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# Analysis and Ranking of Critical Success Factors in the Implementation of Supply Chain Information Systems by Multi-Criteria Technique (Dematel) (Case Study: Mirab Profile Company: Hoffman)

[1]Salahaddin Alipour Navi Motlagh, [2]Kamd biz Shahroodi and [3]Soroush Avakh Darsetani
[1]Department of Industrial Engineering, Islamic Azad University,
International Anzali Branch, Anzali, Iran
[2]Management Collage, Islamic Azad University, Rasht Branch, Rasht, Iran
[3]Industrial Engineering College, Islamic Azad University, Qazvin Branch, Qazvin, Iran

**Abstract:** The success of an enterprise depends largely on its ability to coordinate complex network of communication and information among supply chain. Because today one of the key features oftrade that other companies do not compete with each other, but they are ongoing competitiveness in supply chains. The progress of information technology has led to animportant source of information for organizations to increase competitiveness. Thus, Supplychain Information Systems (SCSI) are the core of success. On the other hand, the implementation of the supply chain information systems has a lot of costs and that most of these systems in leading to failure. The present study is an attempt to identify and ranking thecritical success factors of supply chain information systems, that can help managers with continuous care in the process of implementation, the success of implementing this system anduse the benefits in the entire supply chain. Thus research due to the nature and methods is descriptive. Population is managers of supply chain and information systems in Tabriz Mirabprofile company (Hoffman). The sample is category of experts. Data collection instrument wasa questionnaire consisting of 156 questions is paired comparisons. DEMATEL technique isused for analyze and ranking of data. The results showed that factors: determining the construction programs and vision, project management, take top management responsibility and change management and user training most effective and of high importance.

**Key words:** Supply chain, information systems, enterprise resource management, criticalsuccess factors, DEMATEL

## INTRODUCTION

In fact, information systems is a set of interrelated elements that makes data and information gathering, manipulating and distributing and provide feedback to achieve a goal. Information systems can be divided into different categories. The computer-based information system is composed of five elements include: people procedures-data-software-hardware.

**Supply chain information system:** There's information systems between two or more companies that facilitate Flow of informationand storing it (usually design, engineering, sales, purchase order) (Humphreys *et al*., 2001).

Such a system also known as inter-organizational information systems that basically called asautomation systems shared by two or more organizations (Barrett and Konsynski, 1982). Implementation of a supply chain information systems is complex because of three characteristics.

The range of supply chain refers to the number of participating players. An actor is aorganization with decision-making body by a number of individuals. (Eckartz *et al*., 2010). When actors are more involved complexity increases in supply chain. That's why multinational companies like general motors and general electric, reduce the numberof suppliers and make in Lower level to coordinate for supply chain (Choi and Krause, 2006). In summary, increasing supply chain actors, increase The level of coordination required for improving operational efficiency chain.

Second, supply chain system is communication way between partners. Supply chainscan use written contract that is an official way connect a supply chain coordinated witheach other. Contracts are legal instruments that explicitly describe conditions within theenterprise chain

**Corresponding Author:** Salahaddin Alipour Navi Motlagh, Department of Industrial Engineering, Islamic Azad University, International Anzali Branch, Anzali, Iran

Thirdly, there may be conflict and differences among actors. Including technical capabilities, operational practices, attitudes, culture and management methods and soon. When actors of the supply chain has similar technical capabilities are very easy towork together. For example, when an outdated operating system such as Windows 95 or DOS is still being used by some supply chain partners implementation of a newsupply chain information system will be complicated. When supply chain partners have inconsistent operation procedures this complexity increases. During the past years organizations are suffered a lot of pressure to adapt to changing business environments.

Organizations to survive in today's highly variable markets must be able to quickly adaptto the changing conditions of their business. Large organizations around the world to overcome this problem are looking for agility, high flexibility and tried to deal with internal and external changes in their business by organizational systems.

There are a variety of organizational systems such as: Supply Chain Management (SCM), Customer Relationship Management (CRM) and Enterprise Resource Planning (ERP) (Lu and Lee, 2004).

Enterprise resource planning systems can be defined as software that is integrated with components or modules in functional areas of organizations such as Planning, production, sales, marketing, distribution, accounting, human resources management, project management, inventory management and maintenance services, transportation management and e-commerce.

Enterprise resource planning system is a comprehensive system that tries to integrate all functions and departments within an organization using a single computer system that cansatisfy the specific needs and special sections.

This is performed by using a computer software by a single database, allows users to share information and communicate with each other in different sectors. This software consists of several software modules that each part is responsible for duties in the company (Denolf *et al*., 2015).

In fact, enterprise resource planning is the result of 40 years of experience, trial and error and due to continuous improvement in existing techniques in organizational management and rapid growth of information technology, enterprise resource planning also grown and has followed its evolution. Therefore, very strong basic concepts (which over the years has formed), infrastructure the enterprise resource planning systems (Fig. 1). It is note worthy that in 1998, >20.000 organizations around the world have been invested >$17 billion in enterprise resource planning. In later years this figure has grown by 30-50% in 2003 to around 100 billion dollars.

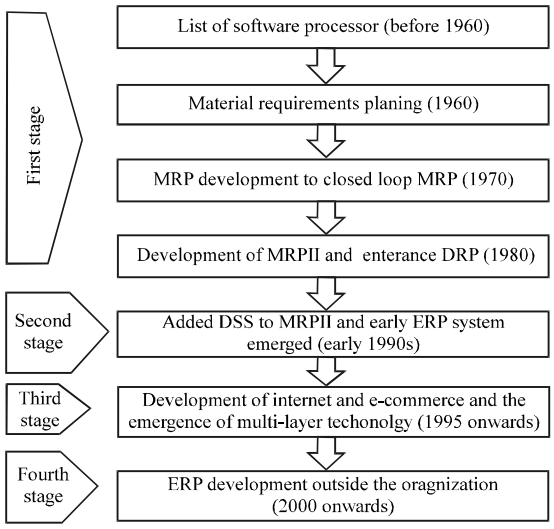



Fig. 1: Evolution of Enterprise Resource Planning system (ERP) (Ahmadvand *et al*., 2011)

**Literature review:** Pourklantry Taher investigated a research to identify associated factors effect on successful implementation of planning system. In this study, factors affecting the success of the deployment of ERP has been studied. First, with regard to theoretical principles, 23 successful effective factors were identified in implementation of enterprise resource planning. Based oncritical success factors, a questionnaire with 84 questions was prepared and distributed amongthe population. By using factor analysis, effective factors in successful implementation of the organization plan include: strategic factor; operating organization; an appropriate choice and control and monitoring.

Jabalameli and Rasolinejad, in study stated: "the use of the analytic network process in the ranking of bank branches: Case Study Saderat Bank "ranking economic units matchedone of the most important issues for decision making and improve the performance of theseunits. One of the most important economic units is the banking sector of each country. Grading is done for the banks operating in our country, but the rankings branches in the traditional way (by check only branch sources) or a purely mathematical method of data envelopment analysis takes place.

Hatami *et al*. (2011), in a study entitled "Roadmap implementation of ERP in healthcare centers", express limitations which multiple activities of the service sector, a good potential for the use of enterprise resource planning systems on the idea that health is considered the best known. The treatment area because of its particular Complexities and sensitivities requires integration of information for more effective service delivery to patients.

Kale *et al.* 2010, in one study of enterprise resource planning function in Indian agencies had concluded that, in organizations that have implemented enterprise resource planning system, in comparison to the widespread impact and significant benefits are expected a lot of their problems resolved with implement system. Due to the complexity of the operation, Meetall these expectations are difficult to achieve all advantages in the short term.

Yoon (2009), evaluate the impact of organizational culture on the success of the deployment ofthe enterprise resource planning system. He considered the altruism, conscientiousness, organizational literature, good general condition, ethical behavior and characteristics of organizational culture and information quality and efficiency in performance are the characteristics of success the enterprise resource planning system deployment. Yoon showed that the successful deployment of the enterprise resource planning system, significantly affected the organizational culture.

Other factors in research support and participation of top management, project management, user training, change management, team collaboration, clear objectives, IT systems as well askey success factors identified in the implementation of enterprise resource planning system (Lau and Lee, 2000).

Investigation in German companies compared to other factors revealed that technological factors are more important than other factors and affecting the success of an enterprise resource planning system project. Also data migration agents and also system testing, even senior management or project management suppor Are the most important factors for enterprise resource planning system projects (Leyh and Thomschke, 2015).

In another study, researcher have been identified factors: effective communication, the champion of the project, the project team, senior management responsibility, determination andvision programs, assessment systems (Denolf *et al*., 2015).

## MATERIALS AND METHODS

**Research analytical framework:** With literature review showed that various factors in preventing the failure of supply chain information systems projects are effective. In a general framework in this study were as follows (Fig. 2).

**Research questions:** The research questions are as follows.

- What factors affect the successful implementation of information systems supply chain

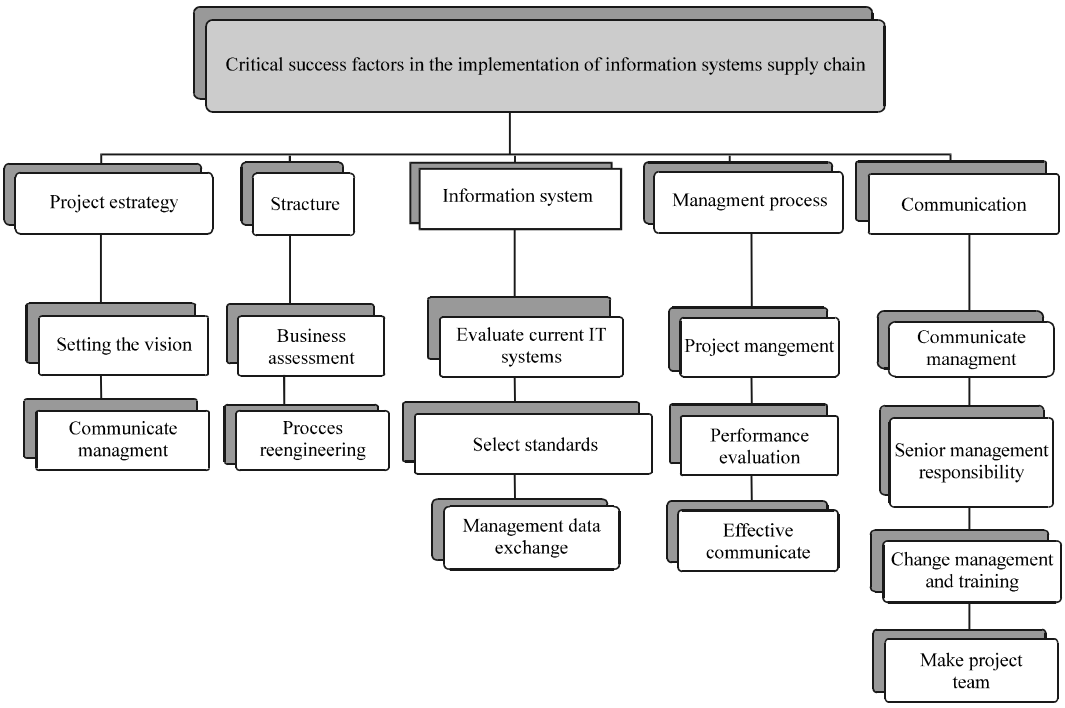



Fig. 2: Percantage the failure od supply chain information system

- Causal relationship between critical success factors of supply chain information systemslook like
- How is priority or rank of these factors in Mirab company profiles (Hoffman)
- Research method

**Statistical society:** The statistical community of supply chain and information systems is Mirab Company profiles (Hoffman). The sample in this research because of the use of operations research techniques and methods D matel has been formed a category of experts.

According to the Saati ten experts for studies based on paired comparison is enough. Also Rizza and Ezilis pointe out that a number of experts should not be too much as the interviewe totally 5-15 people are propose. Asa result, due to the specialized the subject and limitations identified experts, A few experts havechosen that a total of 20 experts are relevant And were selected by judgment and availablesampling in this study. In this type of sampling, individuals are selected for the sample that arein the best position to provide the required information.

**Data collection tool:** In this study, due to the nature of the subject data collected by field surveys and questionnaires were used. During the study, a questionnaire of 156 items was used. In this questionnaire tocollect information needed to D-MATEL Method, matrix was designed based on evaluating the amount of influence of each factor row, on real factors in the column by experts.

## RESULTS AND DISCUSSION

### Inferential statistics

**Prioritize critical success factors using multiple criteria techniques D-MATEL:** From literature review achieved to 13 critical success factor as following table. For summarize, these factors have been identified by words English C1-C13. At this stage these factors isanalyzed using D-MATEL techniques (Table 1).

**Solving the model by D-MATEL Method A:** Direct correlation matrix calculation (average) M paired comparisons after initially collecting the questionnaires and the presence or absence of a relationship between two factors with regard to the majority of experts that have had more match, directcommunication matrix M was formed. It was in this way that, for example, if more than half of the experts had diagnosed zero the severity of the effect of A on B to, ineffectiveness of A on B verified and the corresponding element in the matrix M was considered

Table 1: Abbreviations dedicated to the critical success factors

| Abbreviations | Description vital factor |
|---|---|
| C1 | Effective communication |
| C2 | Choose projects champion |
| C3 | Make project team |
| C4 | Senior management responsibility |
| C5 | Set making and vision program |
| C6 | IT systems and business evaluate |
| C7 | Standards and seller company selection and software package |
| C8 | Reengineering process |
| C9 | Project management |
| C10 | Configuration, testing and troubleshooting |
| C11 | Data exchange management |
| C12 | Change management and user training |
| C13 | Monitoring and evaluating the performance |

zero. Otherwise, according to the consensus of experts or simple average comments, appropriatepoints set and was placed in the corresponding element.

**Normalization of the matrix M:** Total rows calculate the matrix elements M and reverse most of it in the elements of matrix M is multiplied. In so doing the relative intensities of the direct relations can be determined.

$$a = \frac{1}{\max \sum_{j=1}^{n} a_{ij}} N = a.M$$

$$\max \sum_{j=1}^{n} a_{ij} = 37$$

$$a = \frac{1}{37} = 0.027$$

By multiplying coefficient in the matrix M, normalized matrix N obtained that was used in thenext step.

**Calculation of total relations matrix:** In this step matrix relative intensity from direct and indirect relationships (S) according to thefollowing formula was established:

$$S = N(1-N)^{-1}$$

**Calculation of the possible indirect relationship (matrix T):** The severity of possible indirect relationships (From elements on each other) through thefollowing formula was calculated:

$$T = N^2(1-N)^{-1}$$

By analyzing the above and using data matrix with MATLAB and Excel and SPSS Software,The following results for the matrix T and parameters R and J and R + J

Table 2: Results of paired comparsion

| Column1 | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C1 | 0.0 | 2.0 | 1.0 | 0.0 | 0.6 | 1.6 | 1.0 | 0.8 | 0.8 | 1.8 | 1.4 | 0.4 | 0.6 |
| C2 | 0.0 | 0.0 | 0.2 | 0.4 | -0.2 | 2.2 | 1.2 | 1.6 | 0.2 | 1.0 | 0.0 | 0.2 | 0.8 |
| C3 | 1.6 | 1.4 | 0.0 | 1.2 | 1.2 | 0.8 | 1.0 | 2.2 | 0.4 | 2.2 | 1.0 | 1.2 | 0.4 |
| C4 | 1.6 | 2.0 | 0.8 | 0.0 | 1.0 | 0.8 | 1.4 | 2.6 | 1.6 | 2.6 | 1.8 | 1.4 | 1.4 |
| C5 | 1.0 | 1.4 | 0.2 | 0.8 | 0.0 | 2.0 | 2.4 | 2.8 | 1.4 | 2.8 | 3.2 | 1.8 | 2.2 |
| C6 | 0.2 | -0.8 | -0.2 | 0.2 | 0.0 | 0.0 | 1.0 | 1.4 | -0.6 | -0.8 | 0.8 | -0.4 | 1.2 |
| C7 | 1.0 | 1.2 | 1.2 | 0.6 | 0.0 | 0.2 | 0.0 | 0.8 | 2.0 | 1.0 | 3.4 | 2.8 | 1.0 |
| C8 | 0.6 | 0.0 | -1.4 | -0.8 | -1.4 | -1.4 | 0.6 | 0.0 | 0.6 | 1.4 | 1.8 | 1.2 | -0.4 |
| C9 | 0.2 | 10.4 | 3.2 | 2.6 | 1.4 | 1.0 | 2.4 | 2.4 | 0.0 | 3.0 | 2.6 | 1.6 | 1.8 |
| C10 | 1.4 | 0.4 | 0.8 | -1.0 | -1.0 | -0.8 | 0.6 | 0.0 | -0.8 | 0.0 | -0.6 | 0.4 | -0.4 |
| C11 | 0.2 | 1.0 | 0.0 | -0.2 | -0.6 | -0.2 | 1.2 | 0.8 | 0.2 | -0.4 | 0.0 | 0.8 | 1.2 |
| C12 | 2.6 | 2.2 | 1.6 | 1.4 | 1.0 | 2.2 | 2.6 | 1.8 | 2.0 | 1.8 | 2.4 | 0.0 | 2.2 |
| C13 | 2.0 | 1.6 | 1.6 | 1.8 | 0.2 | 0.0 | 1.8 | 2.2 | 2.0 | 1.0 | 2.8 | 0.2 | 0.0 |

Table 3: T-matrix

| T-matrix | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C1 | 0.1747 | 0.1656 | 0.1641 | 0.0501 | 0.1057 | 0.1999 | 0.2252 | 0.2122 | 0.1789 | 0.1351 | 0.2415 | 0.2599 | 0.2052 |
| C2 | 0.2923 | 0.1256 | 0.2223 | 0.1422 | 0.1862 | 0.2800 | 0.3053 | 0.2922 | 0.2432 | 0.2054 | 0.2796 | 0.3281 | 0.2855 |
| C3 | 0.1903 | 0.0831 | 0.0512 | 0.0267 | 0.0462 | 0.1283 | 0.1498 | 0.1594 | 0.0706 | 0.0986 | 0.1653 | 0.1981 | 0.1757 |
| C4 | 0.3456 | 0.2075 | 0.2071 | 0.0723 | 0.2171 | 0.2847 | 0.2659 | 0.2729 | 0.2599 | 0.2322 | 0.3079 | 0.3364 | 0.2888 |
| C5 | 0.2492 | 0.1195 | 0.1649 | 0.1214 | 0.0783 | 0.1993 | 0.2250 | 0.1831 | 0.1560 | 0.1628 | 0.1942 | 0.2584 | 0.2807 |
| C6 | 0.2911 | 0.1580 | 0.1274 | 0.8380 | 0.1681 | 0.1893 | 0.2836 | 0.2972 | 0.1563 | 0.2130 | 0.3693 | 0.3294 | 0.2860 |
| C7 | 0.2262 | 0.1021 | 0.0694 | 0.0391 | 0.6820 | 0.2875 | 0.1283 | 0.2173 | 0.1159 | 0.1458 | 0.2488 | 0.2374 | 0.2069 |
| C8 | 0.2092 | 0.0716 | 0.0631 | 0.0342 | 0.0615 | 0.1915 | 0.1419 | 0.1255 | 0.1293 | 0.1356 | 0.2872 | 0.2185 | 0.1909 |
| C9 | 0.3347 | 0.2228 | 0.2245 | 0.1184 | 0.2066 | 0.2536 | 0.2809 | 0.2879 | 0.1554 | 0.2015 | 0.2750 | 0.3250 | 0.2814 |
| C10 | 0.1131 | 0.0684 | 0.0397 | 0.0237 | 0.4010 | 0.1260 | 0.1228 | 0.1076 | 0.0515 | 0.0528 | 0.1618 | 0.1687 | 0.0777 |
| C11 | 0.2708 | 0.1149 | 0.1134 | 0.0971 | 0.1519 | 0.1986 | 0.1732 | 0.2298 | 0.1341 | 0.1110 | 0.1620 | 0.2784 | 0.2235 |
| C12 | 0.2207 | 0.1015 | 0.0947 | 0.0382 | 0.0670 | 0.2606 | 0.1753 | 0.2108 | 0.1362 | 0.1422 | 0.2183 | 0.1560 | 0.1788 |
| C13 | 0.2488 | 0.1148 | 0.0796 | 0.0442 | 0.7800 | 0.2518 | 0.2479 | 0.2624 | 0.1525 | 0.1867 | 0.2498 | 0.2624 | 0.1524 |

Table 4: R&J parameters

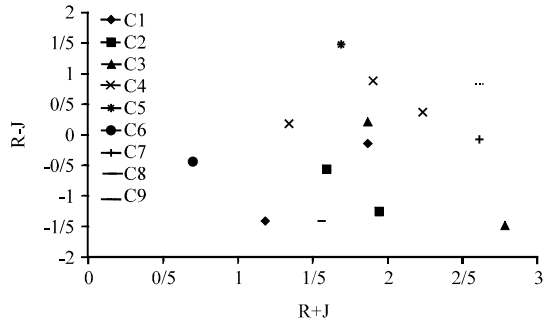
| Parameters | Values |
|---|---|
| **J** | |
| C11 | 1.564967 |
| C8 | 1.414355 |
| C7 | 1.304303 |
| C10 | 1.283458 |
| C2 | 1.079723 |
| C1 | 0.995488 |
| C12 | 0.935664 |
| C13 | 0.875372 |
| C3 | 0.792110 |
| C9 | 0.758280 |
| C6 | 0.559325 |
| C4 | 0.482048 |
| C5 | 0.083350 |
| **R** | |
| C12 | 1.821262 |
| C9 | 1.811705 |
| C5 | 1.598936 |
| C4 | 1.411356 |
| C13 | 1.328134 |
| C7 | 1.276329 |
| C3 | 1.067142 |
| C1 | 0.834896 |
| C2 | 0.493219 |
| C11 | 0.355283 |
| C6 | 0.142977 |
| C8 | 0.096627 |
| C10 | -0.10942 |

Table 5: R+J and R-J parameters

| Parameters | Values |
|---|---|
| **R-J** | |
| C5 | 1.515587 |
| C9 | 1.053425 |
| C4 | 0.929309 |
| C12 | 0.885598 |
| C13 | 0.452763 |
| C3 | 0.275032 |
| C7 | -0.02797 |
| C1 | -0.16059 |
| C6 | -0.51635 |
| C2 | -0.58650 |
| C11 | -1.20968 |
| C8 | -1.31773 |
| C10 | -1.39288 |
| **R+J** | |
| C12 | 2.756925 |
| C7 | 2.580632 |
| C9 | 2.569985 |
| C13 | 2.203506 |
| C11 | 1.920250 |
| C4 | 1.893404 |
| C3 | 1.859252 |
| C1 | 1.830383 |
| C5 | 1.582286 |
| C2 | 1.572942 |
| C8 | 1.510982 |
| C10 | 1.174034 |
| C6 | 0.702302 |

and R-J for 13 indicators (factors) was achieved for success critical as follows (Table 2-5). Finally output MATLAB Software were extracted as follows.

By drawing pairs of R + J and R-J in the coordinate system with Excel Software, the impact andreception of the parameters and the importance (weight) of the system was determined as follows (Fig. 3). Rate of influence and




effectiveness of the parameters and their importance on system rate of influence and effectiveness of the parameters and their importance on system:

- Answers to the survey questions
- According to a survey conducted in various articles of external and internal sources and alsoapplication exits research below question was answered

**First question:** What factors affect the successful implementation of information systems supplychain. According to analyze conducted in this study, critical success factors in the implementation ofinformation systems supply chain are as follows:

- Make effective communicate
- Choose projects champion
- Make project team
- Senior management responsibility
- Set making and vision program
- IT systems and business Evaluate
- Standards and seller company selection and software package
- Reengineering process
- Project management
- Configuration, testing and troubleshooting
- Data exchange management
- Change management and user training
- Monitoring and evaluating the performance

**Second question:** How is the causal relationships between critical success factors of supply chain information systems? According to the results matrix of research and analysis with MATLAB and Excel (matrix T) determined that all of these factors effect on each other and also are impressionable. In D-MATL techniques the amount of Impact and influence determined by R+Parameter. It means, however this parameter is more and its interaction with other elements of systemsbecome more with more weight and importance. Among them the highest amounts

Table 6: Ranking R+J parameters

| Description vital factor | R+J |
|---|---|
| Change management and user training | 2.756925 |
| Standards and seller company selection and software package | 2.580632 |
| Project management | 2.569985 |
| Monitoring and evaluating the performance | 2.203506 |
| Data exchange management | 1.920250 |
| Senior management responsibility | 1.893404 |
| Make project team | 1.859252 |
| Effective communication | 1.830383 |
| Set making and vision plan | 1.682286 |
| Choose projects champion | 1.572942 |
| Reengineering process | 1.510982 |
| Configuration, testing and troubleshooting | 1.174034 |
| IT systems and business assessment | 0.702302 |

Table 7: Ranking R-J parameters

| Description vital factor | R-J |
|---|---|
| Set making and vision plan | 1.5155870 |
| Project management | 1.0534250 |
| Senior management responsibility | 0.9293090 |
| Change management and user training | 0.8855980 |
| Monitoring and evaluating the performance | 0.4527630 |
| Make project team | 0.2750320 |
| Configuration, testing and troubleshooting | -0.027970 |
| Effective communication | -0.160590 |
| IT systems and business assessment | -0.416350 |
| Choose projects champion | -0.586500 |
| Data exchange management | -1.209680 |
| Reengineering process | -1.317730 |
| Configuration, testing and troubleshooting | -1.392880 |

is related to the C12 (change management and usertraining) and then C7 (standard and seller company selection and software package) and C9 (Project Management). The influence of each factor on other elements of the system with RJ parameter is showedthat the greatest amount factors is related to C5 (set making and vision plan) and C9 (project management) and then C4 (responsibility of senior management) andare as the influencing factors. Also factors C10 (configuration, testing and debugging) and C8 (reengineering process)and C11 (data exchange management) that have the least amount of R-J (negative) are definitive factors or influenced.

**Third question:** How is the priority or ranking these factors in MIRAB company profiles (Hoffman) based on the results of this research, ranking the critical success factors in the implementation of information systems supply chain at Hoffman Company is on Table 6 and 7. Resulting from D-MATL and MATLAB and Excel Software output.

## CONCLUSION

Implement an information system supply chain requires effective communication inside and between organizations in the supply chain partner. The impact of

communications beforeand during its implementation is very important. For example, to reduce resistance andfrustration, the future users of this technology should be informed why some decisions havebeen taken or regular communication and interaction should be done between the organizations to set objectives.

Generally, when implementing an information system supplychain, opening and frequent communication is vital. In the research literature, the importance of effective communication is widely recognized by most researchers. When implementing an information system supply chain, requires an implementation teamto facilitate project success which, according to Lu *et al.* (2006) this team is composed of foursub-teams: technical team, partner's team involved, the business (commercial) and the management team. The management team includes senior executives all supply chain partners.

Several studies have theorized that senior management commitment and involvement of all partners involved in the supply chain is a key factor. A senior team, to increase the interaction between the involved agencies must be representative of the management of all participating organizations. The primary responsibility of the senior management team is to provide support such as time, money and resources.

Because by lack of support, implementation will undoubtedly lead to failure. In addition to financial support, senior managers are responsible for employee's psychological support. To reduce differences in implementation, all supply chain partners need a common vision. This is because the compatibility and improve the exchange of information. In particular, supply chain partners need to adjust perspective during implementing supplychain information system and creating a common business plan. To set outlook, open communication and regular meetings between the senior managers of involved partners isvital.

Of course, different organizational cultures may be hampered in this area and prevent their development goals. May be stronger organizations in the supply chain during these sessions impose their views on others because other organizations often depend to them. If supply chain partners with di fferent goals don't make a true communicate with each other, implementation problems will become further and thus may become fail to implement. Business and IT systems currently used in the supply chain may need to be re-evaluated. Because implementation of an information system supply chain need compatibility between supplies chain partners. For compatibility with policies, procedures, job stability, culture, strategy, objectives control, the organizational hierarchy, among different organizations, evaluating business systems and IT in the supply chain is essential.

Chain partners involved IT incompatibility is a very important obstacle to become successful in implementation of supply chain information systems. Before selecting a seller company, supply chain partners must agree on technical standards because some partners may be due to incompatibility of packages with their internal systems, don't be agree with them. Then they must agree on the vendor and information system software package.

Before re-engineer production processes and information existing processes need to further investigate. And require better design activities with value-added throughout the organization and chain. Then to make better use of new supply chain and operation of additional value creation, opportunities, reshaping production processes and information, duties and responsibilities of involved personnel, the organizational hierarchy and guidelines, processes must be redesigned. For successful implementation of supply chain information systems, long-term commitment of involved partners is very important.

Only when all partners are actively engaged, arehighly motivated and in a timely manner implementation problems will solved by the partners and everyone can come to mutual resources. This motivation often is shown withthe use of facilities, expertise and time. The effective implementation of information systems supply chain requires data management strategy. Security and access to information is supply chain partners concerns. For example, when a supplier provides an important piece for two manufacturer, both producers should not share information with suppliers unless it is guaranteed that the information is not leaked to another manufacturer.

In addition, Prem Kumar stated that when supply chain partners are pessimistic about the leakage of information, security concerns become bigger. These concerns can be controlled by firewalls or security or adequate training. In addition, the data must be accurate and timely. If one or more supply chain partners for different operating systems or specific information systems cannot share their information carefully, data can be collected carefully. In this respect Kouh and Chlyder suggested that information standards (such as a data exchange format) should be created during implementing supply chain information systems.

In many cases, during implementation of supply chain information system, there is areluctance to use information system and share information. Several studies show that many managers are reluctant to share information which is often are valued.

In addition, employees prefer current situation and avoid to change. Resistance to change is a special

challenge and employees do not want to change their way by other supply chain organization. To avoid this problem, all users in supply chain partners need to be involved in the design and selection of information system and gain enough confidence. Self-confidence can be created through users training. Performance measurement is one of the important points in the implementation of information systems.

Because the measuring inconsistent performance among the involved partners in the chain provides significant barriers to supply chain management. Performance measurement can support and protect the supply chain process changes. In the supply chain should be on performance indicators, to be agreed between the involved partners and the agreement is considered as a challenge because usually different ways of measuring performance among the partners has been created and can change the direction of its implementation.

## SUGGESTION

According to the results of research and software analysis, the following suggestions are presented in order of priority:

- Familiarize involved managers with benefits of implementation of information systems through conferences or meetings
- Justification seminars and classes before run at a senior level managers to determine project costs
- Peer review in operational costs before proceeding with the implementation of supplychain information and declare it all supply chain partners for more cooperation
- Familiarize users in all levels with benefits and risks of information system implementation and project failure
- Raising corporate culture by training administrators and users towards cooperation with project objectives and reduce their resistance against the alterations taking place (change management)

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