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Interpretive Structural Modeling Analysis of Reverse Supply Chain Critical Success Factors in Air Industry

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Abstract
The air industry is an integral part of the world economy. Based on this, understanding the key factors of success will lead to a competitive advantage and success in this industry. This research with Understanding the subject and identifying 159 factors by studying the literature of research, reached to 73 factors with an initial sieve. Ultimately, 24 critical success factors were identified by Lawshe technique and with the Structural Interpretative Modeling approach and utilizing experts' opinions we categorized the main success factors of the air industry. The results of the research show that the most influential factors are related to inventory management, transportation, materials and information integration, communications, information technology, mutual trust of supply chain partners, supply chain performance, supply chain flexibility, awareness of inverse support, Knowledge management, standardization, supply chain reliability, collection of return products, monitoring systems for return, cooperation of supply chain components, return and protection policies, and commitment of beneficiaries as interface factors which any partial changes on these factors leading to fundamental changes in the system.

Keywords: Critical Success Factors; Reverse supply chain; Structural interpretive modeling analysis; Air industry.

1. Introduction

The air industry plays an essential role in the economic and social development of societies and it also has a powerful effect on improving foreign trade. The air industries are one of the main infrastructures for sustainable development of the country. In a sustainable system, the dynamism and harmony with the environment and the variability associated with environmental changes are considered as undeniable necessities. In order to create the essential contexts for the development and dynamism of this industry, identification of the critical success factor can help the above goal.
Nowadays, the technological complexity, diversity of designs, extensive volume of activities, as well as the numerous cases of organizations and individuals involved in the implementation of projects, encountered many problems for project implementers in achieving their completion and setup them according to time and budget that predicted and in accordance with the quality requirements.
According to the Rackart's definition, Critical Success Factor (CSF) are limited areas in each project which, if lead to desirable results, will provide a competitive advantage of organization [82].
The lack of adequate knowledge of critical success factor in a project makes it difficult to monitor, control and determining project performance. So identifying the factors that affect the failure or success of the projects, depending on the type of project, from managers and employers and administrators, can provide an appropriate framework for evaluating the project outcomes [2]. Several studies on identifying critical success factors are as follows:

- Kumar Mangla et al. (2016), in investigating the critical success factors for reverse logistics in Indian industries, have used a structural model. In this paper, structural model is proposed using the hierarchical and DEMATEL process to CSFs evaluate in the adoption of reverse logistics. The AHP methodology helps to prioritize of CSFs, while the DEMATEL method, groups the usual relationships between them. Findings of this article show that the critical success factor of global competition has been highly prioritized and consequently, in order to increase the impact of reverse logistics adoption in business, high concentration is needed. Relative priority of the remaining residual factors has been attributed to AHP analysis as regulatory factors, organizational factors, economic factors and strategic factors. Findings also show that global competition; conduction and main organizational factors are grouped under the cause and the main factors are grouped under the disabled group [50].
- Agarwal et al., investigated the priority of critical success factors for reverse logistics using the fuzzy method. Electronic industries have become ecological problems due to electronic waste. Complete study of critical success factor is required to successful implementation of reverse logistics. Identified critical success factor are prioritized by Technique for Order of Preference by Similarity to Ideal Solution(Topsis) and identified 12 CSFs and eventually 5 effective factors became the final choice. [93].

- Mohd Yousef et al., ranked the critical success factors in the TOPSIS reverse logistics, in their research. Identifying the critical success factors for reverse logistics is essential to facilitate the implementation of reverse logistics organizations. In this work, critical success factors (CSFs) were identified in reverse logistics based on critical success factors in supply chain management. A review was conducted among reverse logistics experts to identify factors then, factors were ranked with TOPSIS [64].
- Yadav, Braveh, has analyzed the critical success factors of the humanitarian supply chain. The research was aimed at addressing critical success factors (CSFs), human supply chain during disaster readyness and immediate response. By reviewing of research literature and professional consultation, 12 critical factors that lead to human resource chain responsiveness are identified. In this paper, the authors used Interpretative Structural Modeling (ISM) to interpret the interdependence between selected CSFs. In addition, MICMAC analysis has been used to explain the related factor and the power of dependence between the selected factors. This paper discusses that government policies and organizational structures are prevailing factors which have the most power of the stimulus and the least power of dependence and leads to the movement of other factors and form the basis of an interpretive structural model. This paper presents a perspective on human supply chain practices [22].

So far, more research has been done to clarify the critical success factors of other industries and it seems that determining the critical success factors of supply chain of air industry is less studied or this study has not been done in the air industry. The research seeks to strengthen the operational efficiency of supply chains by identifying the critical success factors. Identifying the critical success factors of the reverse supply chain that provided in this study will help researchers, as well as individuals and managers, seek to improve their performance levels by understanding the supply chain.

1.1. Lawshe Content Validity Ratio Model

Content validity describes a technique that is purposefully and systematically designed to identifying specific features of a subject. In order to evaluate content validity, about coordination scale of the measurement tool's content and the purpose of the research, the specialists point of view, is used. In 1975, Lawshe developed a model for determining content validity in this way that questionnaire is provided to the expert group, whose role is to members of the group guidance. So that members can judge accurately based on the necessity of the components of the tool (model or questionnaire) and they are asked to express their opinion on each item on the scale of the judgment given and the members' response to the relative content validity coefficient includes the terms " Essential, Useful but not essential, and Not necessary" [38 , 71]. Lawshe has announced that the minimum number of members is 5. Chadwick et al., Suggest a minimum validation coefficient of 60.0. [13]. Panel members' opinions are quantitative through the calculation of CVR and content validity index. Members' responses to the CVI include "unrelated," related but serious revision is needed, relevant but revision is needed", "completely relevant." [38,71,79,108].

$$CVR = \frac{n_e - \frac{n}{2}}{\frac{n}{2}} \quad (1)$$

n_e is the number of panel members who have responded to the essential option, n is the total number of specialists. If the calculated value is greater than the value of the Lawshe's table, then the content validity of that item is accepted. The ratio of assessors number is "quite relevant, relevant, but requires to review / the total number of assessors" .

1.2. Interpretive Structural Modeling(ISM)

The ISM method is a systematic and structured method for classifying agents and identifying the relationships between elements of a system. It was introduced by Warfield in 1974 and introduced by Sage in 1997. ISM is a powerful quality tool that used in various supply chain areas [7]. This method requires information from experts and specialists to be received and analyzed. The number of experts participating in the ISM in research was usually between 4 and 14 people. The steps of this technique are as follows:

Step 1 - Determining the type of content relationship (underlying) between the factors: This relationship may be a type of precedence, recency or influence relationship. Each of the identified factors may affect other factors.

Step 2 - Obtaining the Structural Matrix of Intrinsic Relations (SSIM): Experts apply one of the symptoms in Table(1) for each pairwise comparison.

Step 3 - Obtaining the acquisition Matrix: By converting the SSIM matrix symbols to zero and one according to the rules in Table(1), the matrix is achieved.

Step 4: Adapting the Access Matrix. The initial acquisition matrix should have internal consistency. That is, if factor A leads to factor b and agent b leads to factor c, then factor A must also lead to the factor c.

Step 5 – Determining the level and priority of the factors: To determine the level and priority of the factors, the set of acquisition for each factor, and the prerequisite set of each factor are determined. Then identifying for each element of the common elements in the acquisition set and prerequisite is done. After determining the common elements, the level of factors is determined. After determining the first level variables, these variables are removed from the table and with the remaining variables, the next table is formed. This procedure continues until the level of all variables is determined.

Step 6 - Drawing the Network of Interactions: By defining the level of factors, final model called the Digraph (ISM Graph) can be determined based on the adapted acquisition matrix.

Table 1. Conceptual Relationships and Quantitative Structural Similarity Index Matrix [99]

Symbols	Note
V Issue i influences Issue j;	If the(i, j) entry in the SSIM is V,then the (i, j) entry in the reachability matrix becomes 1 and the(j, i) entry becomes 0.
A Issue j influences Issue i;	If the(i, j) entry in the SSIM is A,then the (i, j) entry in the reachability matrix becomes 0 and the(j, i) entry becomes 1.
X Issues i and j influence each other;	If the(i, j) entry in the SSIM is X,then the (i, j) entry in the reachability matrix becomes 1 and the(j, i) entry also becomes 1.
O Issues i and j are unrelated.	If the(i, j) entry in the SSIM is 0,then the(i, j) entry in the reachability matrix becomes 0 and the(j, i) entry also becomes 0

2. Research Method

The present research is objective, applied and developmental. By identifying critical success factors, this study tries to examine the operational efficiency of supply chains. According to a recent review of international and national researches, the initial list of reverse supply chain CSFs (all industries) included 159 components was determined. In the initial selection, CSFs that were not relevant to the research field were eliminated as well as the same factors merged and the list of critical success factors included 73 components was prepared according to Table (2).

The critical success factors of the air industry were identified with the Lawshe technique and with the presence of 11 members of the Validity Panel. This technique uses the most authoritative content validity methods, namely CVI and CVR calculation. In this technique, the scale of coordination of the content of the measurement tool and the purpose of the research is examined. The CVI value of the final questionnaire (0.91) indicates the acceptable validity of the questionnaire [105]. Validated questionnaire was provided in person or by e-mail to academics and industrialists that return rate was 100%. Judgment data of panel members was quantified in Microsoft Excel 2007 software and the ultimate critical success factors were extracted according to table (3). The ISM approach has been used to classify factors and identify the relationships between factors. The data of Structural Similarity Index Matrix that was distributed among experts had 100% return rate. The initial acquisition matrix was computed using Microsoft Excel version 2007 and expert data entry in Microsoft Excel 2007 software was reviewed. To illustrate the basic model that developed with ISM and the final analysis, Microsoft Excel 2007 was used.

In Structural Interpretation Modeling, variables are divided into four categories in terms of the influence power and dependence: independent variables, Link variables, autonomy and dependent variables [4]. The variable‘s power of influence is obtained from sum of the variables affected by it and by the variable itself. The amount of dependence of a variable is also obtain from sum of the variables that affect them and the by the variable itself.

Table 2. List of critical success factors derived from literature review and experts recommendation

Row	Components	Source	Row	Components	Source
1	Inventory management	experts recommendation	38	Customer environmental awareness	[1,3,15,32, 80,91]
2	Transportation	[19,36,49,64,65,73]	39	Planning	[42,47]
3	The willingness of dealers, distributors in support	[21,85]	40	Control the program	[99]
4	Optimal distribution	experts recommendation	41	Risk management	experts recommendation

5	Integration of materials and information	[100]	42	Standardization	[26,29,47, 48,64]
6	Raw materials consumption	[3,95]	43	Reliability of the supply chain	[26,48,84]
7	Marketing	[32]	44	Collection of waste and returned products	experts recommendation
8	Specialized and trained personnel	[1,29,35,54]	45	Return monitoring systems	[1]
9	Technical knowledge	37]	46	Competition	[15,36,49, 50,80]
10	Communication	[24,98,100]	47	Advertising and Knowledge Backward Support	[70]
11	Information technology	[14,30,37,46,47,51,53,54, 58,62,64,89, 102]	48	Introducing Reverse Support	[84]
12	Innovation	[5,23,28,29,64,84]	49	Integrating backward and forward support	experts recommendation
13	Manufacturer's Responsibility	[21,43,87]	50	Reverse Support Experts	[1]
14	Responding	experts recommendation	51	Customer service	[26,35,44, 49,64[a],70,8 4]
15	Globalization	[50]	52	Customer demand	[12,63]
16	Organizational culture	[11,46,51,53,100]	53	Environmental Needs	[15]
17	Organization size	[5]	54	Economic Needs	[15]
18	Organizational structure	experts recommendation	55	Customer satisfaction	[5,14,31,3 3,45,46 ,58]
19	Mutual Trust of Supply Chain Partners	[47,98]	56	Process design	[11,16,17,5 6,59,60,79, 94]
20	Continuous improvement	[77]	57	Terms and conditions of the contract	[12]
21	Quality management	[49,64]	58	Laws and regulations	[1,12,21,2 6,44,49,63, 70, 80]
22	Financial constraints	[84,92]	59	Recycling	[3,49,70,7 8]
23	Financial resources	[21,32,37,83]	60	Technology	[27,63,64, 68,75,77,8 8, 91,106]
24	Added value	experts recommendation	61	Knowledge Management	[14,20,55, 61,67,76,1 09]
25	Direct and indirect taxes	[93]	62	Speed and agility	[14,17,30, 33,41,56,5 9,72]
26	Legal issues	[92]	63	External environment	[84]
27	Capital	[1,80]	64	The attention of social activists	[37]
28	Profitability	[44]	65	Cooperation of Supply Chain Components	[47,64,74, 99]
29	Supply Chain Costs	[49]	66	Supply chain coordination	experts recommendation
30	Supply chain performance	experts recommendation	67	Environmental issues	[3,15,26,4 9,80,84]
31	Performance management tools	[98]	68	Preferred Tax Policies	[91]
32	Performance monitoring	[21,84,100]	69	Entrepreneur Policy	[12]
33	Senior Management support	[50,85,92]	70	Economic policies	[70]
34	Senior Management Attitude	[1,21,24,26,27,63,64,84]	71	Return policies	[42]
35	Flexible Supply Chain	[8,24,26,34,49,66, 73,81]	72	Role and commitment of stakeholders	[12,15,80, 91]
36	Awareness of backward support	[21,84,92]	73	Participation of Supply Chain Components	[1,12,24,3 3,49,42,44, 58]
37	Environmental awareness of the supply chain	[34]			

3. Findings

The adapted initial acquisition matrix is presented in table (4). The steps for determining the level of factors are also seen in table (5). The basic model developed by ISM is shown in fig. 1 and the MICMAC analysis chart is shown in fig. 2.

Table 3. Final critical success factors

[a] - Garcia-Rodriguez et al (2013)

CSF	Components	CVR	CSF	Components	CVR
CSF1	Inventory management	1	CSF13	Knowledge Management	0.91
CSF2	Transportation	0.91	CSF14	Standardization	0.91
CSF3	Integration of materials and information	1	CSF14	Reliability of the supply chain	1
CSF4	Communication	1	CSF16	Collection of waste and returned products	1
CSF5	Information technology	1	CSF17	Return monitoring systems	1
CSF6	Mutual Trust of Supply Chain Partners	1	CSF18	Reverse Support Experts	1
CSF7	Financial constraints	0.91	CSF19	Customer service	0.91
CSF8	Technology	0.91	CSF20	Customer satisfaction	0.91
CSF9	Supply chain performance	0.91	CSF21	Laws and regulations	0.91
CSF10	Awareness of backward support	0.91	CSF22	Cooperation of Supply Chain Components	0.91
CSF11	Environmental awareness of the supply chain	0.82	CSF23	Return policies	0.82
CSF12	Flexible Supply Chain	0.91	CSF24	Role and commitment of stakeholders	0.91

Table 4.Final reachability matrix

	CSF1	CSF2	CSF3	CSF4	CSF5	CSF6	CSF7	CSF8	CSF9	CSF10	CSF11	CSF12	CSF13	CSF14	CSF15	CSF16	CSF17	CSF18	CSF19	CSF20	CSF21	CSF22	CSF23	CSF24	DRIVING POWER
CSF1	1	1	1	1	0	1	0	0	1	1	0	0	0	0	1	1	1	0	1	1	0	1	1	1	15
CSF2	1	1	1	1	1	1	0	0	1	1	1	0	0	0	1	1	1	0	1	1	0	1	1	1	17
CSF3	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	0	1	1	0	1	1	1	20
CSF4	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	21
CSF5	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	21
CSF6	1	1	1	1	1	1	0	0	1	1	1	0	0	0	1	1	1	0	1	1	0	1	1	1	17
CSF7	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	0	1	1	1	21
CSF8	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	21
CSF9	1	1	1	1	0	1	0	0	1	1	0	0	0	0	1	1	0	0	1	1	0	1	0	1	13
CSF10	1	1	1	1	1	1	0	0	1	1	0	0	1	1	1	1	1	0	1	1	0	1	0	1	17
CSF11	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	20
CSF12	1	1	1	1	0	1	0	0	1	1	0	1	1	1	1	1	1	0	1	1	0	1	1	1	18
CSF13	1	1	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	0	1	1	0	1	1	1	19
CSF14	1	1	1	1	1	1	0	0	1	1	0	0	1	1	1	1	1	0	1	1	0	1	1	1	18
CSF15	1	1	1	1	1	1	0	0	1	1	0	0	1	1	1	1	1	0	1	1	0	1	1	1	18
CSF16	1	1	1	0	0	1	0	0	1	1	0	0	0	0	1	1	1	0	1	1	0	1	0	1	13
CSF17	1	1	1	1	1	1	0	0	1	1	0	0	1	1	1	1	1	0	1	1	0	1	1	1	18
CSF18	1	1	1	1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	20
CSF19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
CSF20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
CSF21	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
CSF22	1	1	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	0	1	1	0	1	1	1	19
CSF23	1	1	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	0	1	1	0	1	1	1	19
CSF24	1	1	1	1	1	1	0	0	1	1	1	0	0	0	1	1	1	0	1	1	0	1	1	1	17
DEPENDENCE	22	22	22	21	18	22	1	5	22	22	13	8	15	16	22	22	21	2	23	24	1	22	19	22	

Table 5.Level partition of CSF issues

CSF	Reachability set	Antecedent set	Intersection set	Level
CSF1	1,2,3,4,6,9,10,15,16,17,19,20,22,23,24	1,2,3,4,5,6,7,8,9,10,11,12,13,14, 15,16,17,18,21,22,23,24	1,2,3,4,6,9,10,15,16,17,22,23,24	3
CSF2	1,2,3,4,5,6,9,10,11,15,16,17,19,20,22,23,24	1,2,3,4,5,6,7,8,9,10,11,12,13,14, 15,16,17,18,21,22,23,24	1,2,3,4,5,6,9,10,11,15,16,17,22, 23,24	3
CSF3	1,2,3,4,5,6,8,9,10,11,13,14,15,16,17, 19,20,22,23,24	1,2,3,4,5,6,7,8,9,10,11,12,13,14, 15,16,17,18,21,22,23,24	1,2,3,4,5,6,8,9,10,11,13,14,15,16, 17,22,23,24	3
CSF4	1,2,3,4,5,6,8,9,10,11,12,13,14,15,16, 17,19,20,22,23,24	1,2,3,4,5,6,7,8,9,10,11,12,13,14, 15,17,18,21,22,23,24	1,2,3,4,5,6,8,9,10,11,12,13,14,15, 17,22,23,24	3
CSF5	1,2,3,4,5,6,8,9,10,11,12,13,14,15,16, 17,19,20,22,23,24	2,3,4,5,6,7,8,10,11,13,14,15,17, 18,21,22,23,24	2,3,4,5,6,8,10,11,13,14,15,17,22, 23,24	5
CSF6	1,2,3,4,5,6,9,10,11,15,16,17,19,20,22, 23,24	1,2,3,4,5,6,7,8,9,10,11,12,13,14, 15,16,17,18,21,22,23,24	1,2,3,4,5,6,9,10,11,15,16,17,22, 23,24	3
CSF7	1,2,3,4,5,6,7,8,9,10,12,13,14,15,16, 17,19,20,22,23,24	7	7	9
CSF8	1,2,3,4,5,6,8,9,10,11,12,13,14,15,16, 17,19,20,22,23,24	3,4,5,7,8	3,4,5,8	8
CSF9	1,2,3,4,6,9,10,15,16,19,20,22,24	1,2,3,4,6,7,8,9,10,11,12,13,14,15,16,17,18,21,22,2 3,24	1,2,3,4,6,9,10,15,16,22,24	4
CSF10	1,2,3,4,5,6,9,10,13,14,15,16,17,19, 20,22,24	1,2,3,4,5,6,7,8,9,10,11,12,13,14, 15,16,17,18,21,22,23,24	1,2,3,4,5,6,9,10,13,14,15,16,17, 22,24	3
CSF11	1,2,3,4,5,6,9,10,11,12,13,14,15,16,17, 19,20,22,23,24	2,3,4,5,6,8,11,13,18,21,22,23,24	2,3,4,5,6,11,13,22,23,24	7
CSF12	1,2,3,4,6,9,10,12,13,14,15,16,17,19, 20,22,23,24	4,5,7,8,11,12,18,21	4,12	6
CSF13	1,2,3,4,5,6,9,10,11,13,14,15,16,17,19, 20,22,23,24	3,4,5,7,8,10,11,12,13,14,15,17, 21,22,23	3,4,5,10,11,13,14,15,17,22,23	5
CSF14	1,2,3,4,5,6,9,10,13,14,15,16,17,19,20, 22,23,24	3,4,5,7,8,10,11,12,13,14,15,17,18,21,22,23	3,4,5,10,13,14,15,17,22,23	5
CSF15	1,2,3,4,5,6,9,10,13,14,15,16,17,19,20, 22,23,24	1,2,3,4,5,6,7,8,9,10,11,12,13,14, 15,16,17,18,21,22,23,24	1,2,3,4,5,6,9,10,13,14,15,16,17, 22,23,24	3
CSF16	1,2,3,6,9,10,15,16,17,19,20,22,24	1,2,3,4,5,6,7,8,9,10,11,12,13,14, 15,16,17,18,21,22,23,24	1,2,3,6,9,10,15,16,17,22,24	3
CSF17	1,2,3,4,5,6,9,10,13,14,15,16,17,19,20, 22,23,24	1,2,3,4,5,6,7,8,10,11,12,13,14,15,16,17,18,21,22,2 3,24	1,2,3,4,5,6,10,13,14,15,16,17, 22,23,24	5
CSF18	1,2,3,4,5,6,9,10,11,12,14,15,16,17,18,19,20 ,22,23,24	18,21	18	8
CSF19	19,20	1,2,3,4,5,6,7,8,9,10,11,12,13,14, 15,16,17,18,19,21,22,23,24	19	2
CSF20	20	1,2,3,4,5,6,7,8,9,10,11,12,13,14, 15,16,17,18,19,20,21,22,23,24	20	1
CSF21	1,2,3,4,5,6,9,10,11,12,13,14,15,16,17, 18,19,20,21,22,23,24	21	21	9
CSF22	1,2,3,4,5,6,9,10,11,13,14,15,16,17,19, 20,22,23,24	1,2,3,4,5,6,7,8,9,10,11,12,13,14, 15,16,17,18,21,22,23,24	1,2,3,4,5,6,9,10,11,13,14,15,16,17, 22,23,24	3
CSF23	1,2,3,4,5,6,9,10,11,13,14,15,16,17,19, 20,22,23,24	1,2,3,4,5,6,7,8,11,12,13,14,15, 17,18,21,22,23,24	1,2,3,4,5,6,11,13,14,15,17,22,23,24	5
CSF24	1,2,3,4,5,6,9,10,11,15,16,17,19,20,22, 23,24	1,2,3,4,5,6,7,8,9,10,11,12,13,14, 15,16,17,18 21,22,23,24	1,2,3,4,5,6,9,10,11,15,16,17,22,23, 24	3

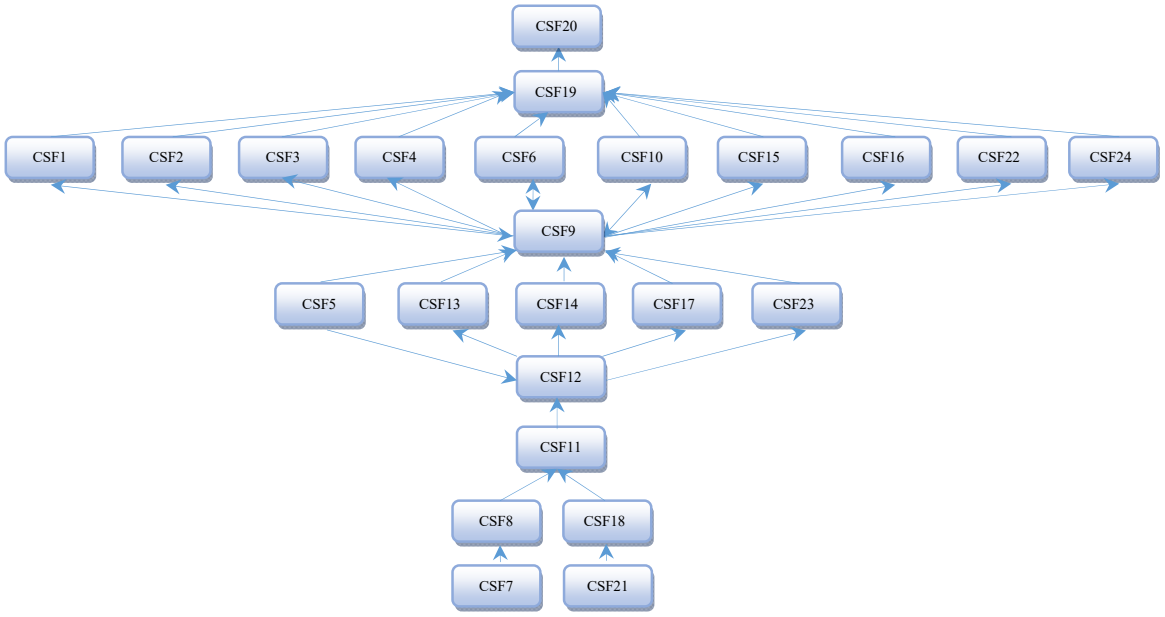

Fig.1.ISM-based attribute model

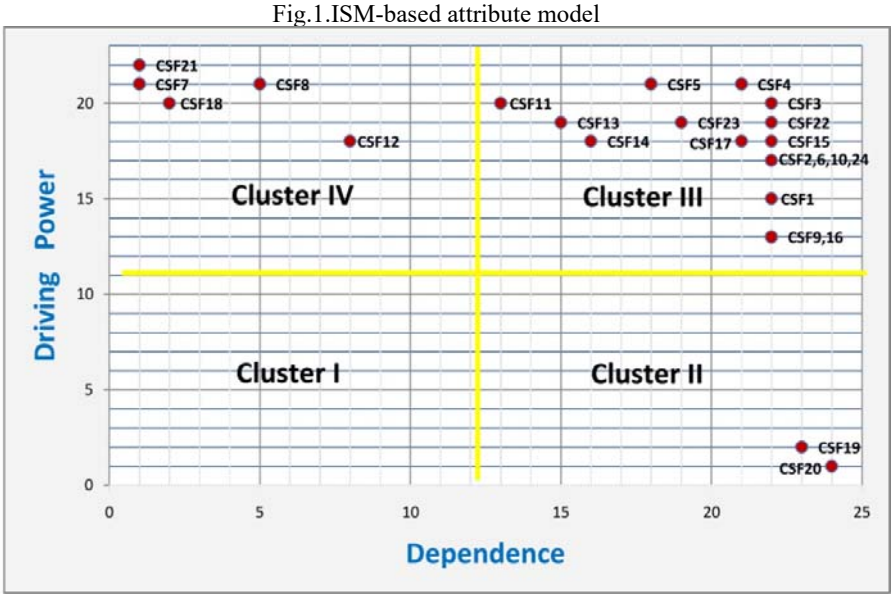

Fig.2.Driving and dependence power diagram (MICMAC analysis).

4. Discussion and Conclusion

Nowadays, the technological complexity, diversity of designs, extensive volume of activities, as well as the numerous cases of organizations and individuals involved in the implementation of projects, encountered many problems for project implementers in achieving their completion and setup them according to time and budget that predicted and in accordance with the quality requirements. Critical success factors (CSF) are limited areas in each project which, if lead

to desirable results, will provide a competitive advantage of organization. This research has examined and identified the critical success factors of air industry by modeling structural interpretive analysis and Lawshe technique. The results of the research show that the identified critical success factors of air industry are has no autonomous variables(Cluster I). Therefore, no factors can be separated from the system. Dependent factors(Cluster II) include (customer service and customer satisfaction) that have high impressionability and little impression on the system. Independent factors(Cluster IV) include (financial constraints, technology, environmental awareness of the supply chain, inverse support experts, and laws and regulations) that have high impressionability and little impression on the system and finally, other factors (inventory management, transportation, materials and information integration, communications, information technology, mutual trust of supply chain partners, supply chain performance, supply chain flexibility, knowledge of reverse support, knowledge management, standardization, reliability of supply chain, collection of returned products, return monitoring systems, cooperation of supply chain components, return policies, and beneficiary commitments) as intermediary agents(Cluster III), high impressionability and impression on the system and any modest change over these factors will make any major changes to the system.

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