HOW TO MEASURE MANAGERIAL COMPETENCIES IN CONTEMPORARY ORGANIZATIONS? GUIDELINES FOR THE DEVELOPMENT AND VALIDATION OF A CONTEXT-BASED SCALE

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Finding ways to evaluate managerial competencies is essential for understanding how individuals can contribute to the advancement of organizations. The study aims to develop an up-to-date competency-based framework, validate a new assessment scale, and outline methodological guidelines for the development of future scales. The validation process consisted of four main phases, involving an extensive literature review, analysis of internal data of a company, development of a competency-based model, and its validation through qualitative and quantitative approaches. The comprehensive managerial competency-based framework leverages a continuous dialogue between theoretical knowledge and practical perspective. The new scale measures four competencies and eighteen skills/abilities/dispositions. Moreover, the innovative measurement format contrasts social desirability effects, obtaining information on workers' current level and potential growth. The instrument can be applied in different contexts and provides data for several human resource (HR) processes. Guidelines are outlined to researchers and practitioners interested in developing competency-based frameworks and tools.

One of the leading approaches employed in human resource (HR) to handle several key internal processes, such as recruitment, development, change, and performance management, is competency-based management (Boyatzis, 1982; Shippmann et al., 2000; Vakola et al., 2007). Unlike more traditional job-based approaches, competency models are descriptive frameworks identifying the key competencies needed to operate in a specific role within a job, occupation, organization, or industry. Competency modeling implies a focus on individual employees' qualities which contribute to the core competency of an organization, rather

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than on the position or job they hold (De Vos et al., 2015). A basic assumption behind such an approach is that a competency is not fixed, but rather can evolve and develop over time. Therefore, competency modeling has become a crucial tool in many organizations to establish competitiveness and strategic positioning, responding to emerging skills in a fast-paced context.

As highlighted by Rubin et al. (2007), the identification of a comprehensive definition of "competency" is not an easy task. Despite the generally accepted distinction in the meaning of competency and competence, the terms are still interchangeably used in the existent literature and professional practice, causing them to mean something different to different people (Vazirani, 2010). The two terms arise from different streams of thought on the concept of fitness at work, where "competency" is a description of behavior and "competence" is a description of work tasks or job outputs. The use of the term competency and its rise to "business speak" is credited to Boyatzis (1982), whose work was furthered by Spencer and Spencer (1993). According to them, competencies are underlying characteristics of people that indicate ways of behaving or thinking, which generalize across a wide range of situations and endure for long periods. In the present paper, we will refer to competency as the underlying set of individuals' behaviors, skills, and dispositions, possibly subject to development, by following Boyatzis' (2008, 2015) definition. According to the author, competency is meant to reflect a combination of personal characteristics and propensities which lead to successful performance. Thus, competencies are more complex than skills and share many features with personality traits or abilities. In particular, managerial competency is one of the most studied concepts in HR and organizational psychology fields, given its close relationship with performance (Boyatzis, 2009; Bucur, 2013). Besides being key for success at higher management levels, managerial competencies are relevant at multiple organizational levels (Mumford et al., 2007), and supporting their development and training is of paramount importance for sustaining a high level of performance by a company. Indeed, competency-based organizations rely on the central assumption that individual employees' skills contribute to the development and improvement of the core organizational competency (Salman et al., 2020).

With this premise, the current work arises from a threefold necessity. First and foremost, a need to develop a novel professional and managerial competency-based model that takes into consideration the new skills required in today's job market (see Avis, 2018; CEDEFOP, 2017). Not only rapid technological advancement (e.g., the fourth industrial revolution, digitalization, globalization, artificial intelligence, interconnectivity) but also several crises (i.e., economic, social, sanitary, political, etc.) have recently demanded working individuals — especially managers — to display new skills and competences, both "hard" and "soft" in nature. Such recent transformations have required high adaptability and flexibility, as well as brought new values to the forefront (such as inclusivity and diversity; Rajagopal, 2022). As some authors highlighted (Perini et al., 2022; Tommasi et al., 2021), nowadays soft skills emerge as core competencies alongside technical and scientific ones and, therefore, traditional competency frameworks require to be revised and updated accordingly.

The second necessity is to develop an assessment instrument that is both scientifically sound (i.e., with strong psychometric properties) and professionally grounded (i.e., context-based). In recent decades, many different competency models have been developed, in both the for-profit and public sectors (e.g., Daouk-Öyry et al., 2021; Heinsman et al., 2006; Nybø, 2004). In their literature review, Cumberland et al. (2016) identified almost twenty different assessment tools aimed to measure personality traits and dispositions indicative of leadership. DiGirolamo and Tkach (2019) examined scales thought to investigate coaching skills, such as the Measurement Model of Coaching Skills (McLean et al., 2005), the Behavioral Observation Scale (Heslin et al., 2006), and the Managerial Coaching Assessment System (David & Matu, 2013). Other scales focusing on specific competencies include: cultural adaptation and comprehension (Earley & Ang, 2003), individual psychological assets (Luthans et al., 2007), entrepreneurship (Di Fabio, 2014; Vargas-Halabí et al., 2017), emotional intelligence (Dawda & Hart, 2000), propensity to innovate (Howell et al.,

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2005), conflict management (Beitler et al., 2018; Henning, 2004), global mindset (Javidan & Teagarden, 2011), openness (Caligiuri et al., 2000), cognitive skills (Portoghese et al., 2020), and work ethic conduct (Meriac et al., 2013). Additional studies were conducted to explore managerial competencies in specific industries (e.g., Shet & Pereira, 2021) or in relation to specific roles (e.g., Dussault et al., 2013; Moradi et al., 2020). However, most scientifically validated scales focus on specific competency sets or subsets, thus making it difficult to be adopted by professionals and companies for an overall competency assessment of employees, due to the presence of different measurement, the metric system, and conceptual overlaps of psychological constructs. To overcome this limitation, many additional tools have been defined and developed in private companies and consulting firms. However, despite the widespread application of such tools, most of this research has been carried out by psychologists based in consulting companies, and most of their studies remain unpublished, providing academic circles with an exaggerated perception of a lack of empirical evidence. The resulting skepticism of scholars is due to the difficulty of systematically examining the reliability and validity of such tools (Boyatzis, 2008). Thus, developing a tool that can be easily adopted by practitioners and performing a systematic process of validation is of paramount importance.

Finally, a third need emerges. As Boyatzis (2008) also recognizes, practitioners need more guidance to ensure a solid and reliable assessment of the instruments they use in professional practice. Moreover, providing methodological guidelines on how to keep updated competency frameworks, whose obsolescence is intrinsic as time passes, can also be beneficial to the scientific and professional community. Therefore, given the limitations of previous studies (i.e., academic studies focused on a limited range of competencies or on specific industries; difficulties in examining the validity of professional studies; scarcity of studies providing methodological guidance for updating competency-based frameworks and assessment tools), the purpose of this study is three-fold: 1) to build a competency-based model able to capture the key managerial skills and qualities required by contemporary working environments, 2) to develop an innovative, valid, and reliable measure of such key competencies (named "Aegis Competencies Scale"), which is both scientifically sound and professionally grounded, and 3) to provide methodological guidelines to support future researchers in the development of new assessment scales. The innovative scope of the project also relies on the collaboration between the academic research team with an HR consulting agency based in Italy, operating in the field of recruitment and assessment. The collaboration between academics and professionals allowed for the combination of two key fields of expertise and permitted them to deal with the major limitations of previous studies. Indeed, on the one hand, academics' scientific and theoretical knowledge ensured the reliability, accuracy, and transparency of the development and validation process. On the other, professionals' expertise was key to bringing businesslike knowledge and comprehension of contemporary organizational patterns and needs, thus allowing the development of a competency model and a tool suitable for professional assessment environments.

The paper is organized as follows: an overview of methods and research phases will be presented; next, detailed results regarding its psychometric properties and validation will follow; then, the theoretical and practical implications of the results will be discussed; last, limitations and directions for future research will be presented.

PROJECT OVERVIEW AND MATERIALS

Project Overview

The overall project was composed of four main phases (Figure 1), inspired by the procedure suggested by the literature on scale development (Cortina et al., 2020; DeVellis, 2017; Hinkin, 1998; Robinson, 2018).

First, an exploratory phase meant to examine the centrality and theoretical importance of key competencies in modern organizations was performed leveraging on multiple sources of knowledge, including an HR consultancy agency and the literature regarding competency-based models and tools. Next, we defined the new competency-based model. Third, we developed a new assessment scale. Finally, Phase 4 was aimed to validate the scale through both qualitative and quantitative approaches. In the next sections, we will discuss each phase of research to explain how we built a scientific and validated competency assessment scale.
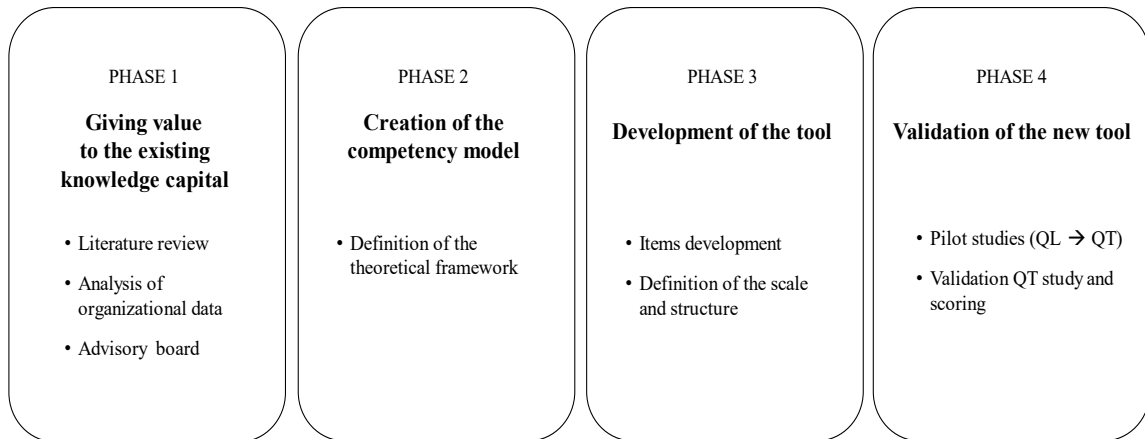

FIGURE 1
Overview on the overall process
Note. QL = qualitative; QT = quantitative.

Phase 1: Giving Value to the Existing Knowledge Capital

Prior to the creation of the new competency model, it was of paramount importance to examine the existing knowledge base to clearly define the constructs being measured. To achieve this aim, three steps were taken.

Initially, a comprehensive literature review was performed to highlight the most important managerial competencies. Using the Scopus and Google Scholar database, we searched titles, abstracts, and keywords using the following search string to identify relevant papers: the words "competenc*" and "Leader*/manage*/professional*." Since we were interested in identifying the most novel competencies required in contemporary work environments and how they are built on traditional competency-based frameworks, we limited our search to research published from 2016 to 2021. In addition, given the existing confusion and interchangeability in the existent literature and professional practice of the words "competency" and "competence," we included both results in our review. The full texts of more than 40 articles were analyzed.

Furthermore, we analyzed data available from previous assessments performed by practitioners inside HR consultancy agencies. In particular, we analyzed the psychometric properties of nonvalidated tools (e.g., behavioral questionnaires) employed to measure candidates' skills. Rasch analysis was used to evaluate the existing tools and, specifically, to assess the intelligibility and reliability of each item. As suggested by the literature, Rasch analysis psychometric techniques allow for the evaluation of the functioning of a survey or a test and the development of alternative forms (Boone, 2016). The aim was to recover companies' knowledge capital and extract information that would be useful in the subsequent development of the new assessment tool.

To complete this first research phase, we formed an advisory board composed of six experts in the competency assessment sector. Advisory boards composed of individuals who are most affected by an issue or have strong expertise in a sector are frequently used in other disciplines such as market research and public health (Carter, 2003; Unertl et al., 2016). The ultimate aim of an advisory board is to build a real-world perspective on an issue. The specific purpose of our advisory board was to generate new ideas and to stimulate reflections around two topics: key competencies in modern organizations, and competency assessment processes. The discussion with the six experts lasted 2.5 hours, was conducted online, and employed a variety of tools: free association tasks, war games, and open questions to stimulate discussion among the participants.

To summarize, this preliminary phase collected useful insights for developing a comprehensive competency model that could in turn be used to develop a new assessment instrument, including information from both a scientific and theoretical point of view (i.e., evidence on constructs and other existing tools in the literature) and an applied point of view (i.e., evidence from the tools already adopted by an HR consultancy agency and opinions from assessment professionals).

Phase 2: Creation of the Competency Model

The information gathered in Phase 1 was used to specify a new competency model. We identified the key skills abilities, and dispositions to be included in the theoretical competency model, based on the review of other competency models proposed in the literature and the insights that emerged from the advisory board. These skills, abilities, and dispositions were grouped into different dimensions of competencies. Then, the specification of the empirical meaning of all relevant constructs was carried out, as a central step in scale development (DeVellis, 2017). Four key competency areas were identified, comprising 18 different skills, abilities, and dispositions (see Table 1 below): personal effectiveness, social competencies, embracing change, and strategic vision. More details are provided in the Results section.

Phase 3: Development of the Tool

In the third phase, the items used to assess each competency were created, along with the format for measurement. We generated a large pool of items based on data collected in the previous research phases. As DeVellis (2017) outlined, at the beginning of the item development phase, inclusiveness is the best strategy to adopt, as redundant items can be eliminated later. Indeed, item reduction was carried out in the last phase (Phase 4). Recommendations followed while drafting the items included avoiding ambiguous statements, focusing on one single aspect in each item, avoiding long and complex formulation, and so forth (Colton & Covert, 2007). About six items were drafted for each competency, for a total of 110 items. A 9-point Likert scale was employed, with a double level of assessment (actual competency level and potential growth). Details are outlined in the Results section.

Phase 4: Validation of the New Tool

After the development of the theoretical competency framework, the items, and the format of measurement, three different multi-methods studies were carried out to refine and validate the assessment

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scale. We designed a qualitative pilot step involving experts in the assessment field to refine the framework and the scale. The aim was to confront the developed framework and measurement with the perspectives of experts in the field to maximize content validity (DeVellis, 2017). Thus, 10 semi-structured interviews were conducted to assess the completeness of the framework, the feasibility and ease of completion of the instrument, the language clarity and essentiality of all items, and the clarity and utility of the structure, and to collect possible suggestions for improvements and an overall evaluation of both the theoretical model and the instrument. The maximum duration of the interview was 30 minutes per interviewee. All participants had over 10 years of experience in the field of competency assessment, in various industries.

Next, a quantitative study was performed to select the most relevant items from a statistical point of view and investigate the factorial structure. The questionnaire included all 110 items, and it was administered via the Qualtrics platform. A professional panel provider recruited the sample, composed of 449 respondents, all employees in private or public organizations. An exploratory factor analysis (EFA) was carried out to reduce the scale to a smaller number of items. Cronbach's alpha was also computed to assess the internal consistency of the scale.

Lastly, a final study was conducted to measure reliability and convergent and divergent validity. We identified validated scales in the literature that would assess the corresponding skills, abilities, and dispositions included in our competency framework. If they were not available in Italian, scales were translated using the "back-translation" technique (Brislin, 1986). Two translators independently translated the scales from the original to the target language and sought agreement on all translated items. Last, a third person translated the items back into the original language. Five different scales — and pertaining subscales — were selected: the Psychological Capital Questionnaire (Alessandri et al., 2015; Luthans et al., 2007), the Technophobia Scale (Martínez-Córcoles et al., 2017), the Self-Report Scale on Leadership (Dussault et al., 2013), the Intrapreneurial Competencies Scale (Vargas-Halabí et al., 2017), and the Innovative Behavior Inventory (Lukes & Stephan, 2017). The measurement structure was designed to act as a control variable, stimulating respondents to engage in careful reflection on each item, and including an attention check (i.e., respondents giving inconsistent answers were excluded from the analyses). Finally, raw scores were adjusted and converted into standardized ones, to ensure easy comparability and usability in the professional context.

Since the instrument was designed to assess managerial competencies, we included only employees in public or private companies with a university degree, in any industry sector, and holding any positions in their organizations. A confirmatory factor analysis (CFA) was performed to assess the fit of the measurement model and verify the proposed structure (both first-level and second-level). The following fit indices were used: comparative fit index (CFI > .90) and root-mean-square error of approximation (RMSEA < .08) (Hooper et al., 2008; Schumacker & Lomax, 2016). Cronbach's alpha was computed for all the scales, and correlations between scale scores were computed to assess the relationship between variables.

RESULTS

In this section, the main results for each phase will be outlined and details about data analysis will be provided. The section follows the same structure presented in Figure 1, differentiating results among the four research phases and substeps.

Phase 1: Giving Value to the Existing Knowledge Capital

The review of the literature reflected the complexity of the current working context. Indeed, a diversity of qualities and skills are required to deal with today's fast-changing, heterogeneous, and uncertain environment. In this first phase, we analyzed several competency frameworks including more than 500 competencies, skills, abilities, and dispositions overall, including interpersonal competencies linked to teamwork and people development, performance-related skills, orientation to innovation, creativity, and flexibility. In Appendix A we present an overview of the skills, abilities, and dispositions which appear central in current organizations. The process entailed the following steps: we analyzed the full-text version of the articles to record the components of each model, considering competencies, skills, abilities, and dispositions at all levels (i.e., first- and second-order) and reporting the definitions provided by the authors; next, starting from the full list of competencies, skills, abilities, and dispositions, macro-clusters were determined to group similar dimensions. The process resulted in the identification of 17 over-arching categories, which represented the basis of the following steps, and which could fully reflect the complexity that emerged in the literature.

During the advisory board with six experts in the field of competency assessment, the dimensions were discussed and confirmed. The discussion highlighted the necessity of having an assessment tool able to provide an overall profile of a person but also to zoom in, putting the spotlight on specific strengths and areas of improvement. Moreover, the group discussion shed light on an additional important quality: the possession of suitable digital skills, key for modern companies and career opportunities (Murawski & Bick, 2017). Therefore, the number of skills identified as being decisive in modern organizational contexts increased to 18.

As concerns the analysis of internal assessment data, the Rasch analysis outlined validity and stability issues of some of the items included in the organizational instrument and provided information regarding stable and reliable dimensions which would prove useful for the construction of our scale. The evaluation of the Rasch model was conducted by using three statistics:

- Difficulty parameter: indicates the difficulty of each item, in ascending order, from the easiest to the most difficult. For each skill/ability/disposition, the difficulty parameter is centered around zero and it is ordered from the easiest to the most difficult.

- Wald test: an invariance test on each item, dividing the sample into two subgroups determined by the median. It tests the independence of the estimates in the two subgroups. The Wald test identifies item instability.

- Chi-square test: for each item, it compares the distribution of the observed responses with the estimated ones. It is a measure of the validity of the item.

To sum up, this first phase served both to map the scientific literature outlining the competencies and skills or abilities needed in modern organizations, and to give value to the knowledge capital of the company through the advisory board and the analysis of internal assessment data. In this preliminary study, we collected insights useful for developing a comprehensive competency model for a new assessment tool by collecting both evidence regarding constructs and existing instruments from the scientific literature as well as evidence from the tools already adopted by an HR consultancy agency and opinions from assessment professionals.

Phase 2: Creation of the Competency Model

In Phase 2, we developed the competency model. Starting from the very large pool of skills, abilities, and dispositions identified after the literature review and the discussion with the advisory

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board, we categorized them into groups. Specifically, we identified similarities and differences among them, to gather related features into single factors. The factors were discussed among the researchers until an agreement was reached. As shown in Table 1, the competency model groups the skills/abilities/dispositions into four main dimensions. We defined "personal effectiveness" as the competency to achieve desired results, disregarding predefined goals, by selecting and filtering useful information to achieve goals, and by thoroughly understanding situations and contexts. This first competency also included the ability to manage and recognize ongoing emotional and communicative processes, as well as specific skills needed to effectively use technological tools. The second competency was labeled "social competencies," referring to the ability to cooperate and work with others, to create and promote teamwork, and to recognize and value emotional processes, from a proximal perspective of growth of in-group members and a distal perspective of respect for the social and environmental context. The third competency, "embracing change," includes the ability to manage and act in uncertain contexts, recognize the value of different perspectives, and proactively create and recognize new opportunities for generating value for one's company. Last, "strategic vision" relates to one's ability to build and share with employees a forward-looking view of the business, identify unusual patterns and connections, and transform opportunities and ideas into innovation, devising and defining new strategies and key relationships for the organization.

TABLE 1
Theoretical competency framework

Competency dimension	Core skills/abilities/ dispositions	Conceptualization
1. Personal effectiveness	Goal orientation	Ability to bring high-level performance to fruition, achieving the required standards: it means being able to focus on goals, achieving success in the short term, and thus having operational skills in planning, control, and time management
	Cognitive abilities	Ability to enact complex thinking processes designed to solve structured problems, efficiently taking into account the multiplicity of available information
	Emotional self-management	Ability to manage stress and setbacks by leveraging one's resources and abilities, and by recognizing, understanding, and listening to one's emotional processes
	Communication skills	Ability to communicate effectively and assertively, and to influence others by sharing and promoting one's ideas and perspectives
	Digital skills	Ability to critically and consciously use technological tools to select and use information, to produce new ideas and solutions, and to communicate and participate in virtual contexts
2. Social competencies	Talent management	Ability to recognize and enhance the abilities of employees with a view to growth and development
	Social and emotional skills	Ability to recognize one's own emotions and the emotions of others, to relate to others efficiently and constructively, and to recognize and manage ongoing emotional processes
	Conflict management	Ability to deal with and resolve conflicts efficiently, taking into account different positions and points of view

(table 1 continues)

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Table 1 (continued)

Competency dimension	Core skills/abilities/ dispositions	Conceptualization
(*2. Social competencies*)	Teamworking and building	Ability to work effectively in a team, coordinating the roles and activities of members and giving trust and responsibility to each actor
	Ethics and integrity	Ability to implement actions aimed to respect the community, environmental, and work setting
3. Embracing change	Diversity sensitivity and enhancement	Ability to recognize and value different perspectives, acknowledging differences, and bridging different cultures and backgrounds
	Adaptability and flexibility	Ability to be mentally and behaviorally flexible, and to adapt to changing contexts
	Proactivity and ownership	Ability to take on increasing responsibilities, go the extra mile, and know how to raise the level of performance to achieve ever better results
	Learning orientation	Ability to constantly seek and find new opportunities for improvement and knowledge
4. Strategic vision	Business acumen	Ability to create and share a strategic vision, resulting from individual abilities to read the internal and external context of the company
	Innovation and creativity	Ability to fuel innovation by playing the role of change agent, recognizing innovative connections between old and new information in order to create original solutions
	Stakeholder management	Ability to identify key stakeholders and know how to create and manage long-term relationships with them
	Role modeling	Ability to inspire, guide, and influence staff by delegating and sharing responsibility and conveying a clear vision

Phase 3: Development of the Tool

In Phase 3 we drafted items for each competency, consisting of 110 items altogether, and specified the measurement format. One of the major issues in professional assessment concerns the risk of eliciting socially desirable responses (Marin-Garcia et al., 2018). It is common for candidates to present themselves in an unrealistically favorable light, overestimating their capabilities. Furthermore, we had to consider that competency assessment is a strategic tool encompassing many internal processes, including recruitment and career development. Therefore, we proposed to include two levels of assessment in the tool: current level of expertise and growth potential. In particular, the focus on growth potential is in line with Boyatzis' (2008, 2015) definition of competency, which includes the possibility of further development. For each item, respondents were asked to assess first their current level of competency, and second their possible advancement:

- Current level of expertise: "For the following skill, what level do you believe you hold at the current stage?" (response scale from 1, *I still have a lot to learn*, to 9, *I am at the level of people with maximum competence*).

- Growth potential: "For the following skill, what is the maximum level you believe you can reach?" (response scale from 1, *I believe I have intrinsic limitations*, to 9, *I can reach the level of people with maximum competence*).

Attributing a higher score to the current competency level than the potential growth in each competency made the answer inconsistent, and thus such responses were excluded from the analysis. A 9-point Likert scale was employed for each question, which is considered to be one of the most reliable and valid response formats (Preston & Colman, 2000). The measurement format we employed allows for the achievement of four different aims: to ensure respondents' understanding and level of attention (i.e., scoring lower on potential growth than actual current level of expertise invalidates the response), to mitigate social desirability effects (i.e., giving low scores to current levels appears more acceptable, considering the possibility to grow and improve in the future), to endorse a more careful reflection by anchoring the answer, and to collect useful data about the potential for growth and improvement, key information for training and development investments in companies.

Phase 4: Validation of the New Tool

The qualitative pilot step involved 10 experts, who were consulted to express their opinions regarding both the completeness of the theoretical framework with its four dimensions and 18 features and the essentiality and intelligibility of the measurement tool. All experts agreed on the usefulness of all dimensions and features in the competency model. Several suggestions were made to fine-tune the items included in the measure.

The quantitative pilot step followed. There were 500 complete answers; among those, 10% were excluded since respondents did not pass the quality check (i.e., speed of compilation, response set, inconsistency between potential and actual level of responses). As previously mentioned, we asked respondents to indicate both their current competency level and their perceived potential for competency growth. A total of 449 valid answers were given. As concerns sociodemographic features, 48.3% of respondents were female and the mean age was 45.2 years ($SD = 9.8$, min = 21, max = 68). Thirty-three point four percent of respondents worked in governmental organizations, while the remaining 66.6% were employed in the private sector. In terms of job positions, 9.1% of respondents occupied leadership positions, 20.9% were middle managers, and the remaining 70% were in neither leadership nor middle management positions.

An exploratory factor analysis (EFA) was performed on the sample to evaluate the structural and psychometric properties of the assessment scale, estimate the factor loadings, and allow for greater accuracy of variable clustering and minimize the covariance between elements on factors. Since the sample was sufficiently large for the number of items, a principal axis method was selected for factor extraction with promax rotations (Barbaranelli, 2007). Cronbach's alpha was calculated to evaluate the internal consistency and reliability of each dimension. The analysis allowed us to confirm the hypothesized factorial structure and shorten the scale, eliminating 40 items. Items were eliminated based on two different criteria: a low level of factor loading in the EFA (below .40) and the evaluation/variation of Cronbach's alpha eliminating each single item. The final assessment scale was composed of 70 items, with three or four items per competency attribute (distributed as shown in Table 2).

Next, to further corroborate the validity and reliability of the shortened instrument, we performed an additional validation study. A quantitative survey was carried out, including both the new assessment scale developed in the previous step and the concurrent and divergent scales (Table 3).

TABLE 2
Items distribution

Competency dimension	Core skills/abilities/dispositions	Number of items
1. Personal effectiveness	Goal orientation	4
	Cognitive abilities	4
	Emotional self-management	4
	Communication skills	4
	Digital skills	4
2. Social competencies	Talent management	4
	Social and emotional skills	4
	Conflict management	4
	Teamworking and building	4
	Ethics and integrity	3
3. Embracing change	Diversity sensitivity and enhancement	4
	Adaptability and flexibility	4
	Proactivity and ownership	4
	Learning orientation	4
4. Strategic vision	Business acumen	4
	Innovation and creativity	4
	Stakeholder management	3
	Role modeling	4
Total number of items		70

TABLE 3
Selected scales to assess convergent and divergent validity

Selected scale and focus	Corresponding related competency in the theoretical framework
Psychological Capital Questionnaire Investigates the individual's psychological capital, given by the synergy of resources available to the individual to succeed in expressing his or her talents and abilities (Alessandri et al., 2015; Luthans et al., 2007)	Personal effectiveness
Technophobia Scale The items included measures of behavioral, affective, and attitudinal responses to modern technologies and/or complex technical devices (Martínez-Córcoles et al., 2017)	Personal effectiveness (digital skills)
Self-Report Scale on Leadership The scale explores components of different leadership styles, among which we find the ability to engage employees, recognize the needs of team members, and celebrate individual merit (Dussault et al., 2013)	Social competencies
Innovative Behavior Inventory The scale assesses individuals' perceptions with respect to their ability to generate new ideas and act proactively to implement them (Lukes & Stephan, 2017)	Embracing change
Intrapreuneurial Competencies Scale The scale investigates the propensity to question existing processes within the organization and to take risks by proposing new ways of working (Vargas-Halabí et al., 2017)	Strategic vision

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The survey was administered online, and a total of 517 answers were collected. Of those, 417 passed the quality check and were included in the subsequent analysis. The sample was composed of 49% females, with a mean age of 44.4 years ($SD = 9.6$, min = 25, max = 70). Sixty-five point nine percent of the respondents worked in the private sector, while the remaining 34.1% were employed in public organizations. As concerns the job position, 8.4% of people occupied a leadership position, 20.4% had middle-management roles, and the remaining 71.2% of respondents were employees who did not work in middle- or upper-level positions.

The model had a good fit to the data and each competency provided a strong level of reliability. Appendix B (Table B1) shows the regression weights and the descriptive statistics for each item. A confirmatory factor analysis (CFA) was conducted on the items composing each dimension. The model was estimated using maximum likelihood with robust standard errors. The model fit resulting from these CFAs was evaluated using the comparative fit index (CFI) and the root-mean-square error of approximation (RMSEA). According to van de Schoot et al. (2012) a CFI > .90 is acceptable and > .95 preferred, while a RMSEA < .08 is acceptable and < .05 preferred. Cronbach's alpha was evaluated for each competency and for each skill/ability/disposition. Descriptive statistics were also calculated. Asymmetry and kurtosis indices were evaluated to test the normality distribution of the score of each competency. Values of asymmetry and kurtosis ranging from −1 to +1 are acceptable. Also, the full correlation matrix between the eighteen skills was calculated. All details are provided in Appendix B (Table B2).

As for the validity of the scale, in Appendix C details about the correlation matrix with selected validated scales can be found. Starting from the first factor, personal effectiveness, we found a significant positive correlation with the Psychological Capital Questionnaire ($r = .51$) and a significant negative correlation with the Technophobia Scale ($r = −.12$). The second factor, social competencies, was positively related to the Self-Report Scale on Leadership ($r = .54$), while the factor embracing change was positively correlated with the Innovative Behavior Inventory ($r =. 55$). Lastly, high values on strategic vision were linked to high values on the Intrapreneurial Competencies Scale ($r = .55$). To conclude, the results of the quantitative study provided evidence of the general stability and reliability of the new Aegis Competencies Scale and of its validity compared to existing measures. To ensure easier use of the tool in the professional field, a scoring system was created, dividing the scores into five levels (high, medium-high, medium, medium-low, low). For each factor and each skill, five groups were thus identified, namely −1.5 standard deviations below the mean, between −1.5 standard deviation and −0.5 standard deviation below the mean, between −0.5 standard deviation below the mean and +0.5 standard deviation above the mean, between +0.5 standard deviation and +1.5 standard deviation above the mean, and +1.5 standard deviations above the mean. More details about the scoring system are available from the authors upon request.

DISCUSSION

In this section, both theoretical and practical implications are discussed. First, the contributions of the present study to the literature are reviewed, focusing on the theoretical competency model and the methodological aspect. Next, applications and suggestions for HR practitioners are outlined. Finally, the section concludes with limitations and directions for future research.

Theoretical Implications

The present study makes three main contributions to the academic literature: a comprehensive competency-based framework, a new format of measurement, and methodological guidelines for developing a competency-based assessment scale.

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First, the design of the present study allowed the development of an innovative and comprehensive theoretical framework that identified a wide range of managerial competencies that are key in the current workplace. Managerial competences include knowledge, skills, abilities, and personal dispositions that are required for effective management and are essential for managers to perform their roles and responsibilities effectively and efficiently (Levenson et al., 2006). The steps carried out in Phase 1 (literature review, group discussion with professionals in the HR context, analysis of internal organizational data) identified four main competencies, pertaining to complementary areas. The first competency, personal effectiveness, combined those skills, abilities, and dispositions needed to achieve effective and timely high-quality performance, recognizing the relevance of both more traditional traits (such as cognitive and communication skills and a result-oriented approach) and more recently identified skills (i.e., emotional self-management and digital skills). The second competency, social competencies, refers to a person's ability to cooperate and work with others, with an emphasis on high-level managerial skills such as talent and group management. Additionally, ethics and integrity emerged as dispositions of paramount importance in a world which is increasingly endorsing respect toward one's company and the whole society (e.g., Dawson et al., 2020; Esser et al., 2018; Salman et al., 2020). The last two factors (strategic vision and embracing change) embody abilities which are key to effectively coping with the uncertainty and the speed of the modern context, as highlighted in previous studies (Popova & Shynkarenko, 2016; Saleh & Watson, 2017). In fact, strategic vision reflects the need to be able to read the external and internal contexts to quickly identify opportunities and potential growth. The embracing change competency encompasses the ability to adapt to an uncertain context, with an eye to individual continuous growth and diversity. The development of such a comprehensive framework was feasible thanks to the deep and continuous collaboration between the academic world and the professional context. Their interplay allowed for the establishment of a fruitful dialogue between theoretical knowledge and practical perspective, which resulted in a framework capable of being applied and adapted to modern organizational contexts.

The second contribution of the present paper concerns the employment of a new measurement format. One of the major risks for self-report scales is social desirability, people's tendency to present themselves in a flattering light, overestimating their skills and strengths and responding based on what is expected to be more culturally accepted (Marin-Garcia et al., 2018). This is particularly true in situations with highly relevant consequences, such as selection processes and career counseling. One of the most employed solutions to deal with response distortion involves the use of social desirability scales, with the aim of capturing potential tendencies to respond in culturally appropriate ways. However, the validity of such scales has recently been questioned (Lanz et al., 2022). To overcome the limitations of social desirability scales, in the present study we propose an alternative method: assessing respondents' ratings of their actual level of expertise and their potential for growth. This encourages respondents to reflect more deeply on their answer, anchoring their thoughts to a specific reference point. Furthermore, it nudges respondents to carefully think about their self-assessment, inducing them to pay greater attention to the questionnaire. Last, it allows for the identification of inconsistent answers (i.e., scoring lower on potential growth than actual current level of expertise invalidates the response), lack of attention and, potentially, lack of interest in completing the scale.

Finally, the present study was aimed to provide methodological guidelines for the development and validation of a competency-based model and scale. Details of the main steps of the research were provided, highlighting the benefits deriving from each. We believe that all phases were key to ensuring a solid, innovative, and applicable framework. Such methodological guidelines might serve both future researchers in the field of organizational and work psychology and HR practitioners aiming to develop a reliable and comprehensive competency measure.

Practical Implications

One of the strengths of the present work is the definition of a rigorous process useful in both the academic context and organizations. Besides the theoretical contribution, the study presented here implies several advancements for competency assessment in the organization context.

First, it allows us to overcome the limits imposed by previous assessment tools created by private companies, whose scientific validity is difficult to assess. We followed a rigorous procedure for validating the scale, strengthened in particular by the continuous cooperation between the research team and the HR professionals involved in the project. Therefore, one of the major strengths of the present work is the strictness and replicability of the process which allowed us to develop the proposed framework and scale.

Second, we did not limit respondents to a specific industry sector, role, or level of seniority. Rather, the scale was administered to a wide range and variety of respondents, thus finding room for application in several contexts. In professional practice, the tool can be applied for competency assessment to different levels, roles, job sectors, and industries. Data systematically collected using this tool will potentially provide practitioners and organizations with extremely valuable knowledge on peculiarities of different sectors/industries/roles, by providing information on prototypical competency profiles. A large dataset on a wide population can also offer benchmarking opportunities.

Moreover, we gathered data regarding both individuals' perceived level of current expertise and their prospective improvement range. This kind of data may be extremely useful in multiple HR processes, including selection, training, and development, and may provide crucial clues about individual development needs and critical competency areas. In fact, the assessment of prospective managerial competencies would help identify promising profiles, based on individual self-perception of potential growth and ambition. Furthermore, the scale would allow to monitor results over time: practitioners might perform longitudinal studies with the aim of monitoring the evolution and development of respondents over the years, or to verify the effectiveness of training programs aimed to enhance certain competencies and skills. As highlighted in the introduction, leveraging managerial competencies is key to sustaining the performance of a company, and the development of critical individual skills is necessary to the growth of the entire organization (Mumford et al., 2007; Salman et al., 2020).

Moreover, practitioners and scholars might select specific competencies to assess based on the needs of the candidate or the specifics of a situation. Indeed, the tool was built and validated so that it would be feasible to select specific competencies to assess, with no need to administer the whole scale.

As previously mentioned, the Aegis Competencies Scale includes an effective approach to identifying social desirability. In addition, we suggest an additional application of the scale, which is suitable to be adapted for triangulation, involving not only the individual worker but also his/her peers, subordinates, superiors, and supervisors. Indeed, 360° feedback and multirater feedback are strategies widely used to ensure the validity of a measurement and have gained increasing popularity in recent decades (Bracken et al., 2016). Gathering multisource assessments would provide a global and complete view of competency profiles, and conflicts between self- and other-evaluations might provide eye-opening insights.

Limitations and Future Directions

Some limitations should be acknowledged. The first concerns the generalization of results: the study was conducted in the Italian context, which might be different from that of other countries with different

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cultural and socioeconomic situations. Therefore, future studies may examine the stability of the scale in other countries and test for measurement invariance across different targets involved. Moreover, as already mentioned, the scale relies on self-report evaluations, which entail the risk of social desirability effects. However, the dual format of measurement (assessing both current perceived skills and perceived potential for improvement) facilitates the identification of such effects, and the adoption of a multirater approach would strengthen the assessment even more. Furthermore, the present study followed all the methodological guidelines recommended by the literature (Cortina et al., 2020; DeVellis, 2017; Hinkin, 1998; Robinson, 2018), with the exception of replication. However, replication is suggested especially when EFA and CFA are performed on the same sample, whereas in the present study such analyses were performed on different samples allowing to replicate the results obtained with the EFA. Last, since the analysis revealed strong correlations between some dimensions of the scale, its discriminant validity might be further investigated.

CONCLUSION

Competency-based assessment is a leading approach in HR processes. The present study defines a comprehensive and up-to-date managerial competency model and an assessment scale which encompasses four competencies, 18 among skills, abilities and dispositions, and an innovative double format of measurement. It also offers methodological guidelines which might help future researchers and HR practitioners in the development and validation of a competency assessment tool.

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APPENDIX A

TABLE A1
Results of Phase 1: Overview of the literature review

Skill/ability/disposition (and description)	References
Champion talent growth (developing and challenging others, providing feedback, mentoring and coaching)	Andriukaitienė et al., 2017; Chen et al., 2019; Dawson et al., 2020; Esser et al., 2018; Kregel et al., 2019; Maduka et al., 2018; Moradi et al., 2020; Ritzhaupt et al., 2018; Rodríguez-Rivero et al., 2018; Seidel et al., 2017
Proactivity and ownership (having initiative, displaying commitment, being reliable and determined, demonstrating entrepreneurship)	Aisha et al., 2019; Andriukaitienė et al., 2017; Chen et al., 2019; Derwik & Hellström, 2017; Esser et al., 2018; Kannan & Garad, 2020; Kotzab et al., 2018; Lan et al., 2020; Maduka et al., 2018; Moradi et al., 2020; Podmetina et al., 2018; Rodríguez-Rivero et al., 2018; Rubin et al., 2007; Santos et al., 2019; Seidel et al., 2017; Shanujas & Radha Ramanan, 2020; Vargas-Halabí et al., 2017
Team building/team working (building trust, coordinating and monitoring group activities, motivating team members, developing team relationships)	Aisha et al., 2019; Andriukaitienė et al., 2017; Chang, 2017; Chen et al., 2019; Dawson et al., 2020; Derwik & Hellström, 2017; Ingason & Jónsdóttir, 2017; Kregel et al., 2019; Maduka et al., 2018; Moradi et al., 2020; Podmetina et al., 2018; Salman et al., 2020; Seidel et al., 2017; Solansky & McIver, 2018; Shanujas & Radha Ramanan, 2020
Goal and performance orientation (ability to meet short- and long-term goals, setting clear standards, planning efficaciously, displaying autonomy)	Aisha et al., 2019; Andriukaitienė et al., 2017; Chang, 2017; Chen et al., 2019; do Vale et al., 2018; Esser et al., 2018; Goldman & Scott, 2016; Ingason & Jónsdóttir, 2017; Kregel et al., 2019; Maduka et al., 2018; Moradi et al., 2020; Salman et al., 2020; Shanujas & Radha Ramanan, 2020
Learning orientation (exhibiting curiosity and valuing learning, promoting opportunities)	Aisha et al., 2019; Dawson et al., 2020; Derwik & Hellström, 2017; Esser et al., 2018; Goldman & Scott, 2016; Kotzab et al., 2018; Maduka et al., 2018
Emotional stability and self-management (exerting self-discipline and self-control, displaying personal resilience and assertiveness, managing stress and pressure)	Aisha et al., 2019; Andriukaitienė et al., 2017; Chang, 2017; Chen et al., 2019; Dawson et al., 2020; Derwik & Hellström, 2017; Esser et al., 2018; Ingason & Jónsdóttir, 2017; Moradi et al., 2020; Periáñez-Cañadillas et al., 2019; Podmetina et al., 2018; Salman et al., 2020; Santos et al., 2019; Shanujas & Radha Ramanan, 2020
Adaptive capacity and flexibility (demonstrating tolerance for ambiguity, adapting to new environments, managing unexpected events and coping with uncertainties)	Aisha et al., 2019; Chang, 2017; Chen et al., 2019; Corner et al., 2021; do Vale et al., 2018; Esser et al., 2018; Fregnan et al., 2020; Kannan & Garad, 2020; Kotzab et al., 2018; Kregel et al., 2019; Moradi et al., 2020; Podmetina et al., 2018; Ritzhaupt et al., 2018; Rodríguez-Rivero et al., 2018; Salman et al., 2020; Shliakhovchuk, 2021; Shanujas & Radha Ramanan, 2020; Vargas-Halabí et al., 2017
Cognitive abilities (displaying conceptual as well as analytical thinking, ability to solve complex problems, exerting critical thinking)	Aisha et al., 2019; Andriukaitienė et al., 2017; Chen et al., 2019; Derwik & Hellström, 2017; Esser et al., 2018; Fregnan et al., 2020; Ingason & Jónsdóttir, 2017; Kannan & Garad, 2020; Lan et al., 2020; Maduka et al., 2018; Moradi et al., 2020; Podmetina et al., 2018; Ritzhaupt et al., 2018; Salman et al., 2020; Seidel et al., 2017; Shliakhovchuk, 2021; Shanujas & Radha Ramanan, 2020
Social and emotional competency (showing empathy, cultivating relationships, displaying social and emotional intelligence)	Aisha et al., 2019; Andriukaitienė et al., 2017; Beitler et al., 2018; Chen et al., 2019; Corner et al., 2021; Dawson et al., 2020; Derwik & Hellström, 2017; do Vale et al., 2018; Fregnan et al., 2020; Ingason & Jónsdóttir, 2017; Kregel et al., 2019; Moradi et al., 2020; Podmetina et al., 2018; Ritzhaupt et al., 2018; Salman et al., 2020; Santos et al., 2019; Shliakhovchuk, 2021; Shanujas & Radha Ramanan, 2020

(table A1 continues)

Table A1 (continued)

Skill/ability/disposition (and description)	References
Networking ability (building alliances and networks, managing stakeholders, being customer-oriented)	Aisha et al., 2019; Chen et al., 2019; Corner et al., 2021; Dawson et al., 2020; Esser et al., 2018; Fregnan et al., 2020; Kregel et al., 2019; Lan et al., 2020; Moradi et al., 2020; Podmetina et al., 2018; Ritzhaupt et al., 2018; Santos et al., 2019; Seidel et al., 2017
Inspirational motivation and role modeling (motivating, inspiring, and influencing others, creating and communicating a shared vision and goals, leading through example, gaining others' support)	Aisha et al., 2019; Andriukaitienė et al., 2017; Chen et al., 2019; Dawson et al., 2020; do Vale et al., 2018; Esser et al., 2018; Fregnan et al., 2020; Ingason & Jónsdóttir, 2017; Kregel et al., 2019; Maduka et al., 2018; Moradi et al., 2020; Podmetina et al., 2018; Rodríguez-Rivero et al., 2018; Salman et al., 2020; Santos et al., 2019; Seidel et al., 2017
Innovation and creativity (nurturing innovation and innovative thinking, developing innovative and challenging actions, investigating opportunities)	Aisha et al., 2019; Dawson et al., 2020; Esser et al., 2018; Kannan & Garad, 2020; Lau, 2016; Moradi et al., 2020; Podmetina et al., 2018; Santos et al., 2019; Shliakhovchuk, 2021; Shanujas & Radha Ramanan, 2020
Business acumen (displaying organizational and environmental awareness, creating business strategy, formulating strategic vision and goals)	Aisha et al., 2019; Andriukaitienė et al., 2017; Chen et al., 2019; Dawson et al., 2020; Derwik & Hellström, 2017; Esser et al., 2018; Goldman & Scott, 2016; Ingason & Jónsdóttir, 2017; Kannan & Garad, 2020; Kregel et al., 2019; Moradi et al., 2020; Podmetina et al., 2018; Ritzhaupt et al., 2018; Rodríguez-Rivero et al., 2018; Santos et al., 2019; Seidel et al., 2017; Vargas-Halabí et al., 2017
Ethical behavior (acting with integrity and respect)	Andriukaitienė et al., 2017; Chang, 2017; Dawson et al., 2020; do Vale et al., 2018; Esser et al., 2018; Kregel et al., 2019; Moradi et al., 2020; Salman et al., 2020; Seidel et al., 2017
Communication skills (communicating in a precise way, presenting effectively, public speaking)	Andriukaitienė et al., 2017; Chang, 2017; Chen et al., 2019; Derwik & Hellström, 2017; do Vale et al., 2018; Esser et al., 2018; Ingason & Jónsdóttir, 2017; Kannan & Garad, 2020; Kregel et al., 2019; Maduka et al., 2018; Moradi et al., 2020; Podmetina et al., 2018; Ritzhaupt et al., 2018; Rodríguez-Rivero et al., 2018; Salman et al., 2020; Santos et al., 2019; Seidel et al., 2017; Shanujas & Radha Ramanan, 2020
Sensitivity and openness to diversity (being culturally self-aware, displaying intercultural sensitivity, managing heterogenous teams, exerting tolerance toward variety)	Andriukaitienė et al., 2017; Corner et al., 2021; Derwik & Hellström, 2017; Kotzab et al., 2018; Maduka et al., 2018; Moradi et al., 2020; Podmetina et al., 2018; Salman et al., 2020; Shliakhovchuk, 2021
Conflict management (demonstrating the ability to solve conflicts adapting management style to the situation)	Chen et al., 2019; Kregel et al., 2019; Maduka et al., 2018; Moradi et al., 2020; Rodríguez-Rivero et al., 2018; Shanujas & Radha Ramanan, 2020

TABLE B1
Reliability measure, model fit indices, and descriptive statistics

	Cronbach's alpha	Factor loading	RMSEA	CFI	*M*	*SD*	Min	Max	Skewness	Kurtosis
Factor 1: personal effectiveness	.97		.071	.958	6.33	1.30	1	9	−.67	.60
Goal orientation	.93	.89			6.38	1.48	1	9	−.67	.39
Cognitive abilities	.94	.93			6.33	1.47	1	9	−.65	.36
Communication skills	.90	.92			6.07	1.57	1	9	−.55	.27
Emotional self-management	.90	.86			6.41	1.44	1	9	−.68	.39
Digital skills	.94	.80			6.46	1.44	1	9	−.49	.19
Factor 2: social competencies	.97		.056	.976	6.18	1.35	1	9	−.64	.64
Talent management	.94	.93			5.96	1.55	1	9	−.66	.35
Social and emotional skills	.93	.89			6.47	1.46	1	9	−.73	.68
Conflict management	.93	.90			6.08	1.52	1	9	−.61	.37
Teamworking and building	.92	.90			6.25	1.51	1	9	−.70	.56
Ethics and integrity	.88	.85			611	1.50	1	9	−.53	.31
Factor 3: embracing change	.97		.073	.967	6.36	1.34	1	9	−.69	.47
Diversity sensitivity and enhancement	.92	.86			6.48	1.41	1	9	−.52	.07
Adaptability and flexibility	.93	.93			6.27	1.46	1	9	−.72	.60
Proactivity and ownership	.92	.96			6.30	1.55	1	9	−.65	.20
Learning orientation	.93	.91			6.38	1.44	1	9	−.61	.32
Factor 4: strategic vision	.96		.033	.994	5.99	1.43	1	9	−.71	.58
Business acumen	.95	.81			5.61	1.77	1	9	−.63	.13
Innovation and creativity	.92	.94			5.98	1.55	1	9	−.62	.35
Stakeholder management	.94	.81			6.44	1.54	1	9	−.99	1.47
Role modeling	.93	.92			6.05	1.57	1	9	−.78	.65

Note. RMSEA = root-mean-square error of approximation; CFI = comparative fit index.

TABLE B2
Full correlation matrix between the eighteen skills

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Goal orientation																		
2 Cognitive abilities	.77																	
3 Communication skills	.74	.79																
4 Emotional self-management	.71	.73	.75															
5 Digital skills	.72	.71	.67	.60														
6 Talent management	.70	.67	.68	.67	.61													
7 Social and emotional skills	.67	.66	.71	.64	.59	.74												
8 Conflict management	.65	.67	.73	.71	.62	.79	.76											
9 Teamworking and building	.71	.71	.73	.66	.62	.79	.76	.76										
10 Ethics and integrity	.65	.67	.66	.63	.55	.74	.73	.67	.68									
11 Business acumen	.64	.60	.56	.61	.50	.66	.53	.59	.63	.58								
12 Innovation and creativity	.69	.70	.69	.67	.62	.76	.65	.71	.73	.68	.72							
13 Stakeholder management	.74	.68	.69	.64	.64	.65	.72	.67	.75	.64	.64	.71						
14 Role modeling	.71	.69	.72	.67	.62	.81	.70	.71	.78	.64	.70	.81	.70					
15 Diversity sensitivity and enhancement	.66	.71	.77	.65	.61	.67	.69	.72	.70	.66	.51	.65	.64	.66				
16 Adaptability and flexibility	.74	.78	.76	.73	.66	.73	.66	.75	.72	.62	.62	.73	.67	.73	.75			
17 Proactivity and ownership	.78	.76	.74	.70	.67	.74	.68	.73	.73	.68	.66	.75	.69	.73	.74	.83		
18 Learning orientation	.72	.72	.75	.67	.66	.72	.70	.70	.74	.68	.59	.72	.67	.70	.74	.77	.82	

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TABLE C1
Correlation matrix with selected scales to assess convergent and divergent validity

	1	2	3	4	5	6	7
1. *Factor 1: personal effectiveness*							
2. Goal orientation	.90						
3. Cognitive abilities	.91	.77					
4. Communication skills	.90	.74	.79				
5. Emotional self-management	.86	.71	.73	.75			
6. Digital skills	.84	.72	.71	.67	.60		
7. Psychological Capital Questionnaire	.51	.48	.43	.49	.46	.39	
8. Technophobia Scale	−.12	−.09	−.06	−.12	−.09	−.18	−.25

	1	2	3	4	5	6
1. *Factor 2: social competencies*						
2. Talent management	.92					
3. Social and emotional skills	.90	.74				
4. Conflict management	.90	.79	.76			
5. Teamworking and building	.90	.79	.76	.76		
6. Ethics and integrity	.84	.74	.73	.67	.68	
7. Self-Report Scale on Leadership	.54	.51	.50	.46	.49	.44

	1	2	3	4	5
1. *Factor 3: embracing change*					
2. Diversity sensitivity and enhancement	.88				
3. Adaptability and flexibility	.92	.75			
4. Proactivity and ownership	.93	.74	.83		
5. Learning orientation	.91	.74	.77	.82	
6. Innovative Behavior Inventory	.55	.45	.52	.55	.49

	1	2	3	4	5
1. *Factor 4: strategic vision*					
2. Business acumen	.88				
3. Innovation and creativity	.91	.72			
4. Stakeholder management	.84	.64	.71		
5. Role modeling	.91	.70	.81	.70	
6. Intrapreneurial Competencies Scale	.55	.52	.51	.39	.50