








# “The primacy of soft skills: A definitive test of managerial strategic planning competencies and professional performance in Hungary and Kazakhstan”

<b>AUTHORS</b>	Anastassiya Lipovka 
	 Zoltan Buzady 
	 Kuanysh Abeshev 
	
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Kuanysh Abeshev, 2026

Anastasiya Lipovka, Ph.D., Associate  
Professor, School of Management,  
Almaty Management University,  
Kazakhstan. (Corresponding author)

Zoltan Buzady, Ph.D., Habil., Associate  
Professor, Department of Decision  
Sciences, Corvinus University of  
Budapest, Hungary.

Kuanysh Abeshev, Ph.D., Associate  
Professor, School of Digital  
Technologies and Economics, Almaty  
Management University, Kazakhstan.

Anastasiya Lipovka (Kazakhstan), Zoltan Buzady (Hungary),  
Kuanysh Abeshev (Kazakhstan)

# THE PRIMACY OF SOFT SKILLS: A DEFINITIVE TEST OF MANAGERIAL STRATEGIC PLANNING COMPETENCIES AND PROFESSIONAL PERFORMANCE IN HUNGARY AND KAZAKHSTAN

## Abstract

Strategic planning is a driver of leaders' performance in today's turbulent and demanding environment, yet the relative importance of soft versus hard skills within it remains insufficiently researched. This study aims to test how gender, age, and cultural context influence the distribution of soft and hard skills in strategic planning and managers' goal attainment. Utilizing a behavioral outcome measure (high performance), we analyzed a sample of 1,468 managers from Kazakhstan ( $n = 694$ ) and Hungary ( $n = 774$ ), who participated in the scientifically grounded AI business simulation. A two-step analytical approach, involving PLS-SEM and logistic regression, was implemented in Python. The results demonstrate that soft skills are the dominant driver of high performance, with an Odds Ratio (OR) of 3.44, indicating they are 2.5 times more effective than hard skills. Leaders' age exerted a negligible effect on their performance (OR = 1.02,  $p = 0.728$ ). The overall sample showed no gender differences, but the country-specific analysis revealed a moderated mediation pattern where the link between gender and soft skills varies by country ( $p = 0.018$ ). Managers in Kazakhstan exhibited slightly higher average softskill scores than their counterparts in Hungary ( $p = 0.014$ ). Despite cultural differences, the model demonstrated consistent predictive utility in both settings, with an overall accuracy of 72.9% in Kazakhstan and 72.4% in Hungary. The designed competency model is highly stable and cross-culturally valid for predicting managerial performance. Thus, managerial excellence is driven by competencies that are largely independent of demographic characteristics across different cultural settings.

## Keywords

hard skills, managers, leadership competencies, gender, strategic planning, resource-based view theory, artificial intelligence (AI), business simulation

**JEL Classification** J24, Q01

## INTRODUCTION

Strategic planning continues to remain one of the most important managers' functions. The stable interest in this dimension has been triggered by the dynamic growth of economic, political, and social pressure between countries and within them for the past five years. The requirements for strategic planning have been seriously modified by the occurrence of high uncertainty, market vulnerability, and global competition enhancement (Dhlamini, 2025). The shift from offline to online services and massive transboundary trade has tremendously intensified the necessity of novel business strategies for survival during and after the COVID-19 pandemic. The world trend for sustainable and ESG leadership engendered additional ambitious requirements for business strategic planning (Elsamadony et al., 2025). Therefore, the new tasks for this leadership competence are high flexibility, fluctuat-



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ing adaptability, shorter planning horizons, creativity, and artificial intelligence (AI). Contemporary managers require solid skills to meet the newly emerged criteria for the companies' effectiveness.

With the rapid AI progression and its penetration into numerous layers of organizational architecture, managerial competencies have been emphasized as the most valuable assets of a company. "Strategic planning is a fundamental process that ensures the long-term success and sustainability of organizations" (Khalilov et al., 2025, p. 98) and constitutes the first and crucial element of strategic management. The process of strategic planning encompasses internal and external environmental scanning, forecasting future scenarios, defining a mission and vision, setting strategic goals, elaborating a strategy, and allocating resources and defining the ways of the plan's achievement (Bagire & Namada, 2013). Business leaders' competencies in strategic planning directly determine whether the enterprise will succeed in a competitive market. Namely, managers decide what resources and how exactly they should be utilized to achieve the organization's goal, whether it would be based on integrity and business ethics, and bring a contribution to sustainable development not only of the enterprise, but also the community, region, and the country as a whole. Managers' skills enrich strategic planning, which, in turn, serves as a source of their successful performance and the company's efficiency (Ahmad et al., 2024).

Despite the attractiveness of strategic planning, an insufficient number of studies are dedicated to the distinction of soft and hard skills, and their impact on managers' performance. Meanwhile, most of the recent research is focused on the link between the overall company's strategic planning (strategy, its indicators, employee commitment to its implementation) and the general enterprise's efficiency and financial results (Dhlamini, 2025). In the case of such a relationship examination, there is a high risk of endogeneity due to numerous confounding effects that may influence the link between these variables, which is extremely difficult to forecast and control (Paustian-Underdahl et al., 2024). Additionally, the existing research on strategic planning is considerably dominated by the United States and United Kingdom scholarship, whereas studies from emerging economies are limited, and scholarly initiatives from Central Europe and Central Asia are even more scarce. The acute relevance of the managers' strategic planning competencies at the current stage and demand for academic knowledge in newly emerging economies served as drivers for this current analysis.

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## 1. LITERATURE REVIEW AND HYPOTHESES

The resource-based view theory (RBVT), proposed by Barney (1991), constitutes an important theoretical basis of this work. RBVT proposes the process and the company's assets contributing to the elaboration of a sustained competitive advantage. RBVT presents one of the most widely accepted theories in strategic management, still keeping its prominent place among today's management studies. The critical aspect of RBVT is its consideration of strategic planning as extremely dependent on managers by distinguishing not solely formal, but also informal, autonomous, and emergent processes. An organization could attain a high level of competitiveness through a synthesis of various resources that have significant value, are rare, difficult to imitate, and do not have substitutes for a certain period of time. Those assets embrace "hu-

man capital, physical capital, and organizational capital resources," within which individual managers' competencies represent human capital, and strategic planning is classified as organizational resources (Barney, 1991, p. 101).

The resources are further classified into tangible and intangible, which should follow the criteria of immobility and heterogeneity (Barney, 1991). Such intangible assets of RBVT, such as strategic planning skills, could be grouped into soft and hard skills. "Hard skills are the technical expertise and knowledge needed for a job. Soft skills are interpersonal qualities, also known as people skills, and personal attributes that one possesses" (Robles, 2012, p. 453). Analytical skills and information processing constitute hard skills in strategic planning, whereas strategic thinking, prioritizing, and future orientation relate to soft skills (Ershadi et al., 2023). Barney (1991) underlined that not all re-

sources, including managerial skills, can similarly and positively contribute to strategic planning; thus, the impact of different skills on performance may vary considerably. Dhlamini (2026) accentuated the necessity to fill in the knowledge gap about what managers' skills and experiences may contribute to effective strategic planning.

Preceding studies postulated that strategic planning is required for managers' and enterprises' good performance; however, most of them do not differentiate between soft and hard skills, but measure them as a united construct (Kubo et al., 2025; Kiambati & Itunga, 2016), or consider only one soft skill – strategic thinking (Kula & Naktiyok, 2021; Rodrigues et al., 2023). Mohammad et al. (2024) deduced that strategic intelligence, thinking, and leadership do not affect large industrial companies' performance in Saudi Arabia, and strategic flexibility does not moderate this relationship; in turn, strategic planning exerts a positive impact. Kubo et al. (2025) in their secondary-data massive study of the listed companies in Japan, examined CEO's corporate planning skills and concluded on their positive influence on the firm's performance. The research among Kenyan top managers defined the direct positive link between managerial skills and corporate strategy (Kiambati & Itunga, 2016). The recent studies have approved the significant positive influence of soft skills on managers' individual and the company's overall performance. Kula and Naktiyok (2021) revealed a link between over 600 CEOs' strategic thinking in dynamic automobile communication sectors and competitiveness enhancement. The field research among 273 middle and upper managers and professionals proclaimed the considerable link between strategic thinking and excellent work results (Rodrigues et al., 2023).

A limited array of studies evaluated the soft and hard skills effect of strategic planning on managers' performance (Dhlamini, 2026). Lamri and Lubart (2023) concluded that soft skills have a higher demand in strategic competence and play a more essential role for managers' work quality. In Pakistan, the mediating role of strategic planning was identified in the connection between business and management competencies and the company's performance, whereas leaders' technical capability did not exhibit any significant relationship (Ahmad et al., 2024).

Gender aspects of leadership competencies significantly fluctuate depending on the robustness of the study, often violated by insufficient endogeneity effect, self-report assessment tools, not rigorous methodology, and ambiguous results interpretation (Paustian-Underdahl et al., 2024). In the series of robust meta-analyses, embracing leadership and gender research for 1970–2020, Paustian-Underdahl et al. (2024) identified women managers' greater inclination to effective agentic and communal behaviors, whereas their male counterparts have less effective and more passive behavior. However, the aforementioned researchers relate this result in many respects to two main causes: first, 64% of the analyzed findings were U.S. and Canadian, where participants might be pushed by social expectations to please women leaders, and second, the masculine environments make women work harder on their development and goal attainment to outperform men in masculine environments.

The results of studies on the gender relationship with strategic planning are controversial since a portion of them say in favor of gender differences (Laidoja et al., 2022; Ledi et al., 2024; Lichtarski et al., 2025), and other reports on their absence (Aukenov et al., 2025; Stošić Panić, 2019; Sandana et al., 2014). In the study among Serbian entrepreneurs, Stošić Panić (2019) concluded on the absence of statistically significant gender differences between male and female participants. The study proclaimed that planning is generally short-term, informal, and rooted in personal experience, feelings, and intuition, with insufficient application of objective data and analysis by both women and men. Better developed strategic planning, assuming a longer horizon, greater formality, and more data analysis, is associated with superior financial performance, but this effect does not differ by gender (Stošić Panić, 2019). The small-scale research revealed that male and female managers/entrepreneurs exhibit broadly similar strategic-planning practices and process qualities (Sandana et al., 2014). The research of managers in the Kazakhstani agricultural sector concluded on the insignificance of gender and age, but the importance of managerial tenure for strategic thinking and planning (Aukenov et al., 2025).

On the contrary, other large- and small-scale studies report on gender specificity in strategic plan-

ning skills. Gender managerial diversity broadens opportunities in mitigating crises and boosting innovations through the organization's strategic thinking enhancement (Ledi et al., 2024). Women experience more benefits from strategic planning compared to men, since business planning by female managers is more often significantly related to their enterprises' better performance (Peake et al., 2018). The research among 184 Polish executives (Lichtarski et al., 2025) defined that women exhibit better soft skills, while men demonstrate more sophisticated hard skills, including analytical orientation. Mynbayeva et al. (2024) in their study among Kazakhstani university leaders proclaimed women's proneness to exercising soft skills, while men's higher focus on hard skills. The analysis encompassing 129 countries (Laidoja et al., 2022) declared that female managers more often practice an exploitative style related to strategic thinking and future forecasting, and their male peers – an explorative style through analysis, data gathering, and processing.

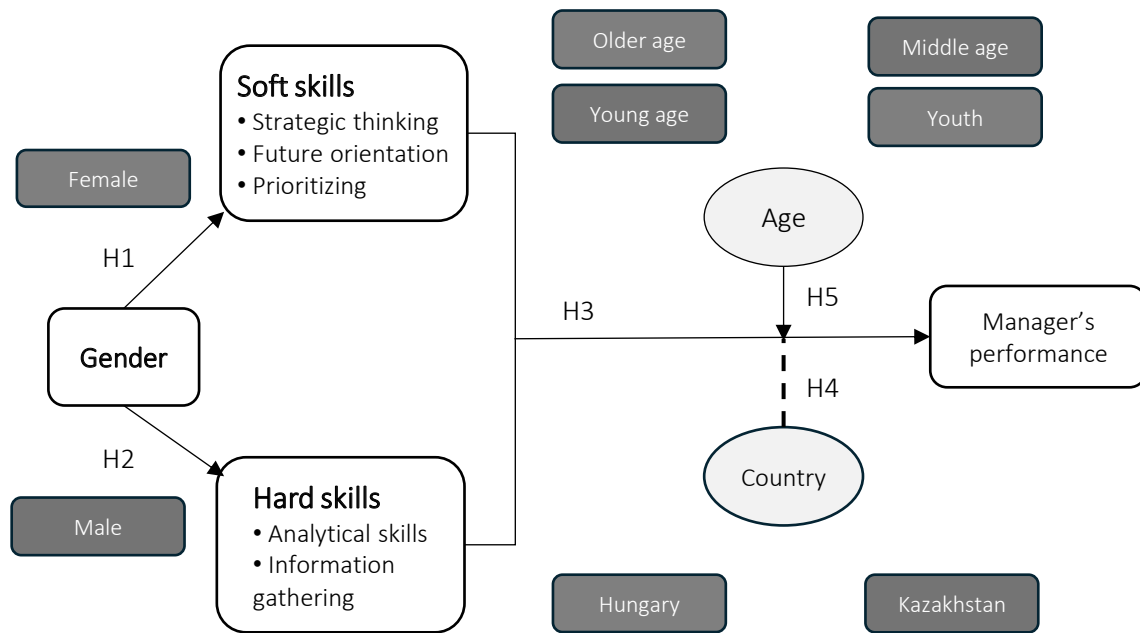
The moderating effect of country was observed in many preceding research endeavors. Escandon et al. (2023) elucidated the country's cultural moderating effect on the relationship between organizational innovation and strategic orientation in Vietnam and Colombia. The study across 58 states evidenced the country's moderating effect between corporate environmental, social, and governance accomplishment and financial performance (Luo et al., 2024). Comparative studies in Southern America among 1,200 respondents uncovered gender and country variations (Ilie & Cardoza, 2018): despite the general similarity between male and female executives' thinking styles, men are inclined to rely mostly on rational thinking, while women tend to count more on emotion-related thinking. The state-bounded differences embraced the U.S. executive's reliance on soft skills, while Latin American leaders' proneness to hard skills of strategic thinking (Ilie & Cardoza, 2018). The leadership studies in European emerging economies reported a noticeable discrepancy in strategic competencies, particularly in long-term planning (Bencsik & Belas, 2024; Remišová & Lašáková, 2015). The massive research among young leaders from over 55 nationalities elucidated the absence of numerous differences between representatives of different countries and wom-

en and men on average, but identified differences in certain skills between Western Europeans, Eastern Europeans, and South Asians and both genders' representatives (Ribera et al., 2021).

The country moderates both gender relationships with leadership competencies and skills' influence on performance. The recent extensive research in Kazakhstan, Hungary, and Türkiye illuminated the multifaceted moderating role of the country on the connection between social-demographic and industrial characteristics and managers' leadership competencies (Lipovka et al., 2025). Comparative studies witnessed that country moderates gender differences in strategic competence (Brandl et al., 2007): gender ideology can fully explain or suppress differences in managerial behaviors (Coron, 2024), and leaders' competencies of information sharing, feedback, and developmental interactions showed robust gender differences (Ye et al., 2016).

Controlling age in leadership studies decreases the risk of confounding effects, particularly when the research relates to managers' competencies and gender. Age as an independent or control variable, as a rule, exhibits versatile effects along the generational continuum (Zellman et al., 2025). Age is often defined as insignificant for leaders' and managers' skills and competences investigation when it is examined as a single construct, not divided into subgroups, and also analyzed separately (Ribera et al., 2021). Archer et al. (2015) in their inventory-based study of 6,800 participants from Sweden who were searching for executive posts, defined a lack of meaningful connection between the candidates' age and their strategic focus, but revealed that younger managers had a higher evaluation of future orientation.

The analysis of South African small and medium enterprise owners defined no planning competence variations among different generations (Sandana et al., 2014). The meta-analysis found that the influence of managers' age on their leadership competencies and style significantly varies from very positive to extremely negative in raters' assessments based on industries, cultures, countries, leadership types, and evaluators' roles (Tomova Shakur et al., 2024). The massive comparative research among the Kazakhstan, Turkish, and Hungarian leaders



**Figure 1.** Conceptual model

resulted in defining an insignificant age effect on strategic thinking of the joint sample. However, a moderating effect of the country was observed: in Hungary, the older age of a manager was positively related to higher strategic thinking, whereas in Kazakhstan, the same relationship was significant but negative (Lipovka et al., 2025).

The choice of Kazakhstan and Hungary for this study is stipulated by a range of commonalities uniting these two states in a favorable field for cross-cultural management research. Both countries under examination represent emerging economies, allied by historical, cultural, and nomadic roots, being a part of the Kipchak tribe in the 13th century. They also have a common recent post-socialist past, which resulted in high women's emancipation and contributed to the current substantive gender equality in international education, health, and labor indices (Buzady & Lipovka, 2024). Today, Hungary and Kazakhstan continue their economic transformation and sustain partner cooperation in energy, trade, culture, and education. Both countries participate in the work of the Organization of Turkic States and are often considered in one group by economic status in the World Bank, United Nations, and Organization for Economic Co-operation and Development analytical reports. Except for the many commonalities, Hungary is an active mem-

ber of the European Union, North Atlantic Treaty Organization, and the Visegrad Group, while Kazakhstan acts as a member of the Shanghai Cooperation Organization, Commonwealth of Independent States, and Collective Security Treaty Organization (Otar, 2025). Orientation for the Europeanisation and European values by Hungary and Kazakhstan's inclination for Turkification and Central Asian traditions represents a distinction of the examined areas. These specific contexts are beneficial for examining how managers' strategic thinking skills affect their performance in newly emerging economies with a common past, active current cooperation, and agreed future initiatives.

Despite RBVT having been known for over 35 years, regular systematic and bibliometric literature reviews observed continuous academic interest in this theory through stable positive publishing dynamics (Kero & Bogale, 2023; Mailani et al., 2024; Rumangkit & Prabowo, 2024). The range of research gaps was identified, including three key areas for the present study: a low representation of cross-cultural studies, a deficit of research on post-socialist countries, and considerable ignorance of gender aspects (Kero & Bogale, 2023; Mailani et al., 2024; Rumangkit & Prabowo, 2024). The strategic planning research, particularly in a cross-cultural perspective, experiences a knowledge gap in evidence-based studies.

Following the results of the earlier local and global studies, this paper aims to examine what managers' skills contribute to strategic planning and whether it impacts leaders' high performance, along with the analysis of gender, country, and age roles in Hungary and Kazakhstan. To attain the declared aim, five hypotheses have been elaborated:

- H1: *Female managers possess better soft skills in strategic planning than male peers.*
- H2: *Male managers demonstrate more advanced hard skills in strategic planning compared to their female peers.*
- H3: *Soft skills in strategic planning have a more significant relationship with a manager's high performance in comparison with hard skills.*
- H4: *Country moderates the relationships between gender and strategic planning, and between strategic planning and managers' high performance.*
- H5: *Age is not associated with gender and strategic planning, not influencing the apparent link between strategic planning and managers' high performance.*

The conceptual model reflecting the hypothetical relationship between the dependent and independent variables and moderating and confounding effects is provided in Figure 1.

## 2. METHODS

The study utilized the results of leadership skills assessment through real managers' involvement in the Fligby (2025) serious business game, rooted in the science of positive psychology, leadership, and management, elaborated by the international team of academics, and designed by the U.S. IT company. The prominent professor M. Csikszentmihalyi, the founder of positive psychology and the concept of flow, significantly contributed to the elaboration of the academic base of Fligby. Fligby serious game is rooted in Csikszentmihalyi's book "Good Business: Leadership, Flow, and the Making of Meaning"

(Csikszentmihalyi, 2003), which proclaimed a novel view on leadership by accentuating the psychological factors, beneficial for work and personnel involvement. The second author of the present article, one of Fligby's content developers, recruited numerous managers from both geographic regions to participate in this virtual assessment through DBA, MBA, executive, and field trainings and consulting. The advanced artificial intelligence examined managers' behavior via their various comprehensive decisions as reactions to the set profit, sustainability, and employee motivation goals. The participants who successfully attain the triple goal win the award and represent high performers. Average time of playing varies from several days to 5.5 hours, depending on the participants' preferred speed. While playing Fligby, participants make above 150 decisions on average.

Data collection spanned the period from 2016 to 2025 to increase the statistical power of the main analysis. To verify the validity of the data for 10 years, considering a long-time continuum, the preliminary analysis was undertaken. Although ANOVA revealed formal differences between the years ( $F(9,1458) = 3.03, p = 0.001$ ), the effect size was extremely small ( $\eta^2 = 0.018$ ), indicating that the year explains only around 2% of the variation in strategic planning. The coefficient variation of averages equaled to 1.91%, and linear regression did not show a significant trend ( $r = -0.025, p = 0.34$ ). Based on these data, all observations for the specified period were combined for further analysis.

The versatile dataset comprises 1,468 managers recruited from two emerging economies: Kazakhstan ( $n = 694; 47.3\%$ ) and Hungary ( $n = 774; 52.7\%$ ). The sample was balanced by gender, with women representing 49.9% ( $n = 733$ ) and men representing 50.1% ( $n = 735$ ) of the participants. The mean age of the respondents was 35.24 (Std = 10.23), with the largest group of people at the age of 30–under 45 (47%) and the smallest – mature participants of 60–75 constituting 1% of the sample (Table 1). The low representation of older adults is caused by the retirement age in both countries, with 62–65 years on average for women and men.

**Table 1.** Demographics

Characteristics	Representation, in numbers	Representation, in %
<b>Country (people)</b>		
Hungary	774	52.7
Kazakhstan	694	47.3
<b>Gender (people)</b>		
Female	733	49.9
Male	735	50.1
<b>Age (years)</b>		
Youth (under 30)	495	33.7
Young (30–under 45)	690	47
Middle (45–under 60)	268	18.3
Older adults (60–75)	15	1
<b>Tenure (years)</b>		
Around a year	472	32.2
1–under 3	378	25.7
3–under 7	296	20.2
7–under 15	220	15
15 and above	102	6.9
<b>Industry/Sector (people)</b>		
Manufacturing, extraction and construction	297	20.2
Education and research	322	21.9
Finance	343	23.4
Consumer goods production and trade	162	11
IT, computers	141	9.6
International, public relations and administration	120	8.2
Services	80	5.4

Following Table 1, participants were employed in seven economic sectors with above 20% representation from manufacturing, extraction, and construction, education and research, and finance. International, public relations, and administration; IT and computers, and consumer goods production and trade constituted from 8 to 11% of the

sample, while services were the least represented with 5.4%. Regarding tenure, a decent percentage of managers had short managerial experience (32.2%), more than a quarter – from 1 under 3 years, 1/5 – from 3 to 7 years, and around 22% – 7 and above years.

The managers’ performance is measured as an accumulation of their attainment of three goals: profit, sustainability, and flow (expressed in employee intrinsic motivation and commitment), and was operationalized as a binary dependent variable with 47.1% ( $n = 692$ ) identified as those who attained the goals and 52.9% ( $n = 776$ ) as participants who did not succeed. The measurement model was developed to assess two latent constructs – soft skills and hard skills – using a 100-point scale. Soft skills in strategic planning were evaluated through three variables: strategic thinking, future orientation, and prioritizing. Two manifest variables – analytical skill and information gathering – spanned hard skills. Age was included as a control variable to mitigate potential confounding effects on managers’ performance. Table 2 clearly defines the core meaning of the variables using the Fligby methodology.

This study employed partial least squares structural equation modeling (PLS-SEM) to examine the relationships between gender, strategic planning competence, and managers’ performance. PLS-SEM was determined to be the most suitable method for this purpose due to several reasons (Hair et al., 2021). First, PLS-SEM is optimized for predictive accuracy and the explanation of variance in dependent constructs in comparison to covariance-based methods, concentrated on theo-

**Table 2.** Measures and their meanings within the present study

Source: Fligby (2025).

No.	Skill	Definition
1	Analytical skills	Visualizing, articulating, and solving complex problems and concepts, and making sensible decisions based on available information, including the ability to apply logical thinking to gathering and analyzing data, designing and testing solutions to problems, and formulating plans
2	Information gathering	Collecting adequate information to perform the next step based on this information. Managers must know what information to gather, where to find it, how to manage it, and ultimately how to process the collected data
3	Strategic thinking	Helps to set goals, determine priorities, review policy issues, and perform long-term planning
4	Future orientation	Thinking in the long term, being “forward-looking”
5	Prioritizing	Evaluating a group of items and ranking them in order of importance or urgency
6	High performance	An accumulated performance evaluation based on three strategic goals attainment: the company’s profit, flow (employee intrinsic motivation and commitment), and sustainability

ry testing and model fit. Given that this study aims to predict a manager's likelihood of high performance based on their soft and hard skills in strategic planning, the high predictive power of PLS-SEM is advantageous. Another reason is that it allows the rigorous assessment of latent constructs (soft and hard skills) via multiple indicators while simultaneously estimating the structural paths between them. The third-choice motivator appeared to be the model's successful integration of PLS-SEM logic with logistic regression to calculate odds ratios since the ultimate dependent variable (performance) is binary (Hair et al., 2021). This combination ensures a sophisticated analysis of how shifts in latent skill levels impact the probability of successful performance. As the present research requires the simultaneous evaluation of mediation (gender → skills → performance) and considering country specificity via polygroup moderation, PLS-SEM provides the flexibility to complete Multi-Group Analysis (MGA) to compare path coefficients across Kazakhstan and Hungary without the strict distributional requirements of other methods (Henseler et al., 2016).

The data obtained were further statistically analyzed with Python 3.12 (utilizing Pandas, SciPy, and Scikit-learn libraries). The analysis followed a two-stage approach: evaluation of the measurement model and evaluation of the structural model. To evaluate the measurement model, reliability was confirmed via Cronbach's alpha ( $\alpha > 0.72$ ) and Composite Reliability (CR  $> 0.87$ ). Convergent validity was established with Average Variance Extracted (AVE) values exceeding 0.70 and factor loadings surpassing the 0.74 threshold. Discriminant validity was verified using the Fornell-Larcker criterion, where the square root of the AVE for each construct exceeded its correlation with other variables.

Evaluation of the structural model resulted in testing the significance of the paths based on a non-

parametric bootstrapping procedure with 5,000 iterations to ensure stable confidence intervals. Model fit was assessed through McFadden's  $R^2$  (0.219), which indicates an excellent level of fit for logistic models. Multicollinearity was ruled out as all Variance Inflation Factors (VIF) were below 1.31. Finally, robustness checks, including outlier removal and sub-sample stability tests, further validated the findings.

### 3. RESULTS

The initial analysis revealed that managers' performance was balanced across the sample, with 47.1% ( $N = 692$ ) high-performers (Appendix A). Preliminary Chi-square tests indicated that neither gender ( $\chi^2(1) = 3.15, p = 0.076$ ) nor country ( $\chi^2(1) = 1.02, p = 0.313$ ) had a statistically significant relationship with managers' high performance. Chi-square tests demonstrated that the probability of receiving a reward does not depend directly on gender or countries at the basic level. This sample is characterized as representative and robust, with equal representation of groups and free of extreme values beyond the interquartile range. The descriptive statistics are given in Appendix B.

Before testing the hypotheses, the measurement model was evaluated for reliability and validity. The soft and hard skills constructs demonstrated strong internal consistency (Table 3).

In compliance with Table 3, Cronbach's alpha ( $\alpha$ ) values ranged from 0.724 to 0.785, and Composite Reliability (CR) values exceeded the 0.70 threshold (0.876–0.879), indicating high reliability. Convergent validity was confirmed, as the Average Variance Extracted (AVE) for both constructs was above 0.70. Furthermore, all factor loadings exceeded the recommended threshold of 0.708, except for prioritizing (0.740), which remained well within the acceptable range.

**Table 3.** Construct reliability, validity, and factor loadings

Construct	Item	Loading	Cronbach's $\alpha$	CR	AVE
Soft skills	Strategic thinking	0.860	0.785	0.876	0.704
	Future orientation	0.909			
	Prioritizing	0.740			
Hard skills	Analytical skill	0.891	0.724	0.879	0.784
	Information gathering	0.880			

**Table 4.** Skills by performance status

Variable	Performance status	N	Mean	SD	t-statistic	df	p-value	Cohen's <i>d</i>
Soft skills	High-performers	692	67.80	7.87	22.048	1,466	< 0.001***	1.153
	Low-performers	776	58.42	8.37				
Hard skills	High-performers	692	70.16	9.00	12.821	1,466	< 0.001***	0.670
	Low-performers	776	63.66	10.29				

Note: \*\*\* $p < 0.001$ ; small ( $d = 0.2$ ), medium ( $d = 0.5$ ), and large ( $d \geq 0.8$ ).

Discriminant validity was established using the Fornell-Larcker criterion, as the square root of the Average Variance Extracted (AVE) for soft skills (0.839) and hard skills (0.885) was found to be substantially greater than the correlation between the two constructs ( $r = 0.485$ ). For preliminary relationships verification, bivariate comparisons were conducted. A comparison of skill levels between high-performers and low-performers uncovered significant differences (Table 4).

Following Table 4, high-performers scored substantially higher on both soft and hard skills in strategic planning. Notably, the effect size for the variations in soft skills was large (Cohen's  $d = 1.153$ ), while the effect for hard skills was medium ( $d = 0.670$ ), providing initial evidence for the primary hypothesis ( $H3$ ) that soft skills are more strongly associated with outstanding managers' performance (Ferguson, 2009). The correlation matrix of relationships between different constructs is placed in Appendix C.

The structural model was evaluated using PLS-SEM to assess the complex relationships between gender, competencies, and high performance. Since the primary outcome variable (performance) is binary, the analysis integrated linear regression to estimate the paths from gender to skills (a-paths) and logistic regression to determine the

influence of skills on the probability of receiving an award (b-paths). The analysis of gender differences in competencies revealed that gender does not significantly predict skill levels (Table 5).

Following Table 5, women scored 0.125 points higher on the raw soft skills scale from 0 to 100, but this difference is not statistically significant ( $p = 0.800$ ). Gender explains < 0.01% of the variance in soft skills. Similarly, men scored marginally higher on hard skills ( $-0.200$ ), but this result also failed to reach significance ( $p = 0.714$ ). Consequently,  $H1$  and  $H2$  were not supported by research evidence.

For testing  $H3$ , a logistic regression was applied. Both soft and hard skills were significant predictors of winning an award ( $p < 0.001$ ), but their impact differed substantially (Table 6).

Thus, soft skills emerged as the dominant predictor with a standardized  $\beta = 1.235$  and an Odds Ratio (OR) of 3.440. This indicates that a one-standard-deviation increase in soft skills is associated with a 244% increase in the odds of receiving an award. Hard skills had a comparatively smaller effect ( $\beta = 0.316$ ; OR = 1.371), representing a 37.1% increase in odds. Ultimately, soft skills were found to be 2.5 times more effective than hard skills in predicting professional success.

**Table 5.** Results of H1 and H2 testing

Parameter	Value	SE	t-statistic	p-value	95% CI
<b>Gender → Soft skills (H1)</b>					
$\beta$ (unstandardized)	0.125	0.493	0.253	0.800	[-0.826, 1.106]
$R^2$	0.0000	–	–	–	–
$f^2$	0.0000	–	–	–	–
<b>Gender → Hard skills (H2)</b>					
$\beta$ (unstandardized)	-0.200	0.545	-0.367	0.714	[-1.298, 0.820]
$R^2$	0.0001	–	–	–	–
$f^2$	0.0001	–	–	–	–

Note: \* $p < 0.001$ . 95% CI = 95% confidence interval. Statistical significance is indicated by confidence intervals that do not include zero.

**Table 6.** Testing H3

Predictor	$\beta$ (standardized)	SE	Wald $\chi^2$	p-value	OR	95% CI for OR
Soft skills	1.235	0.081	232.73	< 0.001***	3.440	[2.933, 4.036]
Hard skills	0.316	0.072	19.22	< 0.001***	1.371	[1.191, 1.580]
Intercept	-0.181	0.052	12.10	< 0.001***	0.835	[0.754, 0.925]

Note: \* $p < 0.001$ . 95% CI = 95% confidence interval. Statistical significance is indicated by confidence intervals that do not include zero.

The statistical quality of the structural model was evaluated using several key fit indices:  $-2$  Log likelihood, McFadden  $R^2$ , Cox & Snell  $R^2$ , and Nagelkerke  $R^2$ .  $-2$  Log likelihood (1,586.34): indicates that the model's predictions align well with the observed data. In the context of logistic regression, McFadden  $R^2$  of 0.219, which is between 0.20 and 0.40, is considered an indicator of excellent model fit. This value confirms that soft and hard skills assure a highly robust explanation of the variance in performance outcomes. The values of Cox & Snell  $R^2$  (0.276) and Nagelkerke  $R^2$  (0.368) significantly exceed their respective appropriate thresholds ( $> 0.10$  for Cox & Snell and  $> 0.25$  for Nagelkerke), further validating the excellent explanatory power of the research model. Collectively, these indices demonstrate that the model is statistically rigorous and reliable.

**Table 7.** Classification table

Observed	Predicted NO	Predicted YES	Accuracy
NO (776)	563	213	72.6%
YES (692)	194	498	72.0%
Overall			72.3%

When combined with the overall classification accuracy of 72.3% – which represents a 19.4 percentage point improvement over the baseline – these fit statistics confirm that the model provides a definitive and cross-culturally valid test of the factors influencing outstanding managers' performance (Table 7).

Statistical significance was assessed using a non-parametric bootstrapping procedure with 5,000

iterations, providing stable 95% confidence intervals (CI) and depicted in Table 8.

Following Table 8, the bootstrap 95% confidence intervals (CI) for both soft skills [1.081, 1.405] and hard skills [0.181, 0.465] entirely exclude zero, providing definitive statistical confirmation of their positive and significant influence on award attainment. The stability of these intervals across thousands of resamples underscores the robustness of the model and ensures that the observed effects are not driven by sample-specific outliers. Furthermore, the clear separation between the intervals, where the lower bound for soft skills (1.081) remains substantially higher than the upper bound for hard skills (0.465), ensures additional empirical weight to the conclusion that soft skills are the primary driver of excellent performance. Combined with a post-hoc statistical power exceeding 0.999 for these effects, these bootstrap results confirm that the findings represent a highly reliable and definitive test of the relative importance of these competencies.

For testing  $H5$ , age was integrated into the structural model as a control variable to determine whether it confounded the relationships between strategic planning competencies and high-performance status. The results, summarized in Table 9, indicate that age has a negligible impact on managers' performance in the sample examined. The inclusion of age did not significantly improve the model fit, as evidenced by a non-significant change in the  $-2$  Log Likelihood ( $\Delta\chi^2(1) = 0.12$ ,  $p = 0.729$ ) (Hosmer et al., 2013).

**Table 8.** Bootstrap confidence intervals for H3

Predictor	$\beta$	Bootstrap SE	Bootstrap 95% CI
Soft skills	1.235	0.082	[1.081, 1.405]
Hard skills	0.316	0.073	[0.181, 0.465]

Note: \* $p < 0.001$ . 95% CI = 95% confidence interval. Statistical significance is indicated by confidence intervals that do not include zero.

**Table 9.** Model comparison for confounding effects for testing H5

Model	-2 Log likelihood	McFadden R <sup>2</sup>	Predictor	β (Std)	p-value	OR (95% CI)
Model 1 (Base)	1,586.34	0.219	Soft skills	1.235	< 0.001	3.44 (2.93, 4.04)
			Hard skills	0.316	< 0.001	1.37 (1.19, 1.58)
Model 2 (+ Age)	1,586.22	0.219	Soft skills	1.237	< 0.001	3.44 (2.94, 4.04)
			Hard skills	0.317	< 0.001	1.37 (1.19, 1.58)
			Age	0.018	0.728	1.02 (0.92, 1.13)

Note: Model comparison:  $\Delta\chi^2(1) = 0.12$ ,  $p = 0.729$ .

In compliance with Table 9, the standardized coefficient for age appeared to be trivial ( $\beta = 0.018$ ,  $p = 0.728$ ) with an Odds Ratio (OR) of 1.019. This indicates that for every one-standard-deviation increase in age, the odds of high-performance increase by a mere 1.9%, compared to the 244% increase associated with soft skills (Ferguson, 2009). Crucially, the coefficients and significance levels for soft and hard skills remained virtually unchanged after controlling for age, confirming that the primary relationships are robust and age independent. Therefore, H5 is supported, as age does not confound the studied link between strategic planning competence and managers' performance. The details of effect size comparisons are provided in Appendix D.

Following the assessment of direct hypotheses, a mediation analysis was conducted to determine if gender exerts an indirect influence on professional success through the acquisition of soft or hard skills (Table 10). This analysis is crucial for understanding whether gender-based differences in performance might be "hidden" within the development of specific competencies.

The results depicted in Table 10 indicate that while competencies are critical predictors of success,

they do not function as mediators for gender. The unstandardized coefficient (Table 5) was 0.125, corresponding to a standardized path coefficient of 0.013 (Table 10). The total effect of gender on receiving an award is statistically non-significant ( $\beta = 0.095$ ,  $p = 0.362$ ), and this lack of significance persisted even after accounting for skills in the model (direct effect:  $\beta = 0.134$ ,  $p = 0.201$ ). Analysis of indirect effects using 5,000 bootstrap iterations confirmed the absence of mediation: the 95% confidence intervals for paths through soft skills [-0.115, 0.138] and hard skills [-0.039, 0.033] included zero. Ultimately, the proportion of mediation was found to be a negligible 5.4%, which is classified as a weak or minimal effect. These findings reinforce the results of hypothesis verification: managers' high performance is driven by competency levels that are distributed evenly between men and women.

To test H4, a multi-group analysis was conducted to determine whether the relationships in the model varied significantly between Kazakhstan and Hungary cohorts (Table 11). The analysis specifically differentiated between the influence of gender on skill acquisition (a-paths) and the influence of those skills on the likelihood of high performance (b-paths). The coefficients in Table

**Table 10.** Standardized path coefficients and mediation results

Effect type	Path	Coefficient (β)	SE	p-value / 95% CI
Direct paths	Gender → Soft skills ( $\alpha_1$ )	0.013	0.051	$p = 0.800$
	Gender → Hard skills ( $\alpha_2$ )	-0.011	0.051	$p = 0.714$
	Soft Skills → high performance ( $b_1$ )	1.235	0.081	$p < 0.001^{***}$
	Hard skills → high performance ( $b_2$ )	0.316	0.072	$p < 0.001^{***}$
Overall effects	Total effect (c)	0.095	0.104	$p = 0.362$
	Direct effect (c')	0.134	0.105	$p = 0.201$
Indirect (bootstrap)	Gender → soft skills → high performance	0.008	0.064	[-0.115, 0.138]
	Gender → hard skills → high performance	-0.003	0.018	[-0.039, 0.033]
Summary	Total indirect effect	0.005	0.067	[-0.125, 0.141]

Note: \* $p < 0.001$ . 95% CI = 95% confidence interval. Statistical significance is indicated by confidence intervals that do not include zero.

**Table 11.** Multi-group comparison by country

Path	Kazakhstan (n=694)	Hungary (n=774)	Comparison
Gender → Soft skills	$\beta = 1.311$ (SE = 0.710) $p = 0.064$ †	$\beta = -0.969$ (SE = 0.686) $p = 0.140$	$\Delta\beta = 2.280$ ; $Z = 2.362$ ; $p = 0.018^*$
Gender → Hard skills	$\beta = 0.577$ (SE = 0.795) $p = 0.459$	$\beta = -0.871$ (SE = 0.741) $p = 0.235$	$\Delta\beta = 1.448$ ; $Z = 1.322$ ; $p = 0.186$
Soft skills → High performance	$\beta = 1.320^{***}$ (OR = 3.743)	$\beta = 1.152^{***}$ (OR = 3.163)	$\Delta\beta = 0.168$
Hard skills → High performance	$\beta = 0.44^{***}$ (OR = 1.567)	$\beta = 0.216^*$ (OR = 1.241)	$\Delta\beta = 0.233$

Note: † $p < 0.10$ , \* $p < 0.05$ , \*\*\* $p < 0.00$ ; standard errors (SE) are provided for linear paths; OR are provided for logistic paths predicting high achievement status; coefficients represent unstandardized linear paths calculated for each country subsample.

11 represent unstandardized paths within each country's subsample, explaining why they differ in magnitude from the aggregate standardized effects reported in Table 10.

In compliance with Table 11, the path coefficient for Gender → Soft skills differed significantly between the two cohorts ( $\Delta\beta = 2.280$ ,  $Z = 2.362$ ,  $p = 0.018$ ), with women in Kazakhstan showing a marginally higher tendency toward soft skills ( $\beta = 1.311$ ,  $p = 0.064$ ) compared to their Hungarian counterparts ( $\beta = -0.969$ ,  $p = 0.140$ ) (Henseler et al., 2016). In contrast, the Soft skills → High performance path remained highly significant and positive across both nations ( $p < 0.001$ ), with soft skills increasing the odds of success by 274% in Kazakhstan (OR = 3.743) and 216% in Hungary (OR = 3.163) (Ferguson, 2009). Therefore,  $H4$  was partially supported, revealing that while cultural context significantly shapes the relationship between gender and soft skills, it does not moderate the impact of those skills on managers' high performance. The model quality by country and descriptive statistics by country are placed in Appendix E.

The final stage of the analysis involved a comprehensive evaluation of the model's predictive accu-

racy and statistical fit. As summarized in Table 12, the structural model demonstrates excellent quality across all primary indices. The logistic regression model achieved a McFadden of 0.219 and a Nagelkerke of 0.368, both of which significantly exceed the established thresholds for excellent fit in behavioral research (Hosmer et al., 2013).

As shown in Table 12, the model's practical utility is further evidenced by its classification performance. The overall predictive accuracy of 72.3% represents a 19.4 percentage point improvement over the 52.9% baseline. Notably, the model maintained high balanced performance, with a sensitivity of 72.0% for identifying high-performers and a specificity of 72.6% for low performers.

Beyond fit indices, the model passed all diagnostic checks for robustness and validity. Variance Inflation Factors (VIF) for all predictors were below 1.31, confirming the absence of multicollinearity. Additionally, the Hosmer-Lemeshow test ( $\chi^2 = 11.24$ ,  $p = 0.188$ ) indicated a good match between observed and predicted frequencies, and residual analysis showed no influential outliers (Maximum Cook's D = 0.043). These combined results provide a rigorous statistical validation of the findings, ensuring the model is stable, cross-

**Table 12.** Overall model fit and classification accuracy

Index category	Measure	Value	Threshold/ benchmark
Model fit	McFadden $R^2$	0.219	(> 0.20)
	Cox & Snell $R^2$	0.276	(> 0.10)
	Nagelkerke $R^2$	0.368	(> 0.25)
Classification	Overall accuracy	72.3%	52.9% (Baseline)
	Sensitivity/specificity	72.0% / 72.6%	(> 70%)
Linear paths	$R^2$ (Soft skills)	0.0000	$\geq 0.01$ (Small)
	$R^2$ (Hard skills)	0.0001	$\geq 0.01$ (Small)

Note: Thresholds for fit indices are based on established benchmarks for logistic regression in behavioral research (Hosmer et al., 2013).

culturally valid, and age-independent (Hosmer et al., 2013). Effect sizes summary (Ferguson, 2009), multicollinearity check, residual analysis, and robustness check are presented in Appendix F.

## 4. DISCUSSION

The findings provided inferences of what constituted the most valuable skills for managers' performance, validated by the results, and proposed new insights on gender and managers' competencies in emerging economies, contributing to the resource-based view theory (Barney, 1991). Therefore, these results assist in filling the knowledge gap, detected in the recent international research (Kero & Bogale, 2023; Mailani et al., 2024; Rumangkit & Prabowo, 2024).

The use of AI business simulation played a crucial role in ensuring data purity and objectivity, which allowed us to call the results a robust test of the managers' skills' significance. Thus, the AI simulation shifted the research from theoretical assumptions to the field of strict statistical validation, providing unbiased data, resistant to outliers and external interference. This ensures that the data reflect the managers' real competencies displayed during the simulation, rather than their own opinion or their colleagues', supervisors', or subordinates' views of them. Considering the scarcity of this tool application in strategic planning research (Dhlamini, 2026) and a leadership and gender meta-analyses (Paustian-Underdahl et al., 2024), this work provides an alternative to research grounded on the conventional and popular instruments.

The most meaningful result is the empirical identification of soft skills (strategic thinking, future orientation, and prioritizing) as the dominant driver of high professional performance. Hypothesis 3 was strongly supported, revealing that soft skills are 2.5 times more effective in predicting success than hard skills (OR 3.44 vs 1.37). This identifies soft skills as the most valuable and inimitable resource, providing a significantly higher increase in the odds of high performance (244%) compared to hard skills (37%). These findings bring new insights not only into RBVT but also into strategic planning studies that lacked a solid foundation

for defining whether soft or hard skills represent the most crucial condition for strategic planning effectiveness (Dhlamini, 2025). The results obtained are consistent with the inferences of Kula and Naktiyok (2021) and Rodrigues et al. (2023) regarding the crucial role of strategic thinking in companies' and leaders' performance. However, the present study provides more insight since, along with strategic thinking marked in earlier studies, future orientation and prioritizing skills are defined as statistically significant.

Testing Hypotheses 1, 2, and 5 resulted in the identification of the obtained results' universal distribution and talent accessibility. Hypothesis 1 about female managers' higher inclination to soft skills and Hypothesis 2 about male managers' more advanced hard skills were rejected since the profound analysis elucidated no significant gender peculiarities. The result states that the strategic competency resource is gender-neutral, debunking common stereotypes. The revealed discrepancy between the scientific forecasting and the factual result is obviously rooted in the method used, since almost all of the earlier research was conducted with the most popular and classical toolkit – surveys and interviews (Laidoja et al., 2022; Ledi et al., 2024; Lichtarski et al., 2025; Mynbayeva et al., 2024). This often engendered biased inferences triggered by gender stereotypes, in-group bias, and out-group prejudice (Brewer, 2007). This finding is supported by a series of meta-analyses on leadership and gender, where raters often overestimate representatives of one or another due to some psychological or social reasons. Thus, women were often rated higher by their leadership skills in developed countries, obviously because of the social demand to exhibit gender egalitarian views (Paustian-Underdahl et al., 2024). In support of the argument above, the result aligns with a recent study on leadership competencies and gender, based on an AI simulation (Lipovka et al., 2025).

The research revealed that managers' performance is not age contingent; consequently, *H5* was supported. Age exerted a negligible effect on managers' goal attainment (OR = 1.02,  $p = 0.728$ ), meaning the value of these strategic resources remains stable across a manager's career lifespan. This result complies with the preceding massive studies among Northern European executives from

private businesses by Archer et al. (2015) and a Kazakhstani study of the agricultural enterprises (Aukenov et al., 2025). The identified insignificance supports the idea that the study of age as a united construct does not demonstrate statistical significance, whereas age could be more visible in precise relationships between each group and the dependent variable (Ribera et al., 2021).

Hypothesis 4 was partially supported since the country context significantly moderated the relationship between gender and soft skills (the a-path,  $p = 0.018$ ), and simultaneously it did not moderate the link between skills and managers' performance. The defined result indicates that while the pathway to developing a resource might be culturally contingent, the strategic value of the resource itself is universal, as the model performed with consistent accuracy in both Kazakhstan and Hungary (72.9% vs. 72.4%). Managers in

Kazakhstan exhibited a higher average level of soft skills compared to managers in Hungary, and no significant difference was found in hard skill levels between the two nations. This indicates that the professional environment or the management training system in Kazakhstan can contribute to a more pronounced development of skills such as strategic thinking and future orientation. Although the general model of success is universal for both countries, there are important details. In Kazakhstan, the cultural context moderates the relationship between gender and the acquisition of soft skills more strongly than in Hungary. Thus, this finding is in line with the earlier comparative study where the Kazakhstani subsample showed a stronger moderating effect of leadership competences in comparison with Hungary (Lipovka et al., 2025) explained by a rather complex country's moderation character reflected in previous academic endeavors (Ribera et al., 2021).

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## CONCLUSION

This study aims to examine what managers' skills contribute to strategic planning and whether it impacts leaders' high performance, along with the analysis of gender, country, and age roles in Hungary and Kazakhstan.

The findings revealed that soft skills, including strategic thinking, future orientation, and prioritizing, represent the dominant drivers of managerial high performance, being more influential than hard skills such as analytical and information gathering. The study found no significant discrepancy between women and men regarding their competency levels, and professional achievement was found to be age-independent. While the cultural context influenced the relationship between gender and the mastery of soft skills, the key finding regarding the primacy of this type of skill proved to be universal across the examined states.

The results justified that soft strategic competencies of managers in emerging economies constituted the primary human capital assets, guaranteeing a competitive advantage for private enterprises. Furthermore, the research inferences signified that these valuable resources were not restricted by demographic characteristics, suggesting that the pool of high-potential talent was broader than traditional stereotypes suggest. The strategic value of these human resources remains stable across different cultural settings, supporting a universal model of managerial excellence. The research stands for forming a talent pool and succession planning without preferences for demographic characteristics and a focus on deeply diagnosing soft competencies in managers' hiring, assessment, and promotion.

## AUTHOR CONTRIBUTIONS

Conceptualization: Anastassiya Lipovka, Zoltan Buzady.  
 Data curation: Zoltan Buzady, Kuanysh Abeshev.  
 Formal analysis: Anastassiya Lipovka, Kuanysh Abeshev.  
 Funding acquisition: Anastassiya Lipovka.

Investigation: Zoltan Buzady.

Methodology: Anastassiya Lipovka, Zoltan Buzady.

Project administration: Anastassiya Lipovka.

Resources: Anastassiya Lipovka, Zoltan Buzady, Kuanysh Abeshev.

Software: Kuanysh Abeshev.

Supervision: Zoltan Buzady.

Validation: Kuanysh Abeshev.

Visualization: Kuanysh Abeshev.

Writing – original draft: Anastassiya Lipovka.

Writing – review & editing: Anastassiya Lipovka, Zoltan Buzady, Kuanysh Abeshev.

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## APPENDIX A

**Table A1.** Sample distribution

Variable	Category	N	Percentage
Gender	Female	733	49.9%
	Male	735	50.1%
Country	Kazakhstan	694	47.3%
	Hungary	774	52.7%
Performance	High	692	47.1%
	Low	776	52.9%
Total		1,468	100.0%

**Table A2.** Performance distribution by demographics

Demographic	Group	High performance	Normal performance	Total	% high performers
Gender	Female	363	370	733	49.5%
	Male	329	406	735	44.8%
Country	Kazakhstan	317	377	694	45.7%
	Hungary	375	399	774	48.4%

## APPENDIX B

**Table B1.** Skills composites, overall sample

Indicator	Count	Mean	Min	25%	50%	75%	Max	Std
Strategic thinking	1,468	63.08	22	56	63	71	100	11.52
Future orientation	1,468	68.23	20	61	68	75	100	11.09
Information gathering	1,468	69.79	10	63.75	70	77	95	11.28
Prioritizing	1,468	57.22	17	50	58	63.25	85	11.04
Analytical skill	1,468	63.66	19	56	63	71.5	94	11.83
Female	1,468	0.50	0	0	0	1	1	0.50
Hungary	1,468	0.53	0	0	1	1	1	0.50
Kazakhstan	1,468	0.47	0	0	0	1	1	0.50
Age	1,468	35.24	18	26	35	43	64	10.23

## APPENDIX C

**Table C1.** Correlation matrix

	1	2	3	4	5	6	7	8	9	10
1. Gender (Female = 1)	1.000									
2. Age	-.034	1.000								
3. Strategic thinking	.010	-.013	1.000							
4. Future orientation	.021	.001	.777***	1.000						
5. Prioritizing	-.001	-.022	.368***	.501***	1.000					
6. Analytical skill	-.015	-.019	.373***	.395***	.237***	1.000				
7. Information gathering	-.007	-.007	.395***	.415***	.354***	.568***	1.000			
8. Soft Skills	.013	-.013	.860***	.909***	.740***	.415***	.454***	1.000		
9. Hard Skills	-.011	-.014	.425***	.453***	.332***	.891***	.880***	.485***	1.000	
10. High performance	.046	.012	.373***	.490***	.391***	.277***	.285***	.499***	.318***	1.000

Note: \*\*\*p < .001.

## APPENDIX D

**Table D1.** Effect size comparison

Predictor	OR	% Change in Odds	Practical Interpretation
Soft skills (1 SD)	3.440	+244.0%	Odds of winning increase by 244%
Hard skills (1 SD)	1.371	+37.1%	Odds of winning increase by 37%
Age (1 SD)	1.019	+1.9%	Odds of winning increase by 1.9%

## APPENDIX E

**Table E1.** Model quality by country

Country	Accuracy	McFadden R <sup>2</sup>	-2LL
Kazakhstan	72.9%	0.229	867.45
Hungary	72.4%	0.211	717.32

**Table E2.** Descriptive statistics by country

Variable	Kazakhstan (n = 694)	Hungary (n = 774)	t-test	p-value	Cohen's d
Soft skills					
Mean (SD)	63.46 (9.77)	62.22 (9.50)	2.449	0.014*	0.128
Hard skills					
Mean (SD)	67.02 (10.21)	66.47 (10.02)	1.040	0.299	0.055
Age	35.81 (9.93)	35.08 (9.82)	1.417	0.157	0.074
High performers (%)	45.7%	48.4%	$\chi^2 = 1.02$	0.313	–

Note: \*p < 0.05.

## APPENDIX F

**Table F1.** Summary of standardized effect sizes

Effect	Measure/ Standardized metrics	Value
Gender → Soft skills	Cohen's d	0.013
	R <sup>2</sup>	0.0000
Gender → Hard skills	Cohen's d	–0.020
	R <sup>2</sup>	0.0001
Soft skills → High performance	OR	3.440
	Log OR	1.235
Hard skills → High performance	OR	1.371
	Log OR	0.316
<b>High performers vs low performers</b>		
Soft skills difference	Cohen's d	1.153
Hard skills difference	Cohen's d	0.670

Note: small (d = 0.2), medium (d = 0.5), and large (d ≥ 0.8); OR benchmarks: 1.5 (small), 2.5 (medium), 4.0 (large).

**Table F2.** Variance inflation factors (multicollinearity check)

Predictor	VIF	Tolerance
Soft skills	1.308	0.765
Hard skills	1.308	0.765
Age	1.002	0.998

Note: VIF < 3.0 (acceptable), VIF < 5.0 (tolerable).

**Table F3.** Residual analysis (Logistic regression)

Diagnostic	Value	Threshold
Hosmer-Lemeshow Test	$\chi^2(8) = 11.24$	$p > .05$
p-value	0.188	
Maximum Cook's D	0.043	< 1.0
% cases with	residual	> 2

**Table F4.** Robustness checks

Analysis	Result
Bootstrap validation	5,000 iterations; CIs stable
Outlier removal	Removing top/bottom 1% → $\beta$ changes < 0.05
Country subsamples	Both show Soft > Hard pattern
Age quartiles	Pattern consistent across age groups