Analysis of Change Management using SAP-LAP hills

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Abstract

Only by the adoption of a proper change management scheme, organizations can thrive towards excellence. SAP-LAP has proved to be an ideal tool in that direction. This research illustrates a case study carried out in a cement manufacturing company. The various situations faced by the company during the five three years have been considered for the study and corresponding to that actors, processes, learning, Action & performance have been identified. A matrix has been formed and quantified using prioritized scores. The results highlighted the areas where the management should focus the change management applications. By locating these areas, it is recommended to the actors how to be behaved in such situations and improve the related process accordingly.

Keywords: SAP-LAP, Actor-Process matrix, SAP-LAP hills.

1. Introduction

From time and again the whole world is subjected to rapid and continuous changes due to many known and unknown aspects. In continuation to this a proper change management scheme has to be adopted by organizations also for their long term sustainability and survival. This research is conducted to know more and more strategies to be adopted for increasing the core competency of an organization in global level (Senge. et al. 1994). The methodology used in this research is Situations, Actors, Processes - Learning, Action, and Performance **(SAP-LAP)** framework. (Hussain et al, 2002). In this competitive industrial environment the situations are changing very fast so the actors must be flexible enough to change the process in bringing out new and improved products with new features at competitive rates. By Adopting new technology also paves an ideal footprint in this research. In SAP-LAP framework those situations in which there are resources of learning has been identified. The roles played by different actors in each situation have been described. The learning issues in each situation has been outlined, possible actions has been suggested. A case organization is a cement manufacturing company located in kerala state of India. This company is an ISO 9001:2008 certified company. In the present scenario company is facing a lot of competitive and also other issues concerning to its smooth functioning.

2. SAP-LAP Framework

SAP-LAP is a well-developed instrument for measuring the flexibility of organizations. As a rule organizational environments are dynamic in nature (Husain and Sushil, 1996). As per this analysis an organization is required to adopt newer and better strategies in right sequence with the dynamism of situation (Arshinder et al, 2007).

In SAP-LAP analysis **situations** are the activities which are carried out in internal and external environment of organization. **Actors** are the major stakeholders involved with the situations. **Processes** are the transformations that converts input to output. By adopting a proper change management scheme helps the organisation for survival and continuous improvement (Sushil, 2001b). The changing situation can be best explained to the method of manufacture of a new product or the same product with new features or execution of a new service. The actors has to adopt to the situations and act accordingly to the situations to supersede the competitors.

Learning represents what is being learned from the situations. **Action** represents the act that is performed in such a way that it yields to a better result. **Performance** can be in the form of better prospects of the organization. (Sushil, 2001).

3. Company Profile

Cement Company is a fully government of kerala owned company which is an ISO 9001: 2008 certified one which is producing superior quality cement vouched by customers spread across the state of kerala. With a production capacity of 4.2 lakhs tons of cements per annum.

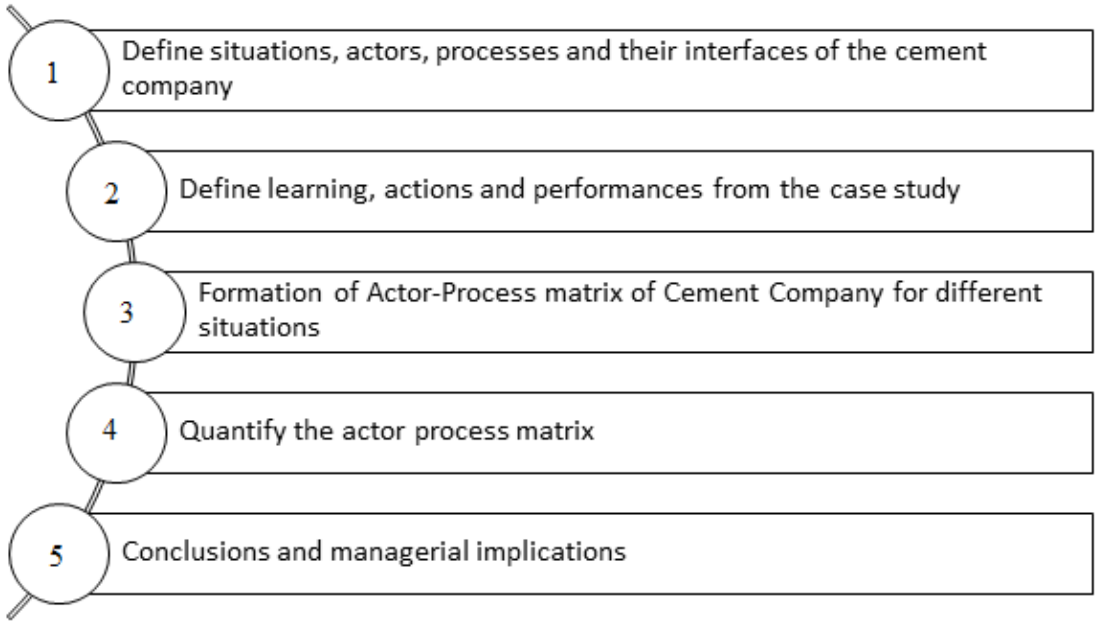
Various modifications which have been carried out since 1995 has improved production and productivity of Cement Company. A 2.5 MW multi-fuel power plant was commissioned in June 1998 to complement 25% of the total power requirement for the Walayar plant operations. At Cement Company, product improvement is not

just a one-time strategy for boosting sales, rather a quest of excellence. Perfecting the product quality is everybody's concern here. Our distinction begins with scientifically selecting the best raw materials for clinker. Stringent quality control is exercised right from pre-blending raw materials, Clinkerisation, clinker grinding, and finally to cement packing.

4. Methodology adopted

In order to have a proper understanding of SAP-LAP frame work, a case study of a Cement company is narrated here. The purpose of the study is to evolve the learning issues and to bring out the "suggested actions" for "improvement in the performance".

SAP-LAP framework of the current study can be summarized in the following steps:



5. SAP LAP formation

5.1 Situations

In order to construct the frame work ten situations faced by the organization were analysed. They are as follows.

1st Situation

Timely salary implementation of officers and workers.

Timely implementation of salary was not being done. This situation happened because of the carelessness of the government and the top level management due to this workers and the employees got frustrated and the morale of the employees were much affected. This may ultimately lead to loss of production in the company.

2nd Situation

ISO phase change implementation.

ISO 9001: 2008 has to be implemented and during this process each department has to give their responses corresponding to the new norms of the ISO implementation policies. Company was also in a process of conforming of company policies to the new ISO standards.

3rd Situation

Retirement of top level managers and introduction of new top level managers.

For appointing new top level managers an advertisement has to be given in newspaper and the candidates were scrutinized and appointed accordingly to the government norms. Company identified the necessity of new employees. Appointment of company secretary and personnel administration manager has been done.

4th Situation

Interchange of key persons from key post

Some of the key employees were transferred from their areas of expertise due to this situation company faced a lot of problems such as technological obsolescence and delayed decisions.

5th Situation
Different level of manpower shortage such as skilled and unskilled employees
Company faced a lot of problems due to the shortage of kalashi, mazdoor, fitter, welders, supervisors and engineers due to this reduction in expertise personnel the production as well as distribution of cement bags to various distributors were interrupted.

6th Situation
Implementation of welfare amenities to employees
Free canteen, annual cash awards, medical facilities, house and vehicle allowances were given to the employees these boosted the morale of the employees and these amenities is to be continued and sustained by the company in the coming years in order to keep motivating the employees.

7th Situation
Major shutdown planning
Lack of proper shutdown planning lead to frequent stoppage of the production plant. So shutdown maintenance has been planned to conduct every 6 months and major replacement such as kiln shell maintenance has been also done.

8th Situation
Shortage of bulk raw materials
Improper availability of raw materials will seriously affect the smooth functioning of production plant so the vendors and suppliers were warned about the situation and made sure they deliver the raw materials at correct time.

9th Situation
Change of management personnel
Due to unnecessary change in management personnel, company faced lot of biased decisions and also personal agenda will affect the company's policies as well.

10th Situation
Environmental sustainability, energy saving and process control
Company identified for sustainability of the company the pollution level is to be decreased so that pollution control measures were adopted such as online dust monitoring system as well as RABH.

5.2 Actors
The following actors were involved in these situations. (1) Management, (2) Trade unions, (3) Government, (4) head of the department, (5) Board of Directors, (6) unskilled and skilled labours, (7) supervisors, (8) engineers, (9) supervisors, (10) suppliers and vendors and (11) pollution control board. Each actors corresponding to the process are shown in Table 1.

5.3 Processes
The processes identified were (1) demotivated and frustrated employees, (2) commitment of employees are affected, (3) conforming the company policies to ISO standards, (4) Advertisement given in newspaper and interview of candidates has been done, (5) technological obsolescence, (6) delayed decisions, (7) reduction in expertise, (8) team work, (9) motivation among workers, (10) lack of maintenance activities, (11) frequent stoppage, (12) Improper availability of raw materials will seriously affect the production, (13) Personal agenda will affect the total goal of the company, (14) Best sustainability pollution level is to be decreased. They are shown in Table 1.

5.4 Learning
The learning activities in this study are (1) Timely implementation should be done (2) In order to sustain the production of company ISO standards are to be implemented (3) Management identified the necessity of new employees and technology (4) Identification of key jobs in their field of expertise and knowledge (5) Identify the team which support maintenance and also the normal functions (6) Sustainable and new amenities to be provided (7) Proper annual as periodical maintenance schedule to be implemented (8) Tenders are to be invited and vendors are to be selected (9) Requirement of new and best strategy to avoid personal agenda and (10) Pollution controlling measures are to be taken.

5.5 Action
Action phase involves (1) Revised salary (2) Implementation of new ISO standards (3) Appointment of new company secretary and personnel administration manager (4) Appointing key persons in key positions (5)

Appointing the skilled and unskilled labours in appropriate departments (6) Free canteen, annual cash awards, medical facilities, house and vehicle allowances (7) Cooler maintenance implementation of ESP (8) Maintenance of kiln shell (9) Long term purchasing tie ups has been made to ensure steady availability of raw materials (10) Creation of good relation among managers and decentralization of decision making (11) Online dust monitoring system (12) Introduction of RABH. They are shown in Table 1.

5.6 Performance

The performance of the organisation are (1) Morality of employee increased (2) Increased the sustainability of company (3) Utilization of new manpower in appropriate places (4) Enhanced competency (5) Utilization of expertise in faded technologies (6) Motivated workmanship (7) Improved production (8) Sustainable production (9) Reduced brain drain (10) Green and clean production plant.

Table.1 SAP-LAP format of Cement Company

Sl No	Situation	Actors	Process	Learning	Action	Performance
1	Timely salary implementation of officers and workers (S1)	Management (Ar 1), Trade unions (Ar 2), Government (Ar 3)	Demotivated and frustrated employees (Pr 1), commitment of employee is affected (Pr 2)	Timely implementation should be done (L 1)	Revised salary (A 1)	Morality of employee increased (P 1)
2	ISO phase change implementation (S2)	Management (Ar 1), Head of the department (Ar 4), Implementation managers (Ar 5)	Conforming the company policies to ISO standards (Pr 3)	In order to sustain the production of company, ISO standards are to be implemented (L 2)	Implementation of new ISO standards (A 2)	Increased the sustainability of company (P 2)
3	Retirement of top level managers and introduction of new top level managers (S3)	Management (Ar 1), Government (Ar 3), Board of directors (Ar 6)	Advertisement given in newspaper, interview of candidates has been done (Pr 4)	Management identified the necessity of new employees and technology (L 3)	Appointment of new company secretary and personnel administration manager (A 3)	Utilization of new manpower in appropriate places (P 3)
4	Interchange of key persons from key post (S 4)	Management (Ar 1), Board of directors (Ar 6)	Technological obsolescence (Pr 5), delayed decisions (Pr 6)	Identification of key jobs in their field of expertise and knowledge (L 4)	Appointing key persons in key positions (A 4)	Enhanced competency (P 4)
5	Different level of manpower shortage such as skilled and unskilled (S 5)	Unskilled and Skilled labours (Ar 7) Supervisors (Ar 8), Engineers (Ar 9)	Reduction in expertise (Pr 7)	Identify the team which support maintenance and also the normal functions (L 5)	Appointing the skilled and unskilled labours in appropriate departments (A 5)	Utilization of expertise in faded technologies (P 5)
6	Implementation of welfare amenities to employees (S 6)	Management (Ar 1), Board of directors (Ar 6), Trade unions (Ar 2)	Team work (Pr 8), motivation among workers (Pr 9)	Sustainable and new amenities to be provided (L 6)	Free canteen, annual cash awards, medical facilities, house and vehicle allowances (A 6)	Motivated workmanship (P 6)
7	Major shutdown planning (S 7)	Maintenance engineers (Ar 9), Supervisors (Ar 8), Labours (Ar 7)	Lack of maintenance activities (Pr 10), frequent stoppage	Proper annual as periodical maintenance schedule to be implemented (L 7)	Cooler maintenance implementation of ESP	Improved production (P 7)

			(Pr 11)		(A 7.1), maintenance of kiln shell (A 7.2)	
8	Shortage of bulk raw materials (S 8)	Management (Ar 1), Suppliers and Vendors (Ar 10)	Improper availability of raw materials will seriously affect the production (Pr 12)	Tenders are to be invited and vendors are to be selected (L 8)	Long term purchasing tie ups has been made to ensure steady availability of raw materials (A 8)	Sustainable production (P 8)
9	Change of management personnel (S 9)	Management (Ar 1) , Trade unions (Ar 2)	Personal agenda will affect the total goal of the company (Pr 13)	Requirement of new and best strategy to avoid personal agenda (L 9)	Creation of good relation among managers and decentralization of decision making (A 9)	Reduced brain drain (P 9)
10	Environmental sustainability, energy saving and process control (S 10)	Pollution control board (Ar 11), Management (Ar 1), Engineers (Ar 9), Supervisors (Ar 8)	Best sustainability pollution level is to be decreased (Pr 14)	Pollution controlling measures are to be taken (L 10)	Online dust monitoring system (A 10.1), Introduction of RABH (A 10.2)	Green and clean production plant (P 10)

6. Actor-Process matrix

This is a metrics of SAP-LAP analysis in which Processes are shown horizontally and Actors are shown vertically. The situations, learning, actions and performances are shown inside the matrix. The Actor-Process matrix of Cement Company formed in this way is shown as Table 2.

Table.2 Actor-Process matrix of Cement Company

Process → / **Actor ↓**	**Demotivated and frustrated**	**Commitment of employees are**	**Conforming company policies to ISO Standards(P_{r3})**	**Advertisement given in newspaper, interview of candidates has been**	**Technology obsolescence (P_{r5})**	**Delayed decisions (P_{r6})**	**Reduction in expertise (P_{r7})**	**Team work (P_{r8})**	**Motivation among workers (P_{r9})**	**Lack of maintenance activities (P_{r10})**	**Frequent stoppage (P_{r11})**	**Improper availability of raw materials will seriously affect the**	**Personal agenda will affect the total goal of the company (P_{r13})**	**Best sustainability pollution level is to be decreased (P_{r14})**
Management (A_{r1})	S1 L1 A1 P1	S1 L1 A1 P1	S2 L2 A2 P2	S3 L3 A3 P3	S4 L4 A4 P4	S4 L4 A4 P4		S6 L6 A6 P6	S6 L6 A6 P6			S8 L8 A8 P8	S9 L9 A9 P9	S10 L10 A10.1 A10.2 P10

Process → / Actor ←	Demotivated and frustrated	Commitment of employees are	Conforming company policies to ISO Standards(P_{r3})	Advertisement given in newspaper, interview of candidates has been	Technology obsolescence (P_{r5})	Delayed decisions (P_{r6})	Reduction in expertise (P_{r7})	Team work (P_{r8})	Motivation among workers (P_{r9})	Lack of maintenance activities (P_{r10})	Frequent stoppage (P_{r11})	Improper availability of raw materials will seriously affect the	Personal agenda will affect the total goal of the company (P_{r13})	Best sustainability pollution level is to be decreased (P_{r14})
Trade unions (A_{r2})	S1L1A1P1	S1L1A1P1						S6L6A6P6	S6L6A6P6				S9L9A9P9	
Government (A_{r3})	S1L1A1P1	S1L1A1P1		S3L3A3P3										
Head of the departments			S2L2A2P2											
Implementation managers (A_{r5})			S2L2A2P2											
Board of directors (A_{r6})				S3L3A3P3	S4L4A4P4	S4L4A4P4		S6L6A6P6	S6L6A6P6					
Unskilled and Skilled labours (A_{r7})							S5L5A5P5			S7L7A7.1A7.2P7	S7L7A7.1A7.2P7			

Process → / Actor ↓	Demotivated and frustrated	Commitment of employees are	Conforming company policies to ISO Standards(P_{r3})	Advertisement given in newspaper, interview of candidates has been	Technology obsolescence (P_{r5})	Delayed decisions (P_{r6})	Reduction in expertise (P_{r7})	Team work (P_{r8})	Motivation among workers (P_{r9})	Lack of maintenance activities (P_{r10})	Frequent stoppage (P_{r11})	Improper availability of raw materials will seriously affect the	Personal agenda will affect the total goal of the company (P_{r13})	Best sustainability pollution level is to be decreased (P_{r14})
Supervisors (A_{r8})							S 5 L 5 A 5 P 5			S7 L7 A7. 1 A7. 2 P7	S7 L7 A7. 1 A7. 2 P7			S10 L10 A10. 1 A10. 2 P10
Engineers (A_{r9})							S 5 L 5 A 5 P 5			S7 L7 A7. 1 A7. 2 P7	S7 L7 A7. 1 A7. 2 P7			S10 L10 A10. 1 A10. 2 P10
Suppliers and vendors (A_{r10})												S8 L8 A8 P8		
Pollution control board officials (A_{r11})														S10 L10 A10. 1 A10. 2 P10

7. Quantified Actor-Process matrix

After actor-process matrix was formed, a trial quantification was carried out. It was quantified using the score 1 for each situation, learning, action and performance. Quantified Actor-Process matrix of Cement Company is shown in Table 3. It is pictorially represented in Figure 1. In Table 3, the values represent the number of elements in each cell. In the quantified actor-process matrix the maximum score was 5. The values corresponding to each actor and process were pictorially represented.

Table 3. Quantified Actor-Process matrix of Cement Company

Process Actor	**P_{r1}**	**P_{r2}**	**P_{r3}**	**P_{r4}**	**P_{r5}**	**P_{r6}**	**P_{r7}**	**P_{r8}**	**P_{r9}**	**P_{r1}**	**P_{r1}**	**P_{r1}**	**P_{r1}**	**P_{r1}**
A_{r1}	4	4	4	4	4	4	0	4	4	0	0	4	4	5
A_{r2}	4	4	0	0	0	0	0	4	4	0	0	0	4	0
A_{r3}	4	4	0	4	0	0	0	0	0	0	0	0	0	0
A_{r4}	0	0	4	0	0	0	0	0	0	0	0	0	0	0
A_{r5}	0	0	4	0	0	0	0	0	0	0	0	0	0	0
A_{r6}	0	0	0	4	4	4	0	4	4	0	0	0	0	0
A_{r7}	0	0	0	0	0	0	4	0	0	5	5	0	0	0
A_{r8}	0	0	0	0	0	0	4	0	0	5	5	0	0	5
A_{r9}	0	0	0	0	0	0	4	0	0	5	5	0	0	5
A_{r10}	0	0	0	0	0	0	0	0	0	0	0	4	0	0
A_{r11}	0	0	0	0	0	0	0	0	0	0	0	0	0	5

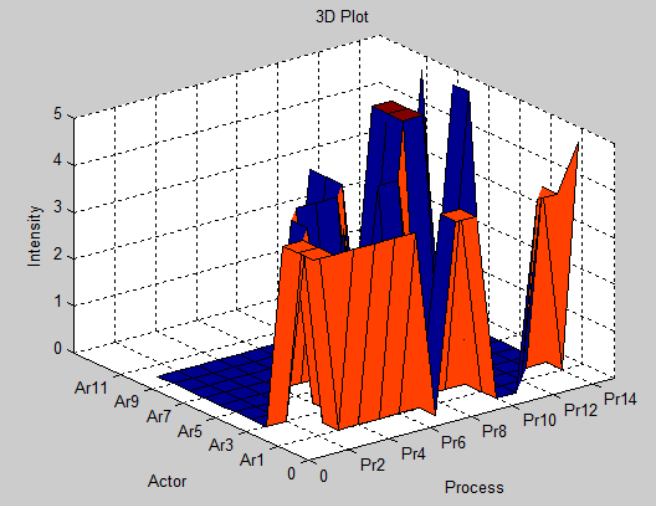


Figure 1. SAP-LAP hills without considering weightages

8. Prioritized Actor-Process matrix

In order to have a precise confirmation, chief engineer of cement company was requested to prioritize the situations, learning, Actions and performances in the scale of 1-10. It was done by brainstorming various executives performing various functions. The figures were added. The sum is shown in prioritized actor process matrices. The maximum score obtained was 37. The values corresponding to each actor and process were pictorially represented.

Table 4. Prioritized Actor-Process matrix of Cement Company

Process Actor	**P_{r1}**	**P_{r2}**	**P_{r3}**	**P_{r4}**	**P_{r5}**	**P_{r6}**	**P_{r7}**	**P_{r8}**	**P_{r9}**	**P_{r10}**	**P_{r11}**	**P_{r12}**	**P_{r13}**	**P_{r14}**
A_{r1}	24	24	17	24	23	23	0	32	32	0	0	17	14	30
A_{r2}	24	24	0	0	0	0	0	32	32	0	0	0	14	0
A_{r3}	24	24	0	24	0	0	0	0	0	0	0	0	0	0
A_{r4}	0	0	17	0	0	0	0	0	0	0	0	0	0	0
A_{r5}	0	0	17	0	0	0	0	0	0	0	0	0	0	0
A_{r6}	0	0	0	24	23	23	0	32	32	0	0	0	0	0
A_{r7}	0	0	0	0	0	0	20	0	0	37	37	0	0	0
A_{r8}	0	0	0	0	0	0	20	0	0	37	37	0	0	30
A_{r9}	0	0	0	0	0	0	20	0	0	37	37	0	0	30
A_{r10}	0	0	0	0	0	0	0	0	0	0	0	17	0	0
A_{r11}	0	0	0	0	0	0	0	0	0	0	0	0	0	30

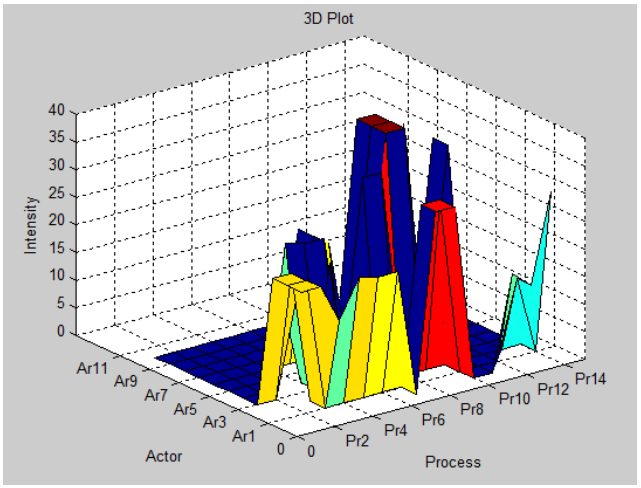


Figure 2. SAP-LAP hills Considering Weightages

9. Managerial implications

The major area of this research is the development of SAP-LAP hills and location of leading actors and process. From the study it has observed that the leading actors and processes were concentrated in two clusters. In the first cluster the leading actor were "unskilled labours, Skilled labours, Supervisors and Engineers" (Ar7, Ar8 and Ar9) and process are Lack of maintenance activities (Pr 10) and frequent stoppage (Pr 11). In the second cluster are management (Ar 1), Trade Unions (Ar 2) and Board of Directors (Ar 6) and process are Team work (Pr8) and Motivation among workers (Pr 9). An action plan was made in this regard. The aim of the action plan was for uplifting the most sensitive aspects which are catalysing the change management process.

1. Management

Management have a vital role in the future prospects of an organisation. A proper management can lead organisation to success. Top level managers are recruited either through promotion or through direct recruitment by giving advertisement in newspapers. The major criterion for promotion is seniority. According to the changing environment managerial recruitment has to fix appropriate bench marks according to their capabilities and needs.

2. Trade unions

There are four trade unions in the company they have to be more responsible about the welfare of the employees. Trade unions should also be capable of conveying the needs of the employees to the top level management and make sure the employees get justice.

3. Board of Directors

The board of directors make the ultimate decisions in the company in various aspects. They should be careful of the decisions they make, it should not be biased to any of the employees. The decisions which are made by the board of directors should be always for the welfare of the company and make sure the employees should get a benefit of the same.

4. Lack of maintenance activities and frequent stoppage

The maintenance schedule in the cement company is not in right manner. So frequent check-ups and continuous monitoring systems should be implemented in kiln and also in other important aspects of the company. By implementing this we can improve the sustainability of the company as well as frequent shutdown of the plant can be more over reduced.

5. Team work and motivation among workers

Interchanging of key persons from key post has greatly affected the team work and also the coordination among workers. Company is also facing shortage of skilled as well as unskilled employees so proper and timely recruitment of employees should be done according to the vacancies available in order to avoid heavy work load.

6. Supervisors and Engineers

Supervisors and engineers play a key role in the functioning of plant and also during the major shutdown maintenance as well. The company is also facing problems with reduction in expertise personnel in production of cement as well as distribution of bags. Supervisors and engineers enter company by either recruitment or

promotion. Since engineers has to coordinate other employees along with doing their work as well they should have good leadership qualities as well.

10. Conclusion

With the help of SAP-LAP, it was possible to recommend certain suggestions for appropriate change management scheme. While analysing various situation it was evident that certain change management scheme has to be implemented in the company for further sustainability of the company. By means of actor process matrix, quantification and SAP-LAP hill construction clear and distinct results were formed. By analysing this result the areas where company should focus could be clearly and visually explained. Instead of vague judgement and assumptions a clear and distinct results were obtained. The implementation of the activities which were mentioned requires a lot of democratic procedures since this company is a government owned company. In future some of the recommendations could be implemented. This work may also be extended as Actor x Action matrix giving relationship of actors for various actions would be useful. There may be interdependency among the SAP and LAP aspects which cannot be accounted in this research. The study reveals that in order to have a good change management scheme the organization has to concentrate on its internal environments. The proposed framework can be treated as a stepping stone to incorporate interrelationships of SAP-LAP in managerial analysis and many avenues are likely to be opened up by future applications.

References

Arshinder, Kanda, A and Deshmukh S.G., 2007. Supply chain coordination issues: an SAP LAP framework, Asia Pacific Journal of Marketing and Logistics 19 (3), 240 – 264.

Banwet D. K. and Pramod V. R. 2010, SAP-LAP Hills: A New Approach for Strategic Change Management Global Journal of Flexible Systems Management, Vol. 11, No. 3, pp 11-20

Husain Z., and. Sushil. 1996. Management of technology, learning issues for seven Indian companies, Technology Management: Strategies and Applications for Practitioners. USA, 3 (1), 109–135.

Husain, Z Sushil, and. Pathak R.D., 2002 A technology management perspective on collaborations in the Indian automobile industry: a case study, Journal of Eng. Technology Management. 19, 167–201

Pramod V.R. and Banwet D.K. (2010b). System Modelling of Telecom Service Sector Supply Chain: A SAP-LAP Analysis. *International Journal of Business Excellence*, 3(1):38–64

Senge. M. P, Ross. R, Smith. B, Roberts. C, and Kleiner. A., 1994 the Fifth Discipline Fieldbook: Strategies and Tools for Building a Learning. Amazon

Sushil (2001a), SAP LAP Framework, Global Journal of flexible systems management, Vol.2, No.1, pp.51-55

Sushil (2001b), SAP LAP Models, Global Journal of flexible systems management, Vol.2, No.2, pp.56-61.

Sushil (2009) SAP-LAP Linkages – A Generic Interpretive Framework for Analyzing Managerial Contexts, *Global Journal of Flexible Systems Management,* 10(2):11-20.