

Providing a Model for Utilizing HRM Tools in Project Management with ISM Technique

Aboozar Zare khafri^{*1}, Seyed Mohammad Poorhosseini², Amin Zare khafri³, Seyed Davood Mirtorabi⁴

¹Islamic Azad University Najafabad branch, Department of Industrial engineering, Esfahan, Iran

²Islamic Azad University Tehran Medicine branch, Department of Medical Genetic, Tehran, Iran

³Researcher of Business Management, Tehran, Iran

⁴Legal Medicine Research Center, Tehran, Iran

ARTICLE INFO

Article history:

Received: 17 March, 2020

Accepted: 28 September, 2020

Online: 12 October, 2020

Keywords:

HRM Tools

ISM

ABSTRACT

An example of the essential factors in ensuring the outcome of project management is the effective use of human resources methods. Researchers' studies have shown that a logical connection exists between "human resource practices" and "project management". The goal of this research was determining a connection between five methods of human resource selection (employee performance appraisal, staff training and development, staff recruitment and selection, employee compensation system and employee welfare) and project management using structural interpretive modeling (ISM) Is. As a result of the present study, it has been observed that hiring and selecting employees and staff welfare are important and influential factors and are at the bottom of the hierarchical structure, these factors are very important for achieving staff training and evolution. Staff capabilities evaluation and their recompense is at a high level of the ISM model, meaning that if shaping methods are performed in project management, it is going to have occurred within the latter a part of the HRM.

1. Introduction

As an idea and content, HRM was suggested in 1980 [1]. The use of resources in any organization is extremely important and effective. Like three constraints (cost, quality, scope), human resources are considered as an example of the essential factors and therefore the most vital factors for any project to be successful. Human resource management includes proper training, hiring experienced workers, acknowledging the importance of the project and using potent methods and strategies to implement the project with the advantage of time and allowance [1]. It is the project manager's duty to successfully and fundamentally do the HRM. Project management involves the utilization of knowledge, expertise, strategies and methods for project activities to satisfy important project needs. This is often done by the utilization and combining the processes of project management to start out, useful preparations, implementation, effective observing, control and closure [2]. Project management and related functions have

received more attention in recent years, mainly due to their significance as a reward for administrative actions in contemporary organizations [3]. Because project management is an essential and complicated process that involves the utilization of ideas, the "Project Management Knowledge Set" (PMBOK) is therefore divided to "42 processes" and "5 groups" issued by the Project Management Institute [2]. No wonder that researchers are constantly searching for more links between project management and human resource practices. So far, this research has received the least reward, because, despite extensive research on project success factors [4], the number of successful projects is worryingly inadequate [5]. The main reason for this can be considered the flexibility of the main elements of the success of a project [4]. These factors of project success are often supported the outer or inner situations of related administrations, but a transparent and obvious classification between these factors are often shown in two sorts of project-related success and they are considered as a success both in project and whole HRM project [6]. Project success is

*Corresponding author: Aboozar zare khafri, Email: Abozar.zare71@yahoo.com

associated with the effective achievement of the planned goal owing to businesses, so it is associated with the goods or assistance of the organization, while the outcome of the management is associated with the effective achievement of the goals associated with allowance and capital, quality and common processes to control Project [7]. These two important and extensive categorization of project success obviously have one common shared feature, which may be a vital dependence on human resources owing to the previous aspect of success comes from its main power from the latest one [8]. Moreover, because "Employee Recruitment and Selection (ERS), Employee Training and Development (ETD), Employee Performance Assessment (EPA), Employee Compensation System (ECS) [8] and Employee Welfare" are among other important issues. Each of the organization's other employees also communicates with the project manager and the selected team, so the connection between these HR methods and project success (PS) is undeniable. Generally, HRM has an eye-catching effect on project management, managing people and creating value for a project. Today, HRM is part of the company's strategy and considers people as a resource, not a cost. By linking HRM to project management, it can be seen that performance plays a strategically important role. In this article, we discuss the primary significance of HRM in effective project management, so we would like to research how performance and impact of human resource management on project management. By considering this, it is essential to spot ways in which human resource performance can play a strategic role. After identifying these methods, it is necessary to create a model for implementation in any type of project.

2. ISM Process

ISM is an collaborative study method and procedure. During this technique, a group of various elements and factors that are directly and indirectly associated with one another are created in a inclusive and structured efficient model. The model that is formed

depicts the form of a drag or complicated problem in an accurate modeled pattern that has diagrams and pictures in addition to words. [9] Interpretive structural modeling (ISM) is a deep-rooted method and approach for recognizing the relationships between particular cases that expresses an issue or a complicated problem. For any complicated problem to be considered, variety of elements could also be associated with an issue or problem. Nevertheless, the direct and indirect relationships between different situational elements are far more accurate than the individual element. ISM begins with identifying factors and variables that are related to the matter or issue, consequently expands to the group analytic method. At that point a textual relationship that is related to the context is defined. After deciding on the set of effective elements and textual relationship, a structural selfinteraction matrix (SSIM) is made supported by the two-by-two analogy of the factors. Next, the SSIM is changed to an accessibility (RM) matrix and its portability is checked. After embedding, a special matrix model is achieved. Then, the elements are split and a new basic model called ISM obtained [9].

3. Steps involved in ISM methodology

Step 1: Structural Self-Interaction Matrix (SSIM)

The ISM process and approach promotes the use of specialist ideas in terms of a variety of effective management methods such as intercommunicating, team design, etc. in building textual relationships between elements. To this end, industry and academics should be conferred to find an essence of an effective textual connection between delegates. The activity and academics should have a deep knowledge of the subject. To analyze the different factors, a "lead" or "impact" textual relationship must be provided. This means that one factor has a significant effect on another. Accordingly, a textual relationships are found between the various identified elements. [9]

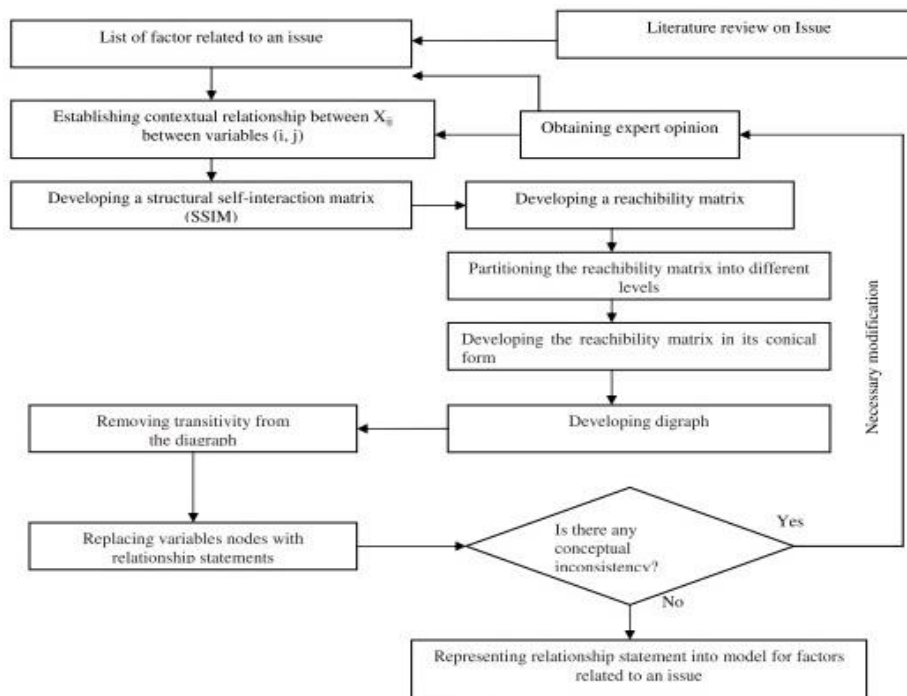


Figure 1: Diagram for developing ISM model [9]

Depending on the proposed textual relationship for each element and the existence of a connection between the two functional elements (i and j), the administration related to the connection goes less than a year. These four distinct symbols are used to indicate the orientation of the connection between two elements (i and j): the connection from element j to element i (ie, element j affects element i) (c) X in both orientations (Elements i and j are independent) (d) O due to the lack of relationship between the elements (i.e. barriers i and j are independent). [9].

Step 2: Discovery of the Matrix

The following important step in the process and method of ISM is to build the first SSIM access matrix. By considering this, SSIM becomes the first access matrix by inserting four different symbols (for example, V, A, X or O) SSIM with 1s or 0s in the first access matrix [9]. The basic practices of this method include: Model 0 input. (B) If the model input (i, j) is in SSIM O, then the input (i, j) in the access matrix is 0 and input (j, i) is 0. (C) If the model input (i, j) is in SSIM A, then the input (i, j) in the access matrix is 0 and input (j, i) is 1. (D) If the model input (i, j) is in SSIM X, the input (i, j) in the access matrix becomes 1 and input (j, i) becomes 1 [9].

Step 3: Level separation

Finally, from the last access matrix, different access sets and priori sets are available for each active item. The access set contains another different agent and element that may have influence on it, while the previous set is another different agent and agent that may have influence on it. After that, the combination of these sets is found in all the elements and factors and the quality of the various elements is checked and investigated. The various elements in which the access set ` level of each element is obtained [9]. This proposed level is very helpful in building the chart and model of ISM.

Step 4: Conical Matrix

In this section, a conical matrix is created by interconnected elements that operate at the same level between different lines and columns of the last access matrix. The driving force of an element obtained through adding its number to the lines and its dependence by adding its number to the columns [9]. Thereafter, the level and level of motivation and confidence is achieved by providing the highest rank in elements with the highest number of rows and columns, respectively.

Step 5: Digraph

At this section, depending on the conical shape of the access matrix, the first diagram containing the transfer links is available. This item is produced with knots and edge lines. Finally, after taking out the indirect links, the final diagram of the model is created. This diagram is used to show the functional elements and their dependence on nodes and edges (this diagram is a perceptible illustration of objects and their interdependence). In this evolution, the top element is at the upper position of the chart and the second

element is in the second position, etc. This process continues until the lowest position which is located at the below part of the chart. [9]

4. HRM tools in project management

Employees Recruitment & Selection (ERS)

Experienced and highly capable staff are important resources to promote business increase. On the other hand, low-skilled staff can be very dangerous in business [10]. Reasonable and appropriate selection of employees can guarantee future career success [11]. If the selection process is implemented correctly, the result will be experienced and appropriate employees [12]. The process of staff selection is based on an examination that may determine the quality of the candidate from another is able to anticipate the future effective performance of the candidates. These evaluations are done by observing the values of the inherent characteristics of the candidates and compliance with the criteria set by the company [11].

Employees Training & Development (ETD)

Selected employees are trained to improve the interests of the organization as well as to improve their skills. Whether it is a small-scale firm or an organization or a large-scale firm, they should instruct all their staff to learn new and innovative technologies. Attitudes towards all colleagues change and a very friendly atmosphere is created. If employees are properly trained, their morale will improve compared to their jobs. They will learn new and advanced skills and become more committed to the organization. Investing in this training is appropriate in terms of time as well as additional costs for the firm, but it increases the efficiency of staff, better collaboration among different parts of the firm and thus increases efficiency and overall productivity [13]. This is a good way to transfer information and knowledge to employers. Employers are equipped with the translation of this information and knowledge to increase the efficiency and productivity of the organization and the high quality of management. This should be considered in conjunction with policies and training systems that are critical to human resource development.

Employees Performance Appraisals (EPA)

Employees Performance Appraisals (EPA) is important to organizations towards determining successes or failures as well as boosting employees' performance. This is because enhancing employee performance is the fundamental aim of any appraisal policy in organization. Thus, the EPA as an essential human resource management (HRM) practice in the 21st century is important because will assist organizations in achieving effectiveness and competitiveness. Employee participation may lead EPA.

Employees Compensation System (ECS)

Compensation is the reward received by employees in exchange for their share in the organization.

Effective compensation management is critical to balancing employee and employee relations by providing financial and non-financial compensation to employees. Compensation consists of all payment methods for employees resulting from work. The appropriate compensation strategy motivates employees to put effort in the job and keep on working with greater resolution. It is a supportive factor for organizations to effectively set appropriate, practical and appreciable performance qualities. Compensation strategies must be in line with human resource practices.

Welfare of Staff (SW)

Singh (2009) has shown that the standard of a career life often is conditional on the standard of living of the worker that the manager provides to meet the needs of employees. It is clear that the well-being of workers helps to improve the business environment and encourages employees, which ultimately leads to the superlative performance in corporate output [14]. Appropriate instruction, without-charge medical care, sports sites, public clubs, restaurants, staff management and operations, hospital club recruitment and savings programs, offer individualized matters just like personal counseling and salary adjustments, pension fund and leave employees, loans especially in difficult situations, assistance transferred staff and most importantly help in the field sector that makes employees feel comfortable in the organization [14]. One of the key factors that leads to employee insecurity and hindering the final performance of employees is the delay in payment of workers' salaries. Welfare is defined in different ways and there is no single definition that can be used globally. The Oxford Dictionary defines the term welfare as "the pursuit of a worthwhile life for the worker."

Identify the main sources of risk in the virtual organization (VO)

Many researchers and scholars who have studied in this field have claimed to have identified the places created in the virtual organization. Extensive and comprehensive study of the literature has recognized 13 risk origins and barriers in terms of time of delivery, price and standard and in cases where partnerships are completely eliminated they can be significant and potentially insurmountable causes. This has been a major threat to the visible organization. The level of trust that exists between partners is closely related to the level that partners believe in the honesty, giving, and worthiness of others. Problems arise when there is no trust between the partners of the organization. For example, they have no desire to pass on sensitive information and it is difficult to agree on how they should manage their finances. In short, they are not trying to increase efficiency and improve corporate governance. Trust and commitment are essential to effective co-operation over a period of time and a willingness to share risks. The greater the level of trust among the partners of the organization, the greater the commitment of employees [15]. Without a close and direct relationship between distance and risk, the risk can increase due to the existing environment and some areas create many problems, for example political and legal problems [16].

5. Identification of The Drivers

The key drivers in human resource management are identified through a text review by a team of specialists.

Table 1, presents the integration results of the questionnaires. The maximum and minimum values as a result of the integration were 9 and 4, respectively. In Table 1, level 8 is repeated more than the other levels and indicates the level of confidence. Therefore, in this research, the mentioned value has been selected as a range for the desired position (significance level).

Table 1: Integration Results of the questionnaires

S.No	ERS	ETD	SW	EPA	ECS	VO
ERS		9		8	8	6
ETD	5		6	9	8	7
SW	7	9		8	8	8
EPA	5	9	4		8	6
ECS	8	9	4	5	6	7
VO	4	7	8	5	8	

Table 2, shows the initial accessibility matrix. In this table, based on the significance range (this range is level 8) for the larger values, the number 1 and the smaller values are assigned the number 0. Also, the value of 0 is considered to be equal to 8. One of the advantages of a significant level is the ease of understanding the subject. By studying the results for the initial Reachability, it is observed that as a result of integrating the questionnaires and defining the level of significance, the number of cases marked with 0 is twice as many as the cases marked with 1.

Table 2: Primary Reachability Matrix (SSIM)

S.No	ERS	ETD	SW	EPA	ECS	VO
ERS	1	1	0	0	0	0
ETD	0	1	0	1	0	0
SW	0	1	1	0	0	1
EPA	0	0	0	1	0	0
ECS	0	1	0	0	1	0
VO	0	0	1	0	1	1

By studying the results of this research in Table 3, the last reachability matrix is submitted. This table shows the drawing power values for five selected HR practices. This value is 2 for all selected HR practices. Also, in the dependency row of this table, it is observed that the highest value is related to staff training and development. Other considerations, including employee performance appraisal and employee compensation, fall into the following categories, respectively.

Table 3: The latest reachability matrix

S.No	ER S	ET D	S W	EP A	EC S	V O	Drivi ng powe r	Ro w
ERS	1	1	0	0	0	0	2	1
ETD	0	1	0	1	0	0	2	2
SW	0	1	1	0	0	1	2	3
EPA	0	0	0	1	0	0	2	4
ECS	0	1	0	0	1	0	2	5
VO	1	4	1	2	2	1	2	6
Depende nce power	1	4	1	2	2	2		

In accordance with the results of previous researchers in this study, reachability set, intersection set and antecedent set values were selected as criteria for evaluating the five methods of human resource selection. Higher values of reachability set indicate the efficiency of the proposed method. According to table 4, it can be seen that Employee Performance Appraisals and Employee Compensation are at a high level of the ISM model. Also, Recruitment & Selection and Staff Welfare are important factors and placed at the bottom of the hierarchical structure.

Table 4: Level Partitions of Drivers Iteration I

HRM Tools	Rechability Set	Antecedent Set	Intersection Set	Level
ERS	1,2	1	1	
VO	3,4	1,2,5	2	
ETD	2,4	1,2,3,5	3	
SW	2,3	3	4	
EPA	4	2,4	5	1
ECS	5	4,5	6	1

In Table 5, in the iteration II, the levels were examined for the desired methods. The results showed that level 2 is assigned by Employees Training & Development. Also, intersection set was obtained for Recruitment & Selection and Employees Training & Development 1 and 2, respectively.

According to Table 5, it is observed that in the iteration III, the Recruitment & Selection and Staff Welfare methods with a level of 3 are important factors and placed at the bottom of the

hierarchical structure. Also, the speed antecedent set for Recruitment & Selection and Staff Welfare are obtained as 1 and 2, respectively.

Table 5: Level Partitions of Drivers Iteration II

HRM Tools	Rechability Set	Antecedent Set	Intersection Set	Level
ERS	1,2	1	1	
VO	3	1,2	2	2
ETD	2	1,2,3	3	2
SW	2,3	-	-	

Table 6: Level Partitions of Drivers Iteration III

HRM Tools	Rechability Set	Antecedent Set	Intersection Set	Level
ERS	1	1	1	3
SW	2	2	2	3

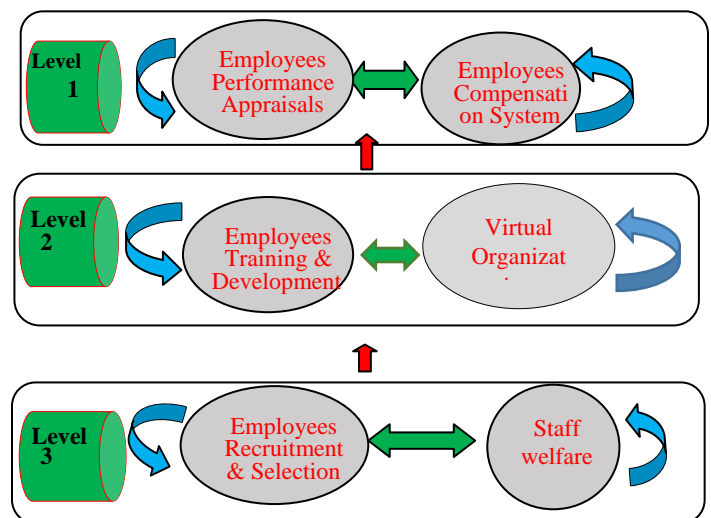


Figure 2: Diagram for developing ISM model

6. Conclusion

This study was conducted to evaluate the significance of selected human resource methods for project success in project-based organizations. The proposed model is very useful and important for understanding the interactions between HRM tools in project

management. In this model, drivers are divided into different levels so that decision makers are aware of the importance of different types of drivers and their implementation methods. A total of 5 types of drivers have been pointed out and an ISM model has been developed.

The model shown in Figure 2 shows that hiring and selection of employees and employee wellbeing are influential factors that are at the bottom of the hierarchical structure and these factors are important for improving staff training and development. The considerations include evaluating employee performance and compensating employees at a high level of the ISM model, meaning that if shaping methods are done in the project, it can happen in the last part of the HRM. In addition, the interaction between management drivers is expected to guide the understanding of the complex situation and create an executive plan.

References

- [1] C. Gill, "Dont know, dont care: An exploration of evidence based knowledge and practice in human resource management. *Human Resource Management Review*, **28**(2), 103–115, 2018. doi: 10.1016/j.hrmr.2017.06.00
- [2] PMI "A Guide to the Project Management Body of Knowledge (PMBOK Guide), (4th Ed.), PMI, Pennsylvania, 2004.
- [3] M.A. Kaulio, "Project leadership in multi-project settings: findings from a critical incident study. *Int. J. Proj. Manag.* **26** (4), 338–347, 2008. <https://doi.org/10.1016/j.ijproman.2007.06.005>
- [4] K. Judgev, "A retrospective look at our evolving understanding of project success. *Proj. Manag. J.* **36** (4), 19–31, 2005. <https://doi.org/10.1177%2F875697280503600403>
- [5] B. Flyvbjerg, Garbuio, M., Lovallo, D., "Delusion and deception in large infrastructure projects: two models for explaining and preventing executive disaster. *Calif. Manag. Rev.* **51** (2), 170–193, 2009.
- [6] T. Cooke-Davies, "The "real" success factors on projects. *Int. J. Proj. Manag.* **20** (3), 185–190, 2002.
- [7] Müller, R., Turner, R., 2010. Leadership competency profiles of successful project managers. *Int. J. Proj. Manag.* **28** (5), 437–448.
- [8] A.S. Khan, "Human resource management practices and project success, a moderating role of Islamic Work Ethics in Pakistani project-based organizations, *International Journal of Project Management*, **20** (3), 185–190, 2014.
- [9] R. Attril, N. Dev1 and V. Sharma, "Interpretive Structural Modelling (ISM) approach: An Overview, *Research Journal of Management Sciences*, ISSN 2319–1171, **8**(5), 2013.
- [10] R. M. Guion, S. Highhouse and D. Doverspike, *Essentials of Personnel Assessment and Selection*, New York: Routledge, 3-15, 2016.
- [11] C. F. Chien and L. F. Chen, Data mining to improve personnel selection and enhance human capital: A case study in high-technology industry., *Expert Systems with Applications*, **34**(1), 280-290, 2008. <https://doi.org/10.1016/j.eswa.2006.09.003>
- [12] S. Vasanthi, S. Rabiyahtul "Designing Implementing and Evaluating Employee Training Programs, *International Journal of Recent Technology and Engineering (IJRTE)*, **8**(3), 2019
- [13] N.M. Musalli et al., "The Relationship Between Staff Development, Organizational Policy, Staff Welfare to Personnel Performance, *Mediterranean Journal of Social Sciences*, **6**(4), 2015. Doi: <http://dx.doi.org/10.5901/mjss.2015.v6n4p288>
- [14] J.J. Mistry, "Origins of profitability through JIT processes in the supply chain, *Industrial Management & Data Systems*, **105**(3), 2005.
- [15] T. DEWITT, L.C. GIUNIPERO, "Clusters and supply chain management: the Amish experience, *International Journal of Physical Distribution & Logistics Management*, **36**(5), 2006.