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    STATEMENT OF THE PROBLEM

    OBJECTIVES

    HYPOTHESES

    RESEARCH METHODOLOGY

    RESULTS & DISCUSSION

    FINDINGS

    RECOMMENDATIONS/SUGGESTIONS

    CONCLUSIONS

    SCOPE FOR FURTHER RESEARCH

    ACKNOWLEDGMENTS

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    APPENDIX/ANNEXURE

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CONTRIBUTIONS TO BOOKS
- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

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- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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FACTOR ANALYSIS OF DEFECTS IN SOFTWARE ENGINEERING

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ABSTRACT

Factor analysis has realistic and profound significance to improve the quality[6] and reliability of software. There is little research on the methods applied to software engineering to analyse defects. Two analyses are carried out in this paper. First analysis is by considering prior defect potential for ten versions of same software projects. Second analysis is for delivered defects taking [7]five different activities.

KEYWORDS
Correlation, defects, factor analysis.

INTRODUCTION
Quality analysis involves exploration of quality results using several metrics. Defect[1] potentials and defect removal efficiency are the primary metrics. Defect potential of a software project is the sum of the errors found in a)Requirements , b)design, c)coding, d)user documentation and e)Bad fixes errors introduced while repairing earlier defects[9]. Defects per function points is better than defects per kloc[8]. These analysis all are pointing defects prior and after software delivery.[2] Hence two similar analysis is carried out here for the delivered defects using factor analysis. Ten versions considered here are 1)Assembly 2) C, 3) Chill, 4)Pascal, 5) PL/I, 6)Ada83, 7) C++, 8)ADA95, 9)Objective and 10) Smalltalk taken from 2[2].

ANALYSIS
Data is standardized using normal distribution principle.
Correlation matrix is generated in table1 to analyze inter relationship among the factors under consideration. Orthogonal factor rotation method is the most popular rotation method of focusing on simplification of columns in factor matrix[4].

VARIMAX ROTATION[3]
This is an orthogonal rotation method that minimizes the number of variables that have high loadings on each factor4. Table A1
Table B1 represents Varimax rotation of defects prior and after delivery. A11 and B11 are corresponding rotation matrices. It simplifies the interpretation of the factors. Varimax method maximizes the sum of variances of required, loadings of the factor matrix. With the Varimax rotational approach, the interpretation is easiest, when the variable factor correlations are (1) close to either +1 or -1, indicating positive / negative association between the variable and the factor; or (2) close to 0 indicating a clear lack of association. Varimax gives a clearer separation of the factors. Varimax rotation tends to be more invariant than that obtained by the quartimax method when different subsets of variables are analyzed. The varimax method has proved successful as an analytic approach to obtaining an orthogonal rotation of factors. Same data is used considering ten versions for five different activities.

EQUIMAX ROTATION
The Equimax[5] approach is a compromise between the quartimax and varimax approaches. Rather than concentrating either on simplification of the rows or on simplification of the columns, it tries to accomplish some of each. Equimax has not gained wide spread acceptance and is used infrequently. Five different activities with ten versions considered. Table A2 and B2 represent Equimax rotation of defects prior and after delivery reapectively. A22 and B22 are corresponding rotation matrices.

QUARTIMAX ROTATION
The goal of a Quartimax4 rotation is to simplify the rows of a factor matrix. That is quartimax focuses on rotating the initial factor so that a variable loads high on one factor and as low as possible on all other factors. In these rotations, many variables can load high or near high on the same factor because the technique centers on simplifying the rows. The Quartimax method is not suitable to produce simpler structures. it involves dealing with cluster of variables; A method that tends to create a large general factor is not in line with the goals of rotation. Table A3 and B3 represents Equimax rotation of defects prior and after delivery. A33 and B33 are corresponding rotation matrices. Quartimax solution is analytically simpler than the varimax solution[6],[9]

CONCLUSION [3]
Correlation matrix is generated to analyze inter relationship among factors. Here two analysis are given. First analysis is pointing defects using five key parameters as factors for ten languages prior delivery. Second similar analysis is, defects after software delivery. The application of factor analysis produces reduction in the data dimensionality through the aggregation of variables in to a smaller set of uncorrelated factors. High degree of freedom involved in the available choices of methods and rotation methods in factor analysis.

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TABLES

Table A1	varimax	
0.0973	0.6579	0.0973
0.5132	-0.5181	0.5132
-0.8345	-0.2673	0.1655
0.0584	0.3948	0.0584
0.1655	-0.2673	-0.8345

Table A11		
0.9591	0.2626	0.1061
-0.2151	0.9191	-0.3301
-0.1841	0.2937	0.938

TableA2	equamax	
0.3881	0.3881	0.3881
0.1264	-0.8736	0.1264
-0.8736	0.1264	0.1264
0.2328	0.2328	0.2328
0.1264	0.1264	-0.8736

Tabe A22		
0.9429	-0.3206	0.0899
0.3004	0.9356	0.1855
-0.1436	-0.1479	0.9785

Table A3	Promax			
0	0	0	0	-1
0	0	0	0	0
-1	0	0	0	0
0	0	0	-1	0
0	0	-1	0	0

Table A33				
0.8529	-0.4106	-0.0001	-0.2	-0.2764
0.1208	0.756	0.0059	-0.3	-0.5516
-0.2304	-0.2347	0.8917	-0.2	-0.2666
0.3427	0.3427	0.3427	0.8	0.067
0.2956	0.2956	0.2956	-0.4	7374

	Correlation			
Req	1	0.9935	0.8608	1	0.9274
Design	0.9935	1	0.8383	0.9935	0.9095
Coding	0.8608	0.8383	1	0.8608	0.9887
Doc	1	0.9935	0.8608	1	0.9274
Bad fix	0.9274	0.9095	0.9887	0.9274	1

Factors	Table B1	varimax	
Req	0.0439	0.0238	0.8427
Design	-0.0014	-0.999	0.0214
Coding	-0.9955	0.0055	0.0361
Doc	0.0263	0.0143	0.5056
Bad fix	-0.0794	-0.034	0.1802

Table B11		
0.9723	0.1314	-0.1933
-0.2286	0.7066	-0.6697
0.0486	0.6953	0.7171

Factors	Table B2	equamax	
Req	0.0247	0.0161	0.8436
Design	-0.002	-0.999	0.0124
Coding	-0.9961	0.0055	0.0136
Doc	0.0148	0.0097	0.5062
Bad fix	-0.0835	-0.035	0.178

Table B22		
0.9765	0.1329	-0.1699
-0.2133	0.7127	-0.6683
0.0323	0.6888	0.7242

Factors	Table B3		promax		
Req	0	0	1	0	0
Design	0	-1	0	0	0
Coding	-1	0	0	0	0
Doc	0	0	0	0	-1
Bad fix	0	0	0	1	0

Table B33				
0.9742	0.1368	-0.117	-0.1164	0.0702
-0.2073	0.72	-0.558	-0.1262	0.3345
0.0186	0.6793	0.6229	0.1021	-0.3738
0.0871	0.0382	-0.151	0.9798	0.0904
0	0	0.145	0	0.8575

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With sincere regards

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Co-ordinator

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ABOUT THE JOURNAL

In this age of Commerce, Economics, Computer, I.T. & Management and cut throat competition, a group of intellectuals felt the need to have some platform, where young and budding managers and academicians could express their views and discuss the problems among their peers. This journal was conceived with this noble intention in view. This journal has been introduced to give an opportunity for expressing refined and innovative ideas in this field. It is our humble endeavour to provide a springboard to the upcoming specialists and give a chance to know about the latest in the sphere of research and knowledge. We have taken a small step and we hope that with the active co-operation of like-minded scholars, we shall be able to serve the society with our humble efforts.

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