

## **“An Analysis of ERP Implementation Success Factors in Indian Power Distribution Companies (Discoms)”**

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### **Abstract**

Power Sector is a critical Infrastructure element required for the smooth functioning of the economy. Indian Power sector is in a rapid growth phase and in a phase of undergoing rapid change - change in a way they used to operate. A special emphasis is laid by the government on the electricity distribution industry to improve their operational and business efficiency.

ERP (Enterprise Resource Planning) is one of the most important enablers in providing an environment for integration of utility applications.

Success of a ERP implementation Project depends on meeting the some Critical factors , which is commonly known as CSF(Critical Success Factor). Some of such factors are common in nature what ever is the Business Domain but some are definitely Industry Specific factors. The current research study is based on searching such Industry Specific i.e Power Discom ( Power Distribution Business) specific success factors of ERP implementation .

**Key Words : Power Discoms, AT&C Loss, Critical Success facors(CSF), ERP ,Implementation.**

### **Research Guide :**

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### **1. Introduction :**

ERP(Enterprise Resource Planning ) is a integrated set of a software modules linked to a common database, handling all basic corporate functions. It attempts to integrate the fundamental functions of all departments in a organisation. ERP can be viewed as a software solution that addresses the organisation needs after considering overall process view of the organisation in order to meet the organisational goals after tightly integrating all functions of an enterprise.

Organizations are providing significant attention and exercising extra attention for making their ERP systems more effective and efficient but even so not all ERP implementations have yielded the desired results. Factor that influence the success of a ERP implementation is also know an Critical Success factors (CSF's) .

### **2. Present scenario of Indian Power Discoms.**

Indian power discoms is witnessing a critical phase . Presently most of the Power distribution utilities / companies (known as Discoms) are cash strapped in spite of highly monopolistic business, never ending product demand and cost plus fixed tariff approach.

They are not even able to earn a minimum rate of return (ROR). The power sector has accumulated a huge deficit, because of the deteriorating financial performance. The reasons are improper business processes and deficiency in maintaining documentary records. Even the electrical energy which is the life blood of Discoms is never recorded accurately due to causal approach and T&D loss calculation has never been correct. The reform process of Power discoms was started way back in 2003 with the enactment of Electricity Act'2003

### **3. The Motivation for the study :**

There are around 35 Power Distribution Companies including private initiatives in India out of which about 40% Discoms have completed ERP Implementation process and some are in the process of Implementation and balance discoms yet to start their process.

Hence some one need to measure the most critical success factors of ERP implementation , which will guide the balance Discoms which not yet started the process or just started. There are no specific research was conducted so far relating to Critical Success factor determination of ERP implementation in Indian Power Distribution Companies.

### **4. Objectives for ERP implementation in Power Discoms**

The prime objective of Power discoms of India for adopting the ERP solution are Process & Efficiency improvement, Cost reduction and better Customer Services & Meeting Regulatory Norms and ATC Loss reduction.

### **5. Literature Review :**

**A.** Articles based on “Critical success factors of ERP Implementation in **Indian power Discoms**” .

**a.** “Need and Challenges of ERP Implementation in Discoms “- Amit

**Gupta –Addl.Chief Engineer of Madhya Pradesh Madhya khetra Viduyt Vitaran company Ltd. , Bhopal.**

The researcher tried to find out the critical success factors of ERP Implementation in Power discoms like MPMKVC . But the researcher not tried to collect data from similar or other Discoms in India to arrive at a conclusion.

**b.** “Analysing Progress and Success Factors for ERP implementation in Indian Power industry –A case study on HPPCL “- Ved Prakash Sharma , Research Scholar, Dept. Of Computer Science , Himachal Pradesh University, Shimla.

Researcher tried to find out the most critical success factor of ERP implementation specific to HPPCL only.

**Research Gap** - No further research has not been conducted on other power discoms in order to arrive at a concrete identification of CSF's of ERP Implementation Indian Power Discoms specific.

**c.** “Information Technology Implementation in Indian Power Distribution “ – a case study- Company : BSES(Bombay Sub – Urban Electricity Supply Company),Delhi. –Sri Dhrubaji Mandal of MDI Gurgaon . under guidance of Prof. Mahadeo jaiswal Chairperson –Process Renovation Project MDI,Gurgaon.

- In The current research study researcher tried to find out the IT methodology , Road map of IT implementations in BSES.

- The researcher also listed some critical success factor of ERP implementation in organisation like BSES.

**The Research Gap** - Researcher picked up a specific power discom like BSES, but other utilities who have implemented the ERP not considered.

### **B. Articles based on Other Industries.**

There are so many studies were conducted towards Critical Success factor determination for ERP implementation in different parts of world . Researcher has reviewed several articles published around the world but there is no specific research was conducted on Power Distribution Companies. Every Industry having their own Characteristics based on ownership pattern and geographical positioning, which may impact the CSF factors . References of such articles reviewed by researcher is provided at the end of this article.

### **6.Overall Research Gap :**

Researcher have reviewed vast no. Of articles , Journal publications, web based information and found that there are no specific research conducted regarding Critical Success factor of ERP Implementation in Indian Power Distribution company's(Discoms).

### **7.Research Objective :**

- a. To identify the most critical Success factors for the effective ERP Implementation in Indian power distribution Companies commonly known as Discoms.
- b. To identify the awareness on ERP Security among the ERP Consultants & Super/users, of Indian Power Discoms .

### **8.Research Methodology :**

The research process involved the following steps :

1<sup>st</sup> a Literature review was undertaken in order to get a idea of Critical Success Factors considered for ERP implementation considered by other Researchers and why.

2<sup>nd</sup> a questionnaire is designed on Critical Success Factors related to ERP implementation in Indian Power Discom based on Knowledge and Experience of Researcher .

3<sup>rd</sup> In depth Interviews has been conducted with Different Project Managers Of Different IT Companies like TCS, IBM India, Accenture etc in order to establish a Success factors of ERP Implementation Project in Indian Power Discom.

4<sup>th</sup> The questionnaire designed as per point no 2 was sent to different key persons like Project Managers, Power users , department heads who belongs to Different Indian Power Distribution Companies , who have implemented ERP during 2000- 2015.

The responses i.e such primary information's was analysed with a statistical tool with a view to identify the most critical success factors based on their responses.

### **9. Data Analysis :**

In the past years several papers were published on the Subject Of Critical Success Factors of ERP implementation . In the current research ,researcher have conducted web search regarding such articles on WEB . Researcher reviewed several articles which are focused to Critical Success Factors of ERP implementation studied in General . And also reviewed 3 (three) articles published in the web related exclusively with Critical Success Factor for ERP implementation in Indian Power distribution companies.

After reviewing such articles following CSF's are listed below and also grouped according to nature.

Researcher have also listed some CSF's based on his working experience with Power Utility Implementation, which are not identified by previous researchers . These factors are also listed with other factors but for identification purpose they marked as \*.

Total 32 CSF is identified related with ERP Implementation in Indian Power Discoms. Out of which researcher identified some new factors ,which are very specific to Indian Power Distribution companies.

The Success factors measured in 5 Point Likert Scale while sending to target groups.

A List of 32 such CSF's are grouped into 8 separate Groups, while sending to respondents for survey , namely –

- a. Management Related Factors,
- b. HR Related Factors
- c. Process Related Factors.
- d. Project Related Factors.
- e. Technology & Business Related Factors.
- f. Infrastructure Related factors
- g. Miscellaneous Factors.

## **10. Analysis of Primary Data (Survey) & Discussions :**

Researcher conducted a survey among all the employees attached with the Information technology cell / department of Indian Power Utilities. All state power utilities including private entities considered for survey.

Survey questions were having 2 part – Part A & Part B.

Before sending the questions a pilot survey was also conducted by sending the question ere to the IT consultants working with Major IT companies in India e.g. Infosys, TCS, IBM & HP. These IT consultants are well experienced in the area of ERP implementation specific to Indian scenario.

After necessary modifications the final question ere Link sent to 443 peoples across the India ,who are working with Information Technology Department of different Power Distribution companies in India either implemented ERP or Not. .

The population size of Employees belongs to such ERP implemented Power Distribution companies is small. Because after evaluation of Part A of questioners it was found that in 9 states only ERP is implemented . On and average there were 8-10 people in each organisations who are directly involved in ERP implementation Process or operations..

Hence the total target population size were about 100 people. Out of that 56 responses received.

Out of total 56 responses, 35 response were complete in all respect .

Following facts were observed during the Survey :

- a. Following states have implemented the ERP solution with a aim to integrate the business operations and to improve the bottom line .

**CHATTISGARH /GUJARAT /  
MAHARASTHA / MADHYAPRADESH /  
WEST BENGAL / ANDHRAPRADESH /  
HIMACHAL PRADESH / TELENGANA/  
DELHI**

- b. Following Indian states not yet implemented the ERP solution for integrating their business.

**BIHAR / KERALA / KARNATAKA / TAMILNADU / ASSAM / MEGHALAY / HARIYANA / JHARKHAND / UTTARAKHAND / UTTAR PRADESH / PUNJAB / RAJASTHAN / ORRISHA.**

- ASSAM & ORRISHA IS IN THE PROCESS OF IMPLEMENTING ERP.
- c. 47% of total respondents belongs to organisation who having annual turnover is more than 50000 crores.
- d. Out of total Power Distribution companies of India in 78% cases SAP-ERP is implemented balance have implemented Oracle & other ERP system.
- e. Out of total companies surveyed in 38% cases ERP was implemented before year 2006.
- f. Out of total 33 complete responses received 30% responders belongs to either Senior Manager or Executive position. 20% Belongs to General

manager position balance belongs to Director or other senior position.

- g. Out of total companies surveyed in 7 % cases ERP was implemented within a year, in 37% cases ERP was implementation process took 1-2 yrs., in 22% cases it took 203 yrs. And 33% cases it took more than 3 yrs..

### 11. Key findings :

While arriving at key CSF factors of ERP Implementation specific to Indian power Distribution Companies the Statistical weighted analysis is conducted . Responses Are shown as below in absolute %..

<u>Sl.No</u>	<u>Success Factors of ERP Implementation</u>	<u>Strongly Agree</u>	<u>Agree</u>	<u>Others (includes Nither agree/disagree, strongly disagree)</u>
<b>A.</b>	<b><u>Management Factors</u></b>			
01.	Clearly Defined Goal & scope of Implementation	<b>67</b>	33	Nil
02.	Project Team composition-Client(organization where ERP to be implemented)	<b>56</b>	40	4
03.	Top Management Involvement & Support	<b>59</b>	41	Nil
04.	Inter Departmental Coordination.	<b>59</b>	26	15
<b>B.</b>	<b><u>HR Factors</u></b>			
01.	Organization Culture Improvement towards ERP adaptability.	<b>63</b>	26	11
02.	Conducting Change Management programmes across the locations.	<b>59</b>	37	4
03.	Simple & Efficient Communication between ERP Implementation Team & User Group.	<b>55</b>	37	8
04.	User Involvement & Training	<b>62</b>	30	8
<b>C.</b>	<b><u>Process Related Factors</u></b>			
01.	Effective Business process Re engineering.	<b>48</b>	40	10
*02.	Availability of Standard Operating	<b>48</b>	37	15

	procedure of Client Business.			
03.	Simple & Integrated Business Process design in ERP.	<b>56</b>	33	11
04.	Rigorous Testing of Business scenarios along with Integrated Testing Before ERP Go Live.	<b>56</b>	33	11
<b>D.</b>	<b><u>Project Related Factors</u></b>			
01.	ERP readiness assessment before Project Implementation .	<b>48</b>	33	19
02.	Proper Project Planning	<b>52</b>	37	11
03.	Full Time Involvement of Client’s (where ERP to be implemented)Project Team .	<b>52</b>	48	Nil
04.	Efficient handling of Project Risks & Exceptions.	<b>52</b>	26	22
05.	Availability of In-house support Team of Client	<b>48</b>	33	19
*06.	Continuity of same implementation team from start to finish.	<b>48</b>	37	15
07.	Project Team composition of Client.	<b>56</b>	37	7
08.	Availability of In House development Team	33	53	14
<b>E.</b>	<b><u>Technology &amp; Business Factors</u></b>			
01.	Efficient Integration between different Business Functions within ERP & Outside of the ERP system.	<b>56</b>	37	7
02.	Support from ERP vendor.	<b>63</b>	30	7
*03.	Quality of Legacy data in terms of Accuracy & Completeness	<b>56</b>	37	7
*04.	Availability of legacy MIS reports	33	52	15
*05.	Conversion of Legacy system data base structure as per ERP requirement.	40	48	12
06.	Minimum Customization	33	22	45
<b>F.</b>	<b><u>Infrastructure Factors</u></b>			
01.	Network connectivity across the locations	<b>75</b>	18	7
<b>G.</b>	<b><u>Miscellaneous Factors</u></b>			
01.	Age profile of End Users	15	38	47
02.	Pilot Run & parallel Processing for a limited period	33	33	34
03.	Business & Technical knowledge of ERP consultant.	<b>67</b>	26	7
04.	Post implementation Audit is required to assess the objective fulfillment of ERP implementation.	40	49	11
*05.	Measuring Key Financial / performance indicators of pre & post Implementation scenario.	<b>50</b>	38	12
* 06.	Periodic review of Functional and Technical Settings of ERP helps to bring Operational excellence	45	50	5

**\* Marked factors are observed as Important determinant for - ERP implementation Success in Power Distribution companies in India.**

**12. Interpretation / Analysis of Survey**

**Results :**

From The said table Only strongly Agree cases having weight age equal to or more than 50% were considered for determining the most Critical Success Factors (CSF) of ERP Implementation in Indian Power Distribution Companies:

Summarised results are now listed as below –

**A. Management Factors :**

- i> Clearly Defined goal & scope of Implementation
- ii> Project Team Composition of the organisation , where ERP to be implemented.
- iii> Top Management involvement & support
- iv> Inter Departmental Coordination.

**B. HR related Factors :**

- i> Organisation culture improvement towards ERP system adaptability.
- ii> Conducting change management Programs across the locations.
- iii> Simple & Efficient Communication between ERP Implementation Team members & User Group.
- iv> User involvement & training.

**C. Process Related Factors :**

- i> Effective Business process reengineering.
- ii> Availability of Standard operating procedure of client business.
- iii> Simple and Integrated Business process design in ERP.
- iv> Rigorous Testing of Business scenario along with integrated testing before go live.

**D. Project Related Factors :**

- i> ERP readiness assessment before project Implementation.
- ii> Proper Project planning.
- iii> Full Time involvement of Client's Project team.
- iv> Efficient handling of Project risks & exceptions.
- v> Availability of in house support team of Client.
- vi> Continuity of same implementation team from start to finish.
- vii> Project team composition of Client.

**E. Technology & Business Factors :**

- i> Efficient integration between different business functions within ERP & Outside of the ERP system.
- ii> Support from the ERP vendor.
- iii> Quality of legacy data in terms of accuracy & Completeness.

#### **F. Infrastructure Factors :**

i>Network Connectivity across the locations.

#### **G. Miscellaneous Factors :**

i>Business & Technical Knowledge of the ERP Consultant engaged by the Co.

ii>Measuring the Key Financial performance indicators of pre & post Implementation scenario.

#### **13. Conclusion :**

More than 60% Indian State Utilities not yet implemented the ERP solution to integrate their business. If they adopt the structured manner and give importance the said evaluated Critical Success factors of ERP implementation it is expected that they will achieve the success in their efforts, though there are other invisible issues which may effect the whole process . Hence there are further scope on research on this area also indicated.

#### **14. Limitations :**

Research was conducted among the employees of Indian Power Discoms who were either directly or indirectly associated with ERP implementation Process. The current research survey was done primarily through E-Mail & Telephonic conversation. In all cases before sending the Survey link to the persons concerned ,a brief idea about the survey objective discussed with them over phone.

Researcher tried to cover all the state power distribution companies along with private players in the power distribution segment. But due to non availability of response from all the key employees of Power distribution companies even after repeated reminders and

phone call. Researcher restricted the time span ,coverage & its analysis.

#### **15. Scope for Further Research :**

More in depth study may be conducted by covering all the employees of the concerned Power Distribution companies and impact of such critical success factors may be further reviewed after applying the same in those cases where ERP is in the process of implementation or to be implemented.

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