USABILITY ASSESSMENT OF OPENOFFICE.ORG AS AN ALTERNATIVE OF MICROSOFT OFFICE IN ACADEMIC INSTITUTES

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ABSTRACT

Of late, academic institutes running with limited budgets have realised that they should embrace free and open source alternatives (FOSS) to proprietary software in order to cut the cost of software, comply with copyright law and avoid vendor lock- in. Microsoft Office (MSO) is one of the most preferred and substantially underutilised productivity software in academic institutions. OpenOffice.org (OOO) is worthwhile, free and open source productivity suite that can be adopted as an alternative of the proprietary Microsoft Office suite. Although Microsoft has launched a cloud-based office suite which is being offered without any cost to some academic institutions; it cannot be considered as a replacement of desktop-based office suite owing to certain adverse implications and necessity of internet connectivity for its use.

One among many reasons that prohibit adoption of FOSS in general and OOO in particular is the negative perception as regards to its usability which represents capability of the software to be understood, learned and used by its user. Usability can be measured by assessing user performance, satisfaction, effectiveness and acceptability while using it. This paper discusses the results of empirical assessment of usability of OpenOffice.org conducted in academic setup.

Keywords: OpenOffice, Software Usability Assessment, Free and Open Source Software

I.   INTRODUCTION

There has been a remarkable adoption of Information and Communication Technology (ICT) in academic and research Institutions in developed as well as developing countries during the last two decades, but concerns regarding appropriateness of technology adopted and optimal usage of the same persist (Bryzki & Dudt, 2005).

Although proprietary software have become relatively expensive over time, drastic decline in the cost of hardware and easy availability of pirated copies of software to a large extent facilitated this remarkable adoption of computers in developing and underdeveloped nations. As with most developing nations, in

India also, the purchase of personal computer has been perceived to be inclusive of software, particularly the Windows Operating System and Microsoft Office suite (MSO).Microsoft Office (MSO) is one of the most preferred and substantially underutilised productivity software. When it comes to selection of office suite, one can hardly think of anything other than Microsoft (Keith et al., 2010). Even in academics, MSO is a default choice, notwithstanding the cost involved (assuming legal compliance) and legal problems (assuming piracy) (Cosovanu, 2003).A near monopoly position of single vendor has led to a situation defined as lock-in which creates entry-barrier for other products and makes it difficult for users to switch to alternatives notwithstanding technical advantages, if any in doing so. Although, vendors of proprietary software offer their products at special discounted rate to academic institutions; the post-discount price is not within reach of many institutions and most students in country like India (Ghosh, 2003). Of late this binding to product of single vendor, despite lack of affordability, facilitated due to poor enforcement of anti-piracy measures has turned out to be a major burden for organisations due to increasing pressure to implement software copyrights.

Many software experts suggest that educational institutes should embrace free and open source alternatives (FOSS) to proprietary software in order to cut the cost of software, comply with copyright rules and avoid vendor lock- in (Tong, 2004) and (Smee, 2009).One other facet of importance at this stage is that Microsoft has radically changed its interface with version 2007 of its Office suite. And many users who have been using Microsoft Office- 2003 for long are finding it difficult to switch to the new version. According to Feldmen (2007),O'Neill (2009) and Hickey(2011)a very high percentage of MSO users still rely on the older version of the software. This situation has created an opportunity to promote Openoffice.org (OOO) whose interface resembles to a large extent to MSO 2003 (Haugland, 2008; Bonfield & Quinn, 2010).

Since its origin before a decade and despite many strong points that OOO has over MSO its adoption by individuals and organisations has not been encouraging. One reason for this indifference is the negative perception about usability of OOO. Many researchers have argued that the focus of FOSS developers is more on functionality than on usability and hence FOSS are not user-friendly (Feller & Fitzgerald, 2002; Miller, 2006; Erkan, 2006).

II. USABILITY
Usability has been identified as one of the crucial software attributes in the ISO 9126 international standard for software evaluation. It refers to the capability of

the product to be understood, learned and used by users, as well as to appeal to users when used under specified conditions (ISO/IEC 9126-1 2001).

According to International Organization for Standardization, usability is a prime feature of user interface that also takes into consideration the functionalities of software. If a system is inferior in terms of usability, its adoption by users would be difficult. Usability is also related to operational aptness of the software for users planning to adopt it. It aims at efficiency, effectiveness and satisfaction derived by the users. Usability is often measured subjectively using self-reported satisfaction and comfort level of users during development and pilot stages (http://en.wikipedia.org/wiki/Usability).

While selecting among alternatives it is important to assess usability of software to be considered in relation to the existing software. Obviously, an alternative resembling existing system and easier to use would stand higher chance of successful adoption. This paper discusses the results of empirical assessment of usability of OOO as an alternative of MSO in academic setup.

III. METHODOLOGY

Quick assessment of usability with 5 users is a common practice during the software development phase. Usability assessment is also desirable while making decision on adoption of new software. Faulkner (2003) and Spillers (2005) recommend conducting usability tests on large sample of varied users to get reliable insights into variety of usability issues faced by users. Spillers (2005) also highlights that smaller samples give "quick and dirty" results and recommends a sample size of 40-100 users, for getting reliable outcomes in usability research. Usability assessment of OOO 3.0 was conducted in this study with a sample 63 participants comprising 17 faculty, 14 non-faculty and 32 students conveniently selected from an institute conducting courses on management.

Complying with the method used by Shah (2009), usability assessment was conducted in computer lab with identical systems. Users of MSO 2003 were selected for this evaluation. Participants were given a systematic overview of various features of OOO. Subsequently, they were asked to perform basic tasks using Writer, Calc and Impress the OOO equivalents of Word, Excel and PowerPoint. Technical support was extended, if required by the participants to complete the tasks.

At the end of the exercise, a questionnaire adapted from tool used by Shah (2009); meant to collect data on perceived usability focussing on the five dimensions viz. Ease of use (Simplicity), Ease of understanding Menus and Icons (Consistency), Ease of Finding Features and Functionalities required (Learnability) Satisfaction in using the Software and Functional Fitness compared to MSO (Completeness) measured on 5-point scale (Strongly Disagree-Strongly agree), separately for Writer, Calc and Impress applications of OOO was canvassed. The questionnaire also included a section to gain relevant background related to comfort level in using MSO. As the user responses were taken separately for Writer, Calc and Impress, to get a composite overview of responses on the three applications taken together representing OOO as a composite suite, cluster analysis was used in the manner that responses of the three applications on each dimension of usability can be collated. Hierarchical cluster analysis was used to identify the number of meaningful cluster in the data. The highest difference in fusion coefficients of agglomeration schedule (Squared Euclidean measure) was used to determine the number of clusters to be specified for the subsequent K-means cluster analysis for segmentation of users (Nargundkar, 2008). Tables based on membership of clusters and responses on 'comfort level with MSO' have been used for drawing conclusions as regards to usability.

IV. RESULTS
For all the 5 usability dimensions of software usability namely Ease of use (Simplicity), Ease of understanding Menu and Icons (Consistency), Ease of Finding features and functionalities required (Learnability) Satisfaction in using the software and Functional fitness (Completeness) the fusion coefficients of agglomeration schedule revealed appropriateness of two cluster solutions for the subsequent K-means cluster analysis. The outcomes of this exercise focussing on the five dimensions are discussed below.

a) Simplicity of OOO:
A very important dimension of software usability is its simplicity. Simplicity has been measured through 'perceived ease of use' in this study. Responses of participants on simplicity of three applications of OOO are given in Table-1a. If we club categories 'Agree' and 'Strongly Agree' to represent Agreement, it is evident that around 70 % , 69% and 76% of respondents are in agreement with respect to 'ease of use' of Writer, Calc and Impress respectively.

Outcomes of cluster analysis used by taking together the responses on 'ease of use' for 3 applications to classify respondents into homogenous clusters to get an

overall impression of simplicity of OOO are given in Table-1b. It is evident from that cluster-1 comprises of users with cluster center at value 4 on 'ease of use/ simplicity' for all the 3 applications, which corresponds to 'Agree' whereas, cluster-2 comprises of users with cluster center at value 2 on 'ease of use' for all the 3 applications which corresponds to 'Disagree'. As expected the F value indicates that the centers of the cluster differ significantly. Besides it is evident that cluster-1 which centers around 'Agree' includes 69% of participants and cluster-2 that centers around 'Disagree' includes 31% of participants of this trial. It is clear that a large majority of participants are in agreement as regards to simplicity of OOO represented by 'ease of use'.

Furthermore, analysis by sub-groups (not included in tables) revealed that almost 59% faculty, 79% non-faculty and 72% students are in agreement that OOO as a composite of Writer, Calc and Impress is easy to use software.

Delving further, the cluster membership on 'ease of use' was tabulated across another important variable 'comfort level of users with MSO' as given in Table-1c. Considering comfort level with MSO as ordinal, it is observed from declining percentages and significance (P <0.01) of linear-by-linear association chi-square statistic that disagreement with respect to 'ease of use' declines significantly with increase in comfort level of participants in using MSO (Agresti ,1996). It is clear that a large majority of those who disagree that OOO is 'easy to use' are the ones who also lack comfort in use of MSO.

B) Consistency of OOO:

In usability parlance consistency of software relates to 'Ease of Understanding of Menus and Icons' in the course of using it. User comfort on this front is critical for success of any software. Responses on 'Ease of Understanding of Menus and Icons' separately for Writer, Calc and Impress are represented in Table-2a. As depicted, almost 67%, 73% and 67 % of the participants are in agreement as regards to 'ease of understanding Menus and Icons' of Writer, Calc and Impress respectively.

The outcomes of K-means cluster analysis for consistency of OOO given in Table-2b exhibit that cluster-1 comprises of participants with cluster centers at 4 on all the three applications which corresponds to 'Agree', whereas, cluster-2 comprises of users with cluster centers at 2 corresponding to 'Disagree' for all the three application for the usability dimension consistency. Also, cluster-1 that represents agreement on this dimension of OOO includes 68% of the

participants whereas cluster-2 that represents 'Disagreement' on this dimension includes only 32% participants.

It was also observed that among faculty 65%, among non-faculty 57% and among students 75% are in agreement that OOO as a composite of Writer, Calc and Impress provides 'ease of understanding menus and icons' and hence it is consistent.

Distribution of 'Comfort of participants with MSO' and cluster membership on "Ease of understanding OOO" is presented in Table-2c. It can be inferred from declining percentages and the significance (P<0.01) of linear-by-linear association chi-square that disagreement on 'understanding menus and icons' decrease significantly with increase in comfort level of participants with use of MSO. The more one is comfortable with MSO the less the chances of his discomfort with OOO.

C) Satisfaction with OOO:
Satisfaction is another dimension of prime importance for usability assessment of software. Higher the comfort of users while using the software the more will be the satisfaction. Responses of participants on satisfaction with three applications of OOO given in Table-3a depict that around 65%, 75% and 67% of respondents are in agreement that they are satisfied with Writer, Calc and Impress respectively.

The outcomes of K-means cluster in Table-3b show that cluster-1 comprises of participants with cluster centers at 4 on all the three applications which corresponds to 'Agree', whereas, cluster-2 comprises of users with cluster centers at 2 corresponding to 'Disagree' for Writer and Impress and at value 3 corresponding to 'Neutral' for Calc. Cluster-2 as regards to this dimension of usability represents participants who disagree that Writer and Impress are Satisfactory and are on an average neutral as regards to satisfaction with Calc. Despite the lack of clear-cut classification in case of cluster-2; it is beyond doubt that cluster-1 represents 'Agreement' with regards to satisfaction from OOO whereas cluster- 2 represents lack of agreement, if not 'disagreement' per se on satisfaction with 3 applications taken together.

Here also, cluster-1 that represents agreement as regards to satisfaction dimension of OOO includes 67% of the participants and cluster-2 that represents 'lack of agreement' on this dimension includes 33% participants.

It was also observed that among faculty 69%, among non-faculty 64% and among students 69% were in agreement that they are satisfied with OOO as a composite of Writer, Calc and Impress.

The tabulation of participants' 'comfort level with MSO' by cluster membership is given in Table-3c. It can be inferred from declining percentages and the significance (P<0.01) of linear-by-linear association chi-square that 'Lack of agreement' with respect to satisfaction with use of OOO decreases significantly with increase in comfort level of participants with use of MSO.

D) Learnability of OOO:
Responses on learnability as reflected by 'ease of finding features and functionalities' are presented in Table-4a. It is evident that around 60 % , 75% and 68% of respondents are in agreement that 'it is easy to find features and functionalities' they need in Writer, Calc and Impress respectively.

The outcomes of K-means cluster in Table-4b show that the segment of users represented by cluster-1 comprises of participants with cluster centers at 4 on all the three applications which corresponds to 'Agree', whereas, cluster-2 comprises of users with cluster centers at 2 , corresponding to 'Disagree' for all the three application for the usability dimension learnability. Also, cluster-1 that represents agreement on this dimension of OOO includes 64% of the participants and the one that represents 'Disagreement' on this dimension includes 36% participants.

It was also observed that among faculty 59%, among non-faculty 79% and among students 59% are in agreement that it is easy to find features and functionalities they need in OOO as a composite software comprising of Writer, Calc and Impress.

Furthermore, the tabulation of participants' comfort level with MSO by cluster membership and the significance associated linear-by-linear association chi-square (P<0.01) given in Table-4c shows that 'Disagreement' with respect to ease of finding features and functionalities of OOO decreases significantly with increase in comfort level of participants with use of MSO.

E) Completeness of OOO Compared to MSO:
In usability assessment completeness of software can be gauged with its comparison with the currently used software. To assess completeness of OOO, its components viz. Writer, Calc and Impress have been compared with their

counterparts in MSO viz. Word, Excel and PowerPoint. High degree of resemblance is a crucial for success of new software.   Responses in this connection, separately for Writer, Calc and Impress are represented in Table-5a show that around 71 % , 72% and 68% of respondents are in agreement that Writer, Calc and Impress respectively are as good as their counterparts in MSO.

The outcomes of K-means cluster are provided in Table-5e2 exhibit that the segment of users represented by cluster-1 comprises of participants with cluster centers exceeding 4 on Writer and Calc whereas the center is close to 4 in case of Impress 'Agree'.Cluster-2 comprises of users with cluster centers below 2 , on Writer and Calc whereas the center is exactly 2 in case of Impress. It can be inferred that cluster-1 comprises of participants with 'Agreement' whereas cluster-2 comprises of participants with 'Disagreement' as regards to completeness of OOO.   Also, cluster-1 that represent agreement on this dimension of OOO includes 71% of the participants and cluster-2 representing 'Disagreement' on this dimension includes 29% participants.

It was also observed that among faculty 65%, among non-faculty 71% and among students 75% are in agreement that they OOO as a composite of Writer, Calc and Impress is as good as MSO.

Furthermore, the tabulation of participants' comfort level with MSO by cluster membership and the significance associated linear-by-linear association chi-square (P<0.01) given in Table-5c shows that 'Lack of agreement' with respect to completeness of OOO decreases significantly with increase in comfort level of participants with use of MSO.

V. CONCLUSION

The analysis of data on usability assessment discussed in previous section underlines that majority of the participants of this trial are in agreement as regards to usability dimensions representing simplicity, consistency, learnability, satisfaction and completeness of OOO . Also, a majority of those who disagree on these fronts are the ones who already have low level of comfort in using Microsoft Office.

OOO being sound in terms of its usability can be considered as an alternative of MSO in academic institutions.

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TABLES

Table-1a: Simplicity of Writer, Calc and Impress						
Writer is Easy to use						
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Count	10	8	1	32	12	63
%	15.90%	12.70%	1.60%	50.80%	19.00%	100.00%
Calc is Easy to use						
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Count	10	3	0	40	10	63
%	15.90%	4.80%	0.00%	63.50%	15.90%	100.00%
Impress is Easy to use						
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Count	9	6	0	36	12	63
%	14.30%	9.50%	0.00%	57.10%	19.00%	100.00%

Table-1b : Final Cluster Centers for Writer, Calc and Impress on Simplicity Dimension				
			F test comparing Distance	
	Cluster		F	Sig.
	Cluster 1 'Agreement'	Cluster 2 'Disagreement'		
Writer is Easy to use [Simplicity]	4	2	133.561	0
Calc is Easy to use [Simplicity]	4	2	87.794	0
Impress is Easy to use [Simplicity]	4	2	36.357	0
Number of Cases	44	19		
	–69%	–31%		

Table-1c: Distribution of Participants by comfort level with MSO and Cluster membership on		Cluster 1 'Agreement'	Cluster 2 'Disagreement'	Total
Poor	Count	0	7	7
	Row %	0.00%	100.00%	100.00%
Fair	Count	13	6	19
	Row %	68.40%	31.60%	100.00%
Good	Count	21	6	27
	Row %	77.80%	22.20%	100.00%
Very Good	Count	10	0	10
	Row %	100.00%	0.00%	100.00%
Total	Count	44	19	63
	Row %	69.80%	30.20%	100.00%
Significance of Linear- by- Linear Association Chi-Square (Treating Comfort level as Ordinal)				0

Table-2a: Consistency of Writer, Calc and Impress						
Menus and icons of Writer are easy to understand						
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Total**
Count	5	11	5	24	18	63
%	7.90%	17.50%	7.90%	38.10%	28.60%	100.00%
Menus and icons of Calc are easy to understand						
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Count	9	3	5	26	20	63
%	14.30%	4.80%	7.90%	41.30%	31.70%	100.00%
Menus and icons of Impress are easy to understand						
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Count	12	2	7	22	20	63
%	19.00%	3.20%	11.10%	34.90%	31.70%	100.00%

Table-2b: Final Cluster Centers for Writer, Calc and Impress on Consistency
        Dimension

Final Cluster Centers			F test comparing Distance between clusters	
	Cluster			
	1	2	F	Sig.
Ease of Understanding Menus and Icons of Writer	4	2	179.888	.000
Ease of Understanding Menus and Icons of Calc	4	2	76.606	.000
Ease of Understanding Menus and Icons of Impress	4	2	50.003	.000
Number of Cases	43	20		
	68%	32%		

Table-2c: Distribution of Participants by comfort level with MSO and Cluster membership on Consistency

		Cluster 1 'Agreement'	Cluster 2 'Disagreement'	Total
Poor	Count	1	6	7
	Row %	14.3%	85.7%	100.0%
Fair	Count	13	6	19
	Row %	68.4%	31.6%	100.0%
Good	Count	19	8	27
	Row %	70.4%	29.6%	100.0%
Very Good	Count	10	0	10
	Row %	100.0%	0.0%	100.0%
Total	Count	43	20	63
	Row %	68.3%	31.7%	100.0%
Significance of Linear- by- Linear Association Chi-Square (Treating Comfort level as Ordinal)				0.001

Table-3a : Satisfaction with Writer, Calc and Impress

Are you Satisfied with Writer						
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Count	11	10	1	29	11	62
%	17.7%	16.1%	1.6%	46.8%	17.7%	100.0%
Are you Satisfied with Calc						
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Count	7	7	2	43	4	63
%	11.1%	11.1%	3.2%	68.3%	6.3%	100.0%

Are you Satisfied with Impress						
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Count	8	11	2	22	20	63
%	12.7%	17.5%	3.2%	34.9%	31.7%	100.0%

Table-3b: Final Cluster Centers for Writer, Calc and Impress on Satisfaction Dimension

Final Cluster Centers			F test comparing Distance between clusters	
	Cluster			
	1	2	F	Sig.
Are you Satisfied with Writer?	4	2	232.778	.000
Are you Satisfied with Calc?	4	3	36.003	.000
Are you Satisfied with Impress?	4	2	34.227	.000
Number of Cases	42	20		
	67%	33%		

Table-3c: Distribution of Participants by comfort level with MSO and Cluster membership on Satisfaction

		Cluster 1 'Agreement'	Cluster 2 'Lack of agreement'	Total
Poor	Count	1	5	6
	Row %	16.7%	83.3%	100.0%
Fair	Count	12	7	19
	Row %	63.2%	36.8%	100.0%

		Cluster 1 'Agreement'	Cluster 2 'Lack of agreement'	Total
Good	Count	20	7	27
	Row %	74.1%	25.9%	100.0%
Very Good	Count	9	1	10
	Row %	90.0%	10.0%	100.0%
Total	Count	42	20	62
	Row %	67.7%	32.3%	100.0%
Significance of Linear- by- Linear Association Chi-Square (Treating Comfort level as Ordinal)				0.001

Table-4a: Learnability of Writer, Calc and Impress

It is easy to find features and functionalities I need in Writer					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Count	10	12	3	32	6	63
%	15.9%	19.0%	4.8%	50.8%	9.5%	100.0%

It is easy to find features and functionalities I need in Calc					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Count	8	7	1	40	7	63
%	12.7%	11.1%	1.6%	63.5%	11.1%	100.0%

It is easy to find features and functionalities I need in Impress					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Count	13	5	2	30	13	63
%	20.6%	7.9%	3.2%	47.6%	20.6%	100.0%

Table-4b: Final Cluster Centers for Writer, Calc and Impress on Learnability Dimension

Final Cluster Centers			F test comparing Distance between clusters	
	Cluster			
	1	2	F	Sig.
It is easy to find features and functionalities I need in Writer	4	2	107.461	.000
It is easy to find features and functionalities I need in Calc	4	2	48.196	.000
It is easy to find features and functionalities I need in Impress	4	2	165.990	.000
Number of Cases	40	23		
	64%	36%		

Table-4c: Distribution of Participants by comfort level with MSO and Cluster membership on Learnability

		Cluster 1 'Agreement'	Cluster 2 'Disagreement'	Total
Poor	Count	0	7	7
	Row %	0.0%	100.0%	100.0%
Fair	Count	12	7	19
	Row %	63.2%	36.8%	100.0%

		Cluster 1 'Agreement'	Cluster 2 'Disagreement'	Total
Good	Count	19	8	27
	Row %	70.4%	29.6%	100.0%
Very Good	Count	9	1	10
	Row %	90.0%	10.0%	100.0%
Total	Count	40	23	63
	Row %	63.5%	36.5%	100.0%
Significance of Linear- by- Linear Association Chi-Square (Treating Comfort level as Ordinal)				0.001

Table-5a : Completeness of Writer, Calc and Impress

Writer is as good as Word					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Count	2	15	1	33	12	63
%	3.2%	23.8%	1.6%	52.4%	19.0%	100.0%

Calc is as good as Excel					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Count	10	6	2	35	10	63
%	15.9%	9.5%	3.2%	55.6%	15.9%	100.0%

Impress is as good as PowerPoint					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Count	10	2	8	38	5	63
%	15.9%	3.2%	12.7%	60.3%	7.9%	100.0%

Table-5b: Final Cluster Centers for Writer, Calc and Impress on Completeness Dimension

	Final Cluster Centers		F test comparing Distance between clusters	
	Cluster			
	Cluster 1 'Agreement'	Cluster 2 'Disagreement'	F	Sig.
Writer is as good as Word For my Needs related to Word Processing	4.27	1.94	360.122	.000
Calc is as good as Word For my Needs related to Word Processing	4.111	1.833	99.381	.000
Impress is as good as Word For my Needs related to Word Processing	3.98	2.00	78.707	.000
Number of Cases	45	18		
	71%	29%		

Table-5c: Distribution of Participants by comfort level with MSO and Cluster membership on Completeness

Comfort Level of Respondent with MSO and Cluster Membership				
		Cluster 1 'Agreement'	Cluster 2 'Disagreement'	Total
Poor	Count	0	7	7
	Row %	0.0%	100.0%	100.0%
Fair	Count	13	6	19
	Row %	68.4%	31.6%	100.0%

		Cluster 1 'Agreement'	Cluster 2 'Disagreement'	Total
Good	Count	22	5	27
	Row %	81.5%	18.5%	100.0%
Very Good	Count	10	0	10
	Row %	100.0%	0.0%	100.0%
Total	Count	45	18	63
	Row %	71.4%	28.6%	100.0%
Significance of Linear- by- Linear Association Chi-Square (Treating Comfort level as Ordinal)				0.000

ABOUT AUTHOR

Dr. Jignasu Yagnik is Associate Sr. Faculty at Entrepreneurship Development Institute of India.   He specializes in the areas of information technology and statistical analysis. His current research interests include; Open Source Applications, MIS, Database Management, IT Infrastructure Management, Data Mining, e-CRM, Programming, Quantitative Techniques, Research Methods and Data Analysis.