The analysis of barriers to the development of industries Iranian Dates

Saeid Ghane

Department of Industrial Engineering, Masjed -Soleiman Branch, Islamic Azad University, Masjed -Soleiman,Iran

Abstract: The aim of this article is to analyze the interaction among the major barriers, which hinder or prevent the application in improvement date industries in Iran. A key task of top management is to diagnose those barriers of logistics that could be crucial to the survival of the organization in the future. This paper utilizes the Grey Relational Analysis (GRA) methodology to ranked barriers. The results analysis shows the barriers priorities of related to date industries in Iran are arranged in three levels: The first is lack of strategic planning and lack of efficient information and technological systems; at the second level, three barriers are determined. These barriers consist of problems with product quality; financial constraints and company policies. At the third level are; lack of training related to logistics ; lack of awareness about logistics; lack of appropriate performance metrics; lack of commitment by top management; reluctance of the support of retailers and resistance to change for activities related to logistics.
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1. Introduction

Logistics is considered to have originated in the military's need to supply themselves with arms, ammunition and rations as they moved from their base to a forward position. In ancient Greek military officers with the title *Logistikas* were responsible for financial and supply distribution matters. Business logistics can be defined as "having the right item in the right quantity at the right time at the right place for the right price in the right condition to the right customer", and is the science of process and incorporates all industry sectors. The main functions of a qualified logistician include inventory management, purchasing, transportation, warehousing, consultation and the organizing and planning of these activities. Logisticians combine a professional knowledge of each of these functions to coordinate resources in an organization. There are two fundamentally different forms of logistics: one optimizes a steady flow of material through a network of transport links and storage nodes; the other coordinates a sequence of resources to carry out some project

Logistics is one of the main key functions for global business and outsourcing. Nowadays, many enterprises realize how important their logistics strategies are in order to compete in the global environment. Many global companies must somehow strengthen their ability to earn their major profits overseas. However, the cost to sell products in a foreign country is definitely high and nobody wants to buy a product with the price that is much higher than they can afford. Also, it is not easy to know how to sell products overseas at the right time, in the right place, and to the right people in the global market.

One way to cope with these difficulties is to formulate an effective logistics strategy. For instance, if companies want to reduce production cost, they can move their assembly lines to local manufacturers so that they can enjoy cheaper labors, materials, lands and the like. If companies want to avoid errors and wastes for shipping and warehousing, a well-designed distribution system or warehousing system can really help them out.

Unfortunately, the infrastructures for implementing international logistics strategies are very high in cost and hard to manage. Most corporations cannot really afford to build up these facilities. Even though the infrastructures are affordable, companies may not have capability or experience to maintain their logistics systems without any hurdle.

Some of these barriers are lack of systems, management inattention, financial resources, personnel resources, lesser importance of reverse logistics relative to other issues, and company policies [8]. The above-mentioned barriers not only affect the operations of logistics but also influence one another. Thus, it is very essential to understand the mutual relationship among the barriers. The identification of the barriers that are at the root of some more barriers (called driving barriers) and those which are most influenced by the others (called driven barriers) would be helpful for the top management implementing the reverse logistics proms. This can be a guide for taking appropriate action to tackle barriers in logistics.

Grey Relational Analysis (GRA) can be used for identifying and summarizing priorities among specific variables, which define a problem or an issue

[5,9]. It provides us a means by which order can be imposed on the complexity of such variables. Therefore, in this paper, the barriers of the logistics in date industries have been analyzed using the GRA methodology, which shows the priorities of the barriers and their levels.

After review of literature on reverse logistics and the opinion of experts, both from industry and the academia, eleven important barriers of reverse logistics have been identified. The literature review, together with the experts' opinion, was used in the development of a GRA model.

The next section discusses the identification of barriers of logistics in Iranian date industries, which is followed by the discussion of GRA methodology.

2. Grey Relational Analysis (GRA):

Grey relation analysis was first suggested by professor Deng 1982, The proposition of Grey theory occurring in the 1990 to 1999 time period resulted in the uses of Grey theory to each field, and the development is still going on. The key advantage of Grey theory is that it can handle both incomplete information and unclear problems very precisely.

is an important method of Grey System theory. The word *"grey"* is used to show the degree of information accessibility that is used to illustrate system structure. Especially terms, word *"black"* shows that the essential information used to illustrate system is completely inaccessible. On the other hand, *"white"* shows that the required internal information is completely accessible. *"Grey"* sets for the information that is incomplete and relatively unknown which comes between black and white.

There are several aspects for the theory of Grey system [1], [4]:

1. Grey generation: This is data processing to supplement information. It is aimed to process those complicate and tedious data to gain a clear rule, which is the whitening of a sequence of numbers.
2. Grey modeling: This is done by step 1 to establish a set of Grey variation equations and Grey differential equations, which is the whitening of the model.
3. Grey prediction: By using the Grey model to conduct a qualitative prediction, this is called the whitening of development.
4. Grey decision: A decision is made under imperfect countermeasure and unclear situation, which is called the whitening of status.
5. Grey relational analysis: Quantify all influences of various factors and their relation, which is called the whitening of factor relation.
6. Grey control: Work on the data of system behavior and look for any rules of behavior development to predict future's behavior, the prediction value can be fed back into the system in order to control the system [6].

Let P(X) represent the factor set of a specific topics, Q is the influence relation, {P(X); Q} is influence space. It must have the following properties:

1. Dimension: the numeric value for all factors must be no dimension.
2. Scaling: the factor value for various series must be at the same level.
3. Polarization: if the factor value in the series is described as the same direction, the series is comparable. Then the measurement space is expressed as $\{P(X); x_i*(k)\}$, the Grey relational space formed by the satisfaction of both factor space and comparability is termed by $\{P(X); \Gamma\}$.

The series formed by P(X) is:

$x_i = (x_i(1), x_i(2), \ldots, x_i(k)) \in I$

Let $I = 0, 1, \ldots, m$,　　　$k = 1, 2, \ldots, n \in N$

Suppose $x_i(k)$ can be the reference series with the rest of them be comparison series, the grey relational coefficient can be defined as:

$$r\left(x_i(k), x_j(k)\right) = \frac{\Delta\min. + \xi\Delta\max.}{\Delta_{ij} + \xi\Delta\max.} \tag{1}$$

Let $I = 1, 2, 3, \ldots, m$, $k = 1, 2, 3, \ldots, n$　$j \in I$

x_i is of the reference series, while x_j is a specific comparison series.

$\Delta_{ij} = \|x_i(k) - x_j(k)\|$ is the norm between x_0 and x_j for k

$$\Delta\min. = \forall_j^{\min.} \in i \ \forall_k^{\min.} \| x_i(k) - x_j(k) \| \tag{2}$$

$$\Delta\max. = \forall_j^{\max.} \in i \ \forall_k^{\max.} \| x_i(k) - x_j(k) \| \tag{3}$$

$\zeta \in [0, 1]$ is the differentiating coefficient (it's adjustable).

In grey relation coefficient, the primary function of differentiation coefficient (ζ) is to conduct the contrast between background value and the object to be estimated, and the size of the value can be adjusted accordingly based on actual need. Generally speaking, the value of the differential coefficient is all considered as 0.5; however, to enlarge the contrast of the result adjustment can be conducted according to actual need. As learned from mathematical validation, any change of the differentiating coefficient will only affect the size of the relative value, and not the ranking order of the grey relational grade [1], [10].

When grey relational coefficient is obtained, the resolution for the average value will be of the grey relational grade.

$$r(x_i, x_j) = \frac{1}{n} \sum_{i=1}^{n} r(x_i(k), x_j(k)) \tag{4}$$

Rank by value sizes obtained from comparison series against the same parameter series x0 of the grey relation, and a grey relation ordinal is found from such a relationship ranking the largest value order accordingly. Therefore in the reference series x0 and comparison series xi

let x0=(x0 (k)), xi =(xi (k)), k=1, 2, 3, ..., n i=1, 2, 3, ..., m

if $\gamma(x0, xi) \geqq \gamma(x0, xj)$

The relational de of xi against x0 is larger than xj against x0, and it is indicated by xi > xj.

3. Barriers of logistics Analysis Barriers Improvement Date Industries:

In this paper, 11 variables for barriers to improve date industries in Iran have been selected from the literature primarily from Ref. [5] and also from discussions with experts in the date industry, keeping the Iran date industry in focus (Table 1). These barriers are explained as follows.

Table 1: barriers to improve date industries in Iran

Code	Barriers
B1	Lack of efficient information and technological systems
B2	Problems with product quality
B3	Company policies
B4	Resistance to change for activities related to logistics
B5	Lack of appropriate performance metrics
B6	Lack of training related to logistics
B7	Financial Constraints
B8	Lack of commitment by top management
B9	Lack of awareness about logistics
B10	Lack of strategic planning
B11	Reluctance of the support of dealers, distributors and retailers.

3.1. Lack of information and technological systems:

A very serious problem faced by the firms in the implementation of logistics is the lack of good information systems. Very few date industries in Iran have successfully automated the information surrounding the returns process. There is a dearth of good logistics information management systems commercially available [8]. Thus, this is a very significant barrier affecting good logistics.

3.2. Problems with product quality:

Another important barrier affecting logistics is the condition of the quality of the products. Many date company in Iran hoping to enter the internationals date market would need to turn to "non-traditional methods". There is opportunity for increased exports of dates products provided high standards of quality and packaging.

3.3. Company policies:

Restrictive company policies are an important barrier to the logistics [8]. The lack of the importance of the logistics and the management inattention are related to the policies followed by the companies.

3.4. Resistance to change to logistics:

A chief barrier seen in the implementation of the logistics is the resistance to change, human nature being a fundamental barrier. People avoid change when possible, and the logistics require a radical change in the mindset and practice. Resistance to change can also be caused especially in the case for small business with limited purchasing power to influence contracts with suppliers [3]. The company policies and organizational structures get in the way rather than facilitate change.

3.5. Lack of appropriate performance metrics:

Lack of performance metrics is a major barrier to the logistics programs. One of the barriers for supply chain alignment is lack of appropriate performance metrics [2]. Performance metrics form the basis of integrated work management systems. Simply stated, Work not measured cannot be managed. The performance measurement of any system is a key element in enabling the process of performance management, performance improvement, performance documentation, etc. If the firms take action linking their performance measurement system to their logistics practices, they will be in a better position to succeed in their endeavor. Successful logistics programs will effectively coordinate all the processes, focus on recapturing value or proper disposal of products, create environmental friendly products, and create performance measurement systems that provide data as to whether the designed logistics is performing up to the expectations.

3.6. Lack of training and education:

An important barrier to good logistics is lack of personnel resources [6]. Lack of training and education is a major challenge to commercial cycling [7]. Education and training are prime requirements for achieving success in any organization. The need for training on logistics extends throughout the company and reaches up and downstream. New or revamped technology necessitates change and the personnel should be given sufficient training in the new technology and processes that will be implemented.

3.7. Financial constraints:

Financial constraints are a key barrier to good logistics proms [9]. Cost considerations are a prime challenge in commercial developing [7]. Finance is vital to support the infrastructure and manpower requirements of the logistics. Companies require allocation of funds and other resources for the implementation of logistics. Efficient information and technological systems is important enabler for logistics. The training of personnel related to the logistics is also very significant for efficiently managing and eventually making the logistics profitable. However, all these require financial support.

3.8. Lack of commitment by top management:

Lack of commitment by top management is a chief barrier for successful logistics [8]. Efficient leadership is needed to provide clear vision and value to logistics proms. The top management should show commitment to the logistics activities on par with other organizational goals by communicating all the members of the supply chain. They should provide permanent support for logistics in the strategic plans, action plans for successfully implementing them.

3.9. Lack of awareness about logistics:

A chief barrier of logistics seen in Iranian date firms supply chain is lack of awareness about the benefits of logistics. Even if companies knew about it, giving relative unimportance to logistics was seen as the largest barrier to logistics [8]. Today, many consumer products have a shorter life cycle. Thus, the lack of the awareness management of these benefits is a major barrier to logistics.

3.10. Lack of strategic planning:

Strategic planning is the identification of logistics goals and the specification of long-term plans for managing them. It involves the attempt on the part of the manager on the course of action that has to be adopted for the realization of logistics. In the present scenario, due to the quick changes in technology and also due to changes in the behaviors of competitors, consumers, suppliers, etc., a sound strategic planning is necessitated for the logistics proms.

3.11. Reluctance of the support of dealers, distributors, and retailers:

Another important barrier to the logistics is the reluctance of the support of the dealers, distributors, and retailers towards the logistics activities. A supportive policy leads to improved risk sharing between sellers and consumers.

4. Model application:

This study has used GRA analysis to determine priorities of logistic barriers for improvement date industries.. With respect to the above mentioned problem, this study has conducted following modification:

(1) criteria are used to analyze the ranking order of logistic barriers with comprehensive judgment;
(2) GRA is used to analyze the ranking order of logistic barriers;
(3) integrated approach is used to analyze sub-levels of barriers.

There are two evaluation criteria as found in this study:

M2. Industries needs for improvement the external markets: the barrier with higher influence to external markets, get the higher the priority.

M2. Industries needs for improvement the internal markets: the barrier with higher influence to internal markets, get the higher the priority.

The explanation on the operation procedures of model is as follows:

Step 1. For each criterion all barriers are comparison and they are denoted with numbers of 1, 3, 5, 7, and 9, and in comparison barriers the higher the score it shows that such barrier under the evaluation criterion is more influence.

Step 2. The results obtained from the questionnaires in previous step, priority score can be derived for each of the barriers.

Step 3. Grey relational calculation after score matrix is obtained.

Step 4. Integrated system analysis based on obtained system levels.

In table 2 are calculated results of step 1 to 3 and in table3 determined barrier levels.

This is the decision-making group formed by scholars and experts who are similar in the study, and subjective value judgment is conducted by this group to see the relevant importance of each evaluation criteria Questionnaire which is employed by the group to conduct the investigation and find out that the experts and scholars will focus on eleven barriers (Indicated by B1, B2, B3, B4, B5 …and B11).

Table2: Results of GRA method for ranking barriers

Barriers / Criterions	Weights	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
M1	50.00%	0.30	0.50	0.30	0.21	0.21	0.30	0.50	0.17	0.30	0.50	0.17
M2	50.00%	0.50	0.17	0.25	0.17	0.25	0.17	0.17	0.25	0.17	0.50	0.25
		B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
	SUM	0.80	0.67	0.55	0.38	0.46	0.47	0.67	0.42	0.47	1.00	0.42

Barriers	B10	B1	B2	B7	B3	B6	B9	B5	B8	B11	B4
Score	1.00	0.80	0.67	0.67	0.55	0.47	0.47	0.46	0.42	0.42	0.38

Table3: Barriers levels

LEVELS	BARRIERS
LEVEL1	- Lack of strategic planning - Lack of efficient information and technological systems.
LEVEL2	- Problems with product quality - Financial Constraints - Company policies
LEVEL3	- Lack of training related to logistics - Lack of awareness about logistics -Lack of appropriate performance metrics -Lack of commitment by top management -Reluctance of the support of dealers, distributors and retailers -Resistance to change for activities related to reverse logistics

5. Conclusions:

The barriers hindering the improvement industries proms pose considerable challenges both for managers and policymakers in industries. Some of the major barriers have been highlighted here and put into a GRA model, to analyze the interaction between the barriers. These barriers need to be overcome for the success in reverse logistics proms.

In order to effectively resolve for the ranking for the barrier of improve logistic needs in internal and external date production marketing in Iran, this study has GRE to construe the evaluation model of ranking order for these barriers. From the processes of study, important conclusions and recommendations obtained are elaborated as follows:

- This study starts from the consideration of GRA method and mathematic steps for use it.

-based model proposed in this paper for identification of barriers of date industries can provide the decision maker a more realistic representation of the problem in the course of conducting barriers. A major contribution of this research lies in the development of linkages among various barriers of a reverse logistics through a single systemic framework. The utility of the proposed GRA methodology in imposing order and direction on the complexity of relationships among elements of a system assumes tremendous value to the decision makers.

-This study introduces types of barriers of improve date industries that divided to eleven categories.

-This study will focus on the fact that strategy is formed because of varied views; therefore, it is a matter of course that the analysis of priority should be accomplished from diverse aspects. Furthermore, since the comparison of strategy priority is complex this study has chosen GRA analysis for resolution as according to the abovementioned reasons. Thus, the method can be widely applied onto the discrete-space decision-making problem.

- The results analysis shows the barriers priorities related to date industries in Iran are arranged in three levels: The first is lack of strategic planning and lack of efficient information and technological systems; at the second level, three barriers are determined. These barriers consist of problems with product quality; financial constraints and company policies. At the third level are; lack of training related to logistics ; lack of awareness about logistics; lack of appropriate performance metrics; lack of commitment by top management; reluctance of the support of retailers and Resistance to change for activities related to reverse.

- This model is provided a useful approach to analyze the relations among sub-levels barriers that could use of others researcher for determined dynamic equations and simulation results.

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