

Original Research

Presenting a Cause-Effect Model of the Factors Affecting the Fundamental Competencies of Human Resource Managers in Service Start-ups with the DEMATEL Approach

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Abstract

The current research has been done to provide a cause-effect model of the factors affecting the fundamental competencies of human resource managers in service start-ups using the Dematel approach. The research method is descriptive-survey with the statistical population of 12 experts, including university professors in the field of human resources and human resources managers and experts of service start-ups in three systems: Snapp, Tapsi and Maxim. At first, based on the research background, the factors affecting the fundamental competencies of human resource managers in service start-ups were determined, and then the DEMATEL technique was used as an approach to identify the cause-effect relationships. Then, with the method of Analytical Hierarchy Process (AHP), factors were prioritized in three taxi order systems. The results of this research showed that vision, leadership, and information technology have been identified as effective causal factors, and the Education and knowledge management, organizational culture, corporate communication, and rules of the organization have been identified as impressive factors. The results of the hierarchical analysis also showed that information technology has the uppermost priority in the Snapp and Tapsi taxi request system, but in the maxim system, vision and strategy receive the uppermost priority.

Keywords: Fundamental competence, Human resources, Service start-ups, Dematel.

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Introduction

Nowadays, in order to build a forward-looking and stable organization, which will form a competitive organization, it is necessary to develop the fundamental competencies within an organization. Fundamental competencies are basically the strategic actions which are taken to achieve the organizational strategic goal. For better performance, every organization needs some strategies directing to its goals. Fundamental competencies are assets that occasionally renew organizational strategies to advance it in the market. The fundamental competencies are the strength of the organization that equips it with the ability to resist to unpleasant changes in the external environment and the stability of the organization. In fact, by using fundamental competencies, organizations can continuously seek new ways to provide services and service innovation to update and engage people (Hooda & Singla, 2021). It is possible to develop competencies to achieve the organization's strategic goals, therefore organization managers should focus on these fundamental competencies as key elements (Sanchez, Jenny, & Miles, 2017). Today, mobile taxi booking (MTB) applications have been developed in cities as a bridge to connect passengers and taxis (Shen, Qiu, Li, & Feng, 2015). With MTB apps, travelers can search for available taxis around them and order or type in GPS. They set their locations by using GPS or by typing the target location so that drivers can easily have access to them. For the first time in the world, this service was provided by Uber in San Francisco, USA (Chan, Chang, Lau, Law, & Lei, 2016). In the last few years, start-up companies have been developed widely in industries of Iran, and accordingly, start-up companies have experienced many failures and accomplishments. In Iran, the urban transport business paradigm faced the digital transformation following the global trend (Nazari, Vedadhir, & Ezati, 2019). Currently, companies such as Snapp, Tapsi, etc. are also providing services in some big cities of Iran with the formation of online taxi request platforms. One of the challenges which startup business managers have faced with in today's world is the selection in human resources units. Therefore, this research seeks the cause-effect relationships of the factors affecting the fundamental competencies of human resources managers.

Theoretical foundations

Fundamental competencies

Fundamental competencies are the set of knowledge, skills and attitudes that managers must have in order to effectively manage different and complex situations (Lee, 2018). Fundamental competencies are also analyzed in the context of values. As Bacha (2012) also mentions. Fundamental competencies are defined as a specific and unique experience of the company allowing it to create value and, as a result, offer products that are unique and difficult to copy by competitors which is why it has been considered in fundamental competencies in a period of time (Nowak, 2018). Fundamental competencies are defined as knowledge and skills that can be identified to perform assigned tasks at the right time and place. It is believed that fundamental competencies have a basic process affecting the development of the organization and are considered as the key to success (Ng & Kee, 2018). Fundamental competencies frequently create challenges for imitative competitors or suppliers and partners. In other words, the lack of these types of competencies, which

are essential and needed, will lead to a significant strategic challenge or loss in the market. The distinction of the fundamental competencies of an organization is that they work overtime and frequently demonstrate the vital factors in order to succeed in a period of time. Another distinction of fundamental competencies is that it is difficult for competitors to copy or produce items (Rigby & Bilodeau, 2015). The fundamental competencies of the organization are defined as the ability to perform specific tasks even better than competitors. Fundamental competencies affect everything that leads to the company's development, what the organization focuses on, and the bottom line. Fundamental competencies may have the following natures (Nowak, 2018):

Market Access Competencies: This skill makes you stand next to customers and buyers.

Integration and Relational Competencies: This skill allows the company to do the job faster, with much more flexibility, or with much more confidence and credibility than the competitors.

Functional and Relational Competencies: This skill enables the company to invest in its own products or services.

Start-up businesses

In the last few years, developments in new technologies means that companies have adopted new business models, which includes globalization and the Internet usage as an asset to promote products and services (Zutshi, Grilo, & Jardim-Goncalves, 2015). With the technology evolution since the first decade of the 21st century, these business models have been adapting to new processes and social changes and also new consumer demands in this new digital era where the use of new technologies has become a habit in the personal and professional world (Saura, Palos-Sanchez, & Grilo, Detecting indicators for startup business success: Sentiment analysis using text data mining, 2019). The term "startup" was invented for business models using technology. A start-up is a technology-based company that offers a new product or service using the added value of embedded technology. This is defined as "innovation through technology" (Kopera, Wszendybyl-Skulska, Cebulak, & Grabowski, 2018). Start-ups can be defined as innovative investments that perform under a situation of uncertainty, time pressure and high risk. Some claim that technology start-ups are one of the most important players in building innovation ecosystems (Genome, 2017).

The goal of many start-ups is to create a revolution in the market in which they perform (Kopera, Wszendybyl-Skulska, Cebulak, & Grabowski, 2018). Start-ups use scalable business models (Saura, Reyes-Menendez, & Alvarez-Alonso, Do online comments affect environmental management? Identifying factors related to environmental management and sustainability of hotels, 2018). Many are creating successful products and services for consumers whose consumption habits are based on the digital age. Examples of services and products created as start-ups include Whatsapp, Facebook, Instagram, and the tech giant Alphabet (Google) (Saura, Palos-Sanchez, & Grilo, Detecting indicators for startup business success: Sentiment analysis using text data mining, 2019). Start-ups are small companies that start from an innovative idea using

technology, and with experience and the time passing through, they will become a technological and innovative company that is stable in time (Hagen & Bergh, 2018).

Although start-ups are pioneers of innovation, they face some specific innovation challenges. The work of innovation in start-ups is based on the entrepreneurial model that focuses on rapid growth and continuous pursuit of opportunities through continuous development in the situation of resource scarcity (Engel, 2015)

Human resource management in start-ups

Start-ups are new generation organizations and should be viewed from a completely different point of view. What works for other companies, may not work for start-ups in general. Trying to produce something innovative makes a start-up company face some challenges such as uncertainty in the future, dealing with competitors in the market, high friction rate and high wages offered by competitors. Also, start-ups are trying to be promoted. For their human resources, it is important to try to find, recruit and retain the best talent. Human resource management functions that should be applied by start-up entrepreneurs in organizations include job design, role description, recruitment and selection, training and development, performance evaluation, strategy incentives, work situations, employees' relations (Boudlaie, Kenarroodi, Amoozad Mahdiraji, & Afari-Sadeghi, 2020).

The results of the research by Sadeghi et al. (2019) showed that human resource management can play different roles from strategic to non-strategic in the start-up growth process. In addition, product quality, company financial performance, and stability are directly dependent on individual employees and their relationships with each other. Human resource managers focus on areas such as selection, recruitment, strategic allocation of human resources, employee development, and organizational environment to create synergy between employees' efforts and business goals (Keir, 2019). When looking at the reasons for the failure of start-ups from the vision of human resources, 60% of startup failures are due to human factors such as poor quality and efficiency, lack of innovation, lack of focus and strategy. The criticality of the human capital element in start-ups attaches importance for the development of human resource management systems to minimize the possibility of failure (Calden, García, & Betancourt, 2019). In addition, start-ups consist of a small number of employees, and this issue creates environmental conditions different from corporate environments (Gallup, 2019).

The importance of human resources in start-ups

Researchers are increasingly supporting the adoption of superior human resource management practices in start-ups. For example, they even support the importance of implementing high-performance work systems (intertwining practices such as structured selection, training, merit-based performance appraisal and promotion, share ownership rewards, and flexible approaches to work). Even in the early stages of start-ups formation this is emphasized, as it seems to increase their chances of achieving a higher level of growth. The longitudinal study of Barron and Hannan's (2002) is a large sample of high-tech start-ups in Silicon Valley that emphasized the enduring effects of early HRM decisions on startup development. In this regard, Rutherford et al. (2003) argued that

when firms achieve higher sales growth, specific features of human resource management such as employee development activities become important. Nevertheless, human resource management in small firms (especially start-ups) is not prioritized and considered very informal, because it includes the introduction of organizational rules and regulations, which often act as a tremendous threat to entrepreneurial spirit and flexibility of This type of business is considered (Jebali & Meschitti, 2021).

Although investment in human resource management can be considered as one of the most important decisions and increase productivity, but this increase in productivity is not enough to cover additional labor costs and new human resource management processes. However, the investment efficiency comes through advanced innovation or reduced conflict. It seems that the HRM efficiency depends on "parameters" such as business industry or strategic position. For example, it is more likely to find HRM systems in firms with a differentiation strategy than those aiming to achieve cost leadership (Harney & Alkhalaf, 2021).

In contrast, other researchers argue that firms with a differentiation orientation are less apt to adopt high-investment HRM systems, as their dynamism and flexibility may be suppressed by increased standardization. Firms can benefit more from the formal and informal coexistence with human resource management in order to improve innovation. Then, instead of being afraid of the increase in formalities in start-ups, both temporary and structured practices can be adopted in a complementary manner (Do & Shipton, 2019).

Background research

The background of the research is summarized in Table 1.

Table 1. Summary of the experimental background of the research

Components of fundamental competencies	Research purpose	Title	Author
In this research, the fundamental competence dimensions of human resource managers and the factors affecting them have been identified and categorized. Based on the findings in the first stage with the qualitative approach, eight dimensions of fundamental competencies including cognitive-insight competence, entrepreneurial competence, leadership competence, communication competence, individual competence, technical and specialized competence, moral competence and psychological	The current research has been done with the aim of designing the fundamental competence model of human resource managers and identifying its dimensions and components as well as the factors affecting the fundamental competence of	Designing fundamental Competencies pattern for human resource managers related to service start-ups in the urban transport sector	(Soleimani, Khademi, AbdulManafi , & Shahnazari, 2023)

competence and six effective factors were formulated.	human resource managers		
According to the results, the main phenomenon of this research is the process of extracting of international marketing managers competencies considering the causal factors (mathematical intelligence, cultural intelligence and personality traits), contextual factors (performance of Iranian consultants, performance of chambers of commerce and confounding factors (economic, political, and cultural conditions)	Present study aims to find international managers competencies by means of grounded theory.	Presenting International Marketing Managers Competency Model	(Basiji, Babaie Zakliki, Hoseinzadeh Shahri, & Khadivar, 2021)
The key dimensions of the identified competencies are: the dimension of fundamental competence, the dimension of technological competence. The research results show that the most important competencies layers of IT managers in the area of fundamental competencies include individual competencies layer and educational competencies layer and in technological competencies dimension include general competencies layer and professional competencies layer of Information technology managers	to design a model for the competencies of Mellat Bank's IT managers	Designing a model of basic and technological competencies of IT managers	(Saeidpanah, Alvani, & Hashemi, 2020)
Including data, information management, human factors, project management, research skills/knowledge, leadership and management, systems development and evaluation, and health/healthcare	Aimed to systematically review the academic literature relating to competencies, skills and existing course curricula in the clinical and health related informatics domains	Fundamental competencies for clinical informaticians: A systematic review	(Davies, Mueller, & Moulton, 2020)
The findings suggested that to ensure the implementation of future-oriented and sustainable e-governance, it is required to develop the fundamental-competencies. The significant fundamental-competencies explored are, namely,	The purpose of this paper is to empirically identify the themes of fundamental-competencies required for future-	Fundamental – competencies – a key to future – oriented and sustainable e-governance implementation: a	(Hooda & Singla, 2021)

process management, employee engagement, internal service quality, external service quality, citizen satisfaction, leadership, culture and technology	oriented and sustainable e-governance practices, especially across the developing nations.	mixed method research	
decision making, relationship management, communication skills, listening, Leadership, conflict, Management, ethical principles, collaboration and team management skills.	The objective of this research is to identify the fundamental competencies needed for nurse managers in the Spanish health system	Nurse Manager Fundamental Competencies: A Proposal in the Spanish Health System	(González García , Pinto-Carral , Villorejo, & Marqués-Sánchez, 2020)
Data show that communication, commitment and leadership appear as the three most relevant aspects. Multivariate analysis identified seven groups of competencies: leadership, self-management, interpersonal, communication, technical, .productivity and managerial	The purpose of this paper is to define the most important competencies to project success and investigate their correlations	The project manager fundamental competencies to project success	(Alvarenga, Branco, Guedes, Soares, & Silva, 2019)
Effective team learning on fundamental competencies (clinical competency, communication competency, critical thinking ability (and self-leadership	The aim of this study was to assess the comparative effectiveness of TBL and lecture-style classes in terms of teaching fundamental competencies in nursing education, which include clinical competence skills, problem-solving ability, communication competencies, critical thinking ability, and self-leadership.	Effects of team-based learning on the fundamental competencies of nursing students: A quasi-experimental study	(Lee, 2018)

Research method

The current research method is applied in the field of descriptive-survey methods, based on the results of previous studies, factors affecting fundamental competencies have been extracted.

Table 2. Factors affecting the basic competencies of human resource managers
 (Soleimani, Khademi, AbdulManafi , & Shahnazari, 2023)

	Variables
1	Corporate communication
2	Vision and organizational strategy
3	Information technology
4	Education and management of organizational knowledge
5	Rules governing the organization
6	Organizational Culture

The statistical population in this study consisted of 12 experts, including university professors in human resources and managers and human resources experts of service start-ups in three systems: SNAPP, TAPSI, and MAXIM, which were selected by the purposeful snowball sampling method. The characteristics of experts are shown in Table 3.

Table 3. Characteristics of experts

Groups	Number	Expertise
Faculty member	6	PhD in Human Resource Management
Internet taxi human resources manager	5	Human resources management
Internet taxi human resources expert	1	Human resources management

At first, the factors affecting the fundamental competencies of human resource managers in service start-ups were identified, and then the Dematel technique was used as an approach to identify cause and effect relationships between factors.

Then, with the Analytical Hierarchy Process (AHP) method, factors were prioritized in three taxi request systems. To continue, Dematel and AHP methods are explained:

Dematel is a technique used to identify the algorithm of causal relationships between a set of variables. The algorithm of the Dematel technique performance is implemented in five steps (Habibia, Izadiyar, & Sarafrazi, 2022):

Step 1: Forming the direct relationship matrix (M)

To identify the pattern of relationships between n criteria, an n×n matrix is formed at first. The effect of the element in each row on the elements in the column is included in this matrix. A range of 0 to 4 points is used for scoring.

Table 4. Quantification of the affect

Number	0	1	2	3	4
Effect	Effectless	Low effect	Medium effect	High effect	Very high effect

Step 2: Normalize the direct correlation matrix.

For normalization, first, the sum of all rows and columns of the direct correlation matrix is calculated. The largest number of the sum of rows and columns will be displayed with k . For normalization, each row of the direct correlation matrix must be divided by k .

$$k = \max \left\{ \max \sum_{j=1}^n x_{ij}, \sum_{i=1}^n x_{ij} \right\} \quad (1)$$

$$N = \frac{1}{k} * X$$

Step 3: Calculate the complete correlation matrix

To calculate the complete correlation matrix, we first form an identical $n \times n$ matrix. Then we subtract this identical matrix from the normal matrix and invert the resulting matrix. The normal matrix is multiplied by the resulting matrix to obtain the complete correlation matrix. The matrix is identical matrix or identity matrix whose all domains except the main diameter are zero.

$$T = N \times (I - N)^{-1} \quad (2)$$

Step four: Calculate the internal correlation matrix

To calculate the internal relations matrix, the threshold value must be calculated. With this method, partial relationships can be ignored and the network of significant relationships can be drawn or the network of relationships map (NRM). Only relations whose values in matrix T are greater than the threshold value will be displayed in NRM. To calculate the threshold value of relationships, just calculate the average values of the matrix. After the intensity of the threshold is determined, all the values of the T matrix that are smaller than the threshold are zeroed, that is, the causal relationship is not considered.

Step five: Create a causal diagram

Four important features can be seen in the causal diagram:

- The degree of effect of variables: the sum of the elements of each row (R) for each factor indicates the degree of effect of that factor on other factors of the system.

- The degree of affect of variables: the sum of the elements of column (C) for each factor indicates the degree of affect of that factor on other factors of the system.

- Therefore, the horizontal vector ($R + C$) is the degree of affect of the desired factor in the system. In other words, the higher the value of $R + C$ of a factor, the more interaction that factor has with other factors of the system.

- The vertical vector (R - C) shows the affect of each factor. In general, if R-C is positive, the variable is considered a causal variable, and if it is negative, it is considered an effect.

Finally, a Cartesian coordinate system is drawn. In this device, the longitudinal axis is based on R + C values and the transverse axis is based on R - C values. The position of each agent is determined by a point with coordinates (R + C, R - C) in the device. In this way, a graphic diagram will also be obtained.

The basis of the work of AHP method is based on three basic principles 1. Creation of the breakdown structure of the investigated problem; 2. Pairwise comparisons of different criteria; 3. Consolidation and obtaining the priority of criteria.

The first step of creating the work breakdown structure consists of dividing the sub-criteria into simple groups, which are displayed at different levels in a hierarchical structure. The second step of pairwise comparisons of criteria: involves assigning a degree of importance to each group to measure the importance at each level of the hierarchy. Then, numerical judgments are created at each level of the matrix hierarchy. In fact, in this matrix, n is the number of criteria at a certain level of the hierarchy and m is the number of options. Therefore n matrix is formed in that level with m rows and m columns. All pairwise comparisons matrices have two basic properties:

1- The main diameter of the matrix is always assigned the value 1 (because each criterion i is compared with itself).

2- Matrices are inverse matrices. (Values from 1 to 9 are considered in the comparison of criteria i compared to j and opposite values in the comparison of j compared to i). There is an agreement that the main w of matrix A is calculated, which is obtained in the form of equation 1-3 (Li, Phoon, Du, & Zhang, 2013).

$$\begin{aligned}
 Aw &= \lambda_{\max} w \\
 \bar{w}_i &= \left(\prod_{j=1}^n a_{ij} \right)^{1/n} \\
 w_i &= \frac{\bar{w}_i}{\sum_{i=1}^n \bar{w}_i} \\
 \sum_{i=1}^n w_i &= 1 \\
 \lambda_{\max} &= \sum_{i=1}^n \frac{(Aw)_i}{nw_i}
 \end{aligned} \tag{3}$$

In these relationships: A: pairwise comparison matrix with positive numbers; n: number of rows and columns of the matrix; λ_{\max} : largest eigenvalue; w: eigenvector associated with the largest eigenvalue. The adjustment of judgment matrices using a measurement criterion called compatibility rate, which is calculated as the following equation:

$$CI = \frac{CI}{RI} \tag{4}$$

Which: CI: consistency index RI: random index CI is also calculated as the following equation:

$$CI = \frac{\lambda_{\max} - n}{n - 1} \quad (5)$$

If the CR matrix includes a high value, it means that the judgment values, consistency rate, are not compatible, and generally values like 0.1 and below are acceptable. If this value is higher, the judgments are not reliable and should be renewed (Bottero & Peila, 2005).

Findings

The results of the Dematel method

In order to identify the pattern of causal relationships between the factors affecting the basic competencies of human resource managers, the Dematel method was used to reflect the internal relationships between the effective factors from the experts' point of view, and the initial matrix of direct relationships or X was formed.

Table 5. Primary matrix of direct relationships

code	Variables	1	2	3	4	5	6
C1	Corporate communications	0	1	2	3	3	3
C2	Vision and organizational strategy	4	0	3	2	3	3
C3	Information Technology	1	3	0	2	4	3
C4	Education and management of organizational knowledge	1	1	2	0	4	3
C5	Rules governing the organization	3	1	1	3	0	3
C6	Organizational Culture	3	1	1	3	3	0

First, the sum of all rows and columns is calculated. The inverse of the largest number of the row and column sum is represented by k. According to the table above, the largest number is 17, and all the matrices of the matrix are multiplied by the inverse of this number to make the matrix normal.

$$k = \frac{1}{\max \sum_{j=1}^n x_{ij}} = \frac{1}{17} = 0.0588$$

Therefore, by normalizing the initial matrix of direct relations, the matrix of normalized direct relations was obtained, which is shown in the Table 6.

Table 6. Normalized direct relationships matrix

Variables	1	2	3	4	5	6
C1	0	0.059	0.118	0.176	0.176	0.176
C2	0.235	0	0.176	0.118	0.176	0.176
C3	0.059	0.176	0	0.118	0.235	0.176
C4	0.059	0.059	0.118	0	0.235	0.176
C5	0.176	0.059	0.059	0.176	0	0.176
C6	0.176	0.059	0.059	0.176	0.176	0

To calculate the complete matrix, first the same matrix $I_-(6 \times 6)$ is formed and in the next step the same matrix is minus the normal matrix, the matrix obtained by subtracting the same matrix from the normal matrix must be reversed. Finally, the normal matrix must be multiplied by the inverse matrix.

$$T = N \times (I - N)^{-1}$$

The complete correlation matrix (T) the main criteria will be as follows in Table 7.

Table 7. Total relationship matrix

Variables	1	2	3	4	5	6
C1	0.277	0.217	0.304	0.468	0.532	0.494
C2	0.549	0.204	0.407	0.499	0.625	0.579
C3	0.378	0.332	0.223	0.451	0.612	0.529
C4	0.32	0.205	0.286	0.293	0.547	0.468
C5	0.409	0.2	0.243	0.445	0.352	0.467
C6	0.409	0.2	0.243	0.445	0.502	0.317

To determine the Network Relationship Map (NRM), a threshold value must be calculated. With this method, it is possible to ignore minor relationships and draw a network of significant relationships Only relations those values in matrix T are greater than the threshold value will be displayed in NRM Threshold values of the relations, that is, the average values of the T matrix, are obtained as 0.389. All the values of the T matrix that are smaller than 0.389 are set to zero, that is, the causal relationship is not considered.

Table 8. Matrix of general relations-applying the threshold limit

Variables	1	2	3	4	5	6
C1	0	0	0	0.468	0.532	0.494
C2	0.549	0	0.407	0.499	0.625	0.579
C3	0	0	0	0.451	0.612	0.529
C4	0	0	0	·	0.547	0.468
C5	0.409	0	0	0.445	0	0.467
C6	0.409	0	0	0.445	0.502	0

The pattern of cluster relations and Cartesian coordinates of the studied variables is as follows in Figure 1.

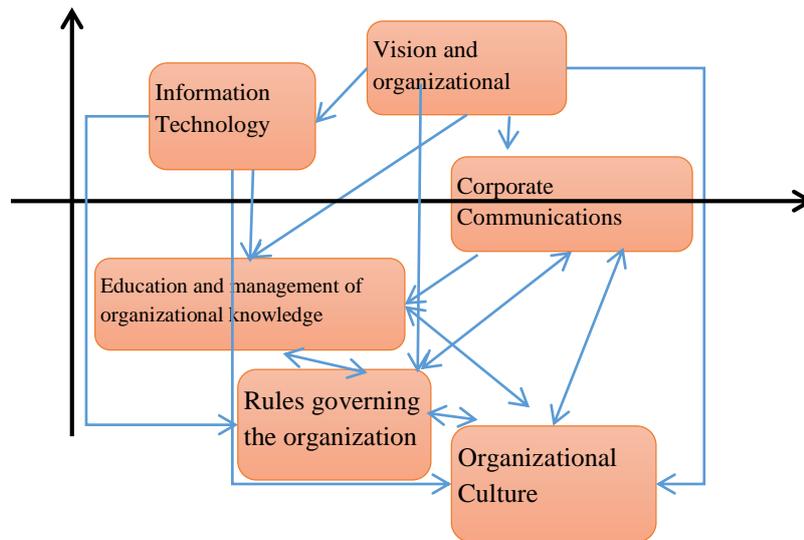


Figure 1. Cluster relations model and Cartesian coordinates

Finally, the order of effect and under effect of the factors is specified in Table 9.

Table 9. The order of affecting and being effected by variables

Variables	1	2	3	4	5	6
(Effect) R quantity	2.292	2.863	2.525	2.119	2.116	2.116
(Efficacy) C quantity	2.342	1.358	1.705	2.601	3.17	2.855
R +C	4.634	4.221	4.23	4.72	5.286	4.97
R - C	-0.05	1.505	0.82	-0.48	-1.05	-0.74

At this stage, the meaningful causal diagram of the relationships between the variables is shown in this way, the variables that are above the horizontal axis are the affecting variables and the variables that are below the horizontal axis are the impressionable variables.

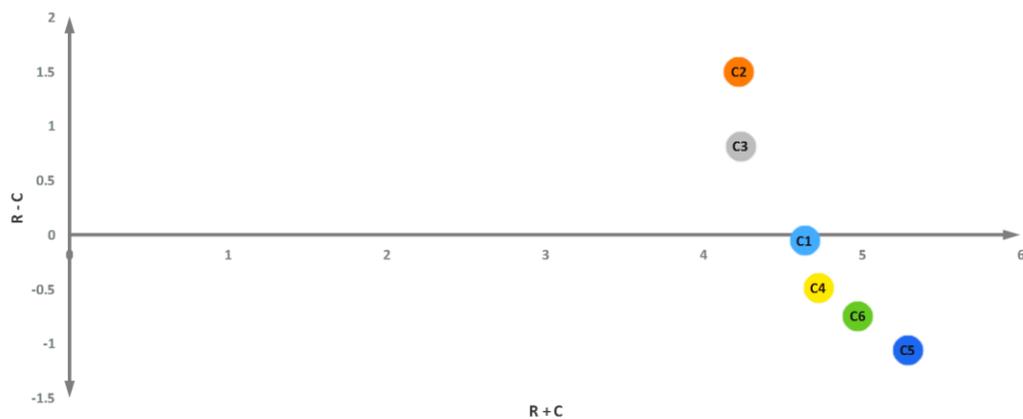


Figure 2. Spatial diagram of relations (public relations diagram)

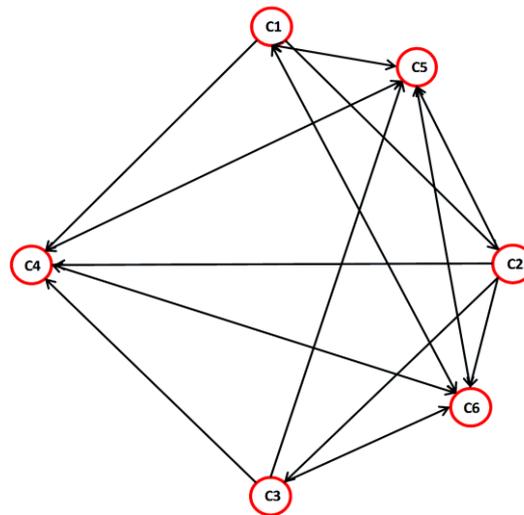


Figure 3. Network relations map

The results of the AHP method

Determining the weights of affecting factors of the fundamental competencies of human resource managers with the AHP method. In the current research, weighting was used in the Expert Choice software environment to determine the factors' weights. The basis of weighting the weights of the factors in the AHP method is shown in the following table:

Table 10. The basis of weighting the factors by AHP method

Verbal expressions	Numbers
Same preference	1
a little more	2
More preferred	3
much more	4
Totally preferable	5

Based on the results of weighting the factors, respectively, information technology with weight (0.220), vision and organizational strategy with weight (0.188), corporate communication with weight (0.186), rules governing the organization with weight (0.141), education and knowledge management with weight (0.140), organizational culture with weight (0.125). Also, based on the output of the software, the value of inconsistency rate equal to 0.003 was obtained, which is less than the reported value of 0.1 and is confirmed.

Table 11. Weights index

Main indicators	weights	Grade
Information Technology	0.22	1
Vision and organizational strategy	0.188	2
Corporate Communications	0.186	3
Rules governing the organization	0.141	4
Education and knowledge management	0.14	5
Organizational Culture	0.125	6

Next, in order to achieve the weighting of the factors in each of the start-up intra-city transportation businesses, i.e., Snapp, Tapsi and Maxim, it has been used in the Expert Choice software environment.

Prioritization and weighting of factors in SNAPP from the point of view of experts

The inconsistency rate of this test is calculated as 0.02. This value is less than the criterion of 0.1, so the reliability of the research tool is confirmed in this part. As it is clear in the above diagram, the information technology factor with 0.22 weight has been assigned the highest priority.

Table 12. Prioritization and weighting of factors in Snapp from the experts' point of view

Main indicators	weights	Grade
Information Technology	0.22	1
Corporate Communications	0.16	2
Education and knowledge management	0.157	3
Vision and organizational strategy	0.156	4
Organizational Culture	0.147	5
Rules governing the organization	0.143	6

Prioritization and weighting of factors in TAPSI from the experts' point of view

The inconsistency rate of this test is calculated as 0.004. This value is less than the criterion of 0.1, so the reliability of the research tool is confirmed in this part. As it is clear in the above diagram, the information technology factor with a weight of 0.183 has been assigned the highest priority.

Table 13. Prioritization and weighting of factors in TAPSI from the experts' point of view

Main indicators	Weights	Grade
Information Technology	0.183	1
Corporate Communications	0.181	2
Vision and organizational strategy	0.163	3
Education and knowledge management	0.163	4
Organizational Culture	0.16	5
Rules governing the organization	0.152	6

Prioritizing and weighting factors in Maxim from the experts' point of view

The inconsistency rate of this test is calculated as 0.003. This value is less than the criterion of 0.1, so the reliability of the research tool is confirmed in this part. As it is clear in the above diagram, the vision and organizational strategy factor with a weight of 0.187 has been assigned the highest priority.

Table 14. Prioritization and weighting of factors in Maxim from the point of view of experts

Main indicators	Weights	Grade
Vision and organizational strategy	0.187	1
Information Technology	0.183	2
Corporate Communications	0.179	3
Organizational Culture	0.155	4
Education and knowledge management	0.149	5
Rules governing the organization	0.147	6

Conclusion and suggestions

As it was mentioned, the current research was done to provide a causal model of the factors affecting the fundamental competencies of human resource managers in service start-ups with the Dematel approach. In the second step, factors were prioritized in three taxi request systems using the Analytical Hierarchy Process (AHP) method. The results showed that the effect of the variables, the sum of the elements of each line for each factor, indicates the effect of that factor on other factors of the system, and the highest impact is related to the variables of vision and organizational strategy and information technology with values of 2.863 and 2.525, respectively. Effect of the variables, the sum of the column elements for each factor indicates the degree of effect of that factor on other factors of the system. The highest effect was related to the variable of rules governing the organization with a value of 3.17 and organizational culture with a value of 2.855. Therefore, the horizontal vector (R + C) is the effect and impression of the desired factor in the system. In other words, the higher the value of R + C of a factor, the more interaction that factor has with other factors of the system. The laws governing the organization have the most interactions with other variables with a value of 5.286. The vertical vector (R - C) shows the effect of each factor. In general, if R-C is positive, the

variable is a causal variable and if it is negative, it is an effect. Causal variables that this value has become positive include the variable of vision and organizational strategy and information technology with values of 1.505 and 0.82, respectively. The results of the hierarchical analysis also showed that the vision and organizational strategy factor with a weight of 0.187 has the highest priority in the Maxim taxi request system, and the information technology factor with a weight of 0.183 has the highest priority in the Tapsi system. Finally, the information technology coefficient with a weight of 0.22 has the highest priority in the Snapp taxi request system. In the literature of startup human resources, technology, culture, and education are mentioned in the research of Kaiver (2018). Also, in a research, work culture and Kartimi are mentioned as effective factors in the human resources of start-ups (Lepanen, 2015). Kaushik (2018) raised the issue of education and culture as effective factors in the human resources of start-ups. Javadin et al. (2020) have mentioned the discussion of effective work culture and skill increase in the human resources model of start-up businesses as the ruling platform.

Therefore, based on the results, it is suggested that the managers of the taxi request systems pay more attention to the discussion of information technology in the organization, considering the dynamic and flexible environment of this type of business, as well as the information technology and the vision and strategies of other effective factors that are considered in the market up. Start-ups should be placed in relation to information technology, its effects on organizations have always been noted, the changes that information technology brings in areas such as structure, authority, power, job content, employee job hierarchy Supervision and job of managers can be mentioned In order to strengthen the technology in the organization, the necessary infrastructure and capital should be considered in every business in the field of information technology related to that business. In the field of organizational visions, the emphasis on employees' participation in improving the determination and implementation of visions and strategies for achieving goals in the organization should be taken into account in order to increase the competencies of human resource managers, and following the improvement of technology and vision, organizational culture and communication can be improved. The improvement will also be the basis for education and knowledge management in the organization and the improvement of the rules governing the organization, and this will provide the fundamental competence of human resource managers. Human resource management and all the factors affecting it formally and informally in order to strengthen innovation in this type of organizations should be taken into consideration so that the prevailing laws and its standardizations do not suppress the running and flexibility of this type of business.

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