic or impulsive); elaborating information,

where is analyzed the person's way of processing information (whether it is more sensing or intuitive); directing and receiving energy, where is identified the individual's attitude towards other people's energy (whether it is an introvert or extrovert personality); outside world approach (whether a person is more judgmental towards the outside environment's inputs or more perceiving). By acknowledging their most preferred behavioral styles, individuals are able to shape the aspects of their personal lives; however, it is also a useful tool in human resources matters since employees can be paired among other employees based on their behavioral style. By doing so, the employees' performance will improve, as well as conflicts can be avoided.

Another type of psychometrics test, the Hogan Personality Inventory® (HPI), was developed in the late 1970s by a group of students of a graduate class taught by Robert Hogan, who asked to analyze items for several "reputation" dimensions. The HPI is grounded on the socio-analytic theory, which states that the core of personality lies on evolutionary adaptations[6]. This theory explains how individuals' nature is to live in groups and their tendency to form hierarchies in order to demonstrate status. In this regard, two universal human motives arise: the actor's view and the observer's view of personality. The theory suggests that since the researcher is only provided with the actor's behavior, and therefore the evaluations should focus on reputation, because is what is produced by an individual's self-presentation (which is the outcome that theory suggests that the candidate is providing to the researcher, not a self-report)[7].

16 Personality Factors, which originally was based on personality traits defined by Gordon Allport, was designed by Dr. Raymond Cattell, a British-American psychologist who believed that a personality is the result of sixteen different personal constructs, which are: abstractedness (imaginative versus practical), apprehension (worried versus confident), dominance (forceful versus submissive), emotional stability (calm versus high-strung), liveliness (spontaneous versus restrained), openness to change (flexible versus attached to the familiar), perfectionism (controlled versus undisciplined), privateness (discreet versus open), reasoning (abstract versus concrete), rule-consciousness (conforming versus non-conforming), self-reliance (self-sufficient versus dependent), sensitivity (tender-hearted versus tough-minded), social boldness (uninhibited versus

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[6] Hogan, 1982; Hogan & Roberts, 2000
[7] Birkman International, 2016

shy), tension (inpatient versus relaxed), vigilance (suspicious versus trusting), warmth (outgoing versus reserved). He suggested that each and every individual possesses these sixteen traits, but every trait is scaled up to a certain degree. This type of assessment is used to identify an individual's personality and assess its strengths and weaknesses with the aim of revealing its potential. It is extensively used in career counseling, marriage counseling and in business employee's recruitment processes. The test is composed by 185 multiple choice questions to which the participant answers identifying a solution in a range of five-point scale between "strongly agree" and "strongly disagree". The aforementioned test questions result in a numerical score, given by the sum of the points obtained in the responses, where "strongly agree/agree" obtains 3 points, "neither" 2 points, nor "strongly disagree/disagree" 1 point.

The Big Five Personality Test is another common tool which is based on the Big Five Model. This test is formed by five questions to which the participant must answer by choosing the characteristic most related to its personality, and once the filling of the questionnaire is completed, the participant will be redirected to its personal profile description. The profile describes the areas in which the individual is most performing, those in which is less performing and also a middle area. These dimensions are represented by the PRISM-OCEAN traits, which are: practical vs open, responsive vs conscientious, introvert vs extrovert, strong-minded vs agreeable, mellow vs nervous.

The Riso-Hudson Enneagram Type Indicator was developed by Don Richard Riso and Russ Hudson in the early 1990s. In developing this tool, they stated that each individual has an inborn personality type, which drives the way in which it behaves and perceives the external environment, which is the dominant type, and this means that the environment does not affect our personality development. This assessment's aim is to deepen the individual's knowledge and awareness about itself and focused on personal development. The RHETI assessment outcomes in nine personality type: the helper, the achiever, the enthusiast, the investigator, the individualist, the peacemaker, the loyalist, the reformer, and the challenger. By looking at the profile's results, it possible to detect the individual's basic type which will be the trait with the highest score. Moreover, each basic type is consisted of other 27 sub-types, which highlights in more a more detailed way the individual's personal style, and each basic type is described with four specific

traits, e.g., the reformer is principled, self-controlled, purposeful, and perfectionistic. The table (Rif. Table 3) below displays of the nine Enneagram type indicators and shows how each indicator is connected to other two indicators.
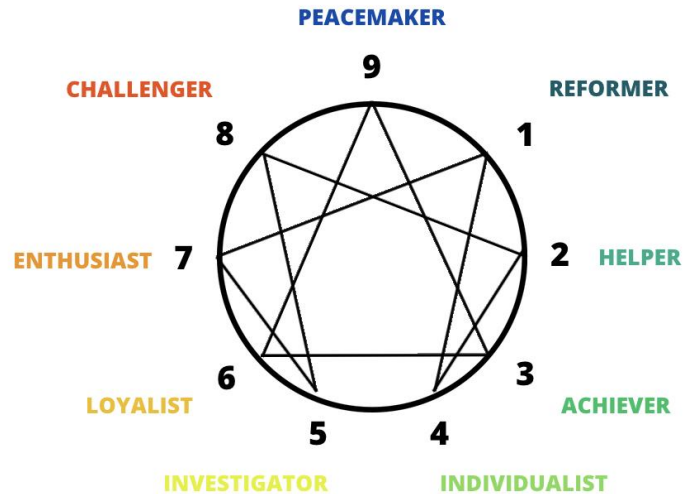
Source: Crosworks official website
https://crosworks.com/why-birkman/

Table 3: Enneagram Type Indicators

The HEXACO Personality Inventory was designed in 2000 by Kibeom Lee and Micheal C. Ashton and is based on the Big Five Model. There are six specific dimensions of personality: honesty-humility (H), emotionality (E), extroversion (X), agreeableness (A), conscientiousness (C), and openness to experience (O). The test is commonly used in the human resources management when considering the candidate's fit to the job position, to analyze its work ethic, and its interaction abilities. This test is preferred to the MBTI because it identifies an additional dimension: the H dimension, honesty-humility.

The Motivational Appraisal Personal Potential Career Assessment Test was developed in 1995 by Henry Neils. This test was designed to understand a lumber business' employee fit to the position he was working in. At first it required hours to produce a valid and reliable outcome, while with time researchers tested the validity and reliability without needing hours to assess it. The assessment's focus is to find the individual's personal match in terms of career and job position satisfaction. In fact, the test results in a list of 10 top career matching the test tacker.

"Who Am I?" personality profile assessment was designed by VisualDNA company and is based on the Big 5 Personality Model. This type of test is more focused on personal development rather than career matching and generates a useful deepened insight on the true personality of an individual. The format is different from a questionnaire, rather is more linked to images and their representation of a certain emotional state, and the result produced will be the evaluation of the 5 personality traits to a certain degree, represented in percentages ranged between 0% and 100%.

1.1.4 Models' comparison

The DISC Assessment is used in the business environment by career and leadership coaches to assess and identify an employee's strengths, communication and behavioral styles. A downside to this method is that it fails to consider environmental factors of the workplace. Whereas Birkman offers eleven scales to which the individual can ground its improvements when developing its interpersonal relationships and environmental expectations. As a consequence, several improvements on the team members' awareness can be done, which can increase their performance quality and efficiency.

When comparing the Birkman Method and MBTI, several strengths and downsides of the assessments arise. The former method is a trait-based assessment and has the ability to generate a measured personal trait based on the amount or intensity, which provides a degree of specificity and personalized insight to a person's uniqueness. Moreover, the Birkman Method highlights the underlying stress factors, interests, and needs, and provides the elements necessary to understand how to improve the individual's life. The latter, instead, is considered questionable by scientists

because it groups individuals into 16 different categories while each person is considered to be unique and therefore most participants do not fall into a specific category. Moreover, the descriptions are too vague, and this impede the system to produce a result specific and unique to each participant.

The Enneagram Personality Test provides the candidate with the interpretation of how he perceives the external environment and how he manages his emotions. It explains in which situations the candidate is more incline to react in a specific way, but it does not provide him with the reason of his behavior. The following table (Rif. Table 4) compares the assessments types by the questionnaire characteristics, the application to departments, the differentiators, the theory on which they are based, support, languages in which they are available and legal issues that implementation could encounter.

Comparison category	The Birkman Method®	HPI	MBTI	DISC
Assessment description	298 items 30 minutes to complete 5 factor and 7 subfactor personality scales 10 occupational, 12 social perception, and 25 derived scales	206 items 20 minutes to complete 6 occupational scales 7 primary scales	The basic form has 93 items 20-30 minutes to complete 4 dimensions with 16 types	24 items < 20 minutes 4 factors
Workplace application	Coaching, executive development, career transition, teamwork, conflict resolution, organizational/job alignment, selection	Employability, individual assessment, selection, individual development	Self/organizational development, relationship/academic counseling, team building Not appropriate for selection	Performance improvement, conflict resolution, individual development Not appropriate for selection

Differentiators	Integrates personality, social perception, and occupational interests in one assessment No other instrument measures social perceptions (Needs) Profiling services offered Construct and criterion validity evidence available	Scales are highly skewed; poorly differentiates between examinees Meta-analytic validity studies do not include all relevant studies Only measures personality factors, not social perceptions	Originally for self-exploration Not originally intended to discriminate between people Only measures personality factors Profiling services not offered	Too many different versions Profiling services not offered Does not measure environmental factors correctly; meaning varies across examinees
Theoretical framework	Five Factor Model Social perception Occupational interests	Five Factor Model	Type theory Jungian typology	Marston's emotional (DISC) theory (to measure behavioral styles)
Support	Online testing available Certification training	Online testing available Certification training	Online testing available No direct support from MBTI	Online testing available No direct support from DISC
Translations	22 languages	37 languages	21 languages	21 languages
Adverse impact / Legality	No AI on race, gender, or age based on a large representative sample	No AI on race, gender, or age information published	No race or age information published There are profile distribution differences by gender	No AI on race, gender, or age information published

Source: Birkman official website

https://birkman.com/birkman-colors-panel/

Table 4: Comparison table between assessment methods

1.3 Advantages and disadvantages of using psychometric test in organizations

In organizations, one of the main aspects to improve efficiency and value creation is forecasting, such as external environment's trends, financial markets shift, political and geopolitical twists. In this regard, psychometric tests are used by managers to improve their talent management by anticipating employee's behavior before the recruitment process. To do so, it is necessary to find effective people, which are at the core of success, and they are identified by analyzing their behavior.

Predictive behavior assessment is developed on four dimensions: bright side of personality, which is described as the potential of being successful; the dark side of personality, what stops them from being successful; motivation, how they describe and show their values that guides them in the pathway to success; cognitive abilities, the way in which they process information, problems and make decisions.

Once the organization has analyzed potential employee's behavior, it is necessary to identify a process of leveraging their potential, and this is done by hiring the right person, understanding the job role, weeding out unwanted resources, and improving recruitment process. Such process must be enhanced by the development of the recruit full potential. Therefore, the recruiter must identify and define the competency framework based on the job role, highlight the recruit's skill gaps, outline training plan and measure the effectiveness of the coaching intervention. In this way the company will be able to create effective with high potential identification, improve current pipeline with succession planning and empower leadership development.

Psychometric tests are used in organizations for the following scopes: cultural fitment, inherent traits, cost and time efficiency, interview independence and standardized testing. When analyzing cultural fitment, the recruiter must focus on the recruit's fit to the team to which he will be integrated and the fit to the company's culture, so whether he embraces the company's values, mission and vision. In this way, managers could prevent employee's attrition, and team's conflicts.

As regards the inherent traits aspect, it is strictly linked to the previously described one, because here it is analyzed the way in which the individual will interact, engage or improve in the working environment. Moreover, the use of psychometric tests enhances the time- and cost-to-hire processes, by decreasing both aspects and lowering the opportunities of error during hiring processes.

Another advantage that psychometric tests bring to the hiring processes, is the possibility to benchmark candidates based on profile assessments results and previous working experiences. Ultimately, psychometric tests are a fair form of testing because bias is reduced because recruiters are less prone to giving subjective opinions and judgments.

Further advantages given by the implementation of psychometric testing, arise in the L&D (Learning and Development) stage. In this context, they can be used as measurement of motivation to learn, openness to learning, learning agility, preference for learning method, which can be used in improving design of development plans for employees, by using the right resources. Moreover, using psychometric tests improves the understanding of strengths and potential. In addition, they can be exploited to define career paths for employees to shape a culture that they can embrace to ensure their success. In this way, employees will obtain tools to satisfy their learning needs, while empowering the organization's productivity and well-being.

Specifically, by using personality profile assessments the organizational planning improves; in fact, organizations realize the importance of evaluating the fitment of future leaders, strategic thinking, decision-making, adaptability, and other competencies. Moreover, it impacts the evaluation of competencies needed by managers and leadership position employees to maintain their roles and ensure that their strategic positions remain occupied with competent leaders. This also has an effect of cost and time of external recruitment and training, which are eliminated. In addition, psychometric tests improve performance evaluation by helping to quantify competencies that are not quantifiable. In fact, traditional assessments contain a high risk of individual bias, since matters such as gender bias, favoritisms, often arise. By implementing these types of assessments in the recruitment processes, organizations are able to base their selection processes on trustworthy criteria, such as inborn skills, or unreliable managerial KPIs. Moreover, through the introduction

of these specific characteristics, the candidate, once in the position for which he has been selected, will be better able to maximize his productivity as he will be able to apply his innate skills to the job for which he has been hired. In this way, the employee will be more satisfied with his or her position and this will contribute to lowering the company's turnover rate.

On the other hand, psychometric tests entail several drawbacks, which can be grouped in two specific categories: candidate performance and experience, and resources required. In fact, psychometric questionnaires could be designed in a way that could induce the candidate to subconsciously fake its response, by answering to questions in the most socially desirable way. This could impact the quality of data and the related prediction of the best recruit to hire. Moreover, these types of tests rely on the assumption that people have a good knowledge of themselves, and their attitude and behavior in a working environment. In many cases, when they do not know how to respond, they lead down two paths: honest guesswork, how they think they would react in a specific situation, or faking, so answering in the way that they think the employer would be most content with.

As regards resources requirements, there are specific limitations in the knowledge and training, and costs related to the use of psychometric assessments. In fact, for some test providers it is necessary a specific training (like in the case of the British Psychological Society), because without it the evaluation through personality profile assessment might be affected and result in a poor analysis based on unreliable data. Thus, investing in these tests place the organization in front of a decision: either risking compromising your process or invest time and financial resources on training. Another disadvantage of psychometric tests is related to cost matters, in fact even if they spare the organization the cost of making bad hiring decisions, they still are expensive, when they are valid and reliable. Lastly, it is extremely important that organizations, when conducting psychometric testing, take into considerable account the issue of data protection. In fact, with the advancement of technology and data sharing, the safety and security of personal data began to become more and more challenging for companies. In this regard, the APA (American Psychological Association), in section 9.03 on Informed Consent in Assessments, states: "ensure that confidentiality of test results and test security are maintained[8]".

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[8] APA, Ethical Principles of Psychologists and Code of Conduct, 2017.

Psychometric assessment tests are nowadays adopted by over 80% of the Fortune 500 organizations in the US and by over 75% of the Times Top 100 companies in the UK. Several reasons for the boosting of psychometric tests used are analyzed and mentioned:

a.   Regulation and legislation. As regulation and legislation processes increased, organizations felt the need to find a selection technique which upfronts the legal challenges that recruitment entails. Psychometric assessment tests are an unbiased and objective tool through which a recruit's skills and competencies are evaluated.

b.   Costs of training human resources. As the company expands, the costs of training increase, therefore larger companies are highly probable to adopt this tool in order to reduce training expenditure.

c.   Testing costs. With the advancement of technology and the use of the Internet, psychometric tests providers increased in numbers, which involved a decline in the price of the assessments. Therefore, companies are encouraged by this matter to adopt this innovative tool of selection.

d.   Formal Human Resources policies. Since psychometric tests provide the organization with scientific credible and objective results to the recruitment process, companies are more prone to implement these tools in their processes, in order to avoid employment-related litigations.

e.   Academic qualifications. In the last years, it has been noticed that there is an evident loss of confidence in school qualifications and standard degrees. Therefore, by introducing psychometric testing, it is common knowledge that relevant information on competencies, such as quantitative reasoning that provides the recruiter with a completer and more trustworthy overview of the candidate.

f.   Screening large numbers of candidates. By using personality profile assessments, the recruiter is able to understand during the early stage of the process which candidate is more suitable to the job position and fit to the company. From a human resource manager point of view, psychometric tests are reducing the workload by cutting the initial screening interviews.

g.   The cost of recruitment. The overall cost of poor selection is extremely high, therefore organizations try to prevent these losses by implementing psychometric testing which,

as mentioned above, will make the recruiter understand in an early phase of the process which is the better fit to its cultural organization and job position.

To summarize, it is possible to state that psychometric tests are overall an innovative and motivating tool, which should be used to improve both personal development and talent acquisition processes. However, when in front of planning on whether to implement the tool or not, there are several disadvantages that must be considered, especially because they might be harmful to the company itself if this is not ready from an innovation point of view. Nevertheless, the focus should also be on a broader overview of the company's cultural innovation: by implementing these tests, the turnover rate is generally reduced, because the tests ensure a high level of increasing the match between personal characteristics to the job position, generating greater satisfaction and fulfillment.

1.4 Analysis of Birkman Method test personal outcome

To substantiate the efficacy of personality profile assessments, I recently undertook a Birkman Method test. This comprehensive assessment comprised a series of inquiries pertaining to both my own characteristics and those of others. I was required to respond sincerely and instinctively within a defined time frame, ensuring that my answers were unclouded by excessive contemplation. Consequently, the quiz yielded authentic insights into my personality traits. In the subsequent phase, I was presented with various job preferences and tasked with ranking them according to my personal inclinations.

The results obtained from the Birkman Method quiz proved captivating, as they aligned with my self-perceptions in certain areas while illuminating unforeseen facets in others. Particularly noteworthy was the discovery that when confronted with stress, I tend to exhibit disorganization, distractibility, argumentativeness, and dominance. Recognizing these tendencies assumes paramount significance in terms of personal development, as it highlights areas warranting focused efforts to effect improvement.

Armed with an awareness of these aspects of my personality, I am equipped to proactively cultivate strategies for stress management, thereby facilitating a composed and concentrated approach during challenging situations. This newfound self-awareness empowers me to explore methodologies such as time management, organizational acumen, and conflict resolution, all of which serve to effectively address these inclinations.

It is important to underscore that personality assessments, such as the Birkman Method, furnish valuable insights into our strengths, weaknesses, and behavioral patterns. They constitute a starting point for introspection and personal growth, shedding light on areas where skill enhancement and positive transformations can be pursued. By acknowledging and addressing these facets, we are better equipped to navigate relationships, work environments, and personal challenges with increased efficacy.

Furthermore, the quiz outcomes shed light on my predilections concerning professional roles. Gaining an understanding of which tasks and responsibilities align harmoniously with my inherent inclinations assumes critical import for career development. The test enabled me to identify areas wherein I experience the greatest comfort and fulfillment, including working with numerical data, exerting influence over others, and engaging in structured thinking. Equipped with this knowledge, I can actively seek out opportunities and career paths that capitalize on these strengths, thereby fostering professional flourishing.

In conclusion, the Birkman Method test has imparted invaluable insights into my personality traits, corroborating some self-perceptions while unveiling unforeseen dimensions. By acknowledging and addressing areas necessitating improvement, such as my stress responses, I am poised to embark on a journey of personal growth and development. Moreover, the test has effectively guided me in comprehending my vocational preferences, equipping me to make informed decisions regarding my career trajectory. Overall, this heightened self-awareness empowers me to navigate the multifaceted facets of life with enhanced clarity and efficacy.

CHAPTER II: Personality profile as human resources tools

The present research is going to analyze thoroughly self-report personality profile assessments and their application in the human resources department of corporations, and specifically the tools used in selection processes.

While selecting their human resources many worldwide organizations rely on academic achievements and reported work experience. Even if these are valuable information, they do not provide an accurate overview of the candidate's personality profile; in fact, job tenure is not a relevant factor when predicting job performance, because the length of time during which one has held a certain position does not imply the high efficiency and productivity of the employee in performing his or her task. Moreover, the perception of the recruiter during a job interview cannot determine with accuracy the individual's personality, because the way in which he propose himself to the recruiter can enormously variate to the way in which he acts on the job.

During the recruitment phase, psychometric tests are usually carried out on a computer in the organization's offices, under straight supervision. Psychologists employed in the organization have the power on the choice of the assessment technique to implement. Based on their knowledge, resources, research results and experience, they propose the testing technique that they consider most suitable to the context and the company's culture. Personality profile assessments usually are computer-based tests, and, as it is administered using technology, it positively impacts the overall administration, because the questionnaire can be completed by candidates at any time (although employers may set deadlines for individuals to respond). The greatest area that technology influences is scoring; in fact, through technological implementation of the test, testing parameters are immediately and more easily provided, and results can be forwarded to the administration in a smoother way to evaluate them. Nonetheless, the recruiter is provided with quick references guide and comparison is enabled through norm tables and statistical evaluations[9].
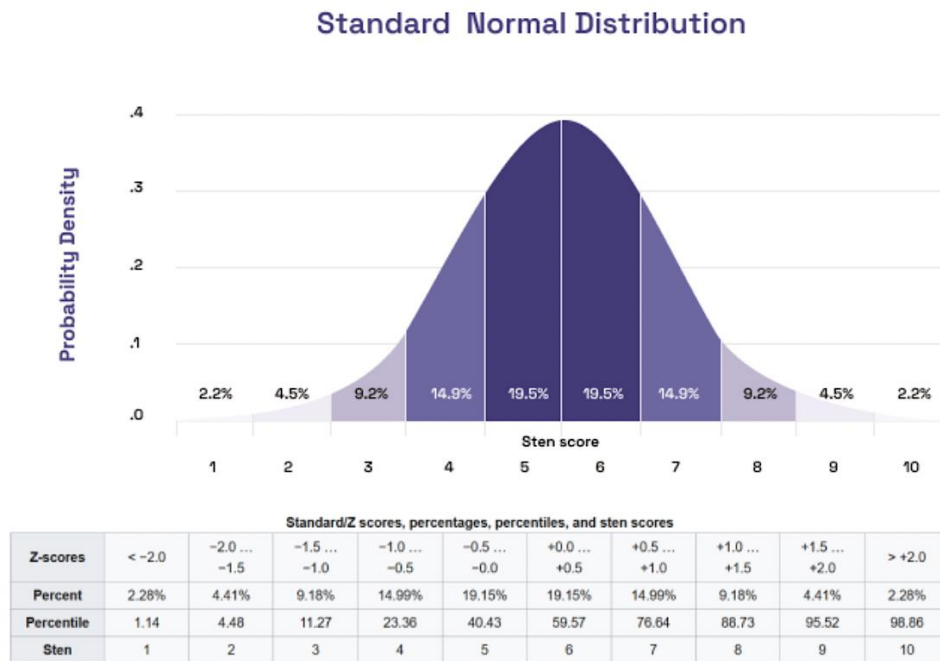
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[9] Smith-Barry S., (2020)

The tests are specifically tailored to the job position for which the recruit is applying, and to the industry in which the company operates. By constructing the tests with these specific features, they ensure that all required skills are effectively screened: some skills are screened on a more basic level, others are evaluated with a higher level of screening. This is because job positions entail different risks and require the employee who is performing that specific task to undertake different responsibility.

When introducing these tools several factors need to be considered such as: the law applied, business needs, and reliability and validity of testing. When considering law matters, it is extremely important to take into account compliance: assure that by using specific psychometric tests, groups of individuals are not unintentionally discriminated. In fact, when designing this kind of assessments, it is of extreme importance that the content of the questions, the way in which they are asked, and the susceptibility of the test to distinguish candidates on a legally basis, are not, in any way, related to discriminatory matters. An assessment that is developed just to distinguish positive or negative traits that have a bearing on the recruit's job performance (such as working under pressure, time management, conscientiousness, openness to new environments and diversity), is much easier not to be pointed as discriminatory.

The aim of personality profile assessments is to reduce or eliminate bias, however, certain assessment methods have failed in doing so because of a wrong usage of the "standard norm" implemented as a basis on which to generate results and categorize individuals in groups. On this subject, the APA stated, section 9.06 of the Psychologists Code of Conduct on Interpreting Assessment Results, that: "[…] situational, personal, linguistic, and cultural differences, […] might affect psychologists' judgments or reduce the accuracy of their interpretation. […][10]". The majority of the tests are graded on a "standard norm" to which participant must align, however due to anxiety and executive functioning challenges, candidates sometimes fail to complete the questionnaire, which would bring them to position themselves outside the acceptable area in the "standard norm". In this regard, an example of scoring and selection of eligible candidates is the understanding of "Big 5" personality assessment scoring. By taking into consideration Graph 1, it is observable that if the participant has a score result of 5, which means that 50% of the other

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[10] APA, Ethical Principles of Psychologists and Code of Conduct, 2017.

participants have scored results below and 50% of the other participants have scored results above, than the participant with a score of 5 is considered to be eligible.

Standard Normal Distribution

Z-scores	< −2.0	−2.0 … −1.5	−1.5 … −1.0	−1.0 … −0.5	−0.5 … −0.0	+0.0 … +0.5	+0.5 … +1.0	+1.0 … +1.5	+1.5 … +2.0	> +2.0
Percent	2.28%	4.41%	9.18%	14.99%	19.15%	19.15%	14.99%	9.18%	4.41%	2.28%
Percentile	1.14	4.48	11.27	23.36	40.43	59.57	76.64	88.73	95.52	98.86
Sten	1	2	3	4	5	6	7	8	9	10

Source: Zioło, M. (2021). Understanding Your Big 5 Personality Results
https://bit.ly/44R9qTZ

Graph 1: Standard Normal Distribution of "Big 5" personality profile assessment

As a determinant factor, business needs must be considered when deciding whether to implement testing tools. In fact, by understanding business needs, the company is able to set priorities on the job positions to deliberate, understand how demanding the job role is, set specific KPIs to the related tasks, understand the team's environment and the company's culture (define its mission, vision and values). Defining business needs is extremely important to the initial phase of assessment in order to identify which personality profile is needed to cover the job position in issue.

The final factor to consider is related to the reliability and validity of the test method implemented. As the paper explained in the previous chapter, these are two of the main characteristics of a test, and they are extremely valuable and significant to what the results of the tests are concerned. During the implementation phase of the tests and the effective use, it is important to collect the test taker's consent, and inform him on how the data collected are going to be used, and their accessibility, i.e., who will have access to the results of the test.

According to Valent Group[11], nowadays, almost 60% of the employees are required to undertake a complete personality profile assessment during hiring processes, and these kinds of assessments have become more common in the past years. One of the reasons of this increase of popularity is that managers believe that by using these tools, the recruitment process becomes much more reliable, because of the automation of its processes that generates the final results, the general feeling is that biases are reduced. However, employers started to depend always more on these data algorithms, without taking into consideration the risks of introducing new sources of bias[12], and to overcome this issue it is essential to constantly monitor the algorithm's effectiveness and carry out analysis to cross-validate new data.

On the other hand, by using personality profile assessments, employers are in the urge of solving the issue of high cost of recovering from failed hiring decisions. In fact, managers believe that, whenever a personality profile test is used, there is a higher probability that the recruit will not have the chance to lie about its own personal features, because the assessment will reveal every trait of the individuals, and therefore, managers will be much more secure of their employment decision. The availability of a large amount of assessment methods, together with the reduction of costs for their implementation and the ease of online completion of the assessment, have contributed to the boost of popularity that these types of tests have recently faced.

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[11] An EBSCO Company that delivers services for risk consulting, employee benefits, businesses and individuals, founded in 2015.
[12] https://practicereasoningtests.com/ultimateinterview-candidates-guide-employers-personality-tests/

2.1 Personality profile assessments in job interviews

The transition between classical and cutting-edge methods with reference to the process of interviewing candidates for an open job position and screening and selecting the right talents can be found in the application of increasingly objective, data-driven, and reliable methods. With the implementation of these tools, the focus not only lies on a candidate's skills or educational and/or work background but is shifted also to personality and reliability. Cultural fit and role-personality matching have become a major driver for hiring processes, as the consequence of this favourable relation allows a company a subsequent optimization of teams and workforce geared toward effectiveness, efficiency, and performance. In most cases, it is possible to detect an underlying tendency on the part of job seekers to include within their resumes lies or skills that they do not actually master; to mitigate this risk, recruiters and head-hunters must minimize the discretion left to subjectivity in interviews, and apply methods that are as scientific, objective, and based on the study of personality and behaviour as possible.

Psychometric assessments add value to the hiring process by contributing to several aspects, such as conducting more thorough, sophisticated, and truthful interviews, containing the possibility of falsification of results, saving time, reducing the margin of error on the part of interviewers, speed, and effectiveness, and obtaining accurate and timely psycho-behavioural information. Scientific and reliable tools such as the Psyft Personality Assessment (PPA), based on the big-five model of personality, the DISC assessment or the MBTI, greatly improve the quality of hiring decisions, enabling more informed and thoughtful decisions, calibrated on information about a candidate's personality, an individual's predisposition to work under stress or in a team setting, manage stakeholders, and find creative and disruptive solutions to problems. Since their advent, psychometric tests have also evolved, becoming much more sophisticated and accurate. With the induction of ipsative test design[13], it has become difficult for candidates to

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[13] Developed by American psychologist Paul Horst in the early 1950s, ipsative measurement, also called forced-choice measurement, is a type of assessment used in personality questionnaires or attitude surveys in which the respondent must choose between two or more equally socially acceptable options. Ipsative measurement tracks the progress or development of single individuals over time and has routinely served as an alternative to normative measurement, which gauges the differences in feelings and perceptions on certain topics between individuals – Chien-Chen Bowen, Ipsative Measurement (Psychology), *Britannica* – source: https://www.britannica.com/science/ipsative-measurement

"fake" or alter results. Psychometric tests are designed in such a way that test-takers cannot detect any apparent patterns or underlying objectives, thus leading them to answer truthfully and transparently and thus ensuring objective and unadulterated results. This is because the goal of employers or company recruiters is to obtain information that truthfully reflects a candidate's personality in order to detect the match between his personal behaviour and the available company role. Any attempt to alter the results by test-takers is easily identified and undermines their integrity in the eye of the employers.

Obtaining an indexed report on a candidate's personality can enable management or recruiters to save and optimize time in the selection process; by quickly scanning the report, they can easily obtain the information they need to formulate more relevant, challenging, and effective questions about candidates' strengths bridges and problem areas during the interview phase. Large organizations, for example, receive hundreds of applications every week; psychometric tests, if programmed correctly, act as an effective filter on this large scale of applicants. All of which ensures a speeding up of the selection process, as well as its optimization. Moreover, as previously highlighted, psychometric testing techniques help the use of greater objectivity in selection processes, reducing the interviewer's margin of error influenced by subjectivity and feelings. This will mitigate the risk of candidate bias, ensuring greater ethics. It may also be easier to check hard facts about the candidate's educational background or past work experience, rather than analyzing softer elements such as personality, motivation, leadership ability, and spirit of adaptation to different contexts. Often, when an individual is faced with the task of assessing these qualities, he unconsciously incurs personal biases; through psychometric tests, on the contrary, it is possible to obtain an objective assessment, as the science does not incur in biases, but is based on the data collected and analyzed. Companies can also use these tests as objective tiebreakers between two candidates of equal liking. Lastly, completing a psychometric test takes greater time and effort for a candidate compared to simply sending its own resume. This gives an initial idea of how serious candidates are and helps hiring managers focus their energies more efficiently and effectively.

2.2 Challenges of using psychometric testing and biases during the selection process

The hiring process of some organizations, in most cases large ones but now increasingly common in smaller ones as well, often includes pre-employment personality testing. These tests are based on psychometric assessment algorithms and analyze desirable personality traits; they are designed with the purpose of meeting a corporate need for cultural fit within the workforce and to promote diversity and inclusion in the corporate organization. On the other hand, however, there are not a few doubts about the integrity of these new screening tools, as in some cases, especially if they are not designed perfectly congruent with their intended purpose, they can create new forms of bias.

The aid of psychometric assessment tests makes it easier for companies to focus their hiring policy on diversity and inclusion, welcoming different but compatible personalities as part of the workforce, reducing the discretion left to the subjectivity of recruiters and instead favouring the implementation of data-driven techniques that allow objectivity. As an example, in the healthcare environment, such as that of clinics or hospitals, it is important to create environments that embrace the cultural diversity of different candidates and eliminate bias.

The terms "diversity" and "inclusion" are often used congruently; however, it is important to distinguish their meaning by starting with their definitions. The Society of Human Resources (SHRM) defines diversity as *"the collective mixture of differences and similarities that include, for example, individual and organizational characteristics, values, beliefs, experiences, back-grounds, preferences, and behaviours."*[14]. Diversity, in turn, can be divided into visible and invisible traits. The former can be traced to physical appearance, gender, race, physical abilities, and age; the latter, on the other hand, include intangible traits, such as those related to religion, sexual orientation, education, and social status. Inclusion, on the other hand, is defined as *"the achievement of a work environment in which all individuals are treated fairly and respectfully, have equal access to opportunities and resources, and can contribute fully to the organization's success."*[15].

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[14] Scepura R. C., DNP(c), MBA/MHA, RN, NEA-BC, CDN, (2020), "The Challenges with Pre-Employment Testing and Potential Hiring Bias"

[15] "Inclusion and the Benefits of Diversity in the Workplace", *Talent Intelligence* - https://www.talentintelligence.com/inclusion-and-the-benefits-of-diversity-in-the-workplace/

In designing pre-employment psychometric assessment tests, it is important to calibrate well the questions and the depth of the aspects one intends to assess, as overly personal questions could increase the risk of candidates dropping out of the test. A widespread sentiment about overly personal questions is that they in turn engender discrimination, precluding deserving candidates from pursuing and excelling in hiring paths solely because they are unwilling to share private and overly personal aspects. An additional factor of discrimination could be the possibility of circumventing the psychometric tests arranged by companies through practice and training: in the market, more and more companies or professionals are offering support in preparing for companies' selection processes, including, even in dealing with pre-employment tests by answering what employers expect to hear and succeeding more easily in obtaining the job for which one is applying.

Moreover, one criticism directed toward psychometric tests is precisely that contrary to their intended purpose, which is to disfavour diversification in favour of homogenization. By setting characteristics that are too stringent in the aspects assessed and skills sought, in order to align the personal values of the workforce with the organization's corporate values, one will go about filtering too tightly and passing to the next stages only candidates with similar and homogeneous characteristics, instead disfavouring the composition of heterogeneous teams that could instead propel corporate growth through multi-lateral and out-of-the-box approaches. Indeed, while it is true that organizations thrive by leveraging workforce diversity, it is unclear to many why there is a need to filter by stringent characteristics.

In 2020, Richard C. Scepura, in his article titled *"The Challenges with Pre-Employment Testing and Potential Hiring Bias"* [16] conducted an analysis focusing on applicants' perceptions of pre-employment testing. The case of a 50-year-old mixed-race Mexican-Filipino-Middle Eastern-American-born male with BSN, MSN and a DNP all from various San Francisco Bay area nursing programs, who has applied for various director, assistant chief nursing officer (ACNO), and CNO roles in large academic university hospitals across the country, as well as smaller or medium-sized hospitals, was examined. However, despite his solid experience and the fact that he structured his

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[16] Scepura R. C., DNP(c), MBA/MHA, RN, NEA-BC, CDN, (2020), "The Challenges with Pre-Employment Testing and Potential Hiring Bias"

resume clearly and effectively by including the keywords needed to have a match with what the target companies were looking for, he was never able to access the next stage of the interview by the hiring office of the companies to which he applied. As part of the screening process by two health care companies, he took psychometric pre-selection tests and, finding some of the questions too personal, in both cases chose to abandon the test and not continue with the application. This generated mixed sentiment toward these psychometric assessment techniques, causing them to be considered highly discriminatory rather than conducive to diversity and inclusion.

In addition, a sensitive issue in psychometric testing is that of candidate privacy. Indeed, questions should not be too intrusive and personal, in order not to invade the privacy of test takers, nor should they be offensive. In addition, the privacy of test-takers must also be guaranteed in the production of the outcome, as sensitive and strictly personal information collected through psychometric assessment tests cannot be disclosed in any way. In addition, setting specific vital traits and tangible characteristics for the position may engender discrimination rather than avoid it. All these aspects should be considered thoroughly when designing psychometric tests as violation of them could induce the opening of legal disputes toward the organization by people who feel their rights have been violated.

On the other hand, however, again with reference to discrimination lawsuits, psychometric tests can also be valuable allies in defending against third-party accusations; in fact, companies that make use of them in their hiring processes can demonstrate that they favour objectivity, leaving low discretion to subjective biases and dictated by the human mind and cognitive automatisms. Big data, predictive analytics and talent analysis play a prominent role in empirical analysis for HR decision making. Indeed, employers' interviewing, hiring, and promotion choices are increasingly driven by data. While helping to avoid biased human decisions, however, data can induce new sources of bias in the case of their inaccuracy or errors in psychometric test design. To remedy any problems that may arise, and to preserve the objectivity aimed at through the use of these tools, it is therefore necessary to monitor the continued effectiveness of the algorithms, including through cross-validation techniques.

Employers are increasingly making use of pre-employment personality tests to skim candidates and move to the next stages only those with the characteristics that best fit a sought-after role. These tests on the one hand allow better acquisition and retention of talent, who are incentivized to stay within a company that is in line with their values and characteristics, while, on the other hand, it can expose employers to lawsuits for violating anti-discrimination laws. The growing popularity of the use of psychometric assessment tests in personnel selection processes is seen as a double-edged sword: on the one hand, it fuels hope in applicants for more unbiased, data-driven hiring and objective analysis, and in employers for the opportunity to search for and select talent whose personal and behavioural characteristics, as well as professional skills, are in line with the profiles sought and company values; however, at the same time, there is concern that the tests may foster-whether or not-warned discrimination toward applicants based on disability, race, gender, or other legally impermissible bases.

By applying pre-employment testing in recruitment processes, employers can mitigate the risk of making errors of judgement in hiring candidates and exposing themselves to the high cost of recovering from bad hiring decisions. In fact, replacing an employee who process to be unsuitable for the position for which is recruited represents a not insignificant economic burden for organizations, which are then forced to repeat the interviewing, hiring, training and mentoring processes, as well as integration of the new staff member in the current workforce. Employers may incur even more onerous costs if the persons hired as a result of a faulty assessment damage a company's operations through negligence, fraud, or damage in terms of image or by undermining the harmony and the cooperation existing within a work team; following these damaging actions, recovering and regaining efficiency and reputation is a laborious and costly process.

Psychometric tests, on the contrary, can enable in-depth and objective assessments by examining cognitive and behavioural aspects of applicants. Many of the questions included in the tests can be confusing to test-takers, who will often fail to understand the logical connection between the questions asked and the job they aspire to hold. These apparent inconsistencies serve precisely to limit a candidate's ability to circumvent the system to his or her own benefit by answering what employers want to hear.

Candidate analysis tools need to be examined carefully to avoid misalignment with what is provided by the guarantor body (e.g., the Union Commission on Non-Discrimination, or the Equal Employment Opportunity Commission statute). Managers need to be able to figure out which filters to have test-providing companies implement in their psychometric evaluation algorithms and which ones might infringe on candidates' privacy and be too personal or even offensive. Providers must be able to help build an algorithm that supports in the detection of the traits sought in order to facilitate cultural fit and the selection of candidates who best fit the profiles sought by companies. Bias in the hiring process is a concern related to the ethics of not harming candidates, who in the case of some companies also represent external customers.

2.3 How the Big 4 companies have implemented psychometric testing

A business case of concrete use of psychometric tests in screening and talent acquisition processes, aimed at hiring more consciously and effectively, is that of the of the so-called "Big four," the four largest multinational accounting firms in the United States, measured in terms of revenue, which are Deloitte, Ernst & Young (EY), PricewaterhouseCoopers (PwC), and Klynveld Peat Marwick Goerdeler (KPMG). In addition to audit services, these four leading firms offer tax, strategic and management consulting services, legal advisory services, and specialized assistance in digital business transformation. As pioneering and leading players in the global consulting industry, all the big four leverage psychometric assessments to optimize talent acquisition processes by measuring various aspects of candidates' personalities, including intelligence, skills, and abilities to adapt to difficult and competitive environments, weed out non-matching candidates, and save time and costs in screening processes.

Deloitte has a global workforce of more than 300,000 people and conducts two main types of testing: the "Deloitte game-based assessment" and the "Deloitte aptitude assessment". The former is an assessment that is based on "gamification," which is a methodology that uses mechanisms typical of gaming and, in particular, of video games (points, levels, rewards, leader boards) to incentivize participant engagement and challenge. The "Deloitte game-based assessment" is based on an assessment called the "Cosmic Cadet" that aims to identify how an

individual (candidate) reacts when in front of different scenarios. The results collected during this test are included into a customized feedback report, which identifies the candidate's opportunities for improvement and strengths. The latter, the "Deloitte aptitude assessment" is a combination of three different tests, which assess numerical reasoning skills, situational strengths, and verbal reasoning.

As an example, and to understand for the purpose of the paper how a world-leading firm that screens thousands of candidates every year optimizes selection processes by leveraging psychometric assessment techniques, it is the intention to analyze through concrete examples the tests that comprises the "Deloitte aptitude assessment".

Deloitte's numerical reasoning test involves a test of 21 untimed questions in the form of tables, graphs and other types of data presentation. The task of test takers (candidates) is to quickly and promptly, but accurately and effectively, analyze the information provided in order to derive the correct answers. To be able to perform effectively during this numerical reasoning test, it will be necessary to have a basic background in ratios, graph analysis, and percentages. Table 5 is an example of the questions proposed by the organization to its candidates.

Zoo Research – Northern Region					
Animal	Neflem	Aucten	Filsten	Kemtern	Congtin
Lion	34	45	2	52	235
Tiger	32	236	5	84	412
Zebra	104	214	74	78	524
Giraffe	123	40	8	45	124
Other	78	112	28	25	108

Source: Deloitte Online Assessment, (2021), *Management Consulted.* https://managementconsulted.com/deloitte-online-assessment/

Table 5: Example question

One question that could be asked within the numerical reasoning test, based on this tabularly represented data, is: *"If the number of giraffes in Congtin were reduced by 63%, what would the approximate ratio of giraffes to animals in the "Other" category be?"*[17]. This is a multiple-choice question and has five answer options "A- 1:2; B- 1:3; C- 2:3; D- 3:7, E- 8:11."

Deloitte's Situational Strengths Test helps recruiters understand how candidates would react in typical situations that might occur in the real work environment. No theoretical background is required to take this test, as common sense thinking and decision-making skills will be assessed. Responses, to be effective, must align with Deloitte's mission, vision, and core values. The situation depicted is typically one of challenge and emergency and demonstrates how the candidate would act to resolve it, choosing the actions to be implemented and related considerations to come to a solution.

Lastly, Deloitte's verbal reasoning test is similar to the "Critical Reading" section of the SAT and is used to identify the accuracy and attention used by a test-taker to extract key information from a text in order to answer questions posed in relation to it. Three types of answers are provided: true, false or "can't say." The candidate has about 45 seconds for each question.

These two psychometric assessment macro-tests are able to provide Deloitte's recruitment team with crucial information to thin out candidates and move to the next stage of interviewing only those who are most in line with the personal and professional values and thinking components sought by Deloitte. This highlights how more cutting-edge recruitment methods, such as those based on scientific and psycho-behavioural applications, can be combined with traditional interview methods and procedures to achieve a more effective and efficient result, both in terms of reducing time spent and in terms of talent acquisition.

EY is a leading global accounting and professional services firm. It is one of the most competitive and coveted work environments, which means that there is considerable competition

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[17] Deloitte Online Assessment, (2021), *Management Consulted*.
https://managementconsulted.com/deloitte-online-assessment/

to join, and that it is required to overcome several steps of traditional selection and psychometric assessment. Depending on the job profile sought and the role and skills of interest by EY, the leading consulting firm may administer various psychometric tests, including numerical reasoning, verbal reasoning, abstract reasoning, diagrammatic reasoning, situational judgment tests, spatial reasoning, personality tests, case studies, group exercises, and presentations[18].

As the two leading companies of the so-known "Big 4" reviewed above, PricewaterhouseCoopers (PwC) also assesses a wide range of skills when selecting candidates to hire top talent and enhance its workforce. The mechanism used is gamification, and specifically, PWC's assessment tests include digital games that measure mathematical, logical-rational, and memory skills and several other types of assessments. In this way, PWC succeeds in assessing some of the key characteristics sought for one of its typical workers, namely numerical and mathematical competence, that of working under pressure and in challenging situations, and rational logic skills; in doing so, PWC is able to skim thousands of candidates every year, identifying the most promising ones. PWC uses the two most common psychometric assessment tests: ability tests and personality questionnaires. The former combines numerical, verbal, and logical-rational reasoning tests, while the latter is a work-preference based questionnaires and provides insight into candidates' typical behavioural styles.

Lastly, KPMG generally uses psychometric tests as part of its recruitment process, to measure cognitive capabilities such as problem solving, numerical and verbal knowledge. These include Situational Judgement Tests (SJTs), Numerical Reasoning Tests and Verbal Reasoning Tests. These tests thin out 50-80% of the candidates.

KPMG's SJTs are tests through which candidates are confronted with different scenarios-types related to KPMG's day-to-day environment, and must identify the best and worst actions, based on drivers such as common sense, ethics, and professional efficiency, in order to demonstrate that they have the key characteristics of the ideal employee.

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[18] Mettl, "Twenty-five companies that use psychometric testing for hiring".
https://resources.mettl.com/wp-content/uploads/2021/08/25-Companies-Psychometric.pdf

Since numerical skills and the ability to interpret tables and graphs are key skills for working for KPMG, through the Numerical Reasoning Tests candidates are asked to perform basic GCSE math calculations. The difficulty of this test lies not solely in mathematical knowledge, but in time pressure and stress. In numerical reasoning tests, candidates have less than a minute to read and understand the question, analyze the data provided, and perform the calculations necessary to arrive at a solution. KPMG's verbal reasoning test assesses candidates' confidence and ability to extract information from an unpublished text and determine whether the given statements are true, phase or impossible to say based on the information provided in the essay.

2.3 Gamification with psychometric tests

Gamification is the implementation of game technology innovations in non-game contexts. It has been a rapidly spreading breakthrough applied in different industries to boost engagement in the recruitment process.

Gamified psychometric testing can be used in the initial stage of the selection process to thin out applicants and select those most fitting the job position and the organization, but it can be also applied to newly employed personnel or to employees' development. Gamification is not an assessment method, it exploits games mechanisms and elements to deepen knowledge and understanding about an individual's personality and consequently, improve the organization's recruitment process. Gamification can be constructed in different forms, such as audios, points, leaderboards and storylines. In this regard, KPMG developed its own mobile app, called KPMG Ready, that is designed in such a way that enables a deeper provision of psychometric assessments. The game is designed to challenge the participant to let its finest personality traits emerge and to keep track of all his decision-making paths. Thanks to the highly efficient evaluation technique, which provides the outcome of the assessment in less than thirty seconds, KPMG has decreased its hiring timelines down to six weeks, instead of ten, and has widen its opportunities to attract worldwide candidates[19].

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[19] Penny C., "Three companies using gamification to complement HR strategies", May 2020, Sage. https://www.sage.com/en-au/blog/gamification-hr-three-companies/

Through the engaging elements of gamification, organizations could encourage competition and increase an individual's sense of achievement. When properly implemented, gamification methods can bring to the processes several beneficial effects, such as the discovery of an individual's full potential, thanks to which performance efficiency will boost, alongside with the enhancement of the company's competitive advantage.

In a study on gamification effects, emerged that when comparing the same sample of questions in a traditional way and in a gamified way, the gap between male and female of the same sociodemographic area is reduced. The cause of this effect, is, indeed, the reduction of stress while carrying out the assessment and the reduction of stereotype threat. As a consequence of this beneficial impact of psychometric gamification, companies are driven to introduce gamification into their recruitment process.

Moreover, it has been noticed that by using gamification techniques, the core features of psychometric assessments are enhanced, and more shallow evaluations are left on the sidelines. The basic structure of gamification techniques is designed on the traditional cognitive, neuroscientific, and experimental psychology, that have set the fundamental elements upon which develop a methodology that would induce the final user to make its true self emerge. Thanks to this structure, an individual's true patters of decision making, reactions, preferences and biases arise. However, several challenges are brought up: firstly, the traditional models upon which the gamification architecture is based, analyze human personality as a whole, without deeply taking into consideration individual's differences, and by considering them only as an unavoidable minimum. The issue with this concept is that differences among individuals must be considered because they are an essential element that distinguishes a person from another, therefore, it must be developed a methodology that, while assessing a personal profile, flattens the degree of differences in individuals. Secondly, hurdles can be found in assessing the relationship between the questionnaire's input and output. Meaning that, the final user hardly understands to which final result the game will bring, and therefore, he will not be able to appreciate the tool at an initial stage, especially if the subject does not have a deep knowledge about his own personality and tries to modify the answers without responding sincerely. In this last case, even though the subject alters

the answers to the test, the final result will still be unaffected because the output is based on an objective and accurate methodology to avoid the impact of these types of situations.

On a general overview, it has been observed that around 89% of the individuals, prefer gamification methods to traditional ones, because they are more engaging and fairer, and they provide the test takers with more detailed knowledge on their own personalities, on which he can set the basis for personal development. Gamification has shown to eliminate anxiety related to testing and is revolutionizing the sector by providing an innovative approach and accurate psychometric evaluations[20].

2.2.1 KPMG's gamified pilot project

In 2014, KPMG company has developed a pilot project to improve its employees' awareness on the company's service capabilities, especially across the Australian Tax, Audit and Advisory departments. The aim behind this action was to increase the staff's ability to meet the client needs, improve relationships by engaging the correct service area when satisfying the customer's needs, and ultimately, boosting the company's growth. The main challenge that KPMG faced while developing this project was to find new engaging technological tools to increase company's capabilities awareness at a cost-effective rate. To do so, the company drafted a set of ten activities to carry out to achieve the ultimate goal. These included:

1.   The consideration of a gamification technique as a solution, which included several mandatory principles, such as the scalability and accessibility of the tool to the entire national workforce, the incorporation of a functionality to promote collaboration, the appeal necessary to attract all employees.

2.   The initial design of ideas, where several types of games were proposed that implied the understanding of the creative boundaries of the company in this regard.

3.   The highlighting of the value proposition, where the target users, goals, KPIs, challenges, benefits, risks, and costs have been defined.
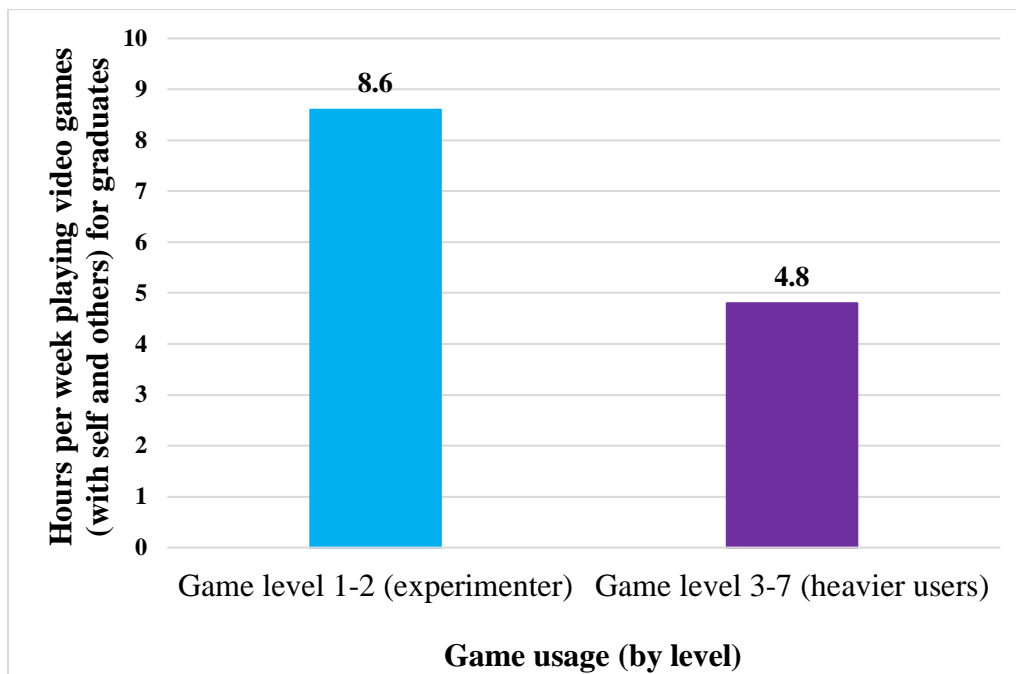
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[20] Artic Shores Official Website

4.   The pitch to the leader to receive feedbacks, from which the team gained the chance to submit a business case.

5.   The creation of the above mentioned formal business case, where there have been drafted the value proposition, risks and return on investment.

6.   The engagement of a sponsor and pilot funding, which have been secured thanks to the approval of the formal business case.

7.   The procurement process to find the supplier.

8.   The selection and recruitment of a project team that carried out the execution of the pilot project.

9.   The initial detailed design, building of the tool and implementation.

10.   The finalized corporate project management activities.

As the planned activities were carried out, the game was ultimately shaped, and employees could easily access the game from their work laptops. The game included a competition, based on a set of seven questions about the company's capabilities that must be answered within two minutes. Within the set of questions, it has been inserted a trigger question about the area of service used in a specific scenario, to which the employees must answer in the quickest and most accurate way. The employee that provides the most accurate answer, will position itself on a firm-wide leaderboard thanks to which gains eligibility to access several small rewards. The game is structured in several levels of difficulty, to which the participant gains access by overcoming the previous level.

The key findings that KPMG has collected are related to the people's perceptions of their gamification tool. It has been found that over the 80% of the participants expressed to have had fun while playing the game; over 16% of KPMG Australian employees accessed the game during the first three months from the issuing and answered to over 60,000 questions. However, even if the game was spread over all departments, at all levels of the pipelines, it has been found that younger employees are more prone to access the tool, with respect to higher levels employees, e.g., Associate Directors and Directors. Nevertheless, it has been measured that awareness about the company's capabilities has boosted by 21%, and 59% of the employees believed that gamification techniques should be introduced as a training tools. The general sentiment from the

senior users towards the pilot gamification project was that their interest lay in the content, which would boost career advancement. In fact, another factor that emerged from this project was that senior employees were more responsive to the experience with gamification than younger peers. Indeed, the group of the company's millennials has resulted to be the first group for probability to log on the platform, but also the second group to drop out and never engage in the gamification project again. The challenge with this group of employees was to keep them engaged. The issue for the group was the comparison with the design of the already on the market gamification competitors, which were much more developed, thanks to the greater availability of financial resources that KPMG's pilot project did not dispose. The graph presented below, figure 5, represents the results of the final survey regarding the level of usage of the gamification platform of the graduate's component of KPMG's employees. As showcased in Graph 2, those millennials who spent 8.6 hours per week playing video games (at a level 1-2) by themselves and with others are considered to be experimenters, while those who spent 4.8 hours per week at a game level 3-7 are considered heavier users.

Source: KPMG official website, "Competing for engagement" https://assets.kpmg.com/content/dam/kpmg/pdf/2014/09/gamification-competing-for-engagement-2014.pdf
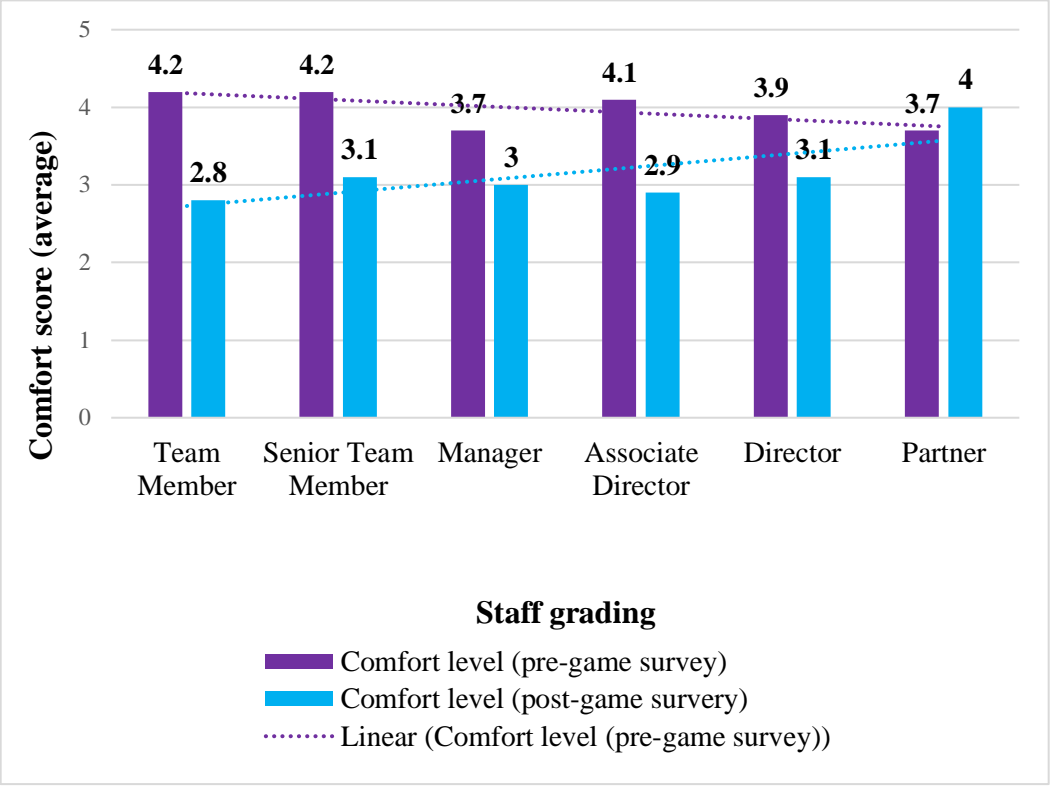
Graph 2: Video game usage for graduates

As regards the participation, the company did not propose the gamification technique as a mandatory tool, but as an optional one, and no management expectations were placed to pressure employees to participate. The personnel population in KPMG, in 2014, was composed by 52% of male component and by 48% of female component, and within the participants that took part to the pilot project were 60% male and 40% females. It has been found that, while males participated to the pilot project just by logging in the gaming platform, females were by 3% more prone to become power users. A discovered benefit of the pilot project is that it has raised interest around the topic on which the gamification was based. By doing so, employees that previously were not captured by the subject matter, by confronting themselves with their participating colleagues were more lured to try the game and get engaged with the topic.

From the performance of the pilot project point of view, it was necessary to set a baseline on the employees' awareness before participating to the gamification pilot project, thanks to which the company was able to assess the improvement generated by the participation to the project. It has been found out that the more the employees participated to the game, the higher the boost in the performance related to the acquisition of awareness of the company's capabilities. Another important finding that emerged from the company's final survey is that, differently from what the company expected, those employees that started by having less knowledge and awareness about the company's capabilities, by the end of the gamification learning path, they have acquired much more awareness than expected, and therefore they were able to close the gap, regardless from the age, employee grade, division or gender.

Another element that has been evaluated by the final survey is the comfort factor, which is how comfortable an individual is while playing what appears to be a video game in a working environment. The survey results highlighted that the general feeling seems to be that employees do not week comfortable while engaging to these tools, even if they are legitimate. In fact, only 41% of the employees resulted to feel comfortable using this methodology on the workplace for training purposes; 22% of the individuals feel neutral about the pilot project; and 37% showcased

discomfort at a certain degree. During the survey carried out before issuing the game, the results highlighted that the more junior staff, the more the general sentiment was comfort towards playing video games for professional purposes. From the graph below (Rif. Graph 3), it is possible to understand which was the comfort score for each staff grade both before issuing the game and after it was issued.

Source: KPMG official website, "Competing for engagement" https://assets.kpmg.com/content/dam/kpmg/pdf/2014/09/gamification-competing-for-engagement-2014.pdf

Graph 3: Comfort score and staffing grade

In the survey carried out after the game was issued, the general feeling over all staff levels was a little more discomfort playing video games on the workplace, with respect to the initial survey. However, overall, the staff felt neutral about this matter. For those employees that felt a

"lack of comfort" the issue was underlying two major aspects: the leadership teams did not exhaustively and explicitly approve the tool as valid for training; participants felt that they were not legitimate to use this training tool because they felt that their colleagues could believe that they were playing video games during working hours, rather than taking part to a training.

Overall, the pre-game and post-game survey results highlighted that the general sentiment about gaming experience was positive, and that the tool was appropriately implemented and developed.

Moreover, it has been analyzed the impact of the financial rewards gained towards the overcoming of the game levels on the employees' behaviour. The game was also composed by a tournament mechanic component, which permitted individuals to play in teams and compete against other teams, where tournaments usually involved 20 or 30 individuals. Initially, tournaments resulted to be perceived as fun, a social gathering that was focused both on completing the task in the game and enjoying time with colleagues, and this aspect was also showed across staff gradings and functional teams. When the "winner takes all" functionality (which defined just one winner on a national tournament) was introduced, individuals' behaviour changed: the game sessions became silent environments, were tension and competition were at the centre stage. In the table below (Rif. Table 6), it is clearly reported the distinction between the employees' behaviours before the introduction of the financial reward and after[21].

	Tournament without financial rewards	Tournaments with financial rewards
What was heard	Noisy conversations Laughter Disturbance	Silence Brief, question-related whispers
What was observed	Smiles Energy and movement throughout the tournament	Concentration Stillness during rounds
Response to IT issues	Ambivalence	Frustration

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[21] KPMG official website, "Competing for engagement."
https://assets.kpmg.com/content/dam/kpmg/pdf/2014/09/gamification-competing-for-engagement-2014.pdf

		Nuisance
Focus of participants	Tool and other participants	Tool
Collaboration	Playful	Proactive
Mood	Casual	Serious

Source: KPMG   official   website,   "Competing   for   engagement"
https://assets.kpmg.com/content/dam/kpmg/pdf/2014/09/gamification-competing-for-engagement-2014.pdf

Table 6: The impact of financial rewards on employees' behaviour

2.4 The Quiggle Assessment for talent retention

Personality profile assessment testing is not only used as a selection tool in human resources recruitment process, but also as a methodology to continuously engage employees by understanding their personalities and triggering their motivation and interests. In fact, as a consequence of the personality assessment, employers are able to match employees personalities with the company's culture and reduce the company's turnover, while boosting employees' efficiency, and consequently, the business' productivity. Psychometric testing reveals individual's strengths and weaknesses, along with providing pieces of information regarding the way in which the individual in examination is most inclined to absorb information, elaborate them, and the behavioral style under stressful situations, towards problem solving, time management and its organizational skills.

In this regard, another method which is used in this context is the Quiggle Assessment[22]. The Quiggle assessment methods is a useful tool for the preparation of a self-brand story, the so-called Success Story, to present the employees' own personality to other co-workers, potential clients, customers, or partners. The Quiggle assessment is an online personality assessment, which categorize personalities in six different success symbols: the guardian, the director, the analyst, the royal, the explorer, and the creator, and then the individual can discover the best way to create the best version of itself. The Quiggle assessment was designed with the believe to teach the

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[22] Developed in 2021 by Dan Quiggle, American entrepreneur, author and CEO of the Quiggle Group, which is an international organization that provides and delivers leadership content worldwide.

communities how to use their personality, to act, and be able to market their strengths. It is challenging for individuals to expose themselves as their true selves and show their weaknesses. The Quiggle Assessment provides the opportunity to generate a power pitch that follows the assessment, and this can happen only when the right words to describe people's strengths are identified. The main aim of the assessment is, in fact, to share the self-strengths and then, by using branding words, create one's own success slogan to the own success story.

When presenting the success story, it is important that individuals come into connection with the speaker, because one of the main characteristics of pitching is relatability. This characteristic is particularly important also when it comes to the Quiggle assessment, because it is addressed to every individual in the society, from college students to CEOs, and therefore, a valuable feature to a presentation is to find a common language thanks to which it is possible to communicate with a widely diverse set of people, and at the same time, make them able to understand the content of what the speaker is sharing.

The Quiggle Assessment finds the individual's strengths and also it points out its weaknesses, so the individual is able to develop a personal confidence on its weaknesses in order to not make them become a serious liability. In fact, if the person's success symbol is the guardian, it would be characterized by a caring, compassionate, helpful, hopeful attitude, which should not be viewed as a weakness. Whereas, if the success symbol is the analyst the individual is a meticulous detail-oriented person, and this is when the true self emerges, and in which lies the value of one's personality, however the ability of marketing one's own personality depends on the person itself [23].

The Quiggle Assessment is an extremely valuable tool, because it enables leaders to create an heterogenous group, by bringing individuals with different success symbols together, in order to generate a sharing environment from which employees learn from each other constantly and exchange values and behaviors to improve personal development. Such assessment technique benefits as well the creation of a robust teams, where leaders can organize teams based on the

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[23] Garage to Goliath | Leaders Building Legacies Podcast
https://quigglegroup.libsyn.com/g2g054-the-quiggle-assessment-online-personality-test

personality matches among employees in order to make sure that they will not clash, rather complement each other. In this way, Quiggle Assessment prevents conflicts and improves teamwork integration.

As regards employee retention, the above mentioned assessment method is used to implement effective communication within the company, in order to develop empowered strong influential leaders and increase the organization's productivity. The Quiggle Assessment helps to understand the most effective matching among employees, based on their work style and preferences, in order to introduce to the team a variety of different optimal skillsets. By doing so, the company reduces turnover and builds a profitable activity.

Effective communication fosters positive communication on workplace because it provides knowledge about the approaches to use when communicating with other colleagues, which it reflects also on the manager-employee interactions. In fact, when undertaking these kinds of assessments, individuals are able to understand their traits and how they can be used as a personal asset, and not liabilities, therefore personal development contributes to positive communication, because it provides a general overview about one's own personality traits that help understanding and developing uniqueness and differences. Moreover, a positive effect is also impacting the communication's efficiency between subordinate and manager, which is able to shape the communication technique based on the employees' communication styles and learning style. As it comes to matching communication styles, it becomes easier for colleagues to inspire others, in fact the Quiggle Assessment is also used to foster motivation and employees' ambition to aspire to a more prestigious position, and, contemporarily, leaders can more easily mentor employees to be more ambitious, becoming stronger influential leaders.

Considering that people are the most valuable asset to a company, it is of utmost importance that these are aligned in teams, where they cover an appropriate position, which is decided based on psychometric tests, and that they have the potential to constantly grow and thrive. Quiggle

Assessment technique helps leaders to have a strategic thinking approach to maximize collaboration and productivity[24].

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[24] Quiggle D., (2021), "Using Personality Assessment for Employee Retention and Other Winning Strategies".

CHAPTER III: How can psychometric tests be used as a strategic tool for companies?

The present chapter will thoroughly investigate the use of personality profile assessments and their application in the human resources department of international corporations, and specifically their strategic exploitation.

In a hyper-dynamic world, in which change is no longer merely a disruptive choice, but a constant for survival and growth that affects more or less all aspects of personal and professional life, it is crucial for strategic business functions to be constantly evolving in order to respond promptly, efficiently and effectively to new daily needs and anticipate wide-ranging market trends and changes. The business functions affected by progressive and constant change are not only those of production and sales, supply chain management, quality control, etc., but also that which underlies any organization, regardless of its size, and characterizes its survival and growth: human resources.

In the previous chapter of the paper, it has been analyzed in depth the use of psychometric testing in human resource management, recruitment processes, acquisition of talents matching sought-after profiles and company's values. The aim of the previous chapter was to highlight how these modern cognitive tools allow to progressively increase talent retention and reduce turnover, providing the company's human resources with an integrated and satisfying work experience, which is the key to a successful organization.

Although psychometrics has been widely used as a tool for acquiring and retaining talent, it can also be useful for change management within organizations. Assessments obtained through psychometric testing can provide accurate and valuable insights on the people of a team, such as their personality and personal behavioural styles, preferred and most challenging work environments, and how they may react in the face of change. By leveraging this information, a change leader will gain a comprehensive overview and understanding of the team's strengths,

weaknesses, and untapped potential, and how individual members can work together to ensure the success of change and the growth of the entire organization.

Within this section of the paper, therefore, the role that psychometric testing plays in the business organization as a strategic leverage for increasing resource performance, maximizing value and improving corporate welfare will be analyzed in detail.

In fact, innovation driven firms no longer rely solely on traditional recruitment processes but also on the use of psychometric testing at every level of the talent management processes, from talent acquisition to talent development. These research-based psychometric assessments help organizations succeed by ensuring the recruitment, identification and improvement of the best people for essential roles and, as a result, allowing for a reduction in the margin of error of hiring people who are not a perfect fit with the role sought and the company's values, which could undermine its overall efficiency and effectiveness, playing a counterproductive role with respect to the company's investment aimed at growth.

3.1. The importance of psychometric tests in organizational planning

Organizational planning, which can be reconducted to the way in which an organization divides its activities, allocates them to certain substructures (company divisions), for the achievement of set goals, identifying high-potential talent, is an integral and fundamental part of broader business and strategic planning and contributes to leadership development. It is also a pressing concern for many organizations because the choices made in business organization affect the entire enterprise, by impacting the value chain and determining the growth or stalling of the enterprise in a dynamic and increasingly competitive environment.

The use of disciplines such as science, psychology, and behavioural economics have permitted and increasingly allow for minimizing the rate of and discretion left to traditional, subjective methods of screening candidates and observing their behaviours in the professional environment. The use of psychometric tests in organizational planning has soared in recent years.

According to 2023 statistics, psychometric assessment tests are now used by more than 80% of Fortune 500 companies in the United States and more than 75% of Times Top 100 companies in the United Kingdom[25]. This reflects how high-rated organizations and future-ready firms realize the importance of assessing future leaders' suitability, leadership orientation, strategic thinking, decision-making, initiative, adaptability, stakeholder management and other important skills.

As competition in the candidate market increases, screening and hiring processes become progressively complex, as does the subsequent constant evaluation and monitoring of the performance of employees placed within the organization. Indeed, employees need to be evaluated against a framework of future competencies with a view to potential succession into roles with greater responsibility and more specific and technical tasks. The use of psychometric testing ensures that an employee is holistically assessed on present and future competencies. Psychometric testing has increased recently due to the recent economic crisis; during an interview aimed at discussing about the value of using psychometrics techniques at the executive and managerial levels, David Angel, Page Executive Director based in London, quoted: *"organizations have been reassessing their talent pool and some have needed to change their senior management to reflect a different dynamic."*[26]. Still from the point of view of Page Executive management, Phil Spencer stated that "*as the market picks up, there will be a greater increase in the use of psychometric testing. Currently there are still cost and time factors, but we will see a big growth in HR using these tools for profile management and sophisticated selection and development of senior executives*"[27].

Effective organizational planning, also based on the use of psychometric tools, can enable an organization to navigate a complex and dynamic business environment, allowing it to move flexibly with respect to the company's growth plans. Moreover, in situations where requirements

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[25] Psychometric Tests – Everything You Need to Know (April 2023), https://psychometric-success.com/aptitude-tests/test-types/psychometric-tests
[26] "What Is the Value of Psychometric Testing at Executive Job Level?", Page Executive https://www.pageexecutive.com/advice/region/global/what-value-psychometric-testing-executive-job-level
[27] "What Is the Value of Psychometric Testing at Executive Job Level?", Page Executive https://www.pageexecutive.com/advice/region/global/what-value-psychometric-testing-executive-job-level

and roles are precisely defined and standardized, the use of psychometric testing helps identifying an employee's future potential in the role. It provides benefits in terms of gathering objective information on employee effectiveness, on his ability to face challenging situations, and behavioural competencies that are suitable for the organizational ecosystem and compatibility with the leadership stage.

The use of psychometric testing for the optimization and internal talent development within the organization makes it possible to identify behavioural traits indicative of leadership potential, with a positive impact on performance management, ensuring that strategic positions remain filled by valuable and motivated people. In this way, it is possible to significantly cut the cost and time of recruiting and screening of new people from outside, and the resulting investment in training, which is statistically more expensive compared to internal promotions. In performance management, a company can leverage psychometric techniques to identify an individual's areas of development and assessing his strengths, as well as motivations and difficulties in critical work areas.

There are a variety of uses of psychometric tests in organizational and strategic planning. As already highlighted in the previous sections of the paper, the most common case of their use in the business environment is the analysis of a candidate's mental and cognitive skills and behavioural characteristics. These tests allow the identification of a candidate's suitability for a particular job based not only on his professional characteristics but also with respect to his personality traits, thus revealing his hidden potential.

Regarding other uses of psychometric tools in talent recruitment and development processes within the organization, such tests are standard reasonableness and normative methods of measurement. The data-driven procedure to which test-takers are subjected is the same, thus promoting objectivity and mitigating the risk of subjectivity and alteration by any interviewer's view. Furthermore, by assessing the broader skills, abilities and personal behaviour of the test-taker than only those sought for a particular job, a complete and comprehensive profile can be obtained through psychometric testing, allowing the candidate's comparability with multiple positions sought and with the company's current workforce.

Another key variable in the process of enrolling a new person within a team or broader organization, which can be measured with the help of psychometric tests, is cultural fit. These tools help determine whether a candidate is able to conform well to the rest of the team or company division in which he has been placed and, even better, whether he fits the culture and core values that characterize the company. Based on the data collected, forecasts can be generated about an individual's cultural fit and an indication of the aspects of the work environment that might foster or inhibit a person's success, affecting his job performance and competence.

Through the application of psychometric methods to learning and development processes, organizations can obtain outstanding results such as assessing the agility in learning of the individuals concerned and the preference for learning modes (e.g., through face-to-face lectures, remote/webinar connections). Based on this data, organizations have the possibility to create more customized training and development plans, maximizing resource allocation. Companies that use psychometric testing in their Learning & Development activities have measured greater success also in terms of return-on-investment.

Psychometric assessment techniques are not limited to assessing competencies but can be used to project a candidate's behaviour in a specific situation in order to achieve organizational results. By identifying and subsequently evaluating a candidate's strengths and weaknesses in different airs of leadership impact, it is possible to obtain an objective and data-driven indication of the situations and work contexts in which an individual is most likely to be more or less effective as a leader.

3.2. The impact of psychometric testing in company's growth

It is possible to group psychometric tests essentially into two macro-areas: those that delineate aptitude, examining numerical competence, verbal and nonverbal reasoning or logical reasoning, and those that assess personality, behaviours and how individuals react when faced with different situations. By using both types correctly, always keeping in mind the fundamental

properties of these psychometric tools, that are reliability, validity, and norming, it will be possible to radically improve the company productivity and the performance of the resources and assets.

The key that makes an organization productive, high-performing, and successful is an effective team, regardless of the industry in which it operates or its size. Among the factors that influence an organization's ability to be productive, and consequently, to be growth-oriented, are motivation, leadership, and the quality of the workforce. Although individual capabilities and professional skills are important for contributing to business development and getting the job done right, compatibility characteristics are the key that can make a team shine and achieve profitable results. Company productivity automatically increases when the workforce is motivated and efficiency-oriented, and in order to achieve this, the role of selecting the right talents assumes crucial importance. Therefore, in order to mitigate the risk of making an inappropriately thoughtful choice and damaging the quality of work teams, it is a benefit to apply scientific, psychometric and behavioural methods to talent acquisition and development processes. The use of such methods offers the opportunity to obtain a reasonably reliable picture of the performance of several candidates, facilitating the selection of a smaller and more suitable group with the profile sought, to be taken to the interview stage, reducing time-and consequently costs-for both HR teams and management.

As noted above, psychometric tests are widely used in the talent attraction and hiring processes, but they could and should also be used after finding the right person, in order to determine the aptitude and environment in which each individual in the workforce can perform best. A person who is more introverted than extroverted will tend not to perform well if forced to work too much in groups or to tasks that require more public exposure, while someone who is more confident and creative at thinking outside the box when it comes to new information may be well suited to roles such as project or program manager. It is also crucial to assemble teams, whether temporary or permanent, also combining different but complementary personalities in order to stimulate greater performance and profitability and the outcome of innovative and out-of-the-box results from an analysis viewed from different personal and professional perspectives and profiles.

As the term "efficiency" in a business perspective refers to *"the peak level of performance that uses the least amount of inputs to achieve the highest amount of output, by requiring the reduction of the number of unnecessary resources used to produce a given output, including personal time and energy"*[28], the use of psychometric testing makes it possible to maximize the usefulness of resources concerning the workforce, choosing from the outset and in an objective and data-driven way those that best fit the needs of the company, and to reduce selection errors, which can be extremely costly for any company, both in terms of investment in training unsuitable resources and misallocation of the budget planned for the increase in work units.

Most companies that choose to use psychometrics techniques do it to make strategic hiring and Learning & Development decisions based on data to obtain useful information and assessments on hiring, workforce planning, and employee development. Mettl, a technology company that provides skill assessment tools, proctoring, and online assessment software, identified a rundown[29] of some of the leading companies in multiple sectors that have transformed their businesses and increased their performance and profitability through the use of psychometric testing. A good portion of those applied psychometric assessment techniques to restructure teams and business units after the Covid-19 pandemic crisis, assessing employees on various competencies, segmented, and customized according to their job responsibilities, or to get into digital transformation.

An interesting example from the perspective of digital transformation is that of Telkom Indonesia, the largest public telecommunications service company in Indonesia based in Bandung, and also one of the leading telecommunications companies globally. The Telkom Group started the digital transformation process in 2020 and introduced three new business portfolios, considering fast-evolving technologies and customer lifestyle and preferences. The new business portfolios required Telkom to diversify roles and hire at scale while preserving its quality and moving cautiously. Every aspect of the organization had to be favourably exposed to digital transformation and change in order to make it effective and worthwhile. Moreover, as the digital

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[28] Banton C., (2022), "Efficiency: What It Means in Economics, the Formula to Measure It", *Investopedia*, https://www.investopedia.com/terms/e/efficiency.asp

[29] "Twenty-five companies that use psychometric testing for hiring", Mettl, https://resources.mettl.com/wp-content/uploads/2021/08/25-Companies-Psychometric.pdf

transformation process was started in the middle of the Covid-19 pandemic and recurring lockdowns, this posed an even greater challenge for the entire organization, which was forced to operate remotely and in a limited way.

This development gave rise to the need to upgrade its employees from a technological/digital perspective, and for this purpose, the Telkom Group administered psychometric tests related to digital potential and skills to its workforce. These tests were designed to test the knowledge, skills, and behaviours of current employees to understand whether they could adapt positively to the organization's transformative culture and change. Through psychometric techniques, personal characteristics such as critical and meticulous thinking and abstract reasoning skills, and digital competence skills, crucial for the use of new technologies, were assessed. By using psychometric tests and digital readiness assessment, the Telkom team was able to profile more than ten thousand current employees, assessing them on more than seventy-five new skills needed to fulfil the new roles[30].

One of the main challenges facing the Telkom group was whether to hire talent from outside, based on the skills required by the new roles, or to develop internal talent already within the company. The Telkom team, working with external consultants and subject matter experts, have drawn a detailed assessment referring to each role and competency to be achieved as a goal. The first objective was to conduct a skills gap analysis of the entire workforce, considering the company's digital initiatives of interest. This analysis was useful to Telkom in determining its talent strategy - i.e., whether to develop its current workforce or to look externally for new talent - by determining who needed to be retrained and the skills that needed to be acquired through the hiring of new people instead. Furthermore, to valuate candidates on the desired behavioural, cognitive and digital skills, Telkom also needed to assess specific technical and professional skills, based on global standards, in order to understand the scope for development for each of them.

The digital readiness assessment comprised two parts: the digital potential assessment and the digital proficiency assessment. The former was composed by the valuation of personality

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[30] "Building a future-ready workforce: How Telkom led its employees on the path of digital transformation", *Mettl*, https://mettl.com/clients/telkom/

profiles, critical thinking competencies and abstract reasoning competences, while the latter covered the necessary skills required to use digital tools and technologies to improve the effectiveness. The competencies there were part of the digital potential assessment tool were creativity and innovation, entrepreneurship, customer orientation, strategic relationship, adaptability, communication, and collaboration, learning agility, and have been identified and defined in detail as described in the following Table 7[31]. Whereas digital skills were identified as the ability to manage and manipulate digital data and information, interact and collaborate through digital tools, and the capability to protect data in the digital environment for the purposes of privacy regulations.

Competency	Definition
Creativity and innovation	The ability to thing and visualize the environment in new was or finding different ways to deal with work problems and business opportunities.
Entrepreneurship	The ability to recognize new opportunities and position the company to achieve business success by developing or improving markets, products, and services.
Customer orientation	The ability to meet customer needs, problems, and expectations. The ability to build productive relationships to achieve satisfaction and customer loyalty.
Strategic relationship	The ability to build partnerships proactively to further the company's business interests.

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[31] "Building a future-ready workforce: How Telkom led its employees on the path of digital transformation; Digital readiness assessment", *Mettl*, https://mettl.com/clients/telkom/

Adaptability	The ability to maintain work effectiveness aimed changing circumstances and surroundings (environment, procedures and people).
Communication and collaboration	The ability to use specific methods and effective interpersonal styles to build workgroup cohesiveness, facilitating the fulfilment of shared goals. Demonstrating the ability to convey the expected information clearly and concisely, ensuring it makes the desired impact.
Learning agility	Demonstrating the ability to learn new skills and modify one's knowledge effectively – based on new information.

Source: "Building a future-ready workforce: How Telkom led its employees on the path of digital transformation" - https://mettl.com/clients/telkom/

Table 7: Competencies analyzed by the digital potential assessment tools

For the purpose of the investigation and digital development, Telkom has created singular assessments for 75 new roles including, but not limited to, Data Engineer, Cloud engineer, IoT engineer, Web designer, Network engineer, Tower maintenance, and graphic designer. The use of customized psychometric tests enabled a thoughtful, effective, and impactful talent strategy, obtaining a thorough and holistic understanding of each employee's positions with respect to the specific skills identified as necessary. In doing so, Telkom was also able to identify each employee's skill gaps, thereby charting a personalized training and development path.

The business case above-examined highlights how psychometric techniques allows to predict employees' behaviour by analysing their bright side, dark side, motivation, cognitive skills and mental capabilities. In addition, they make it possible to build high-performing teams and drive better business outcomes. An individual's motivation is a key aspect to assess, as it guides him in the pathway of success. A thorough assessment of mental and cognitive skills, on the other

hand, allows for the measurement of problem-solving and decision-making abilities. Hiring the right person, weeding out unwanted and then training him by defining the competency framework, identifying skills gaps, outlining the training plan, and measuring the return-on-investment, allows a company to implement a succession strategy toward effective leadership development by creating effective leaders.

Another interesting business case noted by Mettl in its report on the 25 companies that have chosen to use psychometric testing techniques to hire more consciously and effectively is that of the JPMorgan Chase, an American multinational banking and financial services holding company. As one of the leading global banks, JPMorgan Chase has more than 170,000 employees worldwide. This makes it highly coveted by candidates in the industry, and as a result, in order to conduct thoughtful and effective screening, the U.S. bank has chosen to use psychometric assessment tests; to date, JP Morgan Chase rejects an impressive percentage of candidates based solely on psychometric test scores. The tests used are verbal reasoning tests, inductive reasoning tests, and situational judgment tests. After passing these tests, candidates are called for an interview to examine their technical skills, motivation, and self-awareness. Lastly, selected candidates must pass an additional level of psychometric challenge, namely the assessment centre, which includes specific exercises based on the gamification mechanism, such as role-playing games, case studies, and presentations.

Through the study of the impact that psychometric tests have within organizations to grow effectively, efficiently and profitably, and the analysis of business cases from a multitude of industries, the paper aims at highlighting how these psychometric assessment techniques are not limited solely to talent acquisition and retention processes, nor to more thoughtful and meticulous screening; psychometric tests are valuable allies also in digital transformation processes or in the broader area of change management, as could be seen from the case of the Indonesian Telkom Group examined, or in an organization's sustainable transaction processes.

3.3. How are psychometric tests used profitably in the financial sector?

Psychometric testing is not limited solely to internal company processes, such as those of talent acquisition, optimization, and retention, but also, when used correctly, can facilitate a company's business development by being able to profile and analyze customers in depth, making more informed and effective choices when approaching sales and marketing.

The purpose of this section of the paper is to analyze the impact of psychometric assessments within the financial services industry, as tools to better understand the characteristics and biases of a financial institution's customers about money, or a way to identify their risk tolerance and make the right asset allocation decisions.

The increasing use of psychometric assessment techniques in the financial sector and the spread of so-called "financial psychology" is allowing to go beyond mere client information obtained through simple forms or interviews. In fact, through the objective assessments obtained by using psychometric tests, it is possible to get an intrinsic and in-depth knowledge of the psychological and behavioural aspects of the clientele, in order to study and analyze crucial variables for the provision of financial services. Because of the importance and rapid diffusion obtained, "financial psychology" has also been included in the CFP® ("CERTIFIED FINANCIAL PLANNER") certification[32], i.e., the exam that awards the professional who actually succeeds in passing its standards of excellence in the field of financial planning.

To be effectively useful and allow for objective evaluation, the test must be consistent on the basis of three key elements: design, reliability and validity (summarized in Table 8). These characteristics were discussed extensively in the first chapter of this paper, in which the functionality of psychometric tests and the elements that ensure their effectiveness were analyzed. However, for the purpose of offering a comprehensive explanation, it is important to briefly return to the topic, contextualizing it in the financial sector under consideration. Effective design allows a test to be clearly and transparently assigned the purpose and population for which it was designed, allowing the elimination of errors and biases in the results that would undermine its

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[32] Stanley Fallaw S., (2021), "Gaining Better Understanding of Client Personality, Attitudes, and Values Using Psychometric Assessments", *Kitces* - https://www.kitces.com/blog/psychometric-assessment-risk-tolerance-questionnaires-values-predict-future-behavior-test-design/

validity. This allows the test to have greater reliability, making sure that it provides an objective and reliable assessment of the aspects of the test-takers that it is intended to analyze and ensuring that, when the same test is repeated on the same population, the same results are obtained. A good test-programmer will also have carried out statistical analyzes to confirm its reliability and validity and to enable users (e.g., financial advisers or their firms) to be confident about the assessment methods used and the results obtained.

Design	Reliability	Validity
The test has a clear scope, and population, and specifies what will be measured.	Usually demonstrated statistically or with test-retest studies, consistent measurement over time.	The test typically demonstrates in multiple ways over time that it measures what it claims to measure.

Source: Gaining Better Understanding of Client Personality, Attitudes, and Values Using Psychometric Assessments

https://www.kitces.com/blog/psychometric-assessment-risk-tolerance-questionnaires-values-predict-future-behavior-test-design/

Table 8: Elements of a Useful Behavioral or Psychological Risk Tolerance Assessment

One of the main functions of using psychometric assessments in financial planning is to measure a client's risk attitude and relative psychological tolerance, in order to predict his or her behaviour under various market conditions. Risk tolerance is one of the most general components of a client's attitude toward risk. An investor client's attitude may be one of apprehension and anxiety (risk aversion), slow openness, neutrality, or indifference (risk neutrality) but also one of liking when it denotes a propensity toward risk (risk appetite) or even a clear preference over stability (risk lover or affinity). A client's psychological tolerance relates to his behaviours toward contingencies and adverse events that are judged negatively (e.g., the downturn of securities, or

contingencies that shake the financial system unfavourably). It is therefore a quantity influenced by psychological traits and can be defined in the financial field as a measure of a client's ability to support fluctuations in portfolio value, and partially loss scenarios, without changing investment choices. The measurement of a loss is generally made on a point-in-time basis while tolerance toward risk refers to a period of time, such as the fluctuation in the value of investments during the last year or month. The greater the volatility evidenced over time, the greater the tolerance toward risk should be.

Since risk attitude and tolerance are thus purely psychological aspects, psychometric assessment tests can prove valuable allies in the financial planning environment and in predicting a client's behaviour in the face of different scenarios. Being able to understand when clients might be prone to make poor decisions in rising and/or falling markets can enable financial advisors to focus attention where it is most needed during these often stressful and intense periods. Psychometric tests also provide insight into an individual's ability to maintain stability of decision-making behaviour at long term, and to predict his reaction when faced with different conditions than those on which he made an initial assessment. This information can be crucial in the environment of a volatile and unpredictable industry such as finance.

In addition to serving as assessment methods on risk attitude and tolerance, psychometric tests can be used by financial institutions as tools to better understand a client's attitude and savings and spending behaviours in a more objective and in-depth manner; in this way, advisors will be able to study effective techniques for approaching clients about financial investments and making appropriate financial planning recommendations, based on the behavioural and emotional traits detected.

The validity of the tests that are to be used is a matter of high importance. For example, in the case of using psychometric techniques in assessing risk tolerance for the purpose of making an allocation decision for a client, the validating evidence for that specific test should be that a psychological risk tolerance score correlates with client behaviour during periods of market turbulence. It is a widely debated issue among financial advisors, however, whether the fact that their clients can score well (indicating high tolerance) on a risk tolerance questionnaire really

guarantees that they will not panic when markets become volatile. Validity studies involve correlating test scores with outcome scales. An example of this is the Gable & Lytton Risk Assessment [33], through which customers' risk tolerance can be measured with FinTech and psychometric questionnaires instead of just conversations about risk.

The Risk Tolerance Questionnaire developed by Grable & Lytton pioneered the application of psychometric assessments around attitude and risk tolerance. This method continues to be one of the gold standards in the development of psychometric testing in the financial services field. It is a three-factor model that provides insight into investment behaviour, showing that if investors score (outcome) high they tend to hold a percentage of their investments in high-risk assets compared to those who, conversely, score low on the assessment, who instead tend to favour less risky investments such as fixed-income investments or cash. There are several other assessments on the market designed with the psychometric approach, including FinaMetrica's risk tolerance assessment, that meets or exceeds international standards for assessments of its kind with a reliability of 0.9 out of 1 [34].

Psychometricians typically use two strategies when conducting these types of risk aversion studies: predictive studies and concurrent criterion-related validation studies. The former consists of testing in clients at one point in time, and then retesting them later on another but related outcome; this with the aim of identifying whether there is a correlation between the two observations that proves the validity of the psychometric test used. For example, predictive studies might involve first testing customers' propensity to invest at the time of entry and then at a later downturn in the market. If a positive and significant correlation is found between the test scores, there would be evidence of validity. If not, it would be appropriate to change the risk tolerance test.

Concurrent criterion-related validation studies, on the other hand, allow the validity of the psychometric test to be demonstrated by administering it to a client at the same time he provides

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[33] Grable and Lytton (1999) developed, tested, and published in Financial Services Review a financial risk tolerance scale that has since been widely used by consumers, financial advisers and researchers to assess a person's willingness to engage in risky financial behavior.
[34] "Scientific risk tolerance profile", FinaMetrica, https://riskprofiling.com/How-it-Works

criterion or outcome data. A good example of a concurrent study consists in examining a client's score on a conscientiousness measure (the predictor) and the relationship between that score and the client's current savings rate (the criterion)[35]. A statistical relationship between customer conscientiousness and savings rate has been proven; therefore, these types of tests can be conducted simultaneously as a strategy to measure their validity.

In order to prove the validity of a behavioural assessment test based on psychometric criteria, there must be evidence that the test developer has previously conducted statistical research studies that examine its validity, relating it to other similar tests and highlighting any references to scientific studies that show how such tests can enable the consultant to anticipate client's future decisions or behaviour in the area of financial choices. Therefore, the stakes of the decision to which the test has been developed assumes relevance: if it is simply a tool for studying and understanding people's personal attitudes, the type of test required may differ from that which is applied to making financial allocation decisions or develop a client's investment strategy.

However, risk tolerance questionnaires (RTQs) are evaluated solely based on "face validity," or the ease with which risk scores can be linked to portfolio allocation models. This is because regulatory bodies such as the Financial Industry Regulatory Authority (FINRA) and the Securities and Exchange Commission (SEC) have limited themselves to providing rigid, non-binding guidelines on the actual measurement of risk attitude or risk taking, leaving wide discretion to the developers of the assessment models. This loose approach stands in stark contrast to the application of psychometric tests to talent acquisition and optimization processes, which unlike the former are highly controlled because of their potential for inappropriate development or implementation. On the application of psychometric tests to the latter, rather stringent guidelines have been provided by numerous institutional bodies, such as the Equal Employment Opportunity Commission (EEOC), the Society for Industrial and Organizational Psychology (SIOP), and by sources of law, such as Supreme Court cases as Griggs vs Duke Power Company[36].

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[35] Stanley Fallaw S., (2021), "Gaining Better Understanding of Client Personality, Attitudes, and Values Using Psychometric Assessments", *Kitces* - https://www.kitces.com/blog/psychometric-assessment-risk-tolerance-questionnaires-values-predict-future-behavior-test-design/

[36] Willie Griggs filed a class action, on behalf of several fellow African-American employees, against his employer Duke Power Company. Griggs challenged Duke's "inside" transfer policy, requiring employees

Nevertheless, even if with few and non-stringent guidelines for measuring psychological risk tolerance in the financial services field, it remains advantageous and effective to rely on the use of well-designed psychometric tests that meet the requirements of reliability, validity and normalization for behavioural assessments and to learn about the personal and cognitive characteristics that drive how individuals make financial choices. Understanding the degree of an individual's psychological tolerance towards risk can make it easier to gain insight into how they will react if they find themselves in a period of market stress, such as that of the Global Financial Crisis (GFC) of 2007-2008, or that related to the more recent pandemic crisis of 2020 and the current economic crisis of 2022-2023. Well-designed psychometric assessments provide financial advisors with an indexed measure of how well clients can psychologically withstand an economic-financial contingency or a decrease of the value of their investments. Moreover, through well-constructed psychometric tests, it is possible to anticipate clients' reckless choices in severe stress situations and mitigate the damage.

More and more banks and other credit institutions are requesting international technology companies to provide the psychometric assessment tools to get a reliable read on potential customers. Several companies offering such solutions have sprung up, including Innovative Assessments in Israel and RevolutionCredit in the United States (now known as Scorenomics), Singapore-based ConfirmU, and others. In this regard, Seul Fine, Founder and CEO of Tel Aviv-based Innovative Assessments, and a psychologist with two decades of experience in developing psychometric tools, said *"It's an exciting time to be in credit scoring; we are part of the trend for open banking and alternative data sourcing. Psychology offers lenders another way to gauge risky behaviour, particularly for the underbanked."*[37].

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who want to work in all but the company's lowest paying Labor Department to register a minimum score on two separate aptitude tests in addition to having a high school education. Griggs claimed that Duke's policy discriminated against African-American employees in violation of Title VII of the 1964 Civil Rights Act. On appeal from a district court's dismissal of the claim, the Court of Appeals found no discriminatory practices. The Supreme Court granted certiorari. – Source: https://www.oyez.org/cases/1970/124

[37] DigFin Group, (2022), What is psychometrics, and how are banks using it? - https://www.digfingroup.com/what-is-psychometrics/

These companies use variations of personality models to assign different personality traits to the individuals analyzed, with reference to their behaviour and personal characteristics. Most adhere to the Big Five theory of personality factors developed by McCrae and Costa, which is considered to be the one best able to explain more individual variability among subjects. According to this theory, the five macro-categories most commonly used to describe diversity among individuals and characterized by positive and negative poles are: 1) extroversion, characterized by extroversion, positive emotionality and sociability; 2) agreeableness or friendliness, characterized by politeness, altruism and cooperativeness, but in the negative pole by hostility and indifference; 3) openness to experience, characterized by creativity, nonconformity and originality, while in the opposite pole by closure to experience; 4) conscientiousness, referring to conscientiousness, perseverance and reliability; 5) neuroticism, characterized in the positive pole by vulnerability, insecurity and emotional instability, while in the negative pole by emotional stability, dominance and security.

A further application of psychometric assessments is in the context of merger and acquisition (M&A) processes. Merger and acquisition, management buy-outs and venture capital assessments are all strengthened by the process of evaluating a company's executive and key people and by a thorough objective analysis of the strengths and weaknesses and potential of each director and manager, as well as the effectiveness of the team of boards of directors, management teams, and key executives. The results obtained from psychometric tests can provide a range of personal and workforce information about the entities involved, such as qualities including resilience, flexibility, spirit of change, empathy, and many others. This information can enable management to understand the speed and ability of individuals in the environment of interest to adapt to change and to prevent any issues that may arise such as resistance, obstacles, and discontent. Psychometric assessments are only one part of the merger and acquisition process, and must therefore be combined with other assessments; these, however, are able to provide useful information to facilitate the merger and acquisition process especially at the three levels of an organizational structure: at organizational level, and more specifically in terms of integration of cultures; at the team level, in terms of accelerating the effectiveness and performance of new teams; and at the individual level, in terms of managing change in a way that is smooth and enjoyable for the individuals representing the workforce.

Current models of how leadership assessment is conducted in merger and acquisition processes through the use of psychometric testing techniques involve data-driven analysis of leadership characteristics, cultural alignment, future potential, motivation, and mental and cognitive abilities. The most appropriate tools to use involve a strategic assessment and/or structured development interview, career analysis, and manager self-assessment. Psychometric tests, when carefully and effectively developed, are the primary resource used to conduct behavioural assessments and obtain detailed knowledge of each manager's strengths, risks and suitability for key roles. Business skills, decision-making approaches, and mental and cognitive abilities are assessed.

3.4. How to benefit from psychometric testing in private equity operations

In the field of finance and entrepreneurship, psychometric valuation techniques are also valuable allies when applied to private equity, which is a medium- to long-term financial transaction put in place by specialized investors and aimed at injecting venture capital into a target company based on a positive valuation. From the definition that characterizes private equity, it is already possible to see the crucial relevance of evaluations in the industry in exam, whether a company is indeed a target with high potential, both in terms of its economic-financial situation and its internal organization and workforce. Through psychometric testing, a data-driven and objective assessment of the current and future/potential leadership team can be carried out, talent within a portfolio company can be aligned, internal communication within the company can be improved, and the right balance with future management can be found.

Regarding the assessment of a target company's leadership, it is a substantial step both before and along the due diligence process; managing partners of private equity firms interact with and individually examine members of a target company's executive team to understand their characteristics and what drives them. Despite efforts to be impartial, if classical evaluation methods such as one-on-one interviews are used, wide discretion is left to subjectivity, especially as relationships are consolidated; to overcome this problem, and make the process more objective

and analytical, as well as data-driven and outcome-oriented, psychometric evaluation techniques can be used. For example, once the letter of intent has been signed, the first behavioural assessment test could be conveyed to each member of the target company's management team to analyze their individual predisposition to work, communication, and the mental and cognitive skills that guide them in decision-making processes.

After making a major investment through the injection of venture capital in the target company, private equity firms expect a return, that normally might be to generate a multiple on invested capital of 2.0-4.0x with an exit strategy at 3-5 years and an internal rate of return (IRR). The leadership of the portfolio companies is one of the key elements that determines the success or failure of the investment and the achievement of the goals set. In addition to leadership, the organization's internal workforce also plays a crucial role in the path to goal achievement; using psychometric assessment tests, each employee can be evaluated to make sure that his or her behaviours match the underlying investment strategy, and promptly correct any behaviours that deviate from the planned vision and growth path. For example, if the strategy is to expand the production line to increase market share in an 18-month time frame, employees should have characteristics such as innovativeness, risk tolerance, speed of thought, and ability to perform under stress.

Another relevant aspect is internal firm communication, which itself needs to be improved to ensure enhanced performance and efficiency. Regardless of the size of the target firm, communication is important: in a smaller firm with a more limited workforce, time spent in conflict is wasted time; to reduce wasted time, it is essential to profile the personal and behavioural aspect of individual workers, to understand how to handle differences in approach and style and ensure effective interlocking. In a bigger enterprise, on the other hand, there is often more specialization and standardization. Consultants may have professional and specialized skills, for example in tax, process improvement, or business intelligence, while others focus on aspects such as marketing, communication, or sales strategies. Teams are trained to work toward the success of a project or investment, but when relying on subjectivity or traditional methods, often the effectiveness achieved is relative and left to chance, with no real insight into team dynamics. In this case, a psychometric platform can provide objective assessments and information that enable teams to be

formed in a more calibrated and effectiveness-oriented manner to ensure that the team performs better and achieves goals in a timelier manner. The use of psychometric techniques can drastically reduce the time required to create cohesion and harmony in the group and make collaboration more efficient and effective when assembling and reassembling project teams.

Lately, another challenge private equity firms face is that of hiring new staff, which must be in line with the firm's investment strategy. Otherwise, the likelihood of turnover is high and may generate some damage or slowdowns on the path towards the goals. Companies that use psychometric assessment techniques in the talent recruitment process and subsequent talent retention, as seen extensively in Chapter 2 of this paper, have a better chance of finding the perfect candidate and avoiding a costly wrong hire that is not in line with the values and personal and behavioural characteristics sought.

By analysing the many possible applications of psychometric assessment techniques within the growth and business development strategies of international companies of different sizes, this paper aimed to highlight the impact they can have in terms of performance, efficiency and effectiveness, and in the achievement of pre-set goals. It was emphasized how a deeper understanding of the individuals who make up the workforce of one's company can help in the formation of effective and cohesive teams, the optimization of their activities, change management and digital transition processes, as well as in reducing the turnover rate and creating a more comfortable and stimulating corporate welfare for employees, who are the main asset of any company regardless of its size. It focused on the financial sector, mergers & acquisitions, and how psychometric assessments can be a valuable tool to enable private equity firms to make more objective and data-driven assessments of target companies. The in-depth analysis conducted revealed the impact that these cutting-edge assessment tests have not only from the perspective of internal and team and talent management and optimization, but also on growth and business and development strategy. Those, when used by companies providing financial and investment services, can serve to profile customers, their level of risk attitude and resilience, and to predict how they will react in times of market stress of various kinds, dictated by external contingencies or unexpected factors that are difficult to predict.

CHAPTER IV: KUUL.JOBS, the concept of psychometric testing applied to a startup idea

Previous chapters have provided an explanation of psychometric tests, their uses, and their current business applications. In this chapter, the present research proposes a business idea based on personality profile assessments, KUUL.JOBS, which was designed and developed by KUUL.LABS, a strategic consulting company based in Cambridge, that operates on a global scale. The concept behind this idea is to create a groundbreaking innovation in the field of human resources, enabling candidates and businesses to interact and find the best fit for each other.

The business idea involves establishing an employment portal that aims to foster parity in the employer-candidate relationship through the exchange of valid and reliable information based on psychometric test results. The objective is to build a labor market based on objective, valid, and truthful data, fostering trust and transparency from the early stages of the hiring process. Psychometric tests play a crucial role in gathering information about an individual's true personality, talents, and personal characteristics, as discussed in the previous chapters. By leveraging these assessments, candidates can align their career paths with their interests and talents, leading to personal satisfaction and increased job performance. Simultaneously, employees become more driven and motivated by their passion for the job, resulting in improved efficiency.

The business idea aims to create a tool that helps companies expedite the employee selection process by establishing direct communication between the company and the candidate. The intention is to design a matching portal that provides advice and proposes potential matches based on the individual's personal traits and the characteristics of the company and its work environment. This portal serves as a social network for job hunting, allowing individuals to present their authentic selves and enabling companies to showcase their values, corporate culture, and vision. The portal facilitates the posting of spontaneous presentation videos that candidates and companies can display on their profiles, allowing them to present themselves and share their realities.

The motivation behind shortening recruitment times for companies is to make the labor market more efficient, developed, and innovative. Currently, companies often rely on candidates' resumes, listed skills, or brief technical examinations when making hiring decisions, particularly for young professionals. The importance of personal characteristics is often underestimated, with more emphasis placed on past professional experience. This approach creates bias and prevents individuals from changing fields, even if they possess the necessary talent and passion for a different profession.

Another innovative aspect of the portal is its ability to effectively market individuals' characteristics and provide candidates and companies with the necessary tools to showcase themselves in an attractive manner. By emphasizing personalities over resumes, candidates have the freedom to choose their preferred profession. For instance, an individual who decides to switch careers, even without prior experience in the desired field, can still be selected by companies based on their suitability for the position determined by their identified talents. In today's labor market, companies often prioritize candidates with specific professional experience, making it challenging for individuals to transition between different areas of work.

Within this context, the portal, through personality profile assessments, provides a list of suitable job positions that contribute to individual success. Candidates can thoroughly examine the characteristics of these positions and analyze the tasks involved. This is especially valuable during the early stages of one's career, as it allows individuals to select job positions aligned with their interests rather than solely focusing on educational benefits or other external factors. The portal empowers individuals to make informed decisions about their future career paths.

Regarding the role of the portal for companies, it serves as an initial step in the selection process. Companies rely on the KUUL.JOBS portal to identify individuals who are best suited for specific job positions and align with the company's culture. The search is simplified through matches between available candidates and the desired characteristics sought by the company. Based on the assessment results, companies can develop their personnel selection and team formation strategies. Psychometric tests enable the creation of diverse teams that share similar communication styles but possess different skills, interests, and talents. This approach enhances

team efficiency while reducing conflicts and encouraging the sharing of ideas and knowledge among colleagues.

By reorganizing teams and implementing coaching and sharing strategies, employees are incentivized to increase their work pace and improve the working environment. It is crucial for employees to share ideas and information with colleagues to enhance internal company knowledge and provide efficient customer service. Creating a diverse and inclusive working environment is important to reduce discrimination within companies and adapt internal processes to accommodate diversity. In today's society, the acceptance and integration of diversity have become increasingly relevant and sensitive topics within organizations.

4.1 The Human Resources Technology market analysis

KUUL.JOBS is concerned with the automation of the hiring process, where recruiter and recruit have the chance to easily access background information about one another to gain insight about the true behavior and reality of the respective party. To do so, a technology is needed to easily display the information necessary to both employer and candidate to match each other and connect. Based on this concept of how KUUL.JOBS is going to operate; the market of association is going to be the human resources technology market.

The HR Tech market is, by definition, the market in which are included all the software and hardware technologies that are used to automate HR functions, such as talent acquisition, compensation management, performance management, and talent management. HR Tech defines all human resources activities that involves the use of a software, online system, or social media to employ new talents. The aim of HR Tech is to increase the efficiency and effectiveness of the HR functions[38]. There are several technologies that can be used to implement the HR activities of an organization, which chooses the most appropriate technological solution based on its needs and goals. Some of the most used solutions are performance management systems, employee

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[38] HR Tech: definition, synonyms and explanation. (n.d.)
https://www.herohunt.ai/recruiting-glossary/hr-tech

engagement platforms, learning management systems, and applicant tracking systems (ATS). Applicant Tracking Systems are technological applications that organizations use to customize and organize their hiring process, while implementing it into a more efficient and scalable process[39]. This solution allows companies to collect applications, filter them based on the features of the job position and monitor the progress of the application process. Technological solutions like ATS, offer a time- and cost-effective application to manage human resources, and therefore the demand for these solutions is increasingly boosting.

The Human Resources Technology global market size in 2022 was valued at USD 31.50[40] billion and is expected to reach USD 39.90 billion by 2029, with a Compound Annual Growth Rate (CAGR) of 7.5% during the forecasted period[41]. Based on the Fortune Business Insight analysis of the HR Tech global market, in 2020 it has showed an average growth of 3.4% with respect to the previous year. The market's rapid growth was induced by several factors, such the growth in employment opportunities, caused by the fast adoption of technological solutions among companies. Another highlighting factor is the increasing demand for automated processes in the field of human resources management functions, which enlarged the space for market growth opportunities.

In 2020, with the impact of the COVID-19 pandemic emergency, the market growth was boosted by those market players that were able to seize opportunity to enter the market with a long-term perspective. With the shift to remote work and the implementation of a virtual work mode, human resources departments embraced the use of technology to make their processes more agile, and to mitigate the complexities derived from the economic crisis, such as the communication between employees and management, or payroll operations. In this context of pandemic crisis, the most foresighted market players focused their activities on creating new partnerships,

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[39] A recruiter's guide to Applicant Tracking Systems. (n.d.).
https://recruitee.com/applicant-tracking-system-guide

[40] Ltd, R. a. M. (n.d.). *Human Resource Technology Market: Global Industry Trends, Share, Size, Growth, Opportunity and Forecast 2023-2028.*
https://www.researchandmarkets.com/reports/5732921/human-resource-technology-market-global
[41] Human Resource [HR] Technology Market Size | Growth, 2029. (n.d.)
https://www.fortunebusinessinsights.com/human-resource-hr-technology-market-105437

collaborations, investing in research and development to implement workforce management within businesses. For instance, in August 2020, SAP SE collaborated with Bechtle AG[42] to enforce the implementation of SAP SuccessFactors solutions in organizations. Thanks to this partnership, SAP improved its HR solutions in order to provide a unified and consolidated human resources process to Bechtle, which was aiming at delivering to its employees a digital experience combined to a human resources model derived from data.

Moreover, post pandemic organizations expect to enhance investments in technological solutions, such as cloud, artificial intelligence, and machine learning, which improve their streamlined business processes, while reducing costs. As a consequence, the increasing demand for HR tech applications boosted growth opportunities for the market's suppliers, which were pushed to deploy new products or new features for the existing products to compensate the rising demand. In April 2022, Oracle Corporation released Oracle ME, which is a platform for employee experience. It gives enterprises the opportunity to improve workforce engagement. The complement product newly launched was integrated to Oracle Fusion Cloud Human Capital Management, which recruiters utilized for information uniformity and communication update across businesses. This new function developed by Oracle, enhanced the companies' productivity by boosting employee management and talent retention.

One of the latest trends in the market concerned, is the integration of Robot Process Automation (RPA). This technology is relevant for the purposes of efficiency and innovation delivering across human resources management solutions and improving talent strategies. Because companies are searching for new methods to apply to hiring processes by delivering new services at a low cost, RPA is a major solution to which organizations address themselves. In fact, RPA combines AI and machine learning to deliver a service that will implement operations standardization by cutting additional costs for IT purposes. Therefore, market players are focused on delivering a product featuring with advanced tools to integrate to RPA, to satisfy the final users needs. Given the increasingly positive results of the integration of RPA and HR tools, market

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[42] Bechtle AG is Germany's largest IT company, which business model is a combination of information technology services (by directly providing hardware and software IT products), with the maintenance and operation of IT infrastructure for industrial clients and customers from the public sector. https://www.bechtle.com

players always more often integrate also across human resources departments these tools, especially in recruitment software and ATS[43].

The boost in the use of Artificial Intelligence (AI) and Machine Learning algorithms, facilitated the optimization of recruitment processes, such as interview scheduling, and interview performance analysis. Throughout this integration, bots are used, which are algorithms that executes repetitive tasks in an automated way. They recognize the request of the user and communicate to the business systems the desired outcome. Similarly, recruiters adopt AI technologies to execute recruitment activities to make new market opportunities emerge. According to the Recruiter Nation Report of 2021, in the current year, AI was used by 39% of the recruiters for job recommendations on career websites, and 34% for job descriptions.

As regards the limits and downsides included in the concerned market, there are matters regarding data integration and threats to data privacy, which obstacle the market growth. As human resources departments, HR teams deal with individuals and their personal data in several fields, such as when dealing with payrolls, monitoring leaves, or employee performance. During the COVID-19 crisis, there have been distressed regarding social distancing and the role it played in the way of collaborating and communicating through digitalized solutions. It has been proven that applying a digital solution tends to make individuals feel isolated from the society as a whole. Moreover, there have been highlighted hurdles in companies' challenge to adapt workplace infrastructures to individual's homes. In addition, as remote work rises in popularity, data security is put increasingly at risk, thus it is of utmost importance that software tools used in human resources departments are constantly insured to a security suitability to the needs of human resources management.

4.1.1 Market segmentation

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[43] Applicant Tracking Systems

As regards how the market is segmented, the paper analyzes it from several different point of views: by type, by development, by enterprise size, and by industry. Moreover, an analysis based on geographical segmentation of the global market is going to be carried out.

The by type analysis, regards the fields in which operations work through, and these are: talent management, workforce management, recruitment, payroll management, performance management. The segment that is expected to hold the highest market share is the talent management, which is forecasted to grow with the highest value in CAGR between 2023 and 2029[44]. The segment under consideration covers the most relevant activities as regards the organization's workforce, such as managing employee's development, and rewards, and, moreover, through the implementation of technological solutions, it monitors the recruit's onboarding, recruitment, and retention processes. In addition, the second most growing segment that is expected to increase its market share is payroll management, which will be depending on the percentage of adoption of the core HR solutions aimed at engaging employees through employee experience and increased interaction.
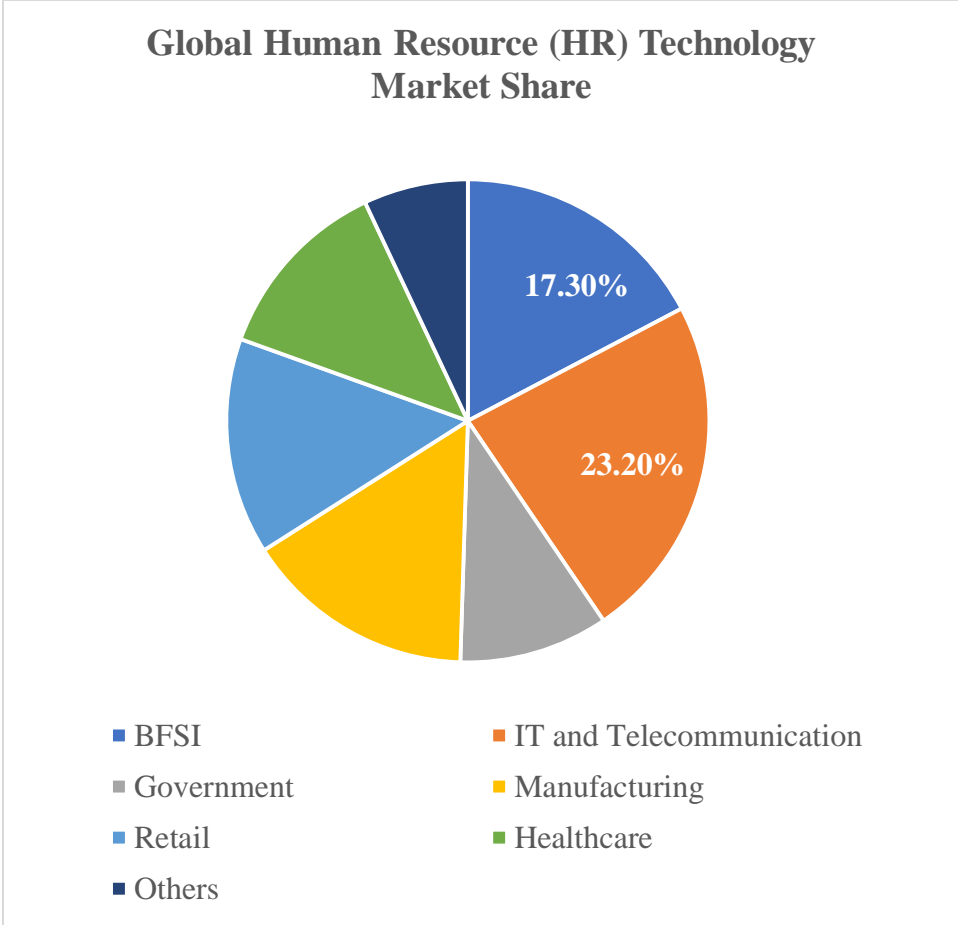
The by development analysis, regards the market classification into cloud and on-premises of its solutions. Due to the adoption of cloud technological solutions among small and medium enterprises (SMEs), cloud-based deployments are forecasted to grow faster. In fact, the foresighted market players are choosing always more cloud developments over on-premises software, because of the increased demand in cost-effective cloud-based applications among industries. According to the SAP North America Senior Vice President and Managing Director of East Region, Lloyd Adams, the cloud market is foreseen to expand by two times its actual size between 2023 and 2025.

The by enterprise size analysis, focuses on the classification between SMEs and large enterprises, where the formers are forecasted to expand with the highest CAGR, because of the rising investments and funding carried out by leading enterprises. As the demand for cloud solutions rises, the investment among SMEs boosts. On the other hand, large companies' segment is expected to hold the major market share, as human resource technological tools increase their

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[44] Human Resource [HR] Technology Market Size | Growth, 2029. (n.d.)
https://www.fortunebusinessinsights.com/human-resource-hr-technology-market-105437

demand and value to satisfy the requirements of organizations to optimize their workforce's payroll, recruitment, and performance processes to be able to manage efficiently it increased number of employees.
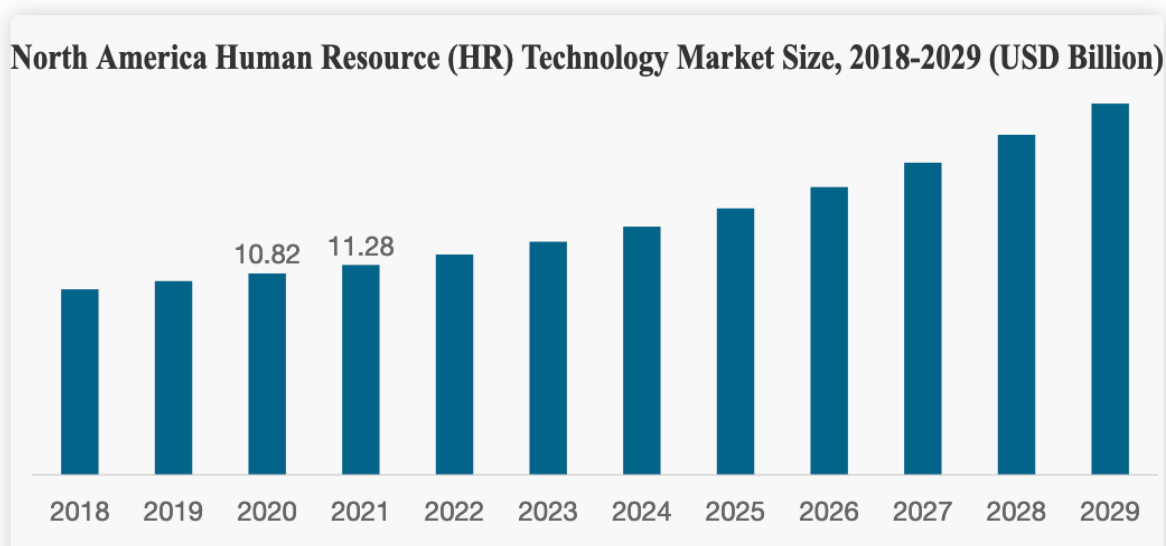
The by industry analysis, concerns the sectors in which the global market is divided, such as IT & telecommunication, manufacturing, retail, government, banking financial services and insurance (BFSI), and healthcare. Due to the pandemic crisis, the healthcare sector increased the demand for more specialized and skilled professional figures across all its departments, human resource and administration, software, hardware, telecommunications, finance, etc. Thus, healthcare suppliers are more prone to acquire human resource management software solutions to select and manage its personnel. Moreover, the manufacturing sector increased in the use of digital solutions thanks to the advent of technology and the development of Industry 4.0, and this is expected to make the market grow.

Global Human Resource (HR) Technology Market Share

BFSI 17.30%
IT and Telecommunication 23.20%
Government
Manufacturing
Retail
Healthcare
Others

Source: Human Resource [HR] Technology Market Size | Growth, 2029. (n.d.) https://www.fortunebusinessinsights.com/human-resource-hr-technology-market-105437

Graph 4: Global HR Tech market share, by industry

As regards the geographical segmentation, the global market of HR Tech is divided in five most relevant regions: North America, South America, Europe, the Middle East & Africa, and Asia Pacific. In 2021, the highest market share was held by the North American region, which was reported to present the highest density of human resources technology solution suppliers' headquarters, among which Oracle Corporation, Automatic Data Processing Inc. (ADP), Ceridian HCM Holding Inc. The concentration of major players headquarters has increased the demand for talent management, recruitment, and performance management HR solutions. In fact, in September 2021, the U.S. Bureau of Labor Statistics, have foreseen employment opportunities to increase from 153.5 million to 165.4 million between 2020 and 2030.

North America Human Resource (HR) Technology Market Size, 2018-2029 (USD Billion)

10.82   11.28

2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029

Source: Source: Human Resource [HR] Technology Market Size | Growth, 2029. (n.d.) https://www.fortunebusinessinsights.com/human-resource-hr-technology-market-105437

Graph 5: HR Tech market size growth forecast

For the European segment, it has been foreseen a relevant expansion for the same period. It is expected an increased demand for workforce automated solutions to digitalize and optimize employee management. According to Eurostat in 2022[45], the employment rate overall in the European Union peaked at 75%, for the year 2021 was of 73.1%, and in 2020 of 71.7%, with a growth rate of 1.4%. Such growth rate demonstrates the region's ability to attract employment opportunities and to sustain the rising demand for HR Tech solutions. In Europe, the major industry segments that is expected to be potential customers are the healthcare and manufacturing industries. As concerns Asia Pacific, it is forecasted the highest growth for the forecast period. Since this region has increasingly developed partnerships, funding, and investments, the chances that the market will largely expand are high, and it is expected to witness the settlement of SMEs. For instance, Salesforce Inc., in January 2021, decided to incest USD 15 million in an HR Tech

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[45] Eurostat. (2023, April 27) https://ec.europa.eu/eurostat/web/products-eurostat-news/w/DDN-20230427-2

platform based in India, Darwinbox. The choice was based on the company's aim of expanding its market opportunities in the Southeast Asian market. Moreover, in this region it is expected to witness the adoption of cloud, Artificial intelligence, and Machine Learning technologies, which are going to rise the demand for HR Tech solutions and expand further the market. As concerns the Middle East & Africa region, it is not expected to witness a relevant expansion, however, it is going to be observed a growth in workforce mobility, employment in SMEs, and acquisition of HR Technologies. For instance, according to the Turkish Statistic Institute, in January 2022[46], the employment rate rised of 48.8, in November 2021 was of 46.6% and in October 2021 was of 46.3%. As the South American region is concerned, it is forecasted a steady growth rate due to the lack of professionals with adequate skills for the matter. For instance, in Brazil there is a high density of SMEs, and according to the Organization for Economic Co-operation and Development in 2020 they played a crucial role for economic growth and social inclusion. SMEs reflect the 62% of the total employment of the country and their national value added is of 50%.

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[46] TRADING ECONOMICS. (n.d.). Turkey Employment Rate, April 2023
https://tradingeconomics.com/turkey/employment-rate

Figure 1: HR Technology market size in North America

As regards the main players in the industry, the most important ones are located in the North American region and in the European region. These major players are focusing their operations towards gaining market share by expanding globally. To do so, they are implementing several strategic plans that involve mergers and acquisitions actions of local SMEs to expand their presence in the specific country (Rif. Table 9).

Country	Company
Germany	SAP SE
US	Oracle Corporation
US	Automatic Data Processing (ADP), Inc.
US	Cornerstone OnDemand, Inc.
US	Ceridian HCM Holding Inc.
US	Workday, Inc.
US	Infor, Inc.
France	Cegid Group
UK	Hi bob Inc.
UK	The Access Group

Table 9: Key players in the HR Tech industry

However, the key players mentioned above are not direct competitors of KUUL.JOBS, as their activities differ significantly from what the proposed business idea entails. Nevertheless, when considering job platforms that could be viewed as direct competitors of KUUL.JOBS, LinkedIn and Indeed come to mind.

LinkedIn and Indeed are two leading recruitment platforms with global popularity and widespread usage. While both platforms offer human resource search and placement services, they differ significantly in terms of user traffic and effectiveness in market analysis.

LinkedIn is a professional networking platform that primarily focuses on connecting professionals and providing them with networking and job search opportunities. It is widely utilized by professionals across various industries to create professional profiles, connect with colleagues, and explore job openings. Boasting over 774 million users in more than 200 countries and territories, LinkedIn offers an extensive talent pool for companies in search of highly qualified and skilled candidates. The platform's advanced features include targeted job postings, access to industry groups, and the ability to interact with influencers and industry leaders. These features empower companies to identify and attract the most suitable candidates for their specific job requirements.

In contrast, Indeed is one of the world's largest job search platforms. Functioning as a search engine for job postings, it aggregates listings from thousands of websites and enables users to search for positions based on criteria like geographical location and industry sector. With a wide global reach, Indeed garners millions of monthly users who leverage its services to discover job opportunities. Boasting over 250 million unique visitors per month and a database containing more than 150 million resumes, Indeed proves to be an invaluable resource for companies seeking candidates across diverse industries and job roles.

Both platforms offer significant advantages to companies throughout the recruitment process. LinkedIn's strength lies in its emphasis on professional networking and fostering connections among professionals. It enables companies to identify qualified candidates through existing connections and grants access to a diverse pool of specialized talent. In contrast, Indeed excels in aggregating job postings from various sources, providing companies with a vast audience of potential candidates and streamlined access to a broad talent pool.

To facilitate effective market analysis, both platforms provide tools and metrics for companies to assess the efficiency of their recruitment strategies. LinkedIn offers detailed data on

user engagement, profile visits, and interactions, enabling companies to evaluate the efficacy of their job postings and improve candidate targeting. Similarly, Indeed offers comparable metrics, enabling companies to track ad views, clicks, and candidate conversions.

In conclusion, LinkedIn and Indeed are both highly efficient recruitment platforms that offer extensive exposure to job opportunities and access to high-quality talent. LinkedIn's focus on professional networking and connections differentiates it from Indeed, which specializes in aggregating job postings. With their robust data and analysis tools, both platforms empower companies to evaluate the effectiveness of their recruitment strategies and connect with the most suitable candidates for their vacant positions.

However, these two social networks differ significantly from the core concept of the KUUL.JOBS business. LinkedIn primarily focuses on facilitating connections among its users and leveraging their professional networks, whereas Indeed focuses on aggregating a vast number of job listings to present to its users. This fundamental analysis highlights a lack of direct competitors for KUUL.JOBS due to its unique concepts and innovative approaches it aims to implement.

4.2 Business Model Canvas

After conducting a thorough evaluation of the market size, key players, and potential market space for introducing the business, an overarching framework has emerged to guide the development of the business idea. Accordingly, this paper will utilize the Business Model Canvas as a tool to delineate the business's customer segments, customer relations, channels, value proposition, key activities, key resources, key partners, cost structure, and revenue streams.

The analysis of the Business Model Canvas commences with the examination of customer segments. In this case, the enterprise will cater to two distinct segments: the Business-to-Business (B2B) segment and the Business-to-Consumer (B2C) segment. The B2B segment encompasses businesses seeking to innovate their recruitment processes, investing in aligning their company's values, mission, and vision to attract potential employees who resonate with their culture. The B2C

segment targets individuals with a keen interest in personal development, willing to invest in psychometric tests to obtain a comprehensive personality report. The tests will be available for a fee, inclusive of the test's purchase price. Free users will receive a more limited evaluation of psychometric details, while subscribed users will pay the cost of the test, which amounts to $70 for Birkman and $45 for DiSC assessment.

Additionally, the B2C segment, consisting of individuals seeking job positions aligned with their interests, talents, and preferred working environments, also plays a crucial role. The primary objective of the business idea, focusing on these two customer segments, is to attract individuals and legal entities who believe in the innovative nature of the platform. The aim is to create a labor market that is grounded in a deep understanding of both the candidate's personality and the company's culture.

The second aspect to examine is customer relations, encompassing the type of relationship established between the business and its customers, as well as the expectations of the customers in terms of that relationship. For KUUL.JOBS, customer relationships will be fostered through initial training and after-sales support. Upon joining the platform, customers will undergo introductory training to familiarize themselves with its functionalities and processes. Initially, a generic training session will be available to all users, regardless of their subscription status. This will enable users to navigate the platform easily, explore registered companies, open job positions, and relevant features. Users will have the ability to visit other users' profiles (both individuals and companies) and initiate contact. Customers requiring more in-depth training can access further sessions to unlock additional platform features and optimize their utilization. In terms of support and maintenance, customers can directly contact the platform's technical support team to report and resolve any encountered issues.

Moving on to channels, the platform will be accessible as a downloadable app for both computers and mobile devices. This ensures that customers can easily connect with their network at any time and stay updated on the progress of their hiring processes. Given society's accustomed ease of information access and quick reachability in today's globalized world, KUUL.JOBS aims to maintain this convenience and expand its accessibility timeframe.

Key partners for the business include suppliers and collaborative alliances. Suppliers consist of psychometric test providers such as Birkman and DiSC, who will furnish the company with the required number of tests to cater to all users seeking a comprehensive personality profile assessment. The supply of questionnaires will be governed by a legal contract that stipulates the terms of the collaboration. The platform will provide customers with a link to the provider's platform, where they can complete the test. Upon test completion, the provider will publish the results report directly on the individual's KUUL.JOBS profile, validating and enhancing its value. The profile will feature a quantified value in the form of a graphic representation (using a scale of 1 to 5 stars). This rating scale will classify individuals based on their talents, interests, and compatibility with registered companies on the platform. When businesses search for candidates during the initial stages of their recruitment process, they will be presented with a list of potential candidates who match the job position and the cultural fit of the company. Similarly, individuals seeking job positions will be provided with a list of relevant opportunities and companies where they can apply. Additionally, the business will collaborate with software technology providers who will offer the necessary technological services to sustain the platform's maintenance. While an in-house IT department will be present, the platform requires external software technologies to handle software engineering aspects.

Furthermore, the business will engage in collaborations with other organizations, associations, and universities to offer additional services. HR Tech providers will enable KUUL.JOBS to offer diverse products aimed at optimizing companies' recruitment processes. For instance, Lattice, a company specializing in performance management, human resources engagement, and payroll management, could be one such provider. Lastly, partnerships with competency centers at universities could provide laboratories for individuals and companies, facilitating their personal development through targeted activities that enhance soft skills. These activities aim to foster personal growth in both professional and personal spheres. These partnerships not only provide certifications for KUUL.JOBS' provision of reliable information and recognition but also enhance marketing efforts, enabling easier market entry and increased visibility. Consequently, the business can mitigate the challenge of gaining market traction (see Table 14 for details).

Key activities for KUUL.JOBS include psychometric testing, the creation of recruiter-recruit matches, and support for personal development activities. These two primary activities are interconnected, as the former generates the latter. As discussed in Chapter 4, the match between the individual and the business is created by aligning the individual's talents and interests with the company's culture and available job positions. In terms of supporting personal development initiatives, the platform acts as an intermediary, suggesting potential initiatives to businesses and users for workforce improvement and publicizing those initiatives.

The business's key resources encompass psychometric tests, HR technologies, and IT technologies, which are essential for carrying out its activities and operations. Ensuring the constant availability of tests is paramount, necessitating clear agreements with suppliers. HR technologies are crucial for leveraging partnerships, facilitating collaborative marketing activities and promoting the product in the market. It is of utmost importance that the product finds its target market segment, particularly considering the potential challenges associated with market traction. Lastly, IT resources are indispensable for the platform's functionality, mitigating obstacles, and promptly resolving any technical issues reported by customers. To efficiently serve its users, the platform must promptly address and resolve their concerns.

Turning to the cost structure, the business needs to cover expenses related to suppliers, partnerships, marketing and advertising activities, IT development and deployment during the platform's initial stages, as well as ongoing maintenance and user support.

Finally, revenue streams must be analyzed, as they represent the source of the business's profit. In this case, the platform operates on a freemium model, necessitating an examination of the reasons why customers choose to subscribe to the platform instead of utilizing it as a free product. Enhanced functionality is a compelling reason for customers to subscribe, offering access to more detailed personality profile reports, engagement in platform initiatives (such as competency development programs), and the ability to freely contact and be contacted by other users without platform permission. Additionally, customers are attracted to the platform's real-time market information, providing timely updates on news, job positions, and new entrants to the

platform. The platform allows users to increase their visibility, making it easier to connect with other profiles.

The innovation behind this business model lies in its value proposition, which enhances accessibility for individuals and companies. Individuals gain easier access to available job positions and can invest in their personal development while effortlessly finding job positions that align with their interests and talents. This makes the recruitment process more efficient and optimized, enabling recruiters to reach potential candidates more effectively and enabling candidates to connect directly with potential employers. Through this process, the platform users can be matched, highlighting their potential in a cost-effective and time-efficient manner. This feature reduces recruitment costs and the time candidates spend searching for the right job that aligns with their talents and desired company culture. By introducing this concept, the platform innovates the hiring processes of businesses and shapes a new labor market that emphasizes the candidates' ability to select suitable job opportunities.

Key Partners	Key Activities	Value Proposition	Customer Relations	Costumer Segments
Suppliers Psychometric tests suppliers Software technologies **Partnerships** HR Tech providers for collaborations Partnerships with universities to promote webinars aimed at boosting personal development and enhance soft skills	Psychometric testing Recruiter-recruit match creation Support in personal development initiatives **Key Resource** Psychometric tests HR technologies IT technologies	Individual's investment on personal development Innovation in recruitment processes Time-cost effectiveness Customized matches	Training for utilization Support and maintenance **Channels** Downloadable app on computer and mobile devices	**B2B** Businesses aiming at innovating their hiring processes **B2C** Individuals that are interested in investing on themselves and on their personal development Individuals that are determined to find a job position that matches their interests and their talents

Cost Structure	Revenue Streams
Suppliers and partnerships Advertisement and marketing activities Initial IT development	Subscription fee → Freemium platform Real-time market Advertising fee

Table 10: Business Model Canvas

4.3 SWOT analysis

Once analyzed the market, its trends, segments and size, and defined the business model of KUUL.JOBS, the present paper is going to conduct a SWOT analysis of the business idea that is currently proposing. SWOT analysis is a strategic tool used to understand the business' internal strengths and weaknesses and the external factors to which the business is subject to, for instance the industry's opportunities and threats. This tool is used to analyze a specific context or sector in order to support a strategic action that the company wants to undertake. In this specific case, the paper is considering a business idea, not a consolidated organization, therefore the factors that are going to be considered are devoid of direct market implication.

KUUL.JOBS is a business idea, which ultimate goal is to increase employment opportunities through the establishment of a new innovative conception of hiring process. What the idea is going to develop is a consistent use of psychometric test results which are going to inform the employer-candidate relationships; by making these results fully available, the business concept gains a strength factor. The use of these type of results is a relevant element when it comes to addressing the reliability thereof, which is evidenced by an appropriate certification given by the supplier of the psychometric test. In fact, during the initial stage of the business' life cycle, the tests used are going to be those already on the market in order to firstly test the validity of the business idea and its operation on the market. The assessment methods that were decided to introduce are The Birkman Personality Test® and the DiSC assessment test, and the individual is going to decide which one to use based on its preferences and whether it prefers to receive a more detailed report or less detailed. Additionally, the website displays of an additional strength which is the use and provision of a more reliable source of information with respect to traditional methods.

As regards the business idea's weaknesses, there could arise potential difficulties in gaining market traction due to the high level of difference with respect to traditional methods of recruitment and the ambitious concept of innovating the recruiter's opinion by shaping its path of action. In fact, as the analysis carried out throughout the paper highlighted, the use of psychometric

testing has great scope for growth in organizations worldwide. Another weak factor that could affect the business is the possibility of encountering legal challenges concerning the use of psychometric data. As explained in Chapter 1 and deepened in Chapter 2, the use of psychometric testing can be subject to discrimination biases challenges because of the lack of precision in the development of the assessment technique. In this regard, another weakness arises which is the lack of introduction of psychometric test developed by the business itself, in order not to rely on other suppliers, such as Birkman and DiSC, to decrease these supply costs.

When considering the external environment, a major factor to take into account is opportunity. In this context, KUUL.JOBS offers the market the potential to reduce cost and time associated to the recruitment processes, since it provides assessments of individual's personalities, which display of all personal strengths, weaknesses, potential value, interests, and fit. Moreover, the platform is going to provide a list of potential matches to companies based on the individual's personal interests and talents, and the searching requests of the business itself that has drawn up during the subscription phase. Another potential opportunity is the possibility to collaborate with other players in the recruitment sector. For instance, HR technologies' providers could exploit the platform to find potential customers and increase their visibility on the market. Nonetheless, the platform, from this collaboration, could gain further knowledge about HR technologies and taking a cue from its partners, it may be able to improve its own product with the implementation of new technological developments. Ultimately, the utilization of technology may also be used to improve accuracy and reliability of results, therefore, the business could cooperate with others HR technologies suppliers to improve its technology.

Another factor to take into consideration when analyzing the external environment is threat. In fact, the business idea could be impacted by the operated of already established recruitment websites, such as LinkedIn or Indeed, which already have gained market share and valuable loyal customers. In addition, the use of technological solutions may be misused or even abused, and this may result to be a threat because, due to the lack of knowledge in how to operate and use the technology itself, both the job providers and recruits may misinterpret results and disclose biased opinions of the product. Another threat to the business idea is the risk of privacy concerns if the reliability of psychometric data is questioned. In fact, as explained in the paragraph of the present

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chapter regarding the analysis of the HR Tech market, one of the major issues arose with the pandemic crisis is the securitization of private personal data.

When considering a SWOT analysis, it is important to understand which weaknesses can be transformed in strengths or can be rebalanced, and which potential threats can be mitigated. In this case, among the internal weaknesses, legal challenges concerning the use of psychometric data can be avoided with the implementation of several regulations on the results and use of the test techniques, combined with the acquisition of a reliable assessment method that is certified from this point of view. KUUL.JOBS, by relying on reliable assessments such as The Birkman Method® and the DiSC assessment, mitigates the risks of generating unreliable results, over which a potential lawsuit may be charged.

On the other hand, several threats can be rebalanced by opportunities that the business could exploit. In this case, KUUL.JOBS could implement collaborations with other market's players in order to foster company's growth and therefore mitigate the difficulty in entering the market due to the already established competitors. In addition, through collaborations with HR technologies providers, the business is able to improve its technological skills and knowledge, and therefore boost its internal capabilities in the processing of the technological activities. The employees of the business will be more skilled in the understanding of how the platform is function, becoming more efficient in the technical support activities and growing their productivity. Additionally, by proposing a different point of view on recruitment processes, the business is able to gain its own loyal customers and show an innovative approach to the selection process. Customers will be more attracted by the innovation behind the concept of the business, thank to which individuals will be inspired in investing on themselves by improving their understanding of their personalities, develop on a personal level, but, at the same time, on a professional one. Moreover, the reduction in time and costs of carrying out the hiring process, could be a motivating factor to which the customers may be attracted. Through the ability of introducing a faster way of selecting the potential candidates, organizations will make their hiring processes more efficient and effective, but at the same time, they will reduce the additional costs of traditional hiring methods.

	Positive factors	Negative factors

Internal factors	Strengths
	   - Psychometric test results to inform employer-candidate relationships.
	   - More reliable source of information.
		Weaknesses
		   - Potential difficulty in gaining market traction.
		   - Legal challenges concerning the use of psychometric data.
		   - Difficulty in the development of a specific psychometric test.

External factors	Opportunities
	   - Reducing the cost and time associated with recruitment processes.
	   - Collaborations.
	   - Use of technology to improve accuracy and reliability of results.
		Threats
		   - Competition from already established recruitment websites.
		   - Potential for the technology to be misused or abused.
		   - The risk of privacy concerns if the reliability of psychometric data is questioned.

Table 11: SWOT analysis

4.4 Competitive advantage

The primary goal of business strategies is to recognize a company's capacity to continuously enhance value creation. To do so, the firm heavily relies on the attractiveness of the industry and its own positioning, which is only successful when its competitive advantage endures over time and is properly sustained. A competitive advantage is established when resources, capabilities, and business activities are difficult for competitors to reproduce. This is based on two fundamental theories: the resource-based business theory[47], which emphasizes the company's resources and capabilities, and the activity-based business theory[48], which considers the business activity. In this section, the paper is going to consider these two theories, applied to the business idea which is being analyzed throughout the chapter.

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[47] Barney, 1991
[48] Porter, 1996

Since the business case that the paper is studying is start up idea, the resource-based business theory cannot be evaluated through a VRIO analysis, and neither could the activity-based theory. In fact, the VRIO analysis evaluates the extent to which a business strength is valuable, rare, imitable and whether the company is organized effectively to sustain and implement the strength as a competitive advantage. Therefore, since the subject of the evaluation is a startup idea, there is no knowledge sufficient to carry out this specific analysis, especially when it comes to understanding the extent to which the company is organized effectively. In light of this realization, the paper is going to analyze whether the strengths identified in the SWOT analysis can be suitable to be proposed as a competitive advantage. The parameters that are going to be used in the evaluation are the value, rarity, and inimitability of the strength.

The first strength that is considering is the ability to inform and match employer-candidate relationships through psychometric test results. This strength is extremely rare to find in the traditional labor market, because the match that the business is providing is based on concrete and objective information provided by the personality profile assessments results. In fact, these personality profile assessments tools are not commonly used in the recruitment processes, and, as it has been identified and explained in the third chapter of this paper is that the majority of personality profile assessments are used in larger companies, i.e. Deloitte, EY. Since the business idea is addressing to every type of organization, independently on their size, it is important to consider also the segment of SMEs. These types of businesses are not very much prone to introduce psychometric testing in their hiring processes, especially because of the challenges that they entail. In fact, as explained in Chapter 1, the use of psychometric tests includes legal challenges that regard discrimination issues, cost challenges because of the increased cost of the psychometric tests and several others previously described. By using KUUL.JOBS' platform, these businesses could bear the risk displayed by these challenges thanks to the lower cost of the platform, which also provides a free use, and the optimization of their processes in a time-cost effective way. As regards the value of this strength, it proposes an innovative solution to the HR Technologies market, and especially in the websites for employment segment, that is able to shape the labor market itself, and improve the communication between candidates and businesses. In addition, the inimitability of the strength is a valuable characteristic because the match based on psychometric test results

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and the businesses' features are based on specific algorithms developed for the platform, which are not disclosed and therefore are not easy to replicate and imitate from competitors.

The second strength that is going to be analyzed is the support that the platform gives businesses in the development and implementation of partnerships to improve workplace diversity initiatives. The value of this strength is very high for all companies that are willing to invest in inclusion and diversity; in fact, thanks to the partnerships acquired from the platform, organizations reduce their time and costs intended for the search, organization and promotion of the initiative, and at the same time they raise awareness inside their companies in order to improve inclusion and diversity within its departments. The strength is extremely valuable also to the B2C segment, because individuals have the opportunity to participate and get involved in the initiative and the related discussions that are going to be carried out both in the initiative's conference and on the platform itself that it is going to be a table for open discussions. However, this strength does not match the criteria for rarity and inimitability. In fact, these types of initiatives are not considered a rare and inimitable strength, because every player in the market could arrange partnerships to collaborate to improve matters such as inclusion and diversity in companies. Nonetheless, KUUL.JOBS, as a promoter of innovation and communication, it is going to establish a certification system thanks to which companies and individuals can gain value by participating and engaging in these kinds of initiatives. Thanks to this system, greater value is going to be added to the matches creation, and together with the platform users is going to be established a sort of platform rating for them to be disclosed with a list of the most attracting companies or individuals to be sorted to recruitment.

As regards the last strength, it is considering the high reliability on the sources of information. This specific strength is increasingly valuable to the platform users and to boost the validity of the platform as an information provider platform, and thereby cannot be neither replaced nor imitate. In fact, the algorithms on which the platform is developed are strictly and solely disclosed to internal workforce, and protected by a non-disclosure agreement, in order not to be easily replicated. As concerns the sources of information, they are based on the test results which are going to be disclosed through a report on the platform's personal profile of the individual. By posting only the report, replicability is protected, and rarity is established. In such way, the

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platform is going to gain higher value also thanks to the increased protection and securitization of its algorithms.

Overall, it is possible to state that two out of three of the strengths mentioned can be used as a competitive advantage. However, there is not enough evidence to understand the organization's ability to be efficiently organized to be able to sustain its competitive advantage and for this reason, it is necessary that before implementing it, the company should make sure to have built an organized and efficient structure. Moreover, the two strengths considered to a competitive advantage need to be evaluated and certified once the business idea is implemented.

Strengths	Value	Rarity	Inimitability	Competitive
Psychometric test results to inform employer-candidate relationships.	Yes	Yes	Yes	Competitive advantage
Support of workplace diversity initiatives.	Yes	No	No	Competitive parity
More reliable source of information.	Yes	Yes	Yes	Competitive advantage

Table 12: Analysis of strengths for competitive advantage

CONCLUSION

In conclusion, psychometric tests are valuable and effective tools that can greatly contribute to both personal development and talent acquisition processes. While considering their implementation, it is crucial to address potential drawbacks, especially in terms of the company's readiness for innovation. However, the focus should be on the broader perspective of cultural innovation within organizations.

One significant benefit of utilizing psychometric tests is the reduction of turnover. These tests ensure a high level of alignment between personal characteristics and working conditions, leading to increased satisfaction and fulfillment among employees. Effective communication plays a pivotal role in promoting positive workplace interactions. Personal development enables individuals to understand their own characteristics and leverage them as assets, thereby fostering positive communication and appreciation for uniqueness and differences. Improved communication efficiency between managers and subordinates, based on employees' communication styles and learning methods, also has a positive impact. Additionally, these tests, such as the Quiggle Assessment mentioned in the second chapter, can motivate employees to aspire to higher rankings and empower leaders to mentor and develop ambitious individuals into influential leaders.

Considering that people are a company's most valuable asset, ensuring their alignment within teams, based on psychometric tests, and providing opportunities for growth and thriving are paramount. The Quiggle Assessment, as discussed in the second chapter, assists leaders in developing a strategic thinking approach, thus enhancing cooperation and productivity.

This paper aimed to illustrate the impact of psychometric assessment methods on performance, efficiency, effectiveness, and the achievement of predetermined targets. Through an analysis of various applications across growth and business development strategies of international companies, it became evident that a profound understanding of the workforce can facilitate the formation of successful and cohesive groups. Such understanding optimizes exercises, alters management and advancement processes, reduces turnover rates, and creates a more comfortable

and stimulating corporate welfare for employees, regardless of the company's size. Furthermore, the paper explored the significance of psychometric appraisals in mergers and acquisitions, empowering private equity firms to conduct objective and data-driven evaluations of target companies. The in-depth examination conducted uncovered the impact of these cutting-edge evaluation tests. When utilized by financial institutions or companies, these tests can provide valuable insights into clients' profiles, risk aversion levels, and anticipated responses to market pressures, enabling more informed decision-making.

To validate the effectiveness of personality profile assessments as innovative tools, the business case of KUUL.JOBS was presented. This platform offers an innovative value proposition that enables individuals and companies to access relevant employment opportunities while investing in personal development and attracting jobs aligned with their interests and talents. This approach enhances the efficiency and effectiveness of the recruitment process, allowing recruitment agents to connect directly with potential candidates and enabling users of the platform to be efficiently matched with suitable employers. Consequently, the platform reduces the costs and time associated with staff recruitment and hiring, aligning talents and company values and culture. This concept revolutionizes business hiring practices by empowering employees to choose their own positions rather than relying solely on companies' decisions.

Furthermore, this innovative approach to recruitment can build a loyal customer base by proposing alternative views on selection processes and showcasing the benefits of investing time and effort in self-understanding and professional skill development. It also motivates potential customers to avail themselves of reduced timeframes and costs associated with completing the recruitment process. Organizations can significantly enhance the efficiency and effectiveness of their recruitment processes by quickly identifying suitable candidates while reducing costs associated with conventional hiring methods.

In conclusion, psychometric tests offer significant advantages in personal development and talent acquisition. By addressing potential drawbacks and focusing on cultural innovation, organizations can improve employee satisfaction, communication, and alignment within teams. The use of these tests can lead to reduced turnover, increased productivity, and strategic thinking.

Additionally, psychometric assessments provide valuable insights for mergers and acquisitions and enable financial institutions to better understand clients' profiles and behaviors. The case study of KUUL.JOBS demonstrates the effectiveness of personality profile assessments as an innovative tool for efficient and effective recruitment, benefiting both individuals and companies. By embracing these advancements, organizations can enhance their recruitment processes, reduce costs, and attract and retain top talent.

REFERENCES

"Twenty-five companies that use psychometric testing for hiring", *Mettl*

Available at the following link:

https://resources.mettl.com/wp-content/uploads/2021/08/25-Companies-Psychometric.pdf

"What Is the Value of Psychometric Testing at Executive Job Level?", *Page Executive*. (n.d.).

Page Executive.

Available at the following link:

https://www.pageexecutive.com/advice/region/global/what-value-psychometric-testing-executive-job-level

B. Welker, (2023), "9 Best Personality Tests [Birkman, Truity, and more]", *Advertiser Disclosure*,

January 29, 2023, Testing.org.

Available at the following link:

https://testing.org/best-personality-tests/

Barney J., (1991), Firm resources and sustained competitive advantage, *SAGE Journals*.

Available at the following link:

https://journals.sagepub.com/doi/abs/10.1177/014920639101700108?journalCode=joma

Cedarafrica. (2023). "Use Psychometrics to Grow Your Organizations Change Leaders". *Cedar Africa Group*.

Available at the following link:

https://cedarafricagroup.com/psychometrics-tests-change-leaders/

DeVon, H. A., Block, M. L., Moyle-Wright, P., Ernst, D. M., Hayden, S. J., Lazzara, D. J.,

Savoy, S. M., & Kostas-Polston, E. A. (2007). A Psychometric Toolbox for Testing Validity and

Reliability. *Journal of Nursing Scholarship*, *39*(2), 155–164.

Available at the following link:

https://doi.org/10.1111/j.1547-5069.2007.00161.x

DiBiasio, J. (2021). "What is psychometrics, and how are banks using it?", *Digital Finance*.

Available at the following link:

https://www.digfingroup.com/what-is-psychometrics/

Disadvantages Of Psychometric Tests | Arctic Shores. (n.d.).

Available at the following link:

https://www.arcticshores.com/insights/disadvantages-of-psychometric-tests

Fallaw, S. (2022). "Using Psychometric Tests to Gain Insight Into Client Values". *Nerd's Eye View | Kitces.com*.

Available at the following link:

https://www.kitces.com/blog/psychometric-assessment-risk-tolerance-questionnaires-values-predict-future-behavior-test-design/

HR Profiling Solutions, (2019), "How to measure the validity of a psychometric assessment", 2019 Validation Report, *HR Profiling Solutions*.

Available at the following link:

https://www.hrprofilingsolutions.com.au/blogs/aus-blog/measure-validity-psychometric-assessment/

Human Resource [HR] Technology Market Size | Growth, 2029. (n.d.)

Available at the following link:

https://www.fortunebusinessinsights.com/human-resource-hr-technology-market-105437

Joshuacogar. (2021, November 19). *Deloitte Online Assessment | Management Consulted*. Management Consulted.

Available at the following link:

https://managementconsulted.com/deloitte-online-assessment/

Mathew, D. (2022). "The Importance of Psychometric Tests in Organizational Strategy". *Discover Assessments*.

Available at the following link:

https://discoverassessments.com/the-importance-of-psychometric-tests-in-organizational-strategy/

Mellett, E. (2023, March 22). *Personality Tests - Interviews: Full Guide | PRT*. Free Practice Tests, Questions and Answers.

Available at the following link:

https://practicereasoningtests.com/ultimateinterview-candidates-guide-employers-personality-tests/

Muralidharan, N. (2021, July 28). *The Importance of Psychometric Tests in Organizational Strategy*. Mettl.

Available at the following link:

https://blog.mettl.com/uses-and-importance-of-psychometric-tests/

Narendra. (2021, September 27). *Telkom*. Clients.

Available at the following link:

https://mettl.com/clients/telkom/

P.C. Kyllonen, H. Kell, (2018), "Ability Test Measure Personality, Personality Tests Measure Ability: Disentangling Construct and Method in Evaluating the Relationship between Personality and Ability", *Journal of Intelligence*, MDPI, pages 2-3, 7-9.

Available at the following link:

https://www.semanticscholar.org/paper/Ability-Tests-Measure-Personality%2C-Personality-and-Kyllonen-Kell/f5fc4cba97824560bbc61f56bbabac91da95aafc

Partners, R. (2021). Recruitment Using Psychometric Testing. *The Safety, Wellbeing & Rehab Experts*.

Available at the following link:

https://www.rrp.com.au/blog-recruitment-using-psychometric-testing/

Personality Assessments | Industry Validated Pre-Employment Personality Tests. (n.d.).
mettl.com.
Available at the following link:
https://mettl.com/personality-assessment-tests/

Psychometric tests in job interviews: what to expect. (2023). *Gradireland.*
Available at the following link:
https://gradireland.com/careers-advice/interviews-and-assessment-centres/psychometric-tests-job-interviews-what-expect

Quiggle, D. (n.d.). "Using Personality Assessment for Employee Retention and Other Winning Strategies".
Available at the following link:
https://www.linkedin.com/pulse/using-personality-assessment-employee-retention-other-dan-quiggle/

Risk Profiling - FinaMetrica: Home of Risk Tolerance Testing. (n.d.).
Available at the following link:
https://riskprofiling.com/How-it-Works

Roberts, B.W., & Wood, D., (2006), "Personality Development in the Context of the Neo-Socioanalytic Model of Personality", in D.k. Mroczek & T.D. Little (Eds.), *Handbook of personality development* (pp. 11-39), Lawrence Erlbaum Associates Publishers.
Available at the following link:
https://psycnet.apa.org/record/2006-07023-002

Saha, B. (2020, August 16). *The Significance of Psychometric Tests in the Recruitment Process for an Organization to Induce its Effectivity*.
Available at the following link:

https://journal.ijresm.com/index.php/ijresm/article/view/175

Saia, M. (2021). 4 ways private equity firms can benefit from psychometrics. *The Predictive Index*.

Available at the following link:

https://www.predictiveindex.com/blog/private-equity-firms-can-benefit-from-psychometrics/

Sarason, I. G. (1999, July 26). *Personality assessment | Definition, Types, Importance, Uses, & Facts*. Encyclopedia Britannica.

Available at the following link:

https://www.britannica.com/science/personality-assessment

Scepura, R. C. (2020). "The Challenges with Pre-Employment Testing and Potential Hiring Bias", *Nurse Leader*, *18*(2), 151–156.

Available at the following link:

https://doi.org/10.1016/j.mnl.2019.11.014

Sheehan, N. T., & Foss, N. J. (2009). Exploring the roots of Porter's activity-based view. *Journal of Strategy and Management*, *2*(3), 240–260.

Available at the following link:

https://doi.org/10.1108/17554250910982480

Simplified Recruitment Model Using Text-Mining on Psychometric and Aptitude Tests. (2018, March 1). IEEE Conference Publication | IEEE Xplore.

Available at the following link:

https://ieeexplore.ieee.org/abstract/document/8474769?casa_token=nglCna7xqS8AAAAA:dWc mCy0XEGi9q8JoIOO-2tHxDdbsP3LEDMX76LNA9czqombgr-Emy1-3Ocz8uTHqupqonWbfT8j6

Smith-Barry, S. (n.d.). Ethics, Technology and Trends in Psychological Testing.

www.linkedin.com.

Available at the following link:

https://www.linkedin.com/pulse/ethics-technology-trends-psychological-testing-sarah/

The Science Behind Gamified Psychometric Assessments | Arctic Shores. (n.d.).

Available at the following link:

https://www.arcticshores.com/insights/science-of-psychometric-assessments

Thompson, B., & Vacha-Haase, T. (2000). Psychometrics is Datametrics: the Test is not Reliable.

Educational and Psychological Measurement, *60*(2), 174–195.

Available at the following link:

https://doi.org/10.1177/0013164400602002

Why Discrimination with Psychometrics is Dangerous - TestPartnership. (n.d.).

Available at the following link:

https://www.testpartnership.com/blog/why-psychometric-discrimination-dangerous.html

WikiJob. (2023). Psychometric Tests – Everything you need to know 2023 – Psychometric
Success.

Available at the following link:

https://psychometric-success.com/aptitude-tests/test-types/psychometric-tests