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IT/IS issues and challenges in Indian SMES: An interpretive structural modeling (ISM) approach

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Abstract
Assessment of IT/IS Adoption and market competitiveness is a crucial endeavor for today's competing SMEs. There has been an increasing value for enhancements among the business effectiveness as well as increasing the profitability consequently in order to enhance business venture, competitiveness. Interpretive structural modeling (ISM) has evolved as a means to analyze the relational aspects of the factors. The objective of this paper is to identify factors of IT/IS adoption and competitiveness and to establish and analyze associations among these factors applying interpretive structural modeling.

1. Introduction

Factors affecting IT/IS adoption in Indian SMEs for the development of business and implementing the changes as per the requirement of time and infrastructure of the organization were extracted from the literature and after discussion with the experts from the concerned industry and academics. Interpretive Structural Modeling (ISM) was used, it is usually believed that often individuals or groups meet up with challenges in coping with difficult issues or systems. The complexity of the issues or systems is because of the presence of a large wide range of factors and correspondence among these factors. The presence of directly or indirectly related factors complicates the structure of a given system that might or may not be articulated within the transparent fashion. It turns into challenging to cope with this sort of technique in which structure is not clearly described. Therefore, it necessitates the creation of a technique which often assists in figuring out a structure within a system. Interpretive structural modeling (ISM) is such a methodology which can be applied to locate the preferences or level of factors selected for the study, SMEs are going through competitive phase and are required to upgrade in terms of technology and the way of business around the world, and it requires in depth study of various sources available and which are feasible to acquire as per the requirement.

Small and medium enterprises or SMEs make up a big part of business organizations, work opportunity as well as the production in India. It is necessary to sustain this powerful area because of the fact that it also prompts employment in a remarkably distributed way throughout the country – in highly urbanized cities, towns in addition to villages; it prevents concentration of economic power; and it also influences on financial progress over the wide range of of production ventures by making use of the dispersed resources, which hopefully will otherwise remain unutilized. Therefore, SMEs occupy an area of strategic importance in the whole Indian economy. However, the economic environment which requires SMEs operate – domestic in addition to international – has undergone a massive transformation since 1991. Consequently, SMEs happen to exposed to intensive competition like never before. Therefore, it is extremely important for SMEs to strengthen their competitiveness for survival and growth. Amongst others, technology is arguably one factor that contributes decisively to building competitiveness in industries along with nations. Technological advancement continues to be the important thing driving strength in developed nations around the world, referring to a lion's part of productivity growth. Technological advancement has enabled newly industrializing economies The economic environment through which Indian SM s are performing at present, worldwide transformations do influence them equally as much as regional progressions. Attaching due sophistication to technology development is certainly needed to improve their competitiveness.

To recognize the requirement and virtuousness of technology development in Indian SMEs in a proper perspective, it is necessary to analyze their overall performance and issues in the light of policy transformations that have taken place in the country and somewhere else. To start with, it is necessary to study their condition in Indian industry and verify whether or not it has gone through any change. Further, it is necessary to visualize the most important policy modifications – regional and worldwide – which have consequences for SMEs and would certainly have had an impact on SME overall performance in the 1990s. After doing so, strategies need to be suggested to address their crucial problems to build competitiveness for significantly better efficiency.

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2. Interpretive Structural Modeling(ISM)

Interpretive Structural Modeling (ISM) is an emerging modeling methodology which is useful as an aid to individual or small groups in developing and understanding of complex situation this modeling tool was introduced by [1], with the objective of understanding of complex relationships among the research variables related to the subject. ISM is a cumulative learning process. In this process, a set of different directly and indirectly related elements are structured into a comprehensive systematic mode. The model formed after the process predicts the structure of a complex issue in a carefully designed pattern implying graphics as well as words. The ISM methodology is an interactive learning process in which a systematic application of some elementary notions of graph theory is used in such a way that theoretical, conceptual and computational leverage are exploited to explain the complex pattern of contextual relationship among a set of variables [2, 3]

ISM methodology is used to investigate the IT/IS adoption in the Indian SMEs and its adoption in various sectors of SMEs for the enhancement of capability of manufacturing and to maintain the quality, ISM process transforms unclear and raw conceptual models of system into clear and well defined useful models. It helps to impose order and direction on the complexity of relationships among elements of a system [4]It enables individuals or groups to develop a map of the complex relationships between many elements involved in a complex decision situation [5]ISM is often used to provide fundamental understanding of complex situations, as well as to put together a course of action for solving a problem [8]The method is interpretive, based on group's judgments; structural means on the basis of the relationship and it is modeling on the ground that the specific relationships are portrayed in a structured digraph model [7].

ISM is a technique that can be placed upon a system – for example group or an environment – to scientifically grasp both the direct and indirect relationships among the list of system's components. Its fundamental rationale ought to utilize experts' practical experience and knowledge to break down a challenging structure into several sub-systems (elements) and generate a multilevel structural model. ISM is most often applied to supply quintessential grasping of challenging circumstances, along with impart collectively a course of action for solving a problem [6]The primary outcomes of ISM are driver power-dependence matrix, recognition of levels of criteria and digraph (relationship among variables). ISM quantifies the associations between buyer-supplier relationship variables and also provides comprehensive visualization of it in the form of digraph. The method is interpretive, based upon group's judgments; structural mans based on this relationship which is modeling on the basis that that the certain relationships are portrayed in a structured digraph model [7] Hence, ISM is currently being used as it gives you relational hierarchy amongst most of the complex variables of any network or system like SMEs.

The different steps involved while developing the ISM model are as follow:

Step1. List all the research variable of system under the study; it can be factors, criteria and dimensions which can be objective, actions and individual etc.

Step2. Establish a contextual relationship among the variables with respect to which pair of variable would be examined.

Step3. Develop the Structural Self-Interaction Matrix (SSIM) for the variables which can indicates pair wise relationships among the variable of the system under consideration.

Step4. Develop the Binary Initial Reach ability Matrix (IRM) from SSIM and the matrix is checked for transitivity, leading to development of "Final Reach ability Matrix ". The transitivity of the contextual relations is basic assumptions made in ISM. It states that if a variable A is related to B and B is related to C, then A is necessarily related to C.

Step 5. The final reach ability matrix obtained in step 4 is partitioned into different levels.

Step6. Based on the relationship given in the reach ability matrix and the determined levels for each variable a directed graph is drawn and the transitive links are removed.

Step7. The resultant diagraph is converted into ISM by replacing variable nodes with statements.

Step8. The ISM model developed in step 7 is reviewed to check for conceptual inconsistency and necessary modifications are made.

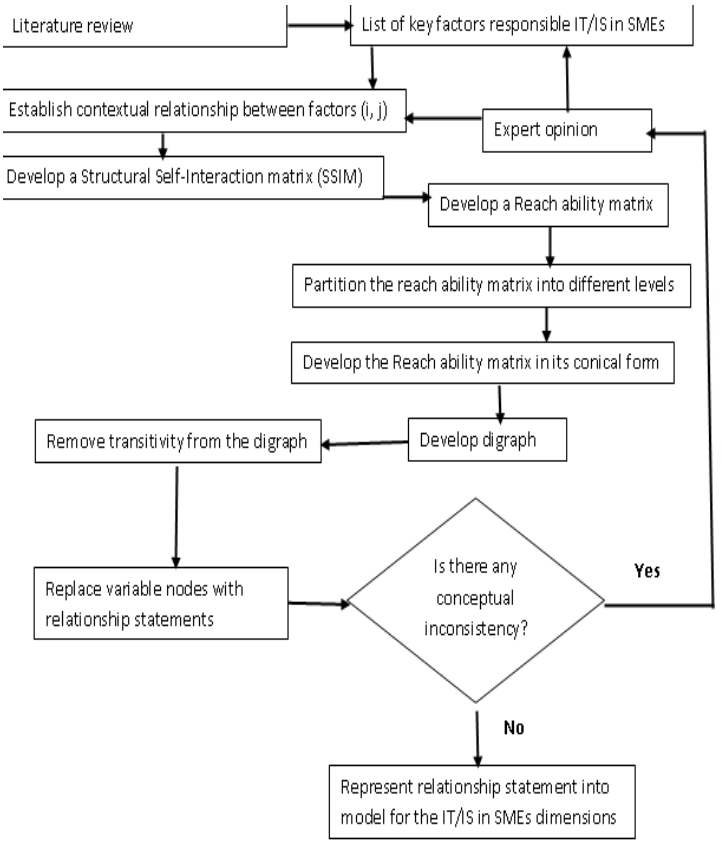


Fig1: Flow chart of ISM process

3.1 Research Variables

In this research study variables are identified by literature review and are related to the IT/IS adoption in Indian SMEs and its effectiveness in SMEs that will lead to the realization of need of the technology in small organization to increase the efficiency and to gain the numerous advantages of information technology that will be helpful in expanding the business in future and to increase the profit as well as to increase the level of customer satisfaction. List of all variables used in this study are shown in the table 1.

3.2 Structural Self-Interaction Matrix (SSIM)

ISM methodology suggest the use of expert opinions based on various management techniques such as brain storming, nominal group technique etc. in developing contextual relationship among the variables [1, 2, 3], the opinion of experts from different sectors of SMEs from across the India have been taken along with the academia people, experts were asked to identify the extent to which one variable lead to another. Based on this contextual relationship and associated direction between any two parameters (i and j) all relationship between the two parameters in associated direction are questioned from the experts, following four symbols are were used to denote the direction of the relationship between the research variables.

V: Variable i will help to achieve variable j
A: Variable j will help to achieve variable i
X: Variable i and j will lead to achieve each other
O: variable I and j are unrelated

Based on the opinion of experts and academia people table1 is developed. The Initial Reach ability Matrix (IRM) shown in table 2:

3.3 Initial Reach ability Matrix (IRM)

SSIM is now transformed into binary matrix called the initial reach ability matrix by substituting V, A, X and O by 1 and 0 according to the following rules

1. If (i, j) entry in the SSIM is V, then the (i, j) entry in the Initial Reach ability Matrix (IRM) becomes 1 and (j, i) entry becomes 0.
2. If the (i, j) entry in the SSIM is A, then the (i, j) entry in the Initial Reach ability Matrix (IRM) become 0 and the (j, i) entry becomes 1.
3. If the (i, j) entry in the SSIM is X, then the (i, j) entry in the Initial Reach ability Matrix (IRM) becomes 1 and the (j, i) also becomes 1.
4. If the (i, j) entry in the SSIM is O, then the (i, j) entry in the Initial Reach ability Matrix (IRM) becomes 0 and the (j, i) also becomes 0.

The final reach ability matrix (FRM) is obtained after checking for transitivity and removing transitivity if there is any, transitivity effects in IRM should be considered and it is to be removed. To remove the transitivity in table 2, we need to follow these steps

1. Look for the entry 0 in IRM.
2. Check for the transitivity e.g., if **A** leads to **B** is 1 and **B** leads to **C** is 1 this implies **A** leads to **C** is 1
3. If there is any transitivity replace the 0 with 1*.

After completing all the entries the final reach ability matrix (FRM) will come into existence.

3.4 Level Partition

From the final reach ability matrix reach ability and antecedent set (Warfield 1974) for each factor are found. The reach ability set contains the element itself and other elements which it can have impact on other elements. the antecedent set consist of the element itself and other factors that may impact it, therefore intersection of the set obtained in reach ability set and antecedent set are derived. The factors for which the reach ability set and intersection set are same occupy the top level of hierarchy in ISM model. The top level factors in the hierarchy will not lead to any other parameter above its own level, once a level is identified its parameters are removed from the further consideration of other levels. Same process is repeated till the level of each and every parameter is identified, these levels help in building the diagraph and the ISM model.

3.5 Conical Matrix

A conical matrix is been developed by clustering the factors of the same level across the rows and columns of the final reach ability matrix. Conical matrix obtained shown in table 12.

3.6 Development of digraph

ISM is one of the important tool for the modeling and it need to be interpreted correctly and hence the successful implementation can be done by relevant authority. A binary digraph is obtained by examining the direct relationship among the factors affecting the IT/IS adoption in Indian SMEs. The relationships among the factors are shown with the help of arrow at their respective levels and hence the digraph or initial model is developed as per the hierarchy of different factors.

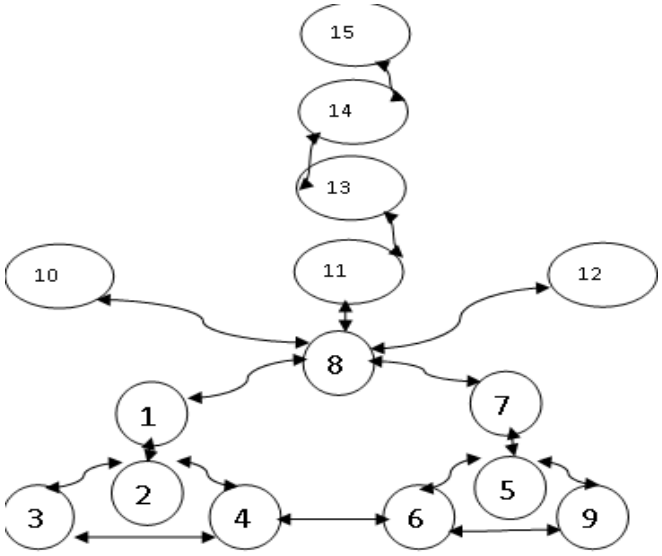


Fig2: Diagraph of ISM model

Table1: Structural Self-Interaction Matrix (SSIM)

Parameters	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
1. Benefits	A	V	A	A	A	A	O	X	X	V	X	X	V	O	
2. Barriers	O	X	X	O	A	A	V	O	O	V	O	O	V		
3. Perception	V	A	X	X	A	V	V	A	A	X	A	X			
4. Advantages	A	V	X	A	V	A	O	V	V	X	O				
5. Government support	V	V	V	O	A	A	O	V	A	V					
6. Application usage	A	V	V	A	X	A	O	X	X						
7. Internet Usage	A	V	X	V	A	V	O	V							
8. Internet for business	A	X	A	V	A	A	O								
9. Reason for No Website	O	X	O	O	A	A									
10. Management role	V	V	X	V	V										
11. Environmental factor	A	X	V	X											
12. Customer Satisfaction	A	V	V												
13. Implementing changes	A	V													
14. Regarding competition	V														
15. IT/IS Adoption															

Table 2: Initial Reach ability Matrix (IRM)

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	0
2	0	1	1	0	0	1	0	0	1	1	0	0	1	1	0
3	0	0	1	1	0	1	1	1	1	1	1	0	1	0	1
4	1	0	1	1	0	1	1	1	0	0	0	0	1	1	1
5	1	0	1	0	1	1	0	1	0	0	0	0	1	1	1
6	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
7	1	0	1	1	1	1	1	0	0	0	0	0	1	0	0
8	1	0	1	1	1	1	1	1	0	0	0	0	0	1	0
9	0	1	1	0	0	0	0	0	1	0	0	0	0	1	0

10	1	1	1	1	1	1	1	1	0	1	0	0	1	0	0
11	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
12	1	0	1	1	0	1	1	1	0	1	1	1	0	0	0
13	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
15	1	0	1	1	1	1	1	0	0	1	1	1	0	1	1

Table 3: Final Reach ability Matrix (FRM)

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**Driving power**
1	1	1	1	1	1	1	1	1	0	1	1	1	0	**1***	0	**12**
2	0	1	1	**1***	0	1	0	0	1	1	0	0	1	1	0	**8**
3	0	0	1	1	0	1	1	1	1	1	1	0	1	0	1	**10**
4	1	0	1	1	0	1	1	1	0	0	**1***	0	1	1	1	**10**
5	1	0	1	0	1	1	0	1	0	0	0	0	1	1	1	**8**
6	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	**6**
7	1	0	1	1	1	1	1	0	0	0	0	1	0	0	0	**7**
8	1	0	1	1	1	1	1	1	0	0	0	0	0	1	0	**8**
9	0	1	1	0	0	0	0	0	1*	0	0	0	0	1	0	**4**
10	1	1	1	1	1	1	1	1	1	1	1	1	0	**1***	0	**13**
11	1	1	1	1	1	1	1	1	1	1	1	1	0	**1***	0	**13**
12	1	0	1	1	0	1	1	1	0	1	1	1	0	0	0	**9**
13	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	**12**
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	**14**
15	1	0	1	1	1	1	1	0	1*	1	1	1	**1***	1	1	**13**
Dependence	**12**	**8**	**15**	**14**	**10**	**14**	**10**	**10**	**7**	**9**	**9**	**8**	**7**	**10**	**4**	

Table 4: Iteration 1

Measure number	Reach ability Set	Antecedent Set	Intersection	Level
1	1-8,10-12,14	1,4-8,10-15	1,4-8,10-12,14	
2	2-4,6,9,10,,13,14	1,2,6,9-11,13,14	2,6,9,10,13,14	
3	3,4,6-11,13-15	1-15	3,4,6-11,13-15	**I**
4	1,3,4,6-8,11,13-15	1-4,6-8,11-15	1,3,4,6-8,11,13-15	**I**
5	1,3,5,6,8,13-15	1,5-8,10,11,13-15	1,5,6,8,13-15	
6	1-6	1-8,10-15	1-6	**I**
7	1,3,4,7,8,10-15	1-12,14	1,3,4,7,8,10,11,14	
8	1,3-8,14	1,3-5,7,8,10-14	1,3-5,7,8,14	
9	2,3,9,14	2,3,9-12,14	2,3,9,14	**I**
10	1-12,14	1-3,10-15	1-3,10,11,12,14	
11	1-12,14	1,3,4,10-15	1,3,4,10,11,12,14	
12	1,3,4,6-8,10-12	`1,7,10-15	1,7,10-12	
13	1-8,10-13	2-5,13-15	3,4,13	
14	1-14	1,2,4,5,8-11,14,15	1,2,4,5,8-11,14	
15	1,3-7,9-15	3-5,15		

Table 5: Iteration 2

Measure number	Reach ability Set	Antecedent Set	Intersection	Level
1	1,2,5,7,8,10-12,14	1,5,7,8,10-15	1,5,7,8,10-12,14	
2	2,10,13,14	1,2,10,11,13,14	2,10,13,14	**II**
5	1,5,8,13-15	1,5,7,8,10,11,13-15	1,5,8,13-15	**II**
7	1,5,7,12	1,7,8,10-15	1,7,12	
8	1,5,7,8,14	1,2,5,8,10-14	1,5,8,14	
10	1,2,5,7,8,10,11,12,14	1,2,10-15	1,2,10,11,12,14	
11	1,2,5,7,8,10,11,12,14	1,10-15	1,10,11,12,14	
12	1,7,8,10-12	1,7,10-15	1,7,10-12	

13	1,2,5,7,8,10-13	2,5,13-15	2,5,13	
14	1,2,5,7,8,10-14	1,2,5,8,10,11,14,15	1,2,5,8,10,11,14	
15	1,5,7,10-15	5,15	5,15	

Table 6: Iteration 3

Measure number	**Reach ability Set**	**Antecedent Set**	**Intersection**	**Level**
1	1,7,8,10,11,12,14	1,7,8,10-15	1,7,8,10,11,12,14	**III**
7	1,7,12	1,7,8,10-15	1,7,12	**III**
8	1,7,8,14	1,7,10-14	1,7,14	
10	1,7,8,10,11,12,14	1,10-15	1, 10,11,12,14	
11	1,7,8,10,11,12,14	1,10-15	1, 10,11,12,14	
12	1,7,8,10,11,12	1,7,10-15	1,7,10,11,12	
13	1,7,8,10-13	11-13	11-13	
14	1,7,8,10-14	1,8,10,11,14,15	1,8,10,11,14	
15	1,7,10-15	15	15	

Table 7: Iteration 4

Measure number	**Reach ability Set**	**Antecedent Set**	**Intersection**	**Level**
8	8,14	8,10-14	8,14	**IV**
10	8,10,11,12,14	10-15	10,11,12,14	
11	8,10,11,12,14	10-15	10,11,12,14	
12	8,10,11,12	10-15	10,11,12	
13	8,10,11,12,13	13,14,15	13	
14	8,10-14	8,10,11,14,15	8,10,11,14	
15	10-15	15	15	

Table 8: Iteration 5

Measure number	**Reach ability Set**	**Antecedent Set**	**Intersection**	**Level**
10	10,11,12,14	10-15	10,11,12,14	**V**
11	10,11,12,14	10-15	10,11,12,14	**V**

12	10,11,12	10-15	10,11,12	**V**
13	10,11,12,13	13,14,15	13	
14	10-14	10,11,14,15	10,11,14	
15	10-15	15	15	

Table 9: Iteration 6

Measure number	**Reach ability Set**	**Antecedent Set**	**Intersection**	**Level**
13	13	13-15	13	**VI**
14	13,14	14,15	14	
15	13-15	15	15	

Table10: Iteration 7

Measure number	**Reach ability Set**	**Antecedent Set**	**Intersection**	**Level**
14	14	14,15	14	**VII**
15	14,15	15	14	

Table 11: Iteration 8

Measure number	**Reach ability Set**	**Antecedent Set**	**Intersection**	**Level**
15	15	15	15	**VIII**

Table12: Conical matrix

Factors	**3**	**4**	**6**	**9**	**2**	**5**	**1**	**7**	**8**	**10**	**11**	**12**	**13**	**14**	**15**
3	1	1	1	0	1	1	1	1	1	1	1	1	0	1*	0
4	1	1*	1	1	1	0	0	0	0	1	0	0	1	1	0
6	1	1	1	1	0	0	0	1	1	1	1	0	1	0	1
9	0	1	1	0	0	0	0	0	1	0	1*	0	1	1	1
2	0	1	1	0	0	1	1	0	1	0	0	0	1	1	1
5	1	0	1	0	1	1	1	0	0	0	0	0	0	0	0
1	1	1	1	0	1	1	1	1	0	0	0	1	0	0	0
7	1	0	1	0	1	1	1	1	1	0	0	0	0	1	0
8	1	0	1	1	1	1	1	1	0	0	0	0	0	1	0

10	1	1	1	1	1	1	1	1	1	1	1	1	0	1*	0
11	1	1	1	1	1	1	1	1	1	1	1	1	0	1*	0
12	1	0	1	1	0	1	1	1	0	1	1	1	0	0	0
13	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
15	1	0	1	1	1	1	1	0	1*	1	1	1	1*	1	1

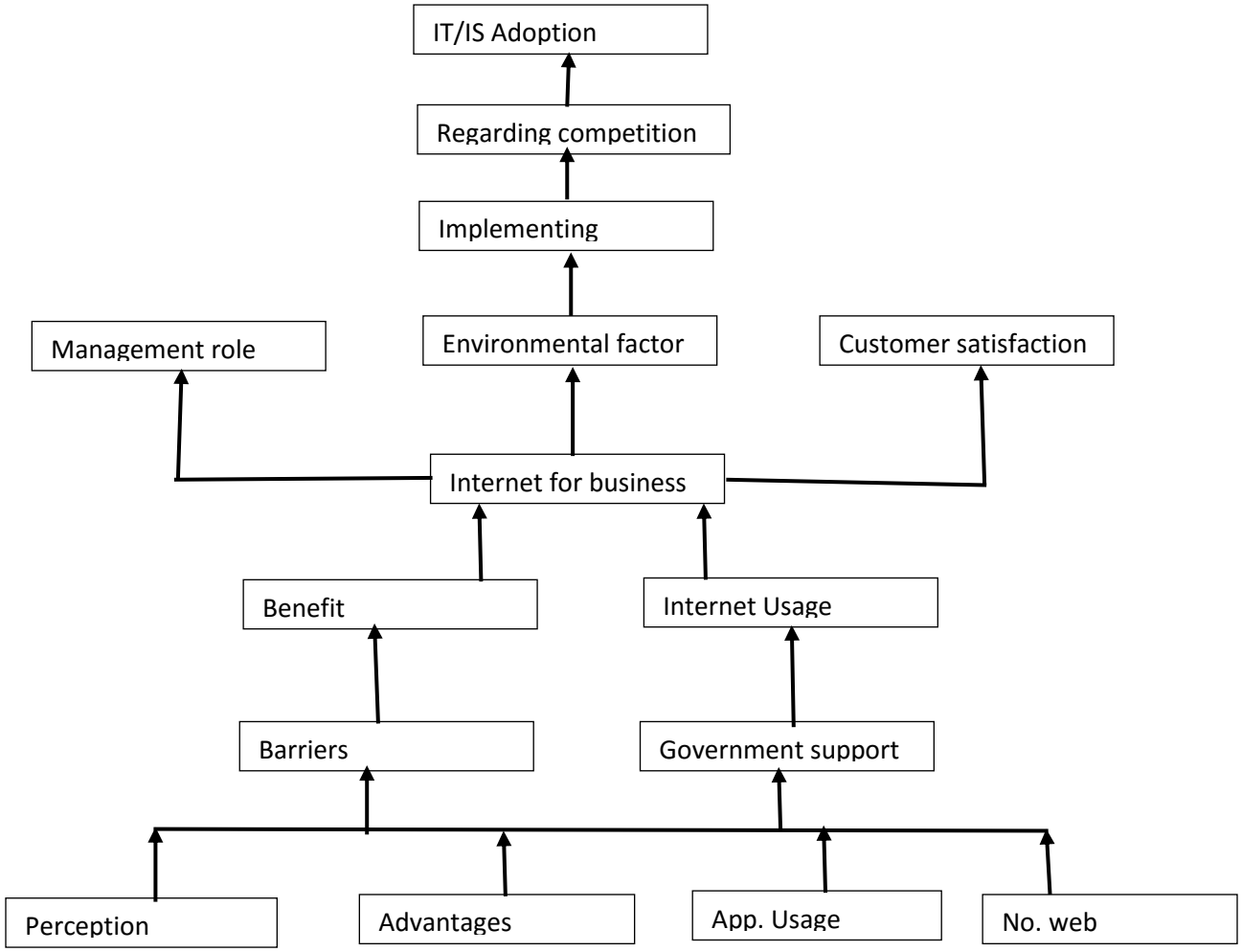


Fig.3: ISM Based Model

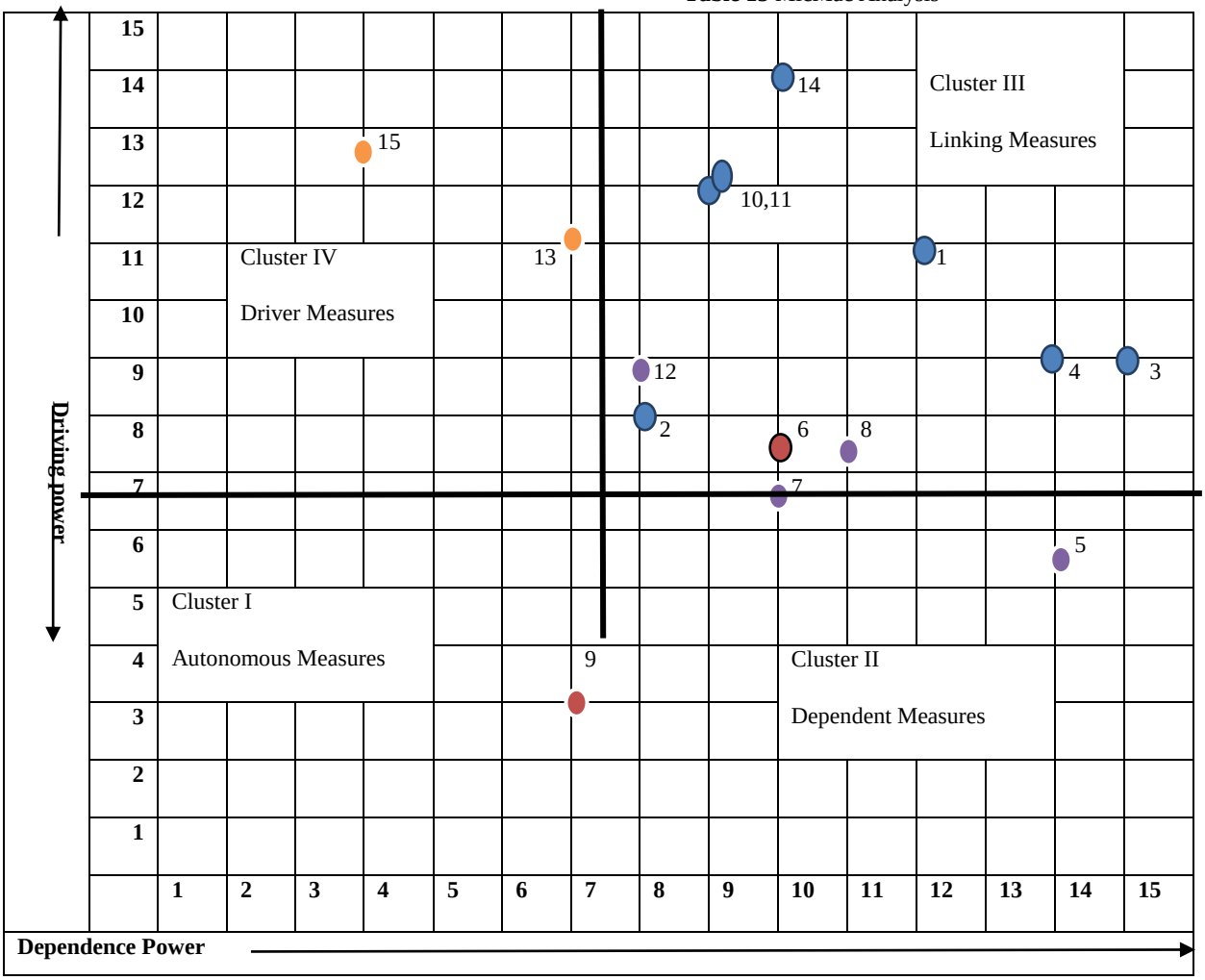
3.7 Development of ISM based model

Relationships among various factors were identified from the conical matrix which is obtained as per the levels of factors, the model will show how the required objective is achieved at various levels and the arrow at various factors indicating relevance at different levels, the levels that were identified were used in building the diagraph and later to build the final model of ISM.

After partition of levels 8 different levels comes into existence and at each level different factors were identified which are listed in the diagram.

ISM supplies a wide variety of added advantages like the procedure is systematic; the computer is programmed to take into consideration all attainable pair wise connections of system factors, either straight from the actions of the members or by transitive inference. The method is efficient; dependent upon the framework, the usage of transitive inference may decrease the multitude of the expected relational enquiries by certain extent, no familiarity with the primary procedure information about given participant in basic terms it must made sufficient knowledge of the entity structure to have the ability to improve with the sequence of relational inquires produced by the computer. It guides and reports the consequences group deliberations on challenging situations in a highly effective and taxonomical approach. It results in planned model or graphical illustration of the chronology predicament circumstances that can be communicated more effectively to others. It is beneficial to the quality of multidisciplinary and interpersonal interactions throughout the framework of the predicament situation by concentrating response of the members on one specific question at a time. It promotes issue interpretation by allowing contributors to review the adequacy of a suggested list of structures factors or concern remark for lighting precise circumstances. It acts as a gaining knowledge of tool by compelling contributors to produce a more profound knowledge of what it actually means and sophistication associated with a selected variable list and interaction. It permits performance or policy interpretation by helping the members in figuring out specific areas for policy action that give many benefits or capitalize upon in seeking precise targets.

Table 13 MicMac Analysis



3.8 Micmac Analysis

Matrice d'Impacts croises-multiplication appliqué and classment (cross impact matrix multiplication applied to classification) is abbreviated as MICMAC.The purpose of the MICMAC analysis is to assess the driving power and the dependence of the variables [9]. Driving power and dependence of each benefit is shown in the final reach ability matrix (Table 3).

It is carried out to obtain the key attributes that drive the system in a number of categories. In accordance to their drive power and dependence power, the variables, have been classified right into four categories i.e. autonomous measures, linkage measures, dependent and independent measures.

Autonomous Measures: These factors do have weak drive power and weak dependence power. They are relatively disconnected from the system, with which they have actually few links, which might be very strong. ***Linkage* measures:** These factors have strong drive power that is likely to be strong dependence power. These variables are unstable within the indisputable fact that any impact on the se variables can have an impact on others as well as are sponsor result on their own. **Dependent measures:** These factors have weak drive power but strong dependence power.

Driver's measures: These variables do have compelling drive power but weaker dependence power. A factor by using a very strong drive power, referred to as 'key factor' is categorized as class of independent or *linkage* factors.

4. Conclusions

(i) As in first cluster factor 9 that is reason for no websites in SMEs comes after analysis it have weak driving as well as dependence power and is relatively disconnected from other factors in the organization.

(ii) Factor 5 that is Government Support has weak derive power and strong dependence power.

(iii) The factors 1,2,3,4,6,7,8,10,11,12 and 14, these factors have strong drive power that is likely to be strong dependence power. These variables are unstable within the indisputable fact that any impact on these variables can have an impact on others as well as are sponsor result on their own.

(iv) Factors 13 and 15 have compelling drive power but weaker dependence power. A factor by using a very strong drive power, referred to as 'key factor' is categorized as class of independent or *linkage* factors.

However if policymakers tend to effectively influence majority of these supporting enhancements into modernization as well as swifter advancement, they ought to enhance the actual procedure to pay attention to, put into practice, and check endeavors. The procedure will certainly be a great deal much more useful, revolutionary, and extremely versatile if a lot more endeavors can incorporate unique models of public-private alliances and regional links. For in the India policy will almost certainly play a bigger task than technology in setting up the stride for a way technology advances. For the reason that the ability to access technological innovation is certainly not the bottleneck in many parts of the India, however generating the whole environmental circumstances for technology to do well continues to be a continuous mission, even in the greater amount of improved economies of the region. A top policy preference really should be to formulate techniques to promote SMEs to invest in technology and progressive business strategies, due to the reason that the bigger economical and sociable advantages could possibly be significant. Maintaining and Supporting Technology and Innovation boosting SMEs increase the ways technology may potentially stimulate innovative and a lot more highly effective business activities. The substantial level and number expenditures needed to bring up Indian SMEs technology and innovation overall performance implies decision makers will need to now explore new financing assistance methods to build infrastructure and technology opportunities. Each of these approaches, illustrating with highly competitive standards and private-sector involvement, will challenge standard perceptions toward the state's role in the economy, but they hold the promise of unlocking much-needed new funding sources. Unique technologies eventually carry change, unsettling at times, as economies and firms adapt. This is especially true for many SMEs. However, all of this conservatism could become an ally to modernization if decision makers eliminate potential risk only by sharing best processes, supporting important information exchanges, and creating regional innovation ventures.

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