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A study on "Challenges of Six Sigma implementation in Human Resource Management" Special reference to Information Technology Sector

Dr. Rajesha. S,

Assistant Professor,
Community Institute of Management Studies,
Jayanagar, Bangalore, India.

ABSTRACT

When we think of applying the Six Sigma in to HRM, an inevitable question is that,to what an extent all the processes of HRM are measurable. Many companies attempted to implement this methodology and got backward in middle of the process or beginning due to the challenges in implementing Six Sigma in HRM. Measurability of a process depends on the perception of an individual HR person; this is mainly due to the non-measurable nature of HR processes. Most of the organizations not considered Human resources as human capitaland as a major line function in their organizations.This research paper studies the challenges of Six Sigma implementation in Human Resource Management and finds critical success factors for successful implementation of Six Sigma in human resource management with respect to Information technology companies.

Keywords: Six Sigma, Human Resource Management, Implementation, Challenges & Critical Success Factors.

INTRODUCTION:

If we cannot measure a process, we cannot control it. And if we cannot control it, we can neither improve it nor can we manage it. In the absence of all these, especially in case of HR, we cannot show the importance of the function, demonstrate financial gains to the organization, and gain the due recognition it deserves.

(Nagaraj&Dr. Kalyani-2013).

Human resource management department has no distinction than some other department in an organization. Human resource management department can convey Six Sigma project with great rate of profitability and Human resource management initiatives are lead towards the internal customer by directing HR employees quicker and all the more effectively or toward the external customer by adding to the continuous change of the organization towards implementation of a well working Six Sigma program. There is different process in HR function in which Six Sigma training is useful. Taking after focuses would make it clear with reference to how is it particularly identified with the HR function – Reduce the time required to hire an employee, Improve employee orientation processes, Reduce expenditures for Recruitment and the value of employee performance reviews, Reduce absenteeism, Improve training efficiency, Improve employee satisfaction, Identify and correct retention issues, Reduce Incentive Compensation errors, Eliminate Over payments to Terminated Salaried Employees, Improving grievance handling process, Consolidation of employee information databases, Integration of multiple payroll systems for remote locations, Increase application for jobs and Increase retention using exit interview information. This is most required and imperative in today's focused period to get best quality management by the Human resource management through execute Six Sigma. It is additionally critical that know the role of human resource management in execute Six Sigma in an organization. This study also illustrating on challenges of Six Sigma

implementation and critical success factors for successful implementation of Six Sigma.

INDIAN IT INDUSTRY:

The Indian Information Technology / Information Technology Enabled Services (IT/ITES) sector has registered tremendous growth over the past decade, achieving iconic status all over the world and a reputation for reliable and cost-effective delivery of services. Today India is recognized as the outsourcing destination of choice in the world. The major developed markets are sourcing IT/ITES from India to gain bottom-line benefits, improving their competitive edge.India is the world's largest sourcing destination for the information technology (IT) industry, accounting for approximately 52 per cent of the US$ 124-130 billion market. The industry employs about 10 million Indians and continues to contribute significantly to the social and economic transformation in the country. The IT-BPM sector in India grew at a compound annual growth rate (CAGR) of 25 per cent over 2000-2013, which is 3-4 times higher than the global IT-BPM spend, and is estimated to expand at a CAGR of 9.5 per cent to US$ 300 billion by 2020. India has emerged as the fastest growing market for Dell globally and the third largest market in terms of revenue after the US and China.

OBJECTIVE OF THE STUDY:

- To study the challenges in Six Sigma implementation in Human Resource Management
- To identify the critical success factors for Six Sigma implementation in Human resource management

SCOPE OF THE STUDY:

This research study is focused on the challenges of implementing Six Sigma in Human resource management. This research study also illustrates on the critical success factors for successful implement of Six Sigma in human resource management to gain the benefit of world class process improvement methodology. The scope of the study is limited Six Sigma implemented IT companies based in Bangalore.

REVIEW OF LITERATURE:

Nagarajshenoy and Dr.KalyaniRangarajan (2013): The biggest challenge is the perception of HR professionals towards Six Sigma methodology. The challenges of Six Sigma implementation in HR domain are 'Measuring a process' of HR is difficult, HR not considered as a major line function, HR isn't a huge part of any business, not considered as human capital and believe that HR not ensure that there's good return on investment in human capital' (Gupta, 2005). In addition, he says in his paper many organizations are using Six Sigma to reduce costs in everyday HR functions like improving the hiring process; enhancing employee satisfaction, increasing the effectiveness of training and development programs, pay fixation, etc.

JithendranKokkranikal and Jiju Antony (2013): Author present three approaches to implementing Six Sigma, are business transformational approach, strategic improvement approach and problem solving approach. This paper set out to consider some of the challenges to successful implementation of Six Sigma initiatives in the service industry. The challenges of "data collection", "defining projects" and "getting group consensus" can be considered to be somewhat very challenging in the context of hospitality industry. Issues of "time management", "resistance to change", etc. can be considered as being specific in need of management attention. Involving human beings is the greatest challenge author felt.

Nilesh V Fursule and Dr.Satish V Bansod (2012):Main cause for failure is lack of academic research on the guidelines for implementation of Six Sigma. Suggest that there is need for more and more academic research on Six Sigma implementation. When other papers speak on monetary benefit get from six sigma implementation this paper speaks on increase in the employee effort, commitment and performance. On the other hand it speaks on the limitation/ challenge of Six Sigma is top management commitment on it.

Obaidullah Hakeem Khan Kundi (2005): The critical success factors Continued top management support and commitment, Suitable organizational infrastructure, Organizational culture change, Education and Training, Effective use of Six Sigma methodology and tools, Project Management Skills, Rewards and recognition, Effective Communication, Employee involvement and empowerment and Linking Six Sigma to Customer. Challenges involved in implementing six sigma good Top management commitment and support, an effective Six Sigma organizational infrastructure, a well-defined training and certification program, Effective communication, changes in organizational culture and in the attitudes of employees.

Mohammad Abdolshah&RosnahMohd. Yusuf: Challenges in implementing Six Sigma in service industry. In

service oriented industries customers expect High satisfaction, individual to individual various customers' need, the Nature of task unpredictable in service industry, there is no standard and qualified information about quality, there is no standard quality indicators and factors and Lack of established quality programs. This research paper also made an attempt to give solution for the above challenges. They are selecting proper metrics, standardized process measurement tools, training to the service provider, information about the service available in their service counter to the customer, defining defects in service and Strong leadership and Top management commitment.

RESEARCH GAP:

Lot of study have been done on the Six Sigma, Six Sigma management and its benefit both in manufacturing and service industry. There is very little work has been done on the Six Sigma in Human resource managementso far in India as well in the globe. This study is focusing on the challenges and factors influence on Six Sigma implementation in Human resource management in selected Information technology companies based in Bangalore.

RESEARCH METHODOLOGY:

When we are thinking on the Six Sigma in Human resource management, it was proved that manufacturing and production based companies is not valid as they work with more machines than people. In service sectors the work is extracted more from people than machine. So it gave an idea to choose service sector is more suitable for implementing Six Sigma concept. Due to that the IT industry is selected for the research.

Sampling technique and Size:

Systematic sampling technique is used for selecting the companies for the research study. Snowball sampling technique is chosen for this study for Six Sigma practicing companies. It is a non-probability sampling technique. This sampling technique is used due to the sample selected for the research is not so open to access and hidden populations which are difficult to access. Practicing of Six Sigma in their organization is confidential and uses as competitive strategy. 10 Six Sigma practicing Information Technology companies are selected for this study which actively exists in the industry from 10 years and above with more than 2000 employees.

Data collection:

A structured questionnaire distributed and collected data from the Six Sigma experts from the selected Information Technology companies, who are running the Six Sigma projects in respective companies.

Selected Sampling Information Technology Companies

Hex aware Technologies Limited (HTL)
Genpact
HCL Technologies Limited
Infosys Ltd
L&T InfoTech
Mphasis
ITC InfoTech
Wipro Limited
TCS
Tech Mahindra Limited

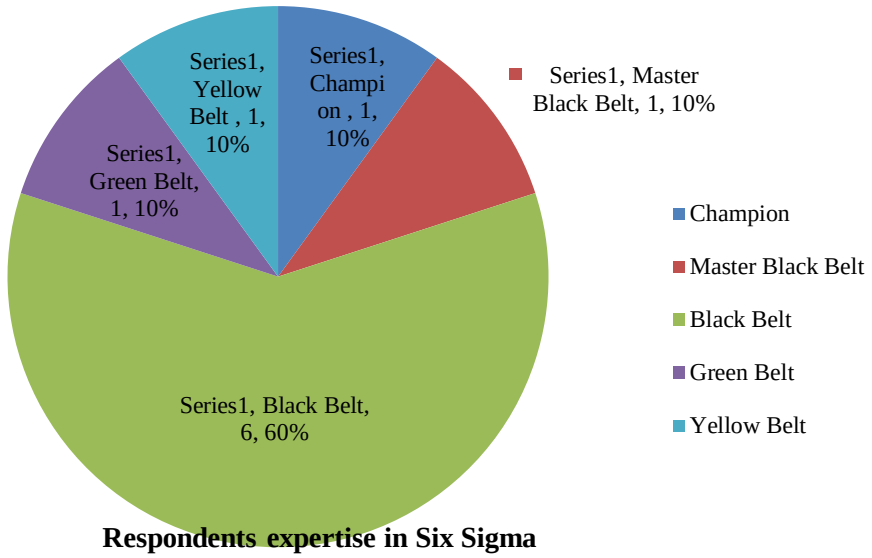
DATA ANALYSIS AND INTERPRETATION:

The Six Sigma expertises of the respondents among the sample selected Six Sigma practicing information technology companies for the research is shown in table 8.1 and chart 8.1:

Table: 8.1: Showing Six Sigma Expertise of the respondents

Six Sigma Expertise	No.of Respondents	Percentage
Champion	1	10%
Master black belt	1	10%
Black belt	6	60%
Green belt	1	10%
Yellow belt	1	10%
Total	**10**	**100%**

Chart 8.1: Showing Six Sigma Expertise of the respondents



Respondents expertise in Six Sigma

ANALYSIS AND INTERPRETATION:

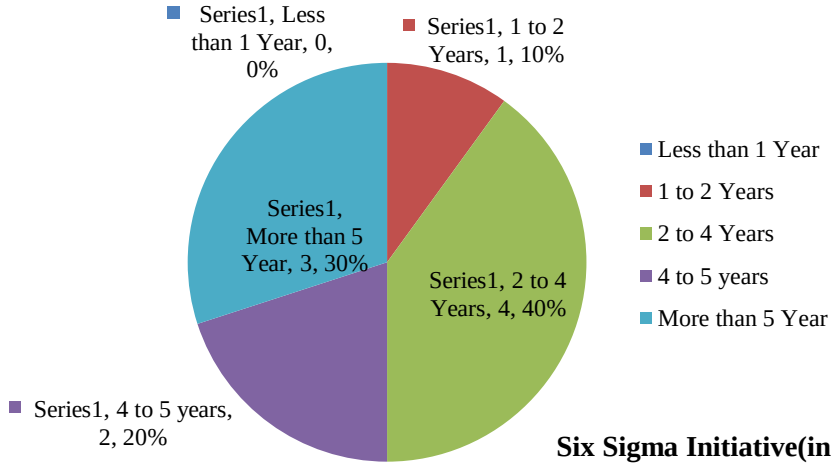
The above table 8.1 and chart 8.1 show shows that the Six Sigma expertise Classification of the respondents and Figure 1 depicts 60% of respondents are Six Sigma black belt experts, 10 % of Six Sigma champion, 10% of Six Sigma master black belt, 10 % Six Sigma green belt and Remaining 10% comprises of the Six Sigma yellow belt expert. It is found from the Analysis that majority of respondents are Six Sigma black belt experts who are responsible for entire project success.

Six Sigma Initiatives in the sample selected Six Sigma practicing information technology companies for the research is shown in table 8.2 and chart 8.2:

Table: 8.2: Six Sigma initiatives in the respondent companies

Six Sigma initiative (in Years)	No of respondents	Percentage
Less than 1 year	0	00%
1 to 2 years	1	10%
2 to 4 years	4	40%
4 to 5 years	2	20%
More than 5 years	3	30%
Total	**10**	**100%**

Chart 8.2: Showing the Six Sigma initiatives in the respondent companies



Six Sigma Initiative(in years)

Analysis and Interpreatation:
It is understood from The above table 8.2 and chart 8.2 show that the Six Sigma initiative in the respondents companies, 40% of the companies practicing Six Sigma from 2 to 4 years, 30 % of companies practicing Six Sigma from more than 5 years, 20 % of companies have 4 to 5 years experience in Six Sigma practice and 10% of companies are now in the early stage of Six Sigma practice in their organisation. It is also found from the above table that nearly 70% of respondents companies practicing Six Sigma from 2 to 5years in their organisation.

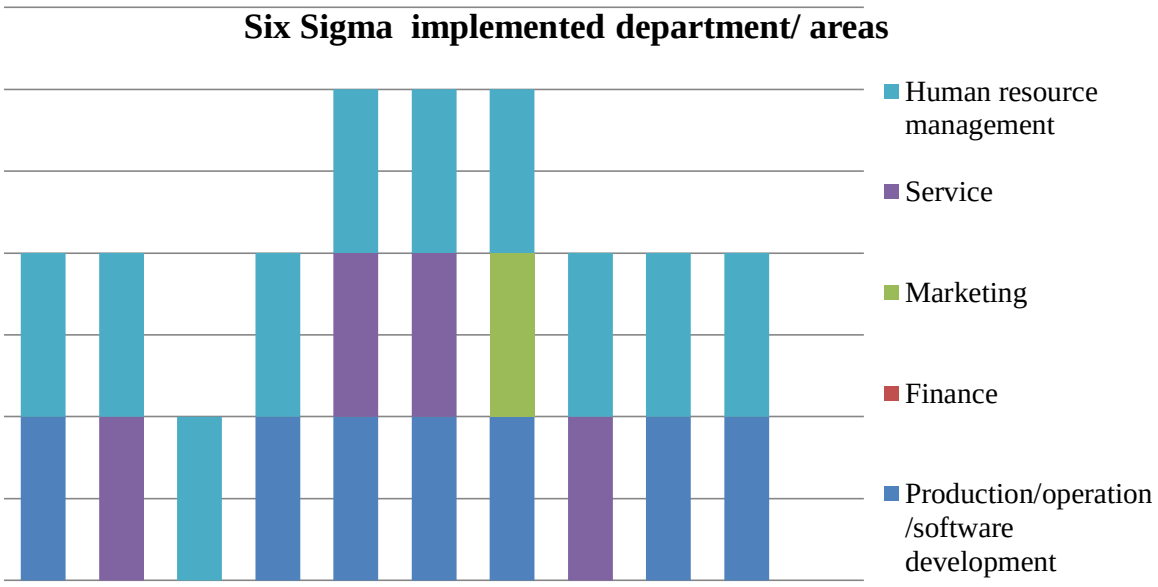
Six Sigma implemented department/ areas in the sample selected Six Sigma practicing information technology companies for the research is shown in table 8.3 and chart 8.3:

Table 8.3: Showing Six Sigma implemented areas/departments in the respondents companies

S.L.no	Respondents Companies	HRM	SD	SER	MAR	FIN	TOTAL
1	ITC	1	1	---	---	---	2
2	INFOSYS	1	---	1	---	---	2
3	HCL	1	---	---	---	---	1
4	TCS	1	1	---	---	---	2
5	NESS TECHOLOGIES	1	1	1	---	---	3
6	HEXAWARE	1	1	1	---	---	3
7	IGATE	1	1	---	1	---	3
8	WIPRO	1	---	1	---	---	2
9	MPHASIS	1	1	---	---	---	2
10	L & T INFOTECH	1	1	--	---	---	2
	TOTAL	**10**	**07**	**04**	**01**	**00**	**22**

Note: HRM= Human resource management
SD= Software Development
SER= Services
MAR= Marketing
FIN= Finance

Chart 8.3: Showing the Six Sigma implemented Areas Company wise



Analysis and Interpretation:
The above table 8.3 and chart 8.3 show it has been inferred that, 3 companies such as NESS technologies, HEXAWARE and IGATE implemented Six Sigma in 3 areas, 6 companies such as ITC, INFOSYS, TCS, WIPRO, MPHASIS AND L&T INFOTECH ARE implemented Six Sigma in 2 areas and only one company

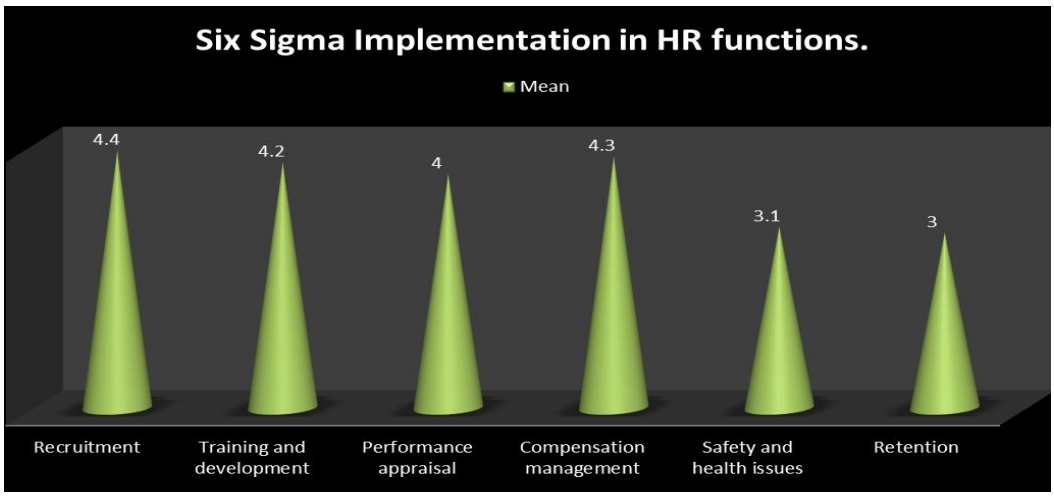
that is HCL is implemented Six Sigma in human resource management function in their organisation. From the analysis it is found that, for extending the Six Sigma implementation to the new departments is depends on the success of implementation in the previous department.

The Six Sigma implementation in HR functions, among the sample selected Six Sigma practicing information technology companies for the research is shown in table 8.4 and chart 8.4

Table 8.4: Sigma implementation in HR functions

Table 3	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Mean	SD
Recruitment	4	6	--	--	--	10	4.40	0.516
%	40	60	--	--	--	100		
Training and development	3	6	1	--	--	10	4.2	0.63
%	30	60	10	--	--	100		
Performance appraisal	2	6	2	--	--	10	4.0	0.67
%	20	60	20	--	--	100		
Compensation management	3	7	--	--	--	10	4.3	0.48
%	30	70	--	--	--	100		
Safety and health issues	--	3	5	2	--	10	3.1	0.74
%	--	30	50	20	--	100		
Retention	--		10	--	--	10	3.0	0.00
%	--		100	--	--	100		

Chart 8.4: Sigma implementation in HR functions



Results of One way ANOVA

	Sum of Squares	DF	Mean Sum of Squares	F Ratio	P Value
Variation Between	19.33	5	3.86	12.25	0.000**
Variation Within	17.048	54	0.32		
Total	**36.38**	**59**			

Analysis and interpretation:

The above 8.4 and chart 8.4 depicts the results of Percentage analysis, measures of Mean SD and One way ANOVA to analyze the Six Sigma implementation in HR functions in relation with the functions such as Recruitment, Training and development, Performance appraisal, Compensation management, Safety and health issues, and Retention, as reported by the practicing HR professionals across the 10 IT companies.

As per the percentage analysis more than 60% of the practicing HR professionals are of the opinion that the six sigma projects may be implemented for the purpose of assisting HR functions except for retention. The opinions clearly lack the consensus among the HR practicing professionals in order to claim in favour of any one or more strong/key areas of HR functions in which Six Sigma can be implemented, which is supported substantially by the results of one way ANOVA (Table4).

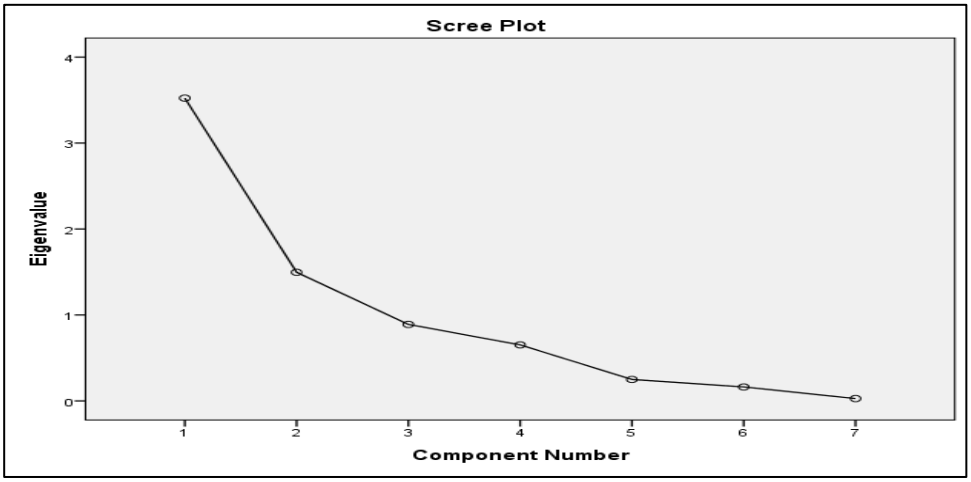
However as per the measures of Mean and SD it can be made an observation to state that the key areas of HR functions in which the Six Sigma can be implemented is found to be primarily in Recruitment (Mean 4.4), Compensation Management (Mean 4.3), Training and Development (Mean 4.2) and Performance appraisal (Mean 4.0) and not in favor of the functions of employee retention and safety & Health (Mean 3.1).

The challenges faced during Six Sigma implementation, among the sample selected Six Sigma practicing information technology companies for the research is shown in table 8.5 and chart 8.5:

Table 8.5: Challenges faced during Six Sigma Implementation

Challenges		
	Component	
	1	**2**
Difficulty in data collection	0.893	
Identification of projects	0.927	
Too complex to use	0.700	
Too complex to learn and train	0.524	
Difficulty in identifying process parameters to be improved	0.937	
Staff turnover between the projects/after training		0.918
Cost and time	0.662	0.456
Eigen Value	3.523	1.496
Total Variance Explained	50.327	21.377
Chi square	33.183	
DF	21	
KMO-Sampling Adequacy	0.495	
Sig Value	0.044*	

Chart 8.5: Challenges faced during Six Sigma Implementation



Analysis and Interpretation:

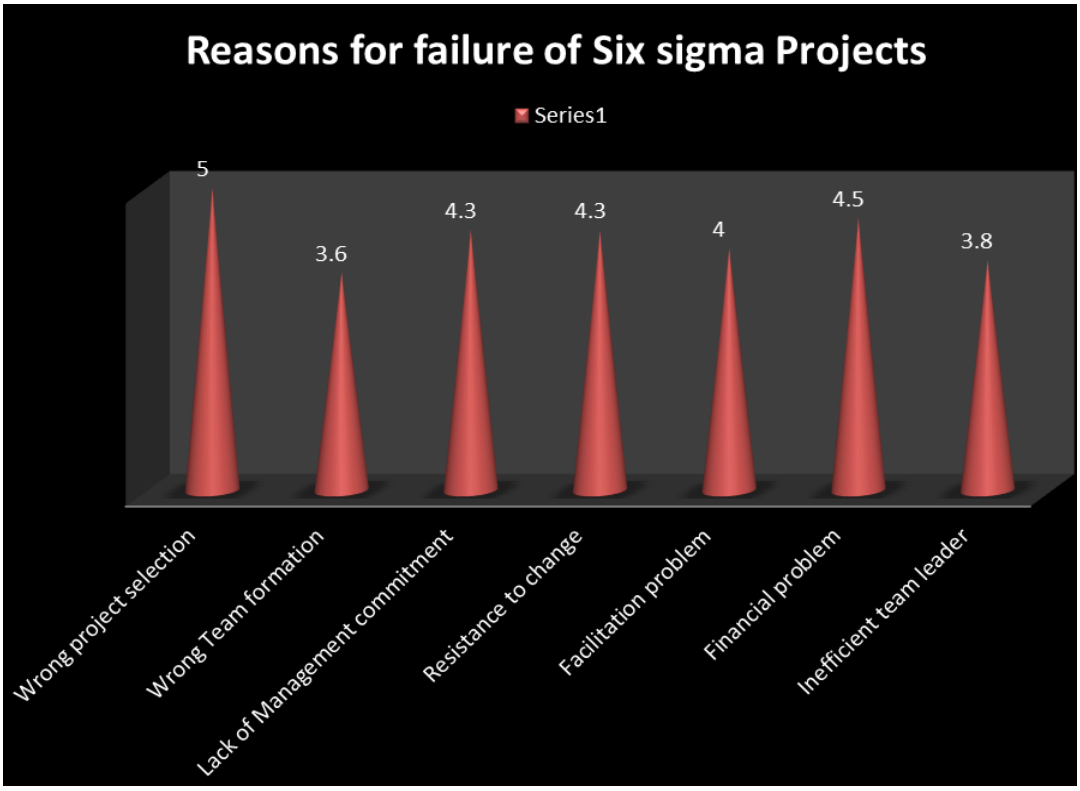
The above table 8.5 and chart 8.5 exhibits factor analysis results to know the challenges of practicing Six Sigma concept in Human Resource department. The challenges such as Difficulty in data collection, Identification of projects, too complex to use, too complex to learn and train, Difficulty in identifying process parameters to be improved Staff turnover between the projects/after training Cost and time are considered for the purpose of evaluations. Two major components (C1, C2) are extracted with the total variance of 71.70 %, and KMO Sampling adequacy coefficient 0.495. The challenges such as Difficulty in data collection, Identification of projects, Too

complex to use, Too complex to learn and train, Difficulty in identifying process parameters to be improved, cost and time are found to be most influencing challenges of first priority, followed by Staff turnover between the projects/after training as the second priority. The scree plot diagram and significant value provides substantial evidence to conclude that the findings from the table are highly significant and supported by the strong mutual correlation between the different roles. The respective objective can be concluded by saying that the implementation of Six Sigma involves the challenges of multifold to be addressed at different levels and abilities of the organization.
The major reasons for failure of Six Sigma projects, among the sample selected Six Sigma practicing information technology companies for the research is shown in table 8.6 and chart 8.6:

Table 8.6: The major reasons for failure of Six Sigma projects

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Mean	SD
Wrong project selection	10	--	--	--	--	10	5.0	0.00
%	100	--	--	--	--	100		
Wrong Team formation	--	6	4	--	--	10	3.6	0.52
%	--	60	40	--	--	100		
Lack of Management commitment	5	3	2	--	--	10	4.3	0.82
%	50	30	20	--	--	100		
Resistance to change	4	5	1	--	--	10	4.3	0.67
%	40	50	10	--	--	100		
Facilitation problem	2	6	2	--	--	10	4.0	0.67
%	20	60	20	--	--	100		
Financial problem	6	3	1	--	--	10	4.5	0.71
%	60	30	10	--	--	100		
Inefficient team leader	3	3	3	1	--	10	3.8	1.03
%	30	30	30	10	--	100		

Chart 8.6: The major reasons for failure of Six Sigma projects



Results of One way ANOVA

	Sum of Squares	DF	Mean Sum of Squares	F Ratio	P Value
Variation Between	13.086	6	2.181	4.488	0.001**
Variation Within	30.613	63	0.486		
Total	**43.699**	**69**			

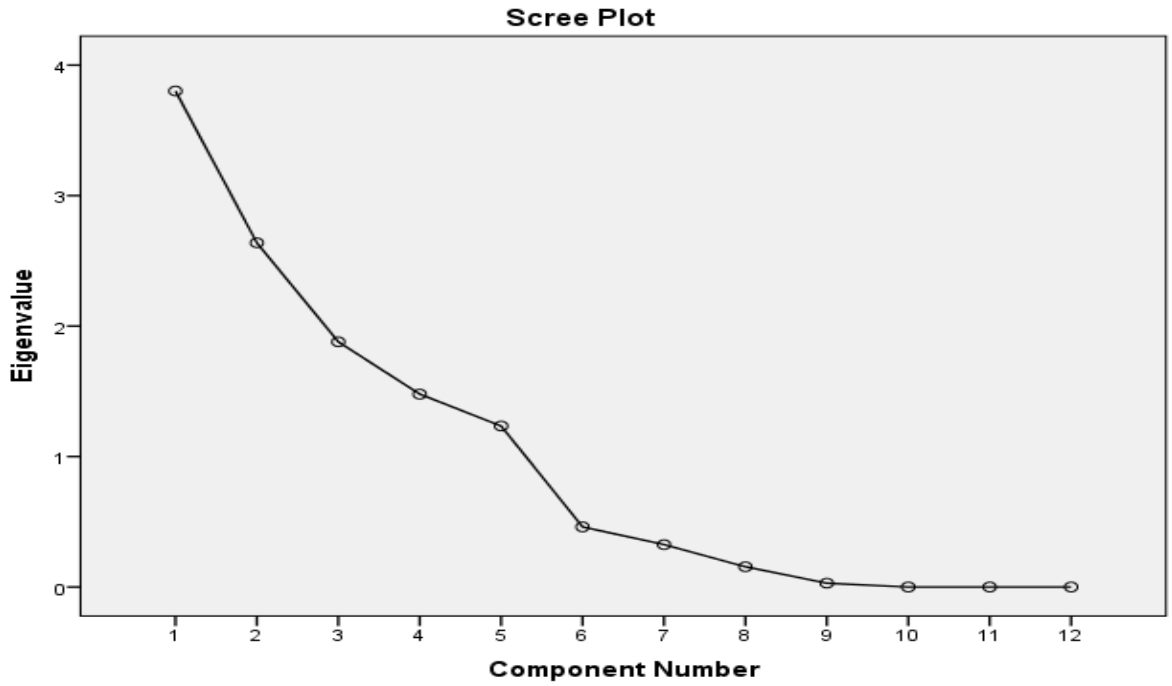
Analysis and Interpretation:
The above table 8.6 and chart 8.6 depicts the results of Percentage analysis, measures of Mean SD and One way ANOVA analysis to analyzethe best possible reasons for the failure of six sigma projects as reported by the practicing HR professionals across the 10 IT companies, As per the percentage analysis more than 60% of the practicing HR professionals are of the opinion that the six sigma projects may fail because of at least any of the reasons as mentioned above in the table. The opinions clearly lack the consensus among the HR professionals in order to claim in favour of any one or more strong reason/s influencing the failure of six sigma projects, which is supported substantially by the results of one way ANOVA.
However as per the measures of Mean and SD it can be made an observation to state that the six sigma projects could fail primarily because of Wrong project selections (mean 5.0), followed by Financial problems (mean 4.5),Lack of Management commitment (mean 4.3),Resistance to change (mean 4.3) and even it could be because of Inefficient team leader (mean 3.8)

Success factors required to Six Sigma implementation, among the sample selected Six Sigma practicing information technology companies for the research is shown in table 8.7 and chart 8.7:

Table 8.9: Success factors required to Six Sigma implementation

	Component				
	1	**2**	**3**	**4**	**5**
Management commitment and involvement					
Linking Six Sigma to business strategy			0.629	0.418	0.44
Creating a Six Sigma Culture	0.48			0.392	
Organizational readiness	0.78				0.42
Treatment of Six Sigma as a holistic concept	0.38				
Investment of adequate resources		0.46			0.72
Customer orientation	0.52		0.69		
Focus on training and its content			0.40		
Adaptation to an organization's situation and needs					
Prioritization and selection of projects		0.85		0.390	
Development of uniform language and terminology	0.93				
Follow-up and communication of success stories	0.87				
Eigen Value	3.80	2.64	1.88	1.48	1.23
Total Variance Explained	31.67	21.98	15.66	12.31	10.28
KMO Measure of Sampling Adequacy	0.573				
Approx. Chi-Square	11.0				
DF	11				
Sig Value	0.000**				

Chart 8.7: Success factors required to Six Sigma implementation



Analysis and Interpretation:

The above table 8.7 and chart 8.7 provides the detailed insight of the key success factors required while implementing Six Sigma, with the view point of practicing HR professionals. Five major components are extracted with the total variance of 91.9% and Eigen values sufficiently more than one. As the first priority of critical success factors, the factors such as Development of uniform language and terminology, Follow-up and communication of success stories, Organizational readiness, followed by Customer orientation, Linking Six Sigma to business strategy, Prioritization and selection of projects, Investment of adequate resources are found to be highly predominant.

KMO Measure of Sampling Adequacy, and Significant values for practicing HR professionals indicates that the table readings are highly reliable and there exists strong mutual correlation.The scree plot diagram and significant value provides substantial evidence to conclude that the findings from the table are highly significant and supported by the strong mutual correlations between the different factors influencing the key success factors. The respective objective can be concluded by saying that the factors leading to the major critical success factors such as Development of uniform language and terminology, Follow-up and communication of success stories, Prioritization and selection of projects and Investment of adequate resources.

FINDINGS:

1. Majority of respondents are Six Sigma black belt experts who are responsible for entire project success in six sigma practicing IT companies.
2. Most of the selected six sigma practicing IT organization falls in the 3- 4 Sigma level. It shows that in India Six Sigma is now growing and implementing Six Sigma in the early stage.
3. NESS technologies, HEXAWARE and IGATE implemented Six Sigma in 3 areas, 6 companies such as ITC, INFOSYS, TCS, WIPRO, MPHASIS AND L&T INFOTECH ARE implemented Six Sigma in 2 areas and only one company that is HCL is implemented Six Sigma in human resource management function in their organization. Extending the Six Sigma implementation to the new departments is depends on the success of implementation in the previous department.
4. Human resource management is the one function which is Six Sigma implemented in the entire selected organization. 70% of the organization implemented Six Sigma in software development function. 40% of the organization implemented Six Sigma in service function. Only 10% of organization implemented Six Sigma in the marketing function and none of the company implemented Six Sigma in the Finance function.
5. Management commitment and involvement plays an important and major role in Six Sigma implementation in an organization.

6. Six Sigma methodologies is purely a statistical measurement methodology, bringing the HR department performance in to the track of Six Sigma methodology is a challenging task.
7. Implementation of Six Sigma methodology requires huge amount of cost and time, the size of the HR department is again stands a challenge and it reflect that it may not ensure the return on their investment on Human resource department and still in many of the organization feeling that, HR department is just major function in their organization.
8. The factors such as Development of uniform language and terminology, Follow-up and communication of success stories, Organizational readiness, followed by Customer orientation, Linking Six Sigma to business strategy, Prioritization and selection of projects, Investment of adequate resources are found to be highly predominant for successful implementation of Six Sigma in HRM.

CONCLUSION:

From the above study can conclude that, Six Sigma is now using beyond its boundary from manufacturing to Human resource management function. It is proved that, Six Sigma can be implementing wherever the process is exist. But it is not as easy as we can implement and measure the improvement as we do in the manufacturing compare to Human resource management. It does not mean that it is impossible; it is possible if we prevent challenges, taking corrective action on the right time and most importantly finding and applying the success factors for implementing Six Sigma is required. Six Sigma is world class process improvement tool, which was adopted, implemented and gained million dollars of benefit from the many organisations all over the world. Anyone can get benefited by Six Sigma when they work dedicated, open to change, committed and management involvement.

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