International Journal of Industrial Engineering and Operational Research (IJIEOR)

Contents lists available at IJIEOR
International Journal of Industrial Engineering and Operational Research
journal homepage: http://ijieor.ir
Volume 5, No. 5, 2023

A Model for Talent Discovery and Recruitment Management in Banks Using Artificial Intelligence

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ARTICLE INFO

Received: 2023/08/15

Revised: 2023/10/22

Accept: 2023/12/09

Keywords:

Talent Discovery, Recruitment Management, Artificial Intelligence, Bank.

ABSTRACT

The importance of using artificial intelligence in human resource management is an undeniable issue, and therefore, over time, most human resource managers will turn to using this technology, but the model of using artificial intelligence for talent discovery and hiring management is not yet clear for some organizations, and banks are no exception either. Therefore, in this research, a qualitative quantitative model has been designed for talent discovery and recruitment management in banks using artificial intelligence. At first, using a literature review, 65 factors constituting talent discovery and hiring management were obtained, and then using the Delphi technique, these 65 factors were reduced to 57 factors, validation of related factors was done and it was shown that all factors in the banking content have credibility. Finally, nine main dimensions for the talent discovery model and AI-based hiring management were identified in the banking industry, including cultural, human resources, and strategic managerial, individual, business, social, organizational and occupational dimensions.

1. Introduction

The use of artificial intelligence in human resource management has increased significantly in recent years. Modern digital technologies have challenged the traditional practices of human resource management in the past few years, making them obsolete (Chen, 2023). The reality is that many people are recruited and recruited by different organizations every year without the talent and qualities they need to hire. The situation is more acute in third world countries where the needs

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Available online 12/09/2023
2676-3311/BGSA Ltd.

for jobs is considered a primary need and human beings are given jobs that provide their basic necessities (Rogers et al., 2023).

Hiring people who are not qualified and talented for the given job is always a big challenge for organizations. On the other hand, traditional approaches to recruitment and recruitment do not allow organizations to find talent and recruit the right people for the desired job (Francha et al., 2023). However, artificial intelligence techniques that have always shown good performance in the field of prediction and classification of information can be used in this field (Gang et al., 2022).

In the meantime, previous researches, which have a relatively high volume, have focused on artificial intelligence and human resources, but their main focus has been on examining components rather than presenting models. The need to present a model of the use of artificial intelligence in human resource management is a necessity. On the other hand, research is focused on one aspect of talent discovery and hiring management, and rarely both issues have been addressed simultaneously, which can be considered as a vacuum given the current needs of organizations for talent discovery and recruitment management simultaneously.

Banks as organizations that need talented and capable people need people with special characteristics, e.g. calculation, high tolerance and personality associated with this job are important characteristics that a bank employee should have. Therefore, it can be said that any organization needs to hire people according to its specific characteristics, and banks are no exception. However, the research does not provide an artificial intelligence-based model for talent discovery and hiring management in banks, and this can seriously increase the research gap.

According to the abovementioned items, the present research seeks to solve the above research gaps by providing a model for talent discovery and recruitment management in banks with a focus on artificial intelligence. For this purpose, a mixed approach is used in the present study which includes a combination of literature review, interviews with experts, Delphi approach and t-test to validate the factors that make up the model. This article, first, reviews the literature identifies research gaps and then presents the research method. After that, the analysis of the information is performed and the conclusion will be described.

2. Literature Review

In this section, we are trying to present similar research to the current research in the field of using artificial intelligence in talent discovery and hiring management. Research is mainly from the last 4 years and focuses on talent discovery and recruitment management in different organizations. Abraham and Hussein (2019) examine the Trends in employment in the age of the 4th generation industry using artificial intelligence and Supporters and opponents are dissenting. Guanzalez et al (2019) put researched the usage of artificial intelligence in talent discovery management. Pillay and Sivatano (2020) consider adopting artificial intelligence for talent acquisition in IT-based organizations. Elam et al. (2020) consider the intentions of human resource specialists in adopting and using artificial intelligence in talent placement. Larium et al. (2021) define recruitment acceptance criteria using artificial intelligence in the process and they identify the workforce. Frij and Lazlo (2021) examine the effect of AI on the hiring process. Pan et al. (2021) adopt artificial intelligence in hiring employees and examine the effect of thematic factors.

Gang et al. (2022) designed the interactive performance of an AI-based human resource management system. Islam et al. (2022) explore the use of artificial intelligence for employment in Bangladesh. Rogers et al. (2023) use an algorithmic AI approach to make ethical decisions in the human resource management process. Tai and Potel (2023) focus on the utilization of artificial intelligence in the field of recruitment of employees. Raj and Prabhavi (2023) explore the future of talent acquisition with the help of artificial intelligence. Faghihi and Miah (2023) explore the AI-based talent management system and explore the risks and options for creating a theoretical basis for such a system. Vedaparada et al. (2023) use AI to manage hiring. Francha et al. (2023) use artificial intelligence to assess and recognize talent in organizations. They use. Chen (2023) presents a model for collaboration between AI and human recruiters to reduce human bias in hiring.

As can be seen, most of the research on the use of artificial intelligence in human resource management especially talent discovery and recruitment has been presented. This research has all been done with a focus on artificial intelligence, but it is rare to find a model based on artificial intelligence for talent acquisition and discovery, as well as recruitment.

Table 1: Literature Review

References	Years	Goal	Talent Discovery	Employment Management	Artificial Intelligence	Conceptual model
Abraham and Hussein	2019	Investigating the recruitment trends in the fourth generation industry age using artificial intelligence		✓	✓	
Gonzalez et al	2019	Investigating the application of artificial intelligence in talent management policies	✓		✓	
Pillai and Sivatano	2020	Adopting artificial intelligence for talent acquisition in it-based organizations	✓		✓	
Science et al.	2020	The intention of human resources specialists in adopting and using artificial intelligence in talent recruitment	✓		✓	
Larium et al	2021	Identification of acceptance criteria in employment using artificial intelligence		✓	✓	
Frige and Laszlo	2021	Investigating the effect of artificial intelligence on recruitment process		✓	✓	

References	Years	Goal	Talent Discovery	Employment Management	Artificial Intelligence	Conceptual model
Pan et al	2021	Adopting artificial intelligence in employing employees		✓	✓	
Gang et al	2022	Interactive performance design of human resource management system based on artificial intelligence		✓	✓	
Islam et al.	2022	Artificial intelligence for employment in bangladesh		✓	✓	
Rogers et al	2023	Using an algorithmic approach of artificial intelligence for ethical decision making in human resource management process			✓	
Tai and Patal	2023	Artificial intelligence in the recruitment process		✓	✓	
Raj and Berabadui	2023	Exploring the future of talent acquisition with the help of artificial intelligence	✓		✓	
Faqih and Miah	2023	Investigating the artificial intelligence based talent management system	✓		✓	

References	Years	Goal	Talent Discovery	Employment Management	Artificial Intelligence	Conceptual model
Vedaparada et al	2023	Using artificial intelligence to manage recruitment		✓	✓	
Francha et al	2023	Using artificial intelligence to assess and recognize talent in an organization	✓		✓	
Chen	2023	A model for collaboration between ai and human recruiters to reduce human bias in hiring		✓	✓	✓
Present Research		A model for talent discovery and recruitment management in banks using artificial intelligence	✓	✓	✓	✓

The only model is Chen's (2023) research, which provides a model for collaboration between artificial intelligence and human recruiters to reduce human bias in hiring. In other research, the conceptual model is not presented by the researchers and only focuses on the study of quantitative components and approaches. Another point about the research that indicates the gap in the present research is the lack of attention to the combination of talent discovery and hiring management. Since these two components are related to each other and the isolated attention to them can lead to defects in the research and obtain incorrect results, therefore, it seems that presenting a model that combines both talent discovery and hiring management can provide better results. Another argument that suggests the research gap is that among the above research, none of them has been done with a focus on the banking industry and indeed banking institutions, which can be considered

an important study vacuum due to the importance of recruitment and talent discovery in these types of organizations, which the present research seeks to fill this gap.

3. Research Method

The presented study is applied in terms of purpose and terms of data collection is descriptive-analytical. The research is of a qualitative type. The method of collecting information is field and library together. First, using library studies, the factors affecting talent discovery and recruitment management are identified and then by using the Delphi approach, these factors are adapted according to the needs of artificial intelligence. In the next step, by using interviews with experts, the factors which can be added to these factors are determined and in this way, semi-structured interviews are used. Then, using the T-test, the extracted factors are validated based on the needs of the studied banking system and finally the final factors will be explained as the final conceptual model of talent discovery and recruitment management in banks.

The statistical population of the present study includes all experts, experts and human resources managers in the banking system across the city of Tehran, who should be familiar with the concepts of artificial intelligence and its applications. For sampling, the snowball method is used, so that after interviewing the first person, they are asked to introduce another person who is an expert in this field for the interview, and this work continues to the extent that theoretical saturation is achieved.

The data collection tools in this research include documents, articles and books in the field of talent identification talent discovery and hiring management, as well as a semi-structured interview, Delphi questionnaire and a Likert scale questionnaire. The validity of the questionnaires is measured by content validity and its reliability is measured using Cronbach's alpha test. Data analysis using the Delphi method for screening identified factors and also the t-test is performed in SPSS software. The steps of conducting research are as follows:

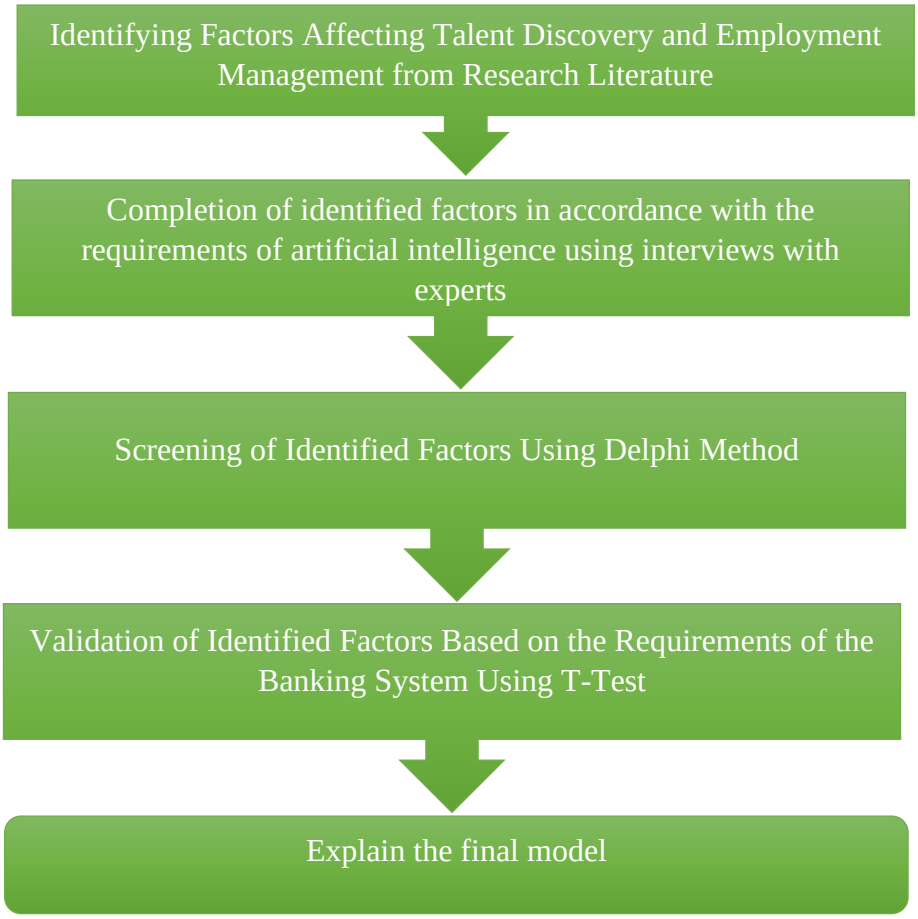

Figure 1: Stages of Research

4. Data Analysis

In this section, data analysis is discussed. In the first step, using a literature review, the factors affecting talent discovery and recruitment management were presented in different research and also models were extracted. The relevant factors are merely general to this subject and in the next steps, it should be screened and validated according to the scope of the study. Based on the literature review, the following factors have been obtained.

Table 2: Factors Affecting Talent Discovery and Hiring Management

Row	Factors	References
1	Shayesteh parvari	Ahmadi et al. (2017)
2	Worthy of selection	Ahmadi et al. (2017)
3	Decentralization	Ahmadi et al. (2017)
4	Engagement	Roshan et al. (2020)

Row	Factors	References
5	Maintenance	Roshan et al. (2020)
6	Creating a talent tank	Roshan et al. (2020)
7	Job market	Roshan et al. (2020)
8	Identify key posts	Roshan et al. (2020)
9	Substitute breeding	Roshan et al. (2020)
10	Talent recovery	Roshan et al. (2020)
11	Discover and identify source of talent	Iqbal et al. (1395)
12	Strategic use of talent	Iqbal et al. (1395)
13	Talent deployment	Koohi Khoor et al. (2020)
14	Cognitive skills	Hassanpour et al. (2016)
15	Human capital	Hassanpour et al. (2016)
16	Social capital	Hassanpour et al. (2016)
17	Kind of looking at things.	Hassanpour et al. (2016)
18	Appearance properties	Hassanpour et al. (2016)
19	Alignment with human resources practices	Parrish et al. (2018)
20	Alignment with business strategy	Parrish et al. (2018)
21	Mindset and culture of talent	Parrish et al. (2018)
22	Providing the required manpower	Parrish et al. (2018)
23	Talent relations management	Parrish et al. (2018)
24	Transparent vision	Parrish et al. (2018)
25	Strategies	Parrish et al. (2018)
26	Career path management	Parrish et al. (2018)
27	Globalization of the economy	Parrish et al. (2018)
28	Demographic trends	Parrish et al. (2018)
29	Global development plans	Parrish et al. (2018)
30	Relative advantage	Penn et al. (2022)
31	Complexity	Penn et al. (2022)
32	Company size	Penn et al. (2022)
33	Ability key	Penn et al. (2022)
34	Rules	Penn et al. (2022)
35	Omar company	Penn et al. (2022)

Row	Factors	References
36	Human resource department size	Penn et al. (2022)
37	The role of human resources	Penn et al. (2022)
38	Uncertainty	Penn et al. (2022)
39	Organizational chart	Penn et al. (2022)
40	Teamwork	Penn et al. (2022)
41	Career dynamics	Penn et al. (2022)
42	Job satisfaction	Penn et al. (2022)
43	Worthy of selection	Penn et al. (2022)
44	Teeth	Piansongnern et al. (2011)
45	Sex	Piansongnern et al. (2011)
46	Education	Piansongnern et al. (2011)
47	Organizational culture	Piansongnern et al. (2011)
48	Quality of work life	Piansongnern et al. (2011)
49	Performance management	Piansongnern et al. (2011)
50	Organizational mission	Piansongnern et al. (2011)
51	Appreciation and encouragement	Piansongnern et al. (2011)
52	Job prospects	Piansongnern et al. (2011)
53	Attract	Rustiavan et al. (2023)
54	Planning talent needs	Rustiavan et al. (2023)
55	Talent development	Rustiavan et al. (2023)
56	Choose	Rustiavan et al. (2023)
57	Information and communication management	Rustiavan et al. (2023)
58	Organizational climate	Rustiavan et al. (2023)
59	Empower	Rustiavan et al. (2023)
60	Training and improvement	Rustiavan et al. (2023)
61	Organization leadership	Rustiavan et al. (2023)
62	Strategic placement	Mukurova and Wangi (2013)
63	Commitment of senior management	Mukurova and Wangi (2013)
64	Organization business plan	Mukurova and Wangi (2013)
65	Organizational maturity	Mukurova and Wangi (2013)

As can be seen, 65 variables were extracted from several studies that presented the model in the field of hiring management or employment discovery. In the following, these 65 variables are first sieved by the Delphi technique to investigate their relationship with the discussion of artificial intelligence from the perspective of the experts of the research, and in fact, the Delphi test was done to match the extracted components with the characteristics and characteristics of artificial intelligence in recruitment and T-test is then validated according to the banking theme. At first, the Delphi test is implemented.

Table 3: First stage of the Delphi test

Row	Factors	1	2	3	4	5	6	7	8	9	10	Average
1	Shayesteh parvari	5	8	4	8	4	10	7	4	4	3	5.7
2	Worthy of selection	3	8	9	5	3	7	5	3	6	8	5.7
3	Decentralization	2	4	2	8	4	9	3	2	10	7	5.1
4	Engagement	3	7	9	6	8	9	4	10	9	5	7
5	Maintenance	3	8	4	2	2	1	4	4	8	3	3.9
6	Creating a talent tank	8	3	7	5	10	9	2	1	2	9	5.6
7	Job market	1	7	1	2	5	4	2	8	1	10	4.1
8	Identify key posts	7	7	10	2	2	5	5	7	8	4	5.7
9	Substitute breeding	1	10	8	7	10	3	4	10	5	8	6.6
10	Talent recovery	7	1	4	8	3	1	1	2	6	5	3.8
11	Discover and identify source of talent	4	5	3	8	9	7	6	9	3	6	6
12	Strategic use of talent	10	10	6	10	5	6	9	6	7	8	7.7
13	Talent deployment	5	4	8	1	3	6	5	3	5	3	4.3
14	Cognitive skills	7	9	2	9	6	8	2	10	4	5	6.2
15	Human capital	8	7	1	7	4	6	10	4	10	6	6.3
16	Social capital	2	9	3	2	3	4	10	3	3	4	4.3
17	Kind of looking at things.	5	10	4	1	9	3	7	8	10	4	6.1
18	Appearance properties	6	6	7	6	1	10	9	8	2	10	6.5
19	Alignment with human resources practices	10	7	10	7	6	5	4	3	6	10	6.8

Row	Factors	1	2	3	4	5	6	7	8	9	10	Average
20	Alignment with business strategy	3	5	3	6	5	2	7	3	10	3	4.7
21	Mindset and culture of talent	2	1	2	6	2	3	3	4	3	9	3.5
22	Providing the required manpower	7	1	2	2	3	6	1	7	10	10	4.9
23	Talent relations management	3	10	7	2	10	9	2	9	5	3	6
24	Transparent vision	4	10	1	7	2	2	4	8	7	5	5
25	Strategies	4	5	7	3	10	9	5	8	6	4	6.1
26	Career path management	10	3	10	1	5	1	6	4	8	3	5.1
27	Globalization of the economy	2	6	10	8	5	4	10	7	10	3	6.5
28	Demographic trends	3	8	2	6	4	5	2	10	8	7	5.5
29	Global development plans	9	6	9	4	8	7	3	6	10	3	6.5
30	Relative advantage	9	3	5	4	1	7	4	7	8	9	5.7
31	Complexity	10	10	4	6	8	5	1	7	6	9	6.6
32	Company size	5	8	4	6	4	1	8	4	7	3	5
33	Ability key	7	6	4	1	10	10	5	2	10	10	6.5
34	Rules	8	3	10	4	3	10	9	3	5	10	6.5
35	Omar company	2	1	6	7	3	7	9	3	4	2	4.4
36	Human resource department size	1	9	8	9	10	7	2	7	3	5	6.1
37	The role of human resources	8	3	3	6	8	10	8	7	6	1	6
38	Uncertainty	3	2	1	9	1	4	3	3	4	9	3.9
39	Organizational chart	4	4	8	9	7	10	8	9	4	5	6.8
40	Teamwork	1	10	10	7	1	8	9	7	4	4	6.1
41	Career dynamics	8	5	7	6	2	5	2	1	8	5	4.9
42	Job satisfaction	10	10	1	3	1	5	8	3	8	2	5.1
43	Worthy of selection	9	9	1	6	6	4	5	10	4	6	6
44	Teeth	5	2	4	6	8	2	2	5	7	4	4.5
45	Sex	8	6	4	8	10	1	6	8	10	6	6.7
46	Education	7	4	4	6	5	3	2	7	9	2	4.9

Row	Factors	1	2	3	4	5	6	7	8	9	10	Average
47	Organizational culture	2	6	7	5	8	1	1	4	3	5	4.2
48	Quality of work life	2	3	8	2	9	5	9	1	7	4	5
49	Performance management	7	2	4	7	8	7	6	6	2	7	5.6
50	Organizational mission	4	2	6	1	10	6	3	2	8	4	4.6
51	Appreciation and encouragement	2	10	2	7	1	2	2	1	1	9	3.7
52	Job prospects	4	10	2	8	9	6	4	5	7	1	5.6
53	Attract	6	10	1	10	4	10	3	8	9	4	6.5
54	Planning talent needs	8	2	3	8	4	5	10	8	10	1	5.9
55	Talent development	6	7	4	5	3	5	6	1	6	9	5.2
56	Choose	4	9	2	5	1	5	3	3	2	4	3.8
57	Information and communication management	8	1	7	8	5	1	10	3	9	4	5.6
58	Organizational climate	1	4	7	9	3	10	7	3	8	9	6.1
59	Empower	1	6	1	4	1	5	4	8	3	1	3.4
60	Training and improvement	9	4	7	4	7	8	7	9	10	1	6.6
61	Organization leadership	7	4	3	3	4	3	6	10	1	9	5
62	Strategic placement	4	7	3	5	2	9	10	2	1	8	5.1
63	Commitment of senior management	7	3	1	1	10	7	1	2	7	6	4.5
64	Organization business plan	9	8	7	4	4	9	2	3	3	4	5.3
65	Organizational maturity	10	8	1	9	6	1	6	1	5	1	4.8

In the first stage of Delphi test, the mean of factors was determined based on the mean of ten experts' opinion. In order to investigate the level of agreement between experts based on factors, the second stage of Delphi test should be implemented in the following table.

Table 4: Stage 2 Delphi Test

Row	Factors	1	2	3	4	5	6	7	8	9	10	Average
1	Shayesteh Parvari	4	6	2	6	2	10	6	4	4	3	4.7
2	Worthy of Selection	2	8	7	3	2	6	3	3	4	8	4.6
3	Decentralization	1	2	1	8	2	9	1	1	8	7	4
4	Engagement	2	5	9	5	8	9	2	10	9	3	6.2
5	Maintenance	1	7	3	1	2	1	3	2	6	2	2.8
6	Creating a talent tank	7	3	7	4	9	8	1	1	1	8	4.9
7	Job Market	1	5	1	1	3	3	2	6	1	10	3.3
8	Identify key posts	5	6	8	1	1	4	3	7	6	3	4.4
9	Substitute Breeding	1	8	6	7	10	1	2	9	3	6	5.3
10	Talent Recovery	5	1	4	6	2	1	1	1	4	3	2.8
11	Discover and identify source of talent	4	4	3	7	9	6	4	8	2	5	5.2
12	Strategic use of talent	10	9	6	9	4	6	9	6	7	7	7.3
13	Talent Deployment	3	3	7	1	2	6	5	1	3	3	3.4
14	Cognitive Skills	7	7	1	8	5	7	2	9	4	4	5.4
15	Human Capital	6	6	1	7	4	6	10	4	9	6	5.9
16	Social Capital	1	7	2	1	1	3	8	1	1	3	2.8
17	Kind of looking at things.	4	9	2	1	9	3	7	6	9	4	5.4
18	Appearance Properties	4	5	7	4	1	9	8	7	2	8	5.5
19	Alignment with Human Resources Practices	10	5	10	7	6	4	4	2	6	9	6.3
20	Alignment with Business Strategy	3	5	2	5	3	1	7	1	9	3	3.9
21	Mindset and culture of talent	2	1	2	4	1	3	3	3	2	7	2.8
22	Providing the required manpower	6	1	1	2	2	4	1	6	9	10	4.2
23	Talent Relations Management	1	10	5	1	8	8	1	7	5	2	4.8
24	Transparent Vision	3	8	1	5	2	2	2	8	5	4	4
25	Strategies	4	5	6	1	8	9	5	8	6	4	5.6
26	Career Path Management	9	2	8	1	4	1	5	2	7	1	4
27	Globalization of the economy	1	4	8	6	4	4	9	5	10	1	5.2

Row	Factors	1	2	3	4	5	6	7	8	9	10	Average
28	Demographic trends	1	8	2	5	3	5	1	8	6	6	4.5
29	Global Development Plans	9	5	9	3	8	5	3	6	10	1	5.9
30	Relative Advantage	9	3	4	4	0	5	2	7	7	8	4.9
31	Complexity	9	10	4	5	7	4	1	7	5	9	6.1
32	Company Size	5	7	4	4	3	1	6	2	5	2	3.9
33	Ability Key	5	5	4	1	10	8	3	2	8	9	5.5
34	Rules	6	3	9	3	3	10	7	2	3	9	5.5
35	Omar Company	1	1	5	6	1	7	9	2	4	1	3.7
36	Human Resource Department Size	1	9	6	9	10	5	1	7	3	3	5.4
37	The Role of Human Resources	7	3	2	5	8	9	7	7	4	1	5.3
38	Uncertainty	2	1	1	8	1	3	1	1	3	9	3
39	Organizational Chart	3	4	6	9	7	9	6	8	2	4	5.8
40	Teamwork	1	8	9	5	1	8	9	5	2	4	5.2
41	Career Dynamics	6	5	6	6	1	4	2	1	8	4	4.3
42	Job Satisfaction	9	8	1	3	1	3	8	2	8	1	4.4
43	Worthy of Selection	9	7	1	5	6	3	4	8	3	5	5.1
44	Teeth	5	2	4	6	6	1	2	3	7	4	4
45	sex	8	6	3	8	8	1	6	7	8	4	5.9
46	Education	6	4	2	6	4	2	1	5	8	0	3.8
47	Organizational Culture	2	5	5	5	6	1	1	2	1	4	3.2
48	Quality of work life	1	2	6	1	8	3	9	1	5	4	4
49	Performance Management	6	1	2	7	7	7	6	4	1	5	4.6
50	Organizational Mission	4	1	5	1	10	4	3	2	6	3	3.9
51	Appreciation and encouragement	1	8	2	5	1	2	1	1	1	9	3.1
52	Job Prospects	3	9	1	8	9	6	2	3	6	1	4.8
53	Attract	4	8	1	9	3	8	3	7	9	3	5.5
54	Planning talent needs	8	1	1	6	4	3	8	6	8	1	4.6
55	Talent Development	6	5	4	3	2	5	4	1	4	8	4.2

Row	Factors	1	2	3	4	5	6	7	8	9	10	Average
56	Choose	3	8	1	5	1	4	2	1	1	2	2.8
57	Information and Communication Management	8	1	5	8	3	1	10	3	8	2	4.9
58	Organizational climate	1	4	6	9	3	10	5	3	8	7	5.6
59	Empower	1	5	1	4	1	5	4	6	2	1	3
60	Training and Improvement	7	4	6	4	5	6	6	8	9	1	5.6
61	Organization Leadership	5	3	3	3	4	3	6	10	1	9	4.7
62	Strategic Placement	3	5	1	4	1	9	9	1	1	6	4
63	Commitment of senior management	5	2	1	1	9	7	1	1	6	4	3.7
64	Organization Business Plan	8	7	6	3	4	9	2	2	1	4	4.6
65	Organizational Maturity	9	6	1	7	4	1	5	1	3	1	3.8

Now, after implementing two steps, it is possible to compare the differences between the two stages to reach the level of agreement between experts, the difference between the two stages has been implemented in the following table.

Table 5: Contrast between the first and second stages

Row	Factors	Average Stage 1	Average second stage	Conflict
1	Shayesteh Parvari	5.7	4.7	1
2	Worthy of Selection	5.7	4.6	1.1
3	Decentralization	5.1	4	1.1
4	Engagement	7	6.2	0.8
5	Maintenance	3.9	2.8	1.1
6	Creating a talent tank	5.6	4.9	0.7
7	Job Market	4.1	3.3	0.8
8	Identify key posts	5.7	4.4	1.3
9	Substitute Breeding	6.6	5.3	1.3
10	Talent Recovery	3.8	2.8	1
11	Discover and identify sources of talent	6	5.2	0.8
12	Strategic use of talent	7.7	7.3	0.4
13	Talent Deployment	4.3	3.4	0.9

Row	Factors	Average Stage 1	Average second stage	Conflict
14	Cognitive Skills	6.2	5.4	0.8
15	Human Capital	6.3	5.9	0.4
16	Social Capital	4.3	2.8	1.5
17	Kind of looking at things.	6.1	5.4	0.7
18	Appearance Properties	6.5	5.5	1
19	Alignment with Human Resources Practices	6.8	6.3	0.5
20	Alignment with Business Strategy	4.7	3.9	0.8
21	Mindset and culture of talent	3.5	2.8	0.7
22	Providing the required manpower	4.9	4.2	0.7
23	Talent Relations Management	6	4.8	1.2
24	Transparent Vision	5	4	1
25	Strategies	6.1	5.6	0.5
26	Career Path Management	5.1	4	1.1
27	Globalization of the economy	6.5	5.2	1.3
28	Demographic trends	5.5	4.5	1
29	Global Development Plans	6.5	5.9	0.6
30	Relative Advantage	5.7	4.9	0.8
31	Complexity	6.6	6.1	0.5
32	Company Size	5	3.9	1.1
33	Ability Key	6.5	5.5	1
34	Rules	6.5	5.5	1
35	Omar Company	4.4	3.7	0.7
36	Human Resource Department Size	6.1	5.4	0.7
37	The Role of Human Resources	6	5.3	0.7
38	Uncertainty	3.9	3	0.9
39	Organizational Chart	6.8	5.8	1
40	Teamwork	6.1	5.2	0.9
41	Career Dynamics	4.9	4.3	0.6
42	Job Satisfaction	5.1	4.4	0.7
43	Worthy of Selection	6	5.1	0.9
44	Teeth	4.5	4	0.5

Row	Factors	Average Stage 1	Average second stage	Conflict
45	sex	6.7	5.9	0.8
46	Education	4.9	3.8	1.1
47	Organizational Culture	4.2	3.2	1
48	Quality of work life	5	4	1
49	Performance Management	5.6	4.6	1
50	Organizational Mission	4.6	3.9	0.7
51	Appreciation and encouragement	3.7	3.1	0.6
52	Job Prospects	5.6	4.8	0.8
53	Attract	6.5	5.5	1
54	Planning talent needs	5.9	4.6	1.3
55	Talent Development	5.2	4.2	1
56	Choose	3.8	2.8	1
57	Information and Communication Management	5.6	4.9	0.7
58	Organizational climate	6.1	5.6	0.5
59	Empower	3.4	3	0.4
60	Training and Improvement	6.6	5.6	1
61	Organization Leadership	5	4.7	0.3
62	Strategic Placement	5.1	4	1.1
63	Commitment of senior management	4.5	3.7	0.8
64	Organization Business Plan	5.3	4.6	0.7
65	Organizational Maturity	4.8	3.8	1

As can be seen, the difference between the two stages for some variables is less than 0.9 threshold, which indicates the agreement of experts on these factors and their final confirmation after two stages of Delphi test. But some factors such as recruitment strategy, organizational maturity, training and improvement and talent selection and development have a threshold value of more than 0.9, which indicates that they should be reevaluated in the third stage of the Delphi test. The third stage of the Delphi test is implemented in the following table.

Table 6: Stage 3 Delphi Test

Row	Factors	1	2	3	4	5	6	7	8	9	10	Average
1	Shayesteh Parvari	2	4	2	4	1	8	5	4	2	3	3.5
2	Worthy of Selection	1	7	5	2	1	4	3	3	4	6	3.6
3	Decentralization	1	1	1	7	1	7	1	1	6	6	3.2
4	Maintenance	1	5	1	1	1	1	3	1	5	1	2
5	Identify key posts	4	5	8	1	1	2	3	5	6	3	3.8
6	Substitute Breeding	1	7	5	5	9	1	2	9	3	5	4.7
7	Talent Recovery	5	1	2	6	2	1	1	1	3	1	2.3
8	Social Capital	1	7	1	1	1	2	7	1	1	2	2.4
9	Appearance Properties	3	4	6	4	1	9	7	6	2	6	4.8
10	Talent Relations Management	1	9	5	1	6	8	1	6	4	1	4.2
11	Transparent Vision	3	8	1	4	1	1	2	7	3	3	3.3
12	Career Path Management	9	1	8	1	3	1	3	1	5	1	3.3
13	Globalization of the economy	1	3	6	6	3	2	7	3	8	1	4
14	Demographic trends	1	8	2	5	1	5	1	6	4	4	3.7
15	Company Size	5	7	2	2	3	1	6	1	3	1	3.1
16	Ability Key	3	5	4	1	10	8	3	2	6	9	5.1
17	Rules	5	1	7	1	1	8	5	2	2	8	4
18	Organizational Chart	2	4	6	8	6	7	4	6	1	2	4.6
19	Education	4	2	1	5	3	2	1	4	6	1	2.9
20	Organizational Culture	1	4	5	5	5	1	1	1	1	3	2.7
21	Quality of work life	1	1	4	1	6	2	7	1	3	3	2.9
22	Performance Management	5	1	1	6	6	6	5	2	1	4	3.7
23	Attract	2	6	1	8	1	7	1	5	9	2	4.2
24	Planning talent needs	8	1	1	5	4	1	6	6	6	1	3.9
25	Talent Development	5	5	4	1	2	3	3	1	3	7	3.4
26	Choose	2	8	1	5	1	2	1	1	1	2	2.4
27	Training and Improvement	7	3	4	2	3	6	6	6	7	1	4.5
28	Strategic Placement	2	3	1	4	1	9	8	1	1	6	3.6
29	Organizational Maturity	9	6	1	6	3	1	4	1	1	1	3.3

After implementing the third stage of Delphi test, a comparison between the second and third stages should be done to determine the level of contradiction and as a result the experts agree on these factors. The results are presented in the table below.

Table 7: Difference between the average of the second and third stages

Row	Factors	Average second stage	Average Third Stage	Conflict
1	Shayesteh Parvari	4.7	3.5	1.2
2	Worthy of Selection	4.6	3.6	1
3	Decentralization	4	3.2	0.8
4	Maintenance	2.8	2	0.8
5	Identify key posts	4.4	3.8	0.6
6	Substitute Breeding	5.3	4.7	0.6
7	Talent Recovery	2.8	2.3	0.5
8	Social Capital	2.8	2.4	0.4
9	Appearance Properties	5.5	4.8	0.7
10	Talent Relations Management	4.8	4.2	0.6
11	Transparent Vision	4	3.3	0.7
12	Career Path Management	4	3.3	0.7
13	Globalization of the economy	5.2	4	1.2
14	Demographic trends	4.5	3.7	0.8
15	Company Size	3.9	3.1	0.8
16	Ability Key	5.5	5.1	0.4
17	Rules	5.5	4	1.5
18	Organizational Chart	5.8	4.6	1.2
19	Education	3.8	2.9	0.9
20	Organizational Culture	3.2	2.7	0.5
21	Quality of work life	4	2.9	1.1
22	Performance Management	4.6	3.7	0.9

Row	Factors	Average second stage	Average Third Stage	Conflict
23	Attract	5.5	4.2	1.3
24	Planning talent needs	4.6	3.9	0.7
25	Talent Development	4.2	3.4	0.8
26	Choose	2.8	2.4	0.4
27	Training and Improvement	5.6	4.5	1.1
28	Strategic Placement	4	3.6	0.4
29	Organizational Maturity	3.8	3.3	0.5

Based on the study of conflict, it can be understood that factors such as education and improvement, absorption, quality of working life, organizational structure, laws, merit development, decency, globalization of the economy, etc. Among the criteria on which there is no consensus and therefore should be excluded from analysis, which means that the relevant factors in the field of artificial intelligence are not applicable and not applicable to the AI model. By eliminating these factors, the final factors are achieved as follows.

Table 8: Final Factors of the Delphi Method

Row	Factors	Symbol
1	Decentralization	C1
2	Engagement	C2
3	Maintenance	C3
4	Creating a talent tank	C4
5	Job Market	C5
6	Identify key posts	C6
7	Substitute Breeding	C7
8	Talent Recovery	C8
9	Discover and identify source of talent	C9
10	Strategic use of talent	C10
11	Talent Deployment	C11
12	Cognitive Skills	C12

Row	Factors	Symbol
13	Human Capital	C13
14	Social Capital	C14
15	Kind of looking at things.	C15
16	Appearance Properties	C16
17	Alignment with Human Resources Practices	C17
18	Alignment with Business Strategy	C18
19	Mindset and culture of talent	c19
20	Providing the required manpower	C20
21	Talent Relations Management	C21
22	Transparent Vision	C22
23	Strategies	C23
24	Career Path Management	C24
25	Demographic trends	C25
26	Global Development Plans	C26
27	Relative Advantage	C27
28	Complexity	C28
29	Company Size	C29
30	Ability Key	C30
31	Omar Company	C31
32	Human Resource Department Size	C32
33	The Role of Human Resources	C33
34	Uncertainty	C34
35	Teamwork	C35
36	Career Dynamics	C36
37	Job Satisfaction	C37
38	Worthy of Selection	C38
39	Teeth	C39
40	sex	C40
41	Education	C41
42	Organizational Culture	C42

Row	Factors	Symbol
43	Performance Management	C43
44	Organizational Mission	C44
45	Appreciation and encouragement	C45
46	Job Prospects	C46
47	Planning talent needs	C47
48	Talent Development	C48
49	Choose	C49
50	Information and Communication Management	C50
51	Organizational climate	C51
52	Empower	C52
53	Organization Leadership	C53
54	Strategic Placement	C54
55	Commitment of senior management	C55
56	Organization Business Plan	C56
57	Organizational Maturity	C57

Therefore, 57 factors have been obtained as the final factors based on the AI-based model. In other words, 8 factors have been eliminated and 57 factors remain. In other words, it can be said that extracted factors have AI-based characteristics and have been calculated based on them, which distinguishes this research from similar research in the field of presenting a model based on talent management and recruitment. So far, experts based on the artificial intelligence approach have screened extractive factors. In the next step, these factors should be examined and validated in the context of banking. In fact, in this step, it is determined whether 57 extracted factors are used in the context of banking and can be confirmed or not the statistical t-test has been used. T-test results in the following table are presented.

Table 9: Validation of factors using t-test

Factors	Symbol	Amaret T	Significance level	Average Difference	95% confidence interval	
					Sublimation	Upper
Decentralization	C1	5.196	.001	3.00000	1.6939	4.3061
Engagement	C2	6.857	.000	3.20000	2.1443	4.2557
Maintenance	C3	6.377	.000	3.30000	2.1294	4.4706
Creating a talent tank	C4	8.232	.000	3.20000	2.3206	4.0794
Job Market	C5	6.815	.000	3.40000	2.2714	4.5286
Identify key posts	C6	7.127	.000	2.90000	1.9796	3.8204
Substitute Breeding	C7	9.222	.000	2.90000	2.1886	3.6114
Talent Recovery	C8	6.053	.000	3.40000	2.1292	4.6708
Discover and identify source of talent	C9	5.715	.000	2.80000	1.6918	3.9082
Strategic use of talent	C10	5.713	.000	2.70000	1.6309	3.7691
Talent Deployment	C11	11.000	.000	3.30000	2.6214	3.9786
Cognitive Skills	C12	6.500	.000	2.60000	1.6951	3.5049
Human Capital	C13	4.882	.001	2.80000	1.5027	4.0973
Social Capital	C14	8.216	.000	3.00000	2.1740	3.8260
Kind of looking at the things.	C15	6.091	.000	2.60000	1.6343	3.5657
Appearance Properties	C16	8.720	.000	3.50000	2.5920	4.4080
Alignment with Human Resources Practices	C17	6.983	.000	3.30000	2.2309	4.3691
Alignment with Business Strategy	C18	7.115	.000	3.00000	2.0462	3.9538
Mindset and culture of talent	c19	6.725	.000	2.80000	1.8582	3.7418

Factors	Symbol	Amaret T	Significance level	Average Difference	95% confidence interval	
					Sublimation	Upper
Providing the required manpower	C20	4.801	.001	2.60000	1.3748	3.8252
Talent Relations Management	C21	7.619	.000	3.10000	2.1796	4.0204
Transparent Vision	C22	6.249	.000	3.20000	2.0416	4.3584
Strategies	C23	10.002	.000	3.40000	2.6310	4.1690
Career Path Management	C24	5.056	.001	2.80000	1.5473	4.0527
Demographic trends	C25	4.975	.001	2.20000	1.1996	3.2004
Global Development Plans	C26	8.720	.000	3.50000	2.5920	4.4080
Relative Advantage	C27	5.547	.000	2.10000	1.2436	2.9564
Complexity	C28	7.150	.000	3.70000	2.5294	4.8706
Company Size	C29	7.606	.000	3.00000	2.1078	3.8922
Ability Key	C30	7.115	.000	3.00000	2.0462	3.9538
Omar Company	C31	7.115	.000	3.00000	2.0462	3.9538
Human Resource Department Size	C32	6.821	.000	2.70000	1.8046	3.5954
The Role of Human Resources	C33	6.332	.000	2.80000	1.7996	3.8004
Uncertainty	C34	5.839	.000	2.50000	1.5314	3.4686
Teamwork	C - 35	7.115	.000	3.00000	2.0462	3.9538
Career Dynamics	C36	4.882	.001	2.80000	1.5027	4.0973
Job Satisfaction	C37	5.449	.000	2.70000	1.5790	3.8210
Worthy of Selection	C38	6.128	.000	2.20000	1.3879	3.0121
Teeth	C-39	6.018	.000	2.90000	1.8099	3.9901
sex	C40	4.811	.001	2.40000	1.2714	3.5286
Education	C41	4.129	.003	2.40000	1.0853	3.7147

Factors	Symbol	Amaret T	Significance level	Average Difference	95% confidence interval	
					Sublimation	Upper
Organizational Culture	C42	6.815	.000	3.40000	2.2714	4.5286
Performance Management	C43	6.228	.000	2.50000	1.5920	3.4080
Organizational Mission	C44	6.021	.000	2.70000	1.6855	3.7145
Appreciation and encouragement	C45	6.000	.000	3.20000	1.9935	4.4065
Job Prospects	C46	4.882	.001	2.80000	1.5027	4.0973
Planning talent needs	C47	5.238	.001	2.50000	1.4204	3.5796
Talent Development	C48	5.809	.000	3.00000	1.8318	4.1682
Choose	C49	6.000	.000	3.20000	1.9935	4.4065
Information and Communication Management	C50	7.203	.000	2.80000	1.9206	3.6794
Organizational climate	C51	20.125	.000	4.50000	3.9942	5.0058
Empower	C52	10.091	.000	3.70000	2.8705	4.5295
Organization Leadership	C53	6.364	.000	3.00000	1.9336	4.0664
Strategic Placement	C54	14.807	.000	4.10000	3.4736	4.7264
Commitment of senior management	C55	6.000	.000	2.40000	1.4951	3.3049
Organization Business Plan	C56	6.034	.000	2.10000	1.3127	2.8873
Organizational Maturity	C57	7.520	.000	3.40000	2.3772	4.4228

In the above table, all 57 factors have been validated, as it can be seen, the significance level for all factors is close to zero and less than 0.05, which indicates the validity of extracted factors. On the other hand, the T statistics for all factors is more than 1.96, which indicates the validity of all factors, so, at the 95% confidence level, it can be said that all factors in the context of banking have credibility and can be placed in a banking-based model. However, due to the high number of factors, they should be placed under the larger dimensions that are presented in the table below.

Table 10: Placing factors below larger dimensions

Dimensions	Factors	Symbol
Social	Social Capital	C14
	Demographic trends	C25
Business	Alignment with Business Strategy	C18
	Relative Advantage	C27
	Organization Business Plan	C56
	Complexity	C28
Individual	Job Market	C5
	Cognitive Skills	C12
	Kind of looking at things.	C15
	Appearance Properties	C16
	Teeth	C39
	sex	C40
	Education	C41
Cultural	Appreciation and encouragement	C45
	Mindset and culture of talent	c19
	Organizational Culture	C42
Human Resources	Discover and identify source of talent	C9
	Human Capital	C13
	Alignment with Human Resources Practices	C17
	Providing the required manpower	C20
	Human Resource Department Size	C32

Dimensions	Factors	Symbol
Strategic	The Role of Human Resources	C33
	Teamwork	C35
	Worthy of Selection	C38
	Talent Development	C48
	Choose	C49
	Strategic Placement	C54
	Maintenance	C3
	Creating a talent tank	C4
	Substitute Breeding	C7
	Transparent Vision	C22
	Strategies	C23
	Global Development Plans	C26
	Uncertainty	C34
	Organizational Mission	C44
	Empower	C52
	Decentralization	C1
	Engagement	C2
Management	Talent Relations Management	C21
	Career Path Management	C24
	Performance Management	C43
	Planning talent needs	C47
	Information and Communication Management	C50
	Organization Leadership	C53
	Commitment of senior management	C55
Enterprise	Identify key posts	C6
	Talent Recovery	C8
	Strategic use of talent	C10
	Talent Deployment	C11
	Company Size	C29

Dimensions	Factors	Symbol
	Ability Key	C30
	Omar Company	C31
	Organizational climate	C51
	Organizational Maturity	C57
	Career Dynamics	C36
Job	Job Satisfaction	C37
	Job Prospects	C46

Figure 2: Conceptual model of current research

As it is seen, nine dimensions are formed and each of the factors is placed under a larger dimension, so it can be said that the talent discovery and recruitment management model using artificial intelligence includes 9 dimensions and 57 criteria, each of which is placed under a larger dimension and each dimension encompasses several criteria. This model is illustrated in the next picture.

As can be seen, in the above form, a conceptual model has been presented which includes cultural, human resources, strategic managerial, personal, business, social, organizational and occupational dimensions.

5. Conclusion

In this paper, an AI-based model for the banking industry regarding talent discovery and hiring management is presented. Research has already addressed this issue and presented models for talent discovery that were mainly explored in these models alone. In addition, the models were more focused on industries other than the banking industry, and most importantly, the use of artificial intelligence in those models was ignored. Considering the existing flaws, research has been provided in an artificial intelligence-based model for the banking industry, at first, 65 factors were extracted from the previous models, some of which were non-conformant with artificial intelligence and therefore excluded from analysis using the Delphi technique. Then, using a t-test based on the banking industry, extracted factors were validated and the results showed that all the remaining factors of Delphi analysis were used and validated in the banking industry and all of them were confirmed at 95% confidence level.

Finally, nine main dimensions for talent discovery and recruitment management model were presented in the banking industry which included occupational, organizational, cultural, managerial, strategic, personal, business, human resources and social dimensions. Extractive dimensions show that in the banking industry, talent discovery and recruitment management need these dimensions together, and human resources managers who are more responsible than others for talent discovery and recruitment should be focused on these important factors. Of course, these factors can be done with the help of artificial intelligence, in other words, if bank managers want to discover talent and hire with an artificial intelligence approach, they can use the 9-fold model designed because the model has all the considerations related to talent discovery and hiring management.

It can be said that if managers of banks want to manage recruitment and talent in banks based on artificial intelligence technology, the proposed model can be suitable because the screening of its factors has been done according to the requirements and factors related to artificial intelligence, and the basis of using artificial intelligence is based on the proposed model. Because the extracted factors based on artificial intelligence can be identified and tracked and therefore the model presented is different from other models based on talent management and recruitment in terms of the fact that the extracted factors are based on artificial intelligence.

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