Management and Production Engineering Review
Volume 9 • Number 4 • December 2018 • pp. 86–95
DOI: 10.24425/119549

RANKING NEW COMERS TO WORK BASED ON COMMITMENT PROPENSITY THROUGH HYBRID METHOD OF AHP AND TOPSIS

Hossein Safari[1], Maria do Rosário Cabrita[2], Maryam Hesan[1]
Meysam Maleki[2], Fatemeh Mirzaeirabore[1]

[1] *Department of Industrial Management, University of Tehran, Iran*
[2] *UNIDEMI, Faculty of Science and Technology, Universidade Nova de Lisboa, Portugal*

Corresponding author:
Hossein Safari
Department of Industrial Management
Faculty of Management
University of Tehran
1411713114 Tehran, Iran
phone: (+98) 21 88000245
e-mail: hsafari@ut.ac.ir

Received: 5 November 2017
Accepted: 15 September 2018

Abstract
This research provides a tool to select and prioritize new comers to work based on their pre-entry organizational commitment propensity through examining links between the big five personality factors: extroversion, agreeableness, conscientiousness, neuroticism, openness; and three component model of organizational commitment: affective commitment, continues commitment, normative commitment. Findings show that extroversion and openness respectively have positive and negative effects on all three components of organizational commitment. Results gained by Structured Equation Modelling (SEM) indicate neuroticism is negatively related to affective and continues commitment and positively to conscientiousness effects on continues commitment. In the second part of the study, the received results are applied to extract the general equations that enables to estimate new comer's pre-entry organizational commitment and to rank them using TOPSIS and AHP. The AHP is used to determine the relative weights of commitment criteria and TOPSIS is employed for the final ranking of new comers based on these criteria's.

Keywords
AHP, organizational commitment, personality traits, Structural Equation Modelling, TOPSIS.

Introduction

Organizational commitment has been one of the main issues in recent decades both for organizational scholars and managers. Nowadays, enterprises have to deal with war talent challenges and to do the best for selecting, recruiting and keeping the best human capital. The loyalty of employees is one of the organizational competitive advantages. It is expected that committed employees are offered to work long life time and to be deeply be involved into the solving of different challenges and hardship of organization. They won't be inspired easily by other opportunities. The reason is that it has been one of the most researched issues to investigate and identify several variables, which can have positive influence on the organizational commitment. These factors are such as: organizational culture [1], work condition [2], perceived organizational support and leadership behavior [3–5], job satisfaction [6], and emotional intelligence [7]. In fact, identification and assessing the influential factors on the organizational commitment is one of the vital human resource strategy subjects [8, 9].

In addition to all identified and discussed work-related influential variables; some other issues have been introduced as well from other aspects. For example, Ng and Feldman in [10] argued the rela-

tionship between individual values and commitment in the workplace or relationship between commitment and psychological contract. Also [1] investigated person-organization (p-o) fit effect to the level of organizational commitment. The model developed in the research by Steers in [11] determined that personality characteristics, job specifications and work-related experiences also affect organization commitment. In addition, Steers and Porter in [12] has discovered that the three antecedents for pre-organizational commitment are: dispositional antecedents, organizational characteristics and non-organizational related factors. Personal characteristics are also identified in Baron and Greenberg model.

This paper focuses on the relationship between five-factor model of personality (big five) [13] and three components of organizational commitment model [14]. It will be introduced how personality traits as dispositional predictors effect on employees' organizational commitment. After the conceptual model approval, the personality score of each new comer can be used for estimating pre entry commitment scores of new comers. The provided conceptual model is an excellent tool, which enables the quantitative and qualitative evaluation of new comer's. Two techniques of analytical hierarchy process (AHP) and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) were used to rank new comers based on their commitment scores.

Therefore, relying on the psychological approach toward the organizational commitment which defines commitment as an attitude or an orientation toward the organization. It is intended to identify the most committed employees and to use the result to benefit the recruitment system of public sector agencies or big enterprises, by selecting applicants who are expected to be committed employee with high possibility. This paper has been followed two main objectives: investigating the relationship between personality traits and organizational commitment, and examining the impact of each five personality factors on three component model of commitment. Afterwards, the result of previous part is used for estimating new comer's commitment propensity and ranking them.

Organizational commitment

By reviewing the theoretical background, various definitions for the notion of commitment can be categorized as unidimensional and multidimensional [15]. In 1984, Meyer and Allen in [14] proposed a bi-dimensional concept for organizational commitment: affective and continuance. Meyer and Allen in [14–16] developed their three components of affective, continuance and normative commitment. However, the nature of these psychological states differs and the three components of commitment are argued to be developed from different antecedents and to have different implications to job-related outcomes other than turnover [17].

Affective Commitment (AC) can be defined as an employee's desire to continue a relationship with a specific employer, due to the enjoyment of the relationship for its own sake, apart from the instrumental worth and because this employee experiences a sense of loyalty and belongingness. Calculative or Continuance Commitment (CC) can be defined as the degree to which an employee experiences the need to maintain a relationship with a specific employer, given the significant perceived switching costs associated with leaving and Normative Commitment (NC) is reflected as the (moral) obligation of an employee to stay in a relationship with a specific employer [9].

Five factor model of personality

Dispositional sources have been significantly examined by organizational psychologists in the field of work behaviors and attitudes over the recent decades [18]. The impact of disposition on job attitudes and other career behaviors has been emphasized under the dispositional approaches [19]. Personality is the dynamic and organized set of characteristics that creates a person's characteristic pattern of behavior, thoughts, and feeling. Allport in [20] has categorized the traits into three types: cardinal trait, central trait and secondary trait. Some believe that personality trait depends on the nature and stable in time, others insists that personality changes and evolve in times [21]. Individual dispositions play a key role in organizational behavior [22].

Eysenck in [23] claimed that personality has three major traits: extroversion, neuroticism and the psychotic. Afterwards, personality trait was developed and categorized into five factor model of personality (big 5) by [13] which is the commonly used model of personality and has been studied in relation to work and vocational behaviors [24–29]. Based on the McCrae trait theory this five personality factors are: openness to experience, conscientiousness, extraversion/introversion, agreeableness and finally Neuroticism.

The first Big Five questionnaire was launched the UK in 1990. Validation studies were published and presented to the British Psychology Society by the end of the 1990's when the Big Five was established

as a significant and fundamental personality testing model. The model provides a natural framework for organizing research, and a guide to the comprehensive assessment of individuals and the relation between personality constructs and important organizational criteria. According to [30, 31] each factor reflects some fundamental characteristics:

- Extroversion: An extroverted person assumes to be sociable, enthusiastic, energetic, adventurous, talkative, assertive, and outspoken.
- Agreeableness: It refers to points such as sympathetic, kind, forgiving, appreciative, trusting, soft-hearted, modest, and considerate.
- Conscientiousness: this factor evaluates competence, order, dutifulness, achievement striving, self-discipline, and deliberation.
- Openness to Experience: this factor includes contrasts poets, philosophers, and artists with farmers, machinists, and 'down-to-earth' people who have little interest in theories, aesthetics, or fanciful possibilities.
- Neuroticism: this factor indicates anxiety, hostility, depression, self-consciousness, impulsiveness and vulnerability.

This survey is focused on the linkage between the big-5 model and multi-dimensional commitment. So three main hypotheses are defining as below:

- Hypothesis 1: There is a significant relationship between each of the five factor of personality and affective commitment.
- Hypothesis 2: There is a significant relationship between each of the five factor of personality and normative commitment.
- Hypothesis 3: There is a significant relationship between personality factors and continuous commitment.

Research methodology

This research has quantitative research method and had been done in the NIOC (main oil company in IRAN). Figure 1 shows the holistic view of the research steps. According to this figure, two steps were defined. The first step is related to construct a conceptual model and confirm it through structural Equation Modelling. In the second step, two mathematical techniques (AHP and TOPSIS) were used for ranking of new comer's.

Modelling through Structured Equation Modelling

In the first step of this study the set of questionnaires, were distributed among a sample of 250 personnel working permanently in the National Iranian Oil Company (NIOC) for five years or more to investigate whether there is any relationship between their personal characteristics and organizational commitment. 153 completed questionnaires were considered in current research. These questionnaires consist of two parts.

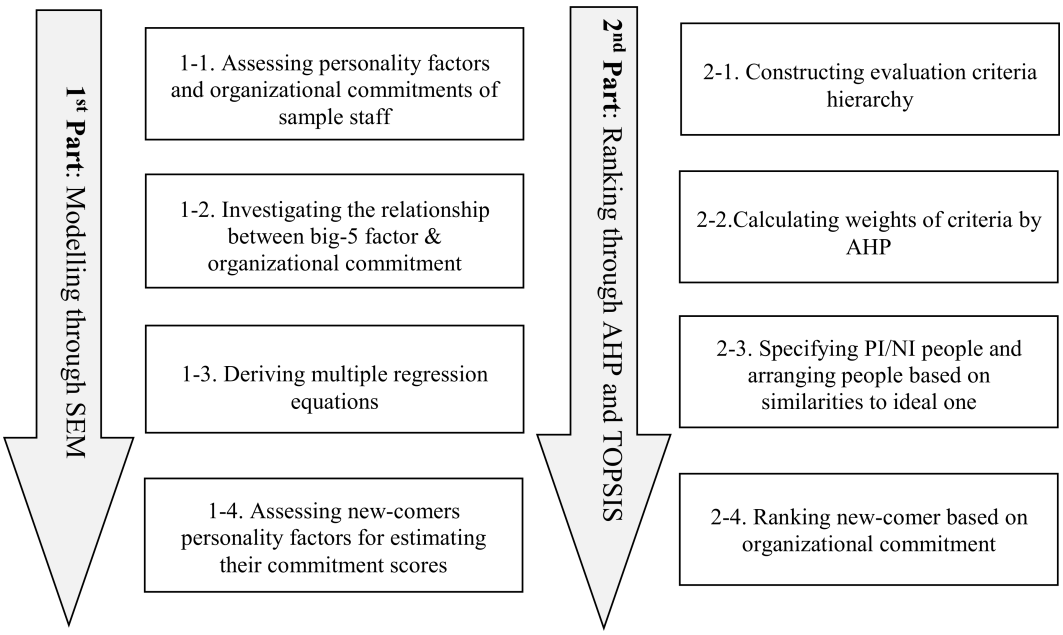
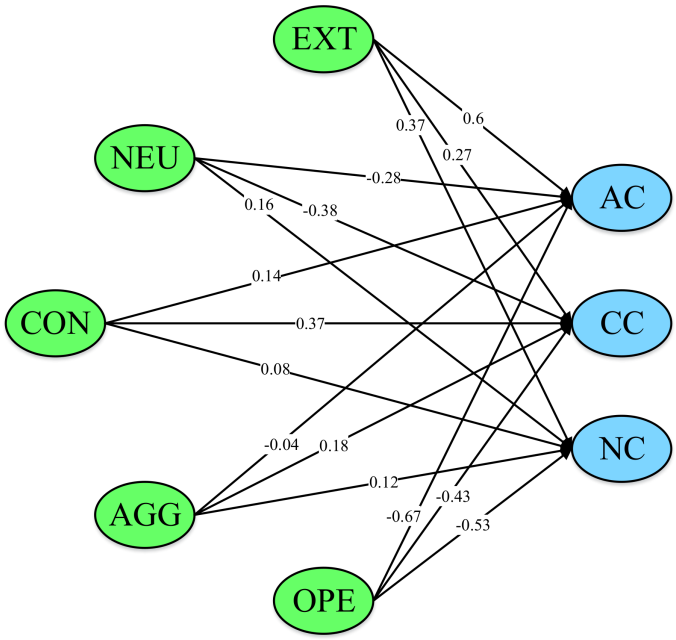


Fig. 1. The overall procedure.

Table 1
Estimated Cronbach of variables.

Independent variables				
Extroversion	Neuroticism	Conscientiousness	Openness	Agreeableness
0.769	0.834	0.830	0.802	0.718
Dependent variables				
Affective commitment		Normative commitment	Continues commitment	
0.812		0.796	0.786	



Chi-Square = 2292.79, df = 877, P-value = 0.00000, RMSEA = 0.107

Fig. 2. Confirmed structure and measurement models.

In this research two questionnaires were defined. The first one is related to the assessing of personality and the second one is related to the assessing of commitment. The purpose of the NEO Personality Inventory (NEO_PI) questionnaire is to assess the sampled staff personalities on a Likert-type anchoring ranging from strongly agree (5) to strongly disagree (1), which include all five personality factors. This questionnaire validity has been tested in different cultures and languages. Cronbach (alpha) as a commonly-used reliability coefficient was used in this study. The related coefficient for each factor is reported in Table 1 and the overall estimated Cronbach is 0.713. The second questionnaire designed for assessment of the three components of organizational commitment. Meyer and Allen has developed questionnaire based on a five-point Likert-type scale. The estimated Cronbach for these three dependent variables are as follows.

Construct validity of the both parts of distributed questionnaires were verified by confirmatory factor analysis (CFA). Lisrel 8.0 is used in order to assess hypothesis and data analysis. Each commitment component assumed as dependent variable and big five factors as independents variables were examined. Significant degree and related t-values are indicated in Fig. 2.

Ranking through AHP and TOPSIS

The second step of the study contains the application of proposed conceptual framework. The aim is to rank new comers based on their commitment propensity. First by conducting NEO-PI questionnaires among apprentices, their personality scores are obtained. Then by using the collected data as the inputs of general extracted equations, the commitment scores for ranking them are obtained.

Actually the primary section of this survey is to develop a valid selecting tool, which can be applied for recruitment sector. The studied organization has to place a group of apprentices with different attitudes and characteristics in various sectors of depart-

ment. Using the result of new comers' commitment scores, in addition to other commonly-used criteria for prioritizing new comers, can give a better insight for best person job fit procedures. Multi Attribute Decision Making (MADM) is the most appropriate model to assist human resource managers in making multi criteria decisions. The in-depth interviews were conducted with experienced human resource managers and supervisors in order to use their judgments for computing criteria weights through AHP. Afterwards, the new comers were ranked by application of TOPSIS as one of the most commonly-used MADM techniques. The main idea of TOPSIS is to find the closest alternative to the ideal solution in a multi-dimensional space. By using TOPSIS, different persons as different alternatives can be ranked based on three commitment criteria's. In the next part, the mentioned techniques and their application in this research will be described.

AHP

As it is indicated in the Fig. 1, the first step of the second part of the study is to construct the evaluation of criteria hierarchy, which can be conducted by AHP methodology [32]. This method calculates the relative weights of a set of criteria in a MADM problem [33]. It is based on pairwise comparisons of criteria's through a $n * n$ matrix for assessing the decision maker's judgments by using the AHP nine points scale from 1 "equally important" to 9 "absolutely more important".

Suppose in a MADM problem, there are C_1, $C_2, C_3, \ldots, C_n$ criterion. Consider equations (1) to (4) [33]

$$\text{Pairwise Matrix} = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \cdots & \cdots & a_{ij} & \cdots \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{bmatrix}. \quad (1)$$

At this step, the decision matrix should be normalized. Then each set of column values is summed and then each value of decision matrix is divided by its respective column total sum value

$$a'_{ij} = \frac{a_{ij}}{a_{1j} + \ldots + a_{nj}}. \quad (2)$$

Then normalized pairwise matrix is as below

$$\text{Normalized Pairwise Matrix} = \begin{bmatrix} a'_{11} & a'_{12} & \cdots & a'_{1n} \\ a'_{21} & a'_{22} & \cdots & a'_{2n} \\ \cdots & \cdots & a'_{ij} & \cdots \\ a'_{n1} & a'_{n1} & \cdots & a'_{nn} \end{bmatrix}. \quad (3)$$

And finally, weight of each criterion is calculated in Eq. (4)

$$w_n = \frac{a'_{n1} + a'_{n2} + \ldots + a''_{nn}}{n}. \quad (4)$$

Equation (5) is significant with respect to the consistency of the pairwise matrix

$$a_{ij} = \frac{W_i}{W_j} = \frac{1}{a_{ij}}. \quad (5)$$

In Table 2, the pairwise comparison matrix of three commitments criteria are indicated. This matrix is geometric mean of 20 judgments where the 20th root of the product of 20 judgments is employed. The empirical values are gained from conducting in-depth interviews with the expert member of decision making groups. Each element in dates the preference of i-th row on j-th column.

Table 2
The pairwise comparison matrix of criteri.

	AC	CC	NC
AC	1	2.7305	1.5681
CC	0.3661	1	1.5969
NC	0.6374	0.6258	1

According to Eqs. (1) to (4), normalized pairwise matrix and final weights are as presented in Table 3.

Table 3
The normalized pairwise matrix and weight of each criterion.

	AC	CC	NC	W_j
AC	0.4991	0.6267	0.3764	0.500
CC	0.1827	0.2295	0.3834	0.2652
NC	0.3181	0.1436	0.2400	0.2339

TOPSIS

Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) was firstly proposed by [34] as one of the main MADM techniques, which is based on m-alternatives in the n-dimensional geometric space or criteria. The basic concept of this method is that the chosen alternative should have the shortest distance from the ideal solution and the farthest from the negative-ideal solution. In fact, the ideal solution is viewed as the most privileges solution and the negative ideal solution is deemed as the least privileges solution. It is required to have numeric attribute values and commensurable units to apply this method [35]. In this paper the TOPSIS is applied in order to rank new comer's. In the following you will find the stepwise procedure for performing TOPSIS method.

Suppose a decision matrix with m alternative and n criteria like shown in the Table 4.

Table 4
Decision matrix.

		C_1	C_2	...	C_n
	A_1	X_{11}	X_{12}		X_{1n}
	A_2	X_{21}	X_{22}		X_{2n}
Decision Matrix =					
	A_m	X_{m1}	X_{m2}		X_{mn}
	W_j	w_1	w_2	...	w_n

Equation (6) normalizes the decision matrix

$$S_{ij} = \frac{X_{ij}}{\sqrt{\sum_{i=1}^{m} X_{ij}^2}}, \qquad j = 1, \ldots, n. \tag{6}$$

The weighted normalized decision matrix is gaining through the multiplication of weights to the normalized decision matrix

$$\begin{bmatrix} P_{11} & P_{12} & P_{13} & \cdots & P_{1n} \\ P_{21} & P_{22} & P_{23} & \ldots & P_{2n} \\ P_{31} & P_{32} & P_{33} & \ldots & P_{3n} \\ \vdots & \vdots & \vdots & \ldots & \vdots \\ P_{m1} & P_{m2} & P_{m3} & \cdots & P_{mn} \end{bmatrix} = \begin{bmatrix} W_1S_{11} & W_2S_{12} & W_3S_{13} & \cdots & W_nS_{1n} \\ W_1S_{21} & W_2S_{22} & W_3S_{23} & \ldots & W_nS_{2n} \\ W_1S_{31} & W_2S_{32} & W_3S_{33} & \ldots & W_nS_{3n} \\ \vdots & \vdots & \vdots & \ldots & \vdots \\ W_1S_{m1} & W_2S_{m2} & W_3S_{m3} & \cdots & W_nS_{mn} \end{bmatrix}. \tag{7}$$

In the Eq. (8), the positive and negative ideal solutions are calculated. The positive ideal solution is the most benefited solution (in the benefit criteria, maximum of column and in the cost criteria, minimum of column) and the negative ideal solution is *vice versa*

$$\begin{aligned} A^+ &= \{(\max S_{ij}|j \;\; J), (\min S_{ij}\,|j \;\; J)|i \\ &\quad = 1, 2, 3, \ldots, m\} \\ &= \left\{V_1^+, V_2^+, V_3^+, \ldots, V_n^+\right\}, \\ A^- &= \{(\min S_{ij}|j \;\; J), (\max S_{ij}\,|j \;\; J)|\, i \\ &\quad = 1, 2, 3, \ldots, m\} \\ &= \left\{V_1^-, V_2^-, V_3^-, \ldots, V_n^-\right\}, \end{aligned} \tag{8}$$

$$\text{If } J = \{j = 1, 2, 3, \ldots, n|\, j \text{ associated with benefit criteria}\},$$

$$J = \{j = 1, 2, 3, \ldots, n|\, j \text{ associated with cos criteria}\}.$$

In the TOPSIS, ranking of alternatives is based on the degree of closeness to positive ideal solution and furthest to the negative ideal solution. Then distance from each alternative to positive and negative ideal solutions should calculated

$$\begin{aligned} D_i^+ &= \sqrt{\sum_{j=1}^{n} =(S_{ij} - V_i^+)^2} \\ &\quad j = 1, 2, 3, \ldots, m, \\ D_i^- &= \sqrt{\sum_{j=1}^{n} =(S_{ij} - V_i^-)^2} \\ &\quad j = 1, 2, 3, \ldots, m. \end{aligned} \tag{9}$$

Finally, coefficient of closeness is a basis for ranking of different alternatives as below.

$$CC_i = \frac{D_i^-}{D_i^+ + D_i^-}, \qquad i = 1, \ldots, m. \tag{10}$$

Result and discussion

Two items (one for extroversion and one for agreeableness) were omitted due to the low correlation with the other items and to achieve the consequently good fitness statics (Chi-Square = 2292.79, $df = 877$, $\chi^2/df < 3$) which enables to improve measurement model reliability. The effects of big-5 factor on organizational commitment are shown in the Table 5.

In order to perform a better structural analysis of the conceptual framework, the coefficients of the paths are given in Fig. 3.

The result of the structure equation analysis proved some of the expected relationships and some are not supported. Comparing the scores of the paths it is discovered that openness has the strongest effect on affective commitment ranks ($Y' = -0.67$, $t = -4.53$) and the impact of the extroversion has the weakest effect on continues commitment ranks ($Y' = 0.27$, $t = 2.04$) among the estimated effects of personality traits on commitment. According to the first hypothesis, it was expected that big-five factors may have a significant effect on Affective Commitment (AC). As it is indicated in Fig. 2, the impacts of extroversion, neuroticism and openness on AC were proved. Openness which was described as creative – curious mind that is willing to have different experiences by facing various challenges & accepting new beliefs, may cause motivated staff to change their work places, in order to receive new and fresh experiences and to welcome big challenges. So, openness has a negative effect on AC ($Y' = -0.67$, $t = -4.53$). Extroversion with the second-ranked impact factor, showed a positive relationship with AC ($Y' = 0.60$, $t = 3.98$). Being sociable, enthusiastic and assertive

Table 5
The effects of big-5 factor on organizational commitment.

Dependent variable	Extroversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Affective commitment	$Y' = 0.60$ $t = 3.98$	NS	NS	$Y' = -0.28$ $t = -1.99$	$Y' = -0.67$ $t = -4.53$
Continues commitment	$Y' = 0.27$ $t = 2.04$	NS	$Y' = 0.37$ $t = 3.08$	$Y' = -0.38$ $t = -2.74$	$Y' = -0.43$ $t = -3.22$
Normative commitment	$Y' = 0.37$ $t = 2.56$	NS	NS	NS	$Y' = -0.53$ $t = -3.50$
NS = Not Supported by the survey findings					

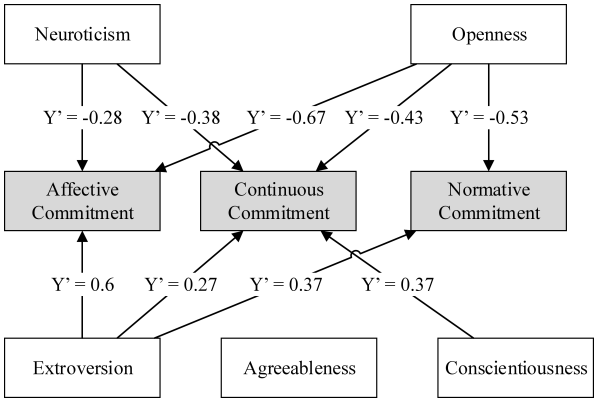


Fig. 3. Path of effects.

will help to maintain strong relationship with supervisors and seeks for bigger success. Neuroticism is another personality trait which has negative effect on AC ($Y' = -2.28$, $t = -1.99$). It is consistent with previous findings, which showed that neurotic people are mostly limit their emotional response towards their organizations [27].

The second hypothesis built on relationships among big-5 factors and continues commitment was supported by four personality factors (all except for agreeableness). CC was affected positively by extroversion ($Y' = 0.27$, $t = 2.04$) and conscientiousness ($Y' = 0.37$, $t = 3.08$) and negatively by neuroticism ($Y' = -0.38$, $t = -2.74$) and openness ($Y' = -0.43$, $t = -3.22$). Those socially active and energetic are the one, whose plans and forecasts are keen to achieve goals and get praised (extroversion and conscientiousness). They perceive much more cost when leaving organizations and breaking the developed relationships. For the second group (openness to experience and neuroticism) it is almost *vice versa*.

Finally, the third hypothesis on the relationship among big-5 factors and normative commitment (NC) was supported by two personality factors that are extroversion and openness. Extroversion has a positive effect on NC ($Y' = 0.37, t = 2.56$) as extroverted people are looking for praise and tends to be in the center of social networks. So, they respect the obligations and rules and being remained with the organization. People with high openness to experience think on feet and don't bound themselves to the things valued like rewards, which tied up employees to the organizations. Therefore, this kind of personality factor has the negative effect on NC ($Y' = -0.53$, $t = -3.50$). This finding is in accordance with the previous survey findings (for instance [27]).

The result of the structure equation analysis in this study, mostly confirms the effects of the big-5 personality factors on organizational commitment component.

Extracted equations for commitment propensity

As it has been previously mentioned, the main purpose of current study is to improve and achieving to a more valid selecting tool. In addition, to some criteria like age, gender, job tuner and training scores (out of 100) the score of pre-entry commitment propensity of the apprentices is applied for ranking new comers. Outcomes of the multiple regression equations are the scores of commitment propensity. For example, for the first person of case study with the personality scores (as Table 6), his pre-entry commitment propensity score will be -0.6512.

Table 6
The overall trait personality scores of the first person.

Person 1	
Extroversion	2.5
Agreeableness	3.3
Conscientiousness	2.76
Neuroticism	2
Openness	2.88

According to the Figs. 2 and 3 and Table 5, different kind of commitments are calculating as below

$$\begin{aligned} Y_{\text{Affective Commitment}} &= 0.6X_{\text{Extroversion}} \\ &- 0.28X_{\text{Neuroticism}} - 0.67X_{\text{Openness}} \\ + 0.65Y_{\text{Continues Commitment}} &= 0.27X_{\text{Extroversion}} \\ &+ 0.37X_{\text{Conscientiousness}} - 0.38X_{\text{Neuroticism}} \\ &- 0.43X_{\text{Openness}} + 0.7Y_{\text{Normative Commitment}} \\ &= 0.37X_{\text{Extroversion}} - 0.53X_{\text{Openness}} + 0.75. \end{aligned} \tag{11}$$

Then estimated scores of commitment for person Alpha are as Eqs. (12)

$$Y_(\text{“Affective” “Commitment”}) = 0.6(2.5) - 0.28(3.3) - 0.67(2.88) + 0.65 = -0.7036,$$

$$Y_(\text{“Continues” “Commitment”}) = 0.27(2.5) + 0.37(2.76) - 0.38(3.3) - 0.43(2.88) + 0.7 = -0.0962,$$

$$Y_(\text{“Normative” “Commitment”}) = 0.37(2.5) - 0.53(2.88) + 0.75 = 0.1486,$$

$$[(\text{“Total Score of Alpha Commitment Propensity”} = Y)]_\text{“AC”} + Y_\text{“CC”} + Y_\text{“NC”} = -0.6512. \tag{12}$$

Application of proposed supported structural equations for ranking new comers

Personnel selection problem as one of the MCDM problems, has been discussed widely in the literature. Estimated scores of new comers' pre-entry commitment, together with other considered criteria are indicated in Table 3. Based on these various criteria there are several apprentices as alternatives, TOPSIS is used to rank them. Decision matrix is presented in the Table 7.

Table 7
Decision matrix.

	AC	CC	NC
P_1	−0.7036	−0.0962	0.1486
P_2	−0.79	0.51	−0.26
P_3	0.1375	0.4625	0.4275
P_4	−0.435	0.48	0.19
P_5	−0.3	0.96	0.11
P_6	0.8	0.915	1.01
P_7	0.3275	0.6765	0.6615
P_8	0.325	1.076	0.486
P_9	−0.56	0.1745	0.0545
P_{10}	0.265	0.8585	0.5785
P_{11}	−0.274	0.361	0.27
P_{12}	0.94	1.29	1.01
P_{13}	−1.845	−0.78	−0.71
P_{14}	−1.23	−0.4405	−0.4755
P_{15}	−0.47	0.585	0.11
P_{16}	0.2	0.645	0.64
P_{17}	−0.1	1.065	0.455
P_{18}	0.05	1.073	0.258
P_{19}	−0.005	1.2975	0.2825
P_{20}	0.145	0.625	0.375
P_{21}	−1.39	0.61	−0.63
W	0.5	0.265	0.233

In this all persons who apply for recruitment are alternatives and three kind of commitments are criteria. Numbers in the Table 7 are estimated from equations of structural equation modelling. According to the Eq. (6) to (10), coefficients of closeness and ranking are presented in the Table 8.

Table 8
TOPSIS calculations.

	ACom	CCom	NCom	D_i^+	D_i^-	CC	RANK
P_1	−0.10717	−0.00709	0.01478	0.283826	0.200142	0.413543	17
P_2	−0.12033	0.037567	−0.02586	0.297928	0.191981	0.391871	18
P_3	0.020944	0.034068	0.042519	0.148599	0.335211	0.692856	8
P_4	−0.06626	0.035358	0.018897	0.232688	0.250509	0.51844	14
P_5	−0.05027	0.070715	0.010941	0.2146	0.276284	0.56283	13
P_6	0.121857	0.0674	0.100455	0.035336	0.455165	0.92796	2
P_7	0.049885	0.049832	0.065793	0.109536	0.373664	0.773311	4
P_8	0.049504	0.07926	0.048338	0.108434	0.376956	0.776605	3
P_9	−0.0853	0.012854	0.005421	0.260918	0.221442	0.45908	16
P_{10}	0.040365	0.063238	0.057538	0.116012	0.366452	0.759542	5
P_{11}	−0.04174	0.026592	0.026854	0.210643	0.271712	0.563303	12
P_{12}	0.143182	0.095023	0.100455	0.000552	0.482155	0.998855	1
P_{13}	−0.28103	−0.05746	−0.07062	0.48233	0	0	21
P_{14}	−0.18736	−0.03245	−0.04729	0.384024	0.099724	0.206149	20
P_{15}	−0.07159	0.043092	0.010941	0.238526	0.246226	0.507942	15
P_{16}	0.030464	0.047512	0.063655	0.127944	0.355074	0.735115	6
P_{17}	−0.01523	0.078449	0.045254	0.168628	0.320229	0.655056	11
P_{18}	0.007616	0.079039	0.025661	0.155711	0.333494	0.681707	9
P_{19}	−0.00076	0.095576	0.028098	0.161107	0.334238	0.674759	10
P_{20}	0.022087	0.046038	0.037298	0.145282	0.337991	0.699379	7
P_{21}	−0.21173	0.044934	−0.06266	0.393867	0.123896	0.239291	19

In fact, CC and ranking are the basis for selection of people for employ in the organization.

Conclusion

Based on results given in accordance to previous surveys (see also the findings of the study by [26] and [27]) the effect of personality factors on organizational commitment was explored. Referring to the previous findings, each five personality factors could affect organizational commitment through positive or negative relationship.

The most consistent result is received for the positive effect of extroversion on organizational commitment (also partly explored by [28]). It was also proved by empirical evidences that extroverted employees are considered to be successful in social networks and affiliations. The negative effect of openness on all three commitment component should be noticed by personnel managers, who should care for the ambitions of these kind of employees and provide them enough freedom to explore and being well trained through job experiences and to enable them to go deeper into working tasks in order to fulfil their potentials. Otherwise they will most probably quit their jobs and positions and start looking for opportunities in other organizations. These kind of people are supposed to switch the organizations frequently. In another research the strong relationship between openness and job changes was explored. Linkage between neuroticism and organizational commitment is consistent to previous findings and indicate that less socially integrations with organizational networks is expected from neurotistic ones as they almost have conflicts with others and make their environment much less conductive and prevent it from development. The human resource managers and supervisors should be familiar to these kind of characteristic and to be conscious about using neurotistic employees in team-work projects and sections, which require much more public relations. Finally, the other empirical result is proved the positive effect of consciousness on continues commitment that can be considered as an advantage for employers. When these kinds of people are hired they are almost keen on gaining work rewards and associate much more cost with organizational abandon.

Human or interpersonal managerial skill, as one of the three identified types of managerial skills is equally essential on all hierarchical levels and highly advised for HR managers to have dispositional approach and be informed of personality characteristics to make accurate policies for selecting and placing applicants for the best appropriate jobs. Considering the dispositional impacts on the organizational commitment, job satisfactions and job-performance, it can be suggested to make it bold and focusing on psychological pre-entry interviews equally to other preferred selection tools, especially for those organizations facing high employee turnover challenges and working in high-technology industries which employ scientists and engineers. For the aim of formulating appropriate human resource strategies especially for recruiting, training and promoting, concerning new employees' personality are equally as important as minding the specific knowledge and job-related abilities for organizational practitioners in human resource management.

References

[1] Silverthone C., *The impact of organizational culture and person-organization fit on organizational commitment and job satisfaction in Taiwan*, The Leadership & Organization Development Journal, 25, 592–599, 2004.

[2] Arrowsmith J., Parker J., *The meaning of 'employee engagement' for the values and roles of the HRM function*, International Journal of Human Resource Management, 24, 14, 2692–2712, 2013.

[3] Akroyd D., Legg J., Jackowski M.B., Adams R.D., *The impact of selected organizational variables and managerial leadership on radiation therapists organizational commitment*, Radiography, 15, 113–120, 2008.

[4] Almeida S., Fernando M., Sheridan A., *Revealing the screening: organisational factors influencing the recruitment of immigrant professionals*, The International Journal of Human Resource Management, 23, 9, 1950–1965, 2012.

[5] Celep C., Yilmazturk O.E., *The relationship among organizational trust, multidimensional organizational commitment and perceived organizational support in educational organizations*, Social and Behavioral Sciences, 46, 5763–5776, 2012.

[6] Paulin M., Ferguson R.J., Bergeron J., *Service climate and organizational commitment: The importance of customer linkages*, Journal of Business Research, 59, 906–915, 2006.

[7] Guleryuz G., Guney S., Aydin E.M., Asan O., *The mediating effect of job satisfaction between emotional intelligence and organizational commitment of nurses: a questionnaire survey*, International Journal of Nursing Studies, 45, 1625–1635, 2008.

[8] Bednarczyk T.K., *Human resources and motivation in knowledge management*, Management and Production Engineering Review, 1, 4, 13–18, 2010.

[9] Meyer J.P., Allen N.J., *Commitment in the workplace: theory, research, and application*, Newbury Park, CA: Sage, 1997.

[10] Ng T.W.H., Feldman D.C., *Can you get a better deal elsewhere? The effects of psychological contract replicability on organizational commitment over time*, Journal of Vocational Behavior, 73, 268–277, 2008.

[11] Steers R.M., *Task-goal attributes, n achievement, and supervisory performance*, Organizational Behavior and Human Performance, 13, 3, 392–403, 1975.

[12] Steers R.M., Porter L.W., *Work and motivation: some concluding observations*, Motivation and Work Behavior, pp. 573–582, 1991.

[13] McCrae R.R., Costa P.T. Jr., *Validation of the five-factor model of personality across instruments and observers*, Journal of Personality and Social Psychology, 52, 81–90, 1987.

[14] Meyer J.P., Allen N.J., *Testing the "side-bet theory" of organizational commitment: some methodological considerations*, Journal of Applied Psychology, 69, 372–378, 1984.

[15] Meyer J.P., Herscovitch L., *Commitment in the workplace toward a general model*, Human Resource Management Review, 11, 299–326, 2001.

[16] Meyer J.P., Allen N.J., Gellatly I.R., *Affective and continuance commitment to the organization: evaluation of measure and analysis of concurrent and time-lagged relations*, Journal of Applied Psychology, 75, 710–720, 1990.

[17] Panuwatwanich K., Nguyen T.T., *Influence of organisational culture on total quality management implementation and firm performance: evidence from the Vietnamese construction industry*, Management and Production Engineering Review, 8, 1, 5–15, 2017.

[18] Allen T.D., Johnson R.C., Saboe K.N., Cho E., Dumani S., Evans S., *Dispositional variables and work-family conflict: a meta-analysis*, Journal of Vocational Behavior, 80, 17–26, 2012.

[19] Staw B.M., Bell N.E., Clausen J.A., *The dispositional approach to job attitudes: a lifetime longitudinal approach*, Administrative Science Quarterly, 31, 56–77, 1986.

[20] Allport G.W., *Pattern and growth in personality*, Holt, Rinehart & Winston, New York, NY, 1961.

[21] Sternberg R.J., *Pathways to psychology*, 2nd ed., Harcourt, A Division of Thomson Learning, Inc., New York, NY, 2000.

[22] House R.J., Shane S.A., Herold D.M., *Rumors of the death of dispositional research are vastly exaggerated*, Academy of Management Review, 21, 1, 203–224, 1996.

[23] Eysenck H.J., *Manual of the Eysenck personality questionnaire*, Hodder & Stoughton, 1975.

[24] Armstrang P.I., Anthoney S.F., *Personality facets and RIASEC interests: an integrated model*, Journal of Vocational Behavior, 75, 346–359, 2009.

[25] Barrick M.R., Mount M.K., *The Big Five personality dimensions and job performance: a Meta-Analysis*, Personnel Psychology, 44, 1–26, 1991.

[26] Erdheim J., Wang M., Zickar M.J., *Linking the Big Five personality constructs to organizational commitment*, Personality and Individual Differences, 41, 5, 959–970, 2006.

[27] Kumar K., Bakhshi A., *The five-factor model of personality and organizational commitment: is there any relationship?*, Humanity Social Sciences Journal, 5, 1, 25–34, 2010.

[28] Panaccio A., Vandenberghe C., *Five-factor model of personality and organizational commitment: the mediating role of positive and negative affective states*, Journal of Vocational Behavior, 80, 647–658, 2012.

[29] Wille B., Fruyt F.D., Feys M., *Vocational interests and Big Five traits as predictors of job instability*, Journal of Vocational Behavior, 76, 547–558, 2010.

[30] Rubenzer S.J., Faschingbauer T.R., *Personality, character & leadership in the White House*, Washington, D.C.: Brassey's, Inc., 2004.

[31] Stadnicka D., Sakano K., *Employees motivation and openness for continuous improvement: comparative study in Polish and Japanese companies*, Management and Production Engineering Review, 8, 3, 70–86, 2017.

[32] Saaty T.L., *The analytic hierarchy process*, New York: McGraw-Hill, 1980.

[33] Amiri P.M., *Project selection for oil-fields development bu using the AHP and fuzzy TOPSIS methods*, Expert Systems with Applications Journal, 37, 6218–6224, 2010.

[34] Hwang C.L., Yoon K.P., *Multiple attribute decision making: methods and applications*, New York, Springer-Verlag, 1981.

[35] Behzadian M., Otaghsara K.H.S., Yazdani M., Ignatius J., *A state-of the-art survey of TOPSIS applications*, Expert Systems with Applications Journal, 39, 13051–13069, 2012.