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Opinion Survey on the Quality of Corrective Actions and Time provided to Customers versus Quality of Issues Description of Issues Raised in Mobile Terminals

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Abstract

This paper is an extension of the work presented in April at the ICEP 2006 conference [1]* An opinion survey on the response time and quality of corrective actions provided to the customers versus quality of the description of the issues raised by customers were conducted. It is important that the technical issues raised by mobile terminals users are resolved in time and that the corrective actions are of good quality. On the other hand, in order to help speed up the corrective actions, description of the technical issue needs to be as clear as possible from the first time the issue is raised. A partially or completely poorly described issue will result in a ping pong situation and leading to a high open time for the issue. Randomly, a batch of issues which had already been resolved, from the years 2004 to 2006 were collected from an in-built tool knowledge database known as GENIUS and were sent to customers to give their opinion on the time spent providing a solution and its quality. At the same time the same batch of issues had were also sent to the issue resolvers to obtain their opinion on the quality of the description of the issues raised by the same customers. The survey results has been analysed using suitable statistical methods, that has helped to establish a mathematical correlation and association between perceived quality of corrective action (OUTPUT) and quality of description and time spent to provide the solution (INPUTS). Based on the test statistic calculation results, conclusion of the survey was made.

1. Introduction

In this work 8 different customers were asked to evaluate the quality of the corrective actions to them and also the time spent on providing the corrective actions by upper levels (see figure 1 for levels). At the same time the same issues were sent to 8 different corresponding resolvers to evaluate the quality of the description provided by the customers. It is perceived that the better the description of the issues, the better is the quality of the provided corrective. In this paper this it has been shown statistically, that yes indeed good quality description

of the issues corresponds to better quality of the corrective actions. It has also been established that Quality of the corrective actions can still be good despite of the long resolution time.

2. Current state analysis

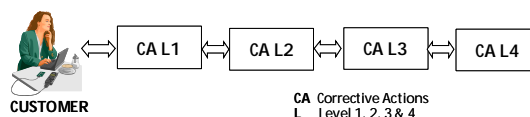


Fig. 1 A simplified issues escalation path Diagram

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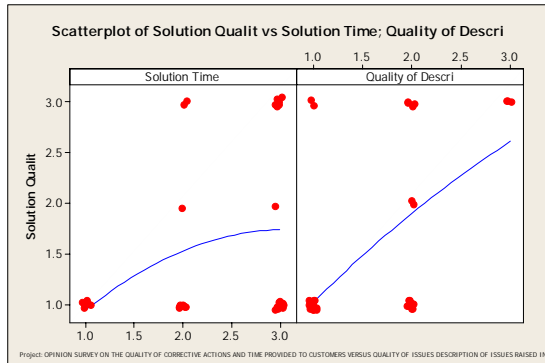


Fig.2 Scatter of Corrective actions Quality Time Vs Solution time; quality of description

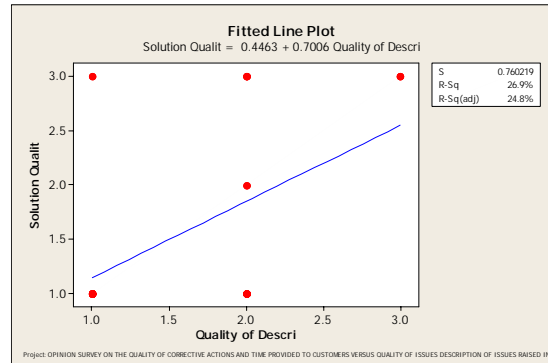


Fig 3. Regression Analysis: Solution Quality versus Quality of Description

ANALYSIS :

Correlation

Correlations: Solution Qualit; Quality of Descri; Solution Time; Times asked for m; RST

	Solution Qualit	Quality of Descri	Solution Time	Times asked for	RST
Quality of Descri	0.519 0.001				
Solution Time	0.307 0.068	0.220 0.197			
Times asked for	0.278 0.100	0.105 0.544	0.305 0.071		
RST	0.166 0.334	0.091 0.597	0.550 0.001	0.289 0.088	

Cell Contents: Pearson correlation
P-Value

Conclusion: Statistically significant correlation between Solution Quality and Quality of description

Regression Analysis

Regression Analysis: Solution Qualit versus Quality of Description

The regression equation is
Solution Qualit = 0.4463 + 0.7006 Quality of Descri

S = 0.760219 R-Sq = 26.9% R-Sq(adj) = 24.8%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	7.2392	7.23917	12.53	0.001
Error	34	19.6497	0.57793		
Total	35	26.8889			

Regression Analysis: Solution Time versus Quality of Description

The regression equation is
Solution Time = 1.977 + 0.2599 Quality of Descri

S = 0.758468 R-Sq = 4.8% R-Sq(adj) = 2.0%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	0.9962	0.996234	1.73	0.197
Error	34	19.5593	0.575274		
Total	35	20.5556			

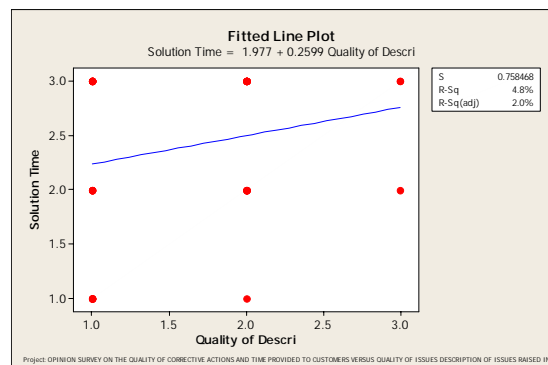


Fig.4 Regression Analysis: Solution Time versus Quality of Description

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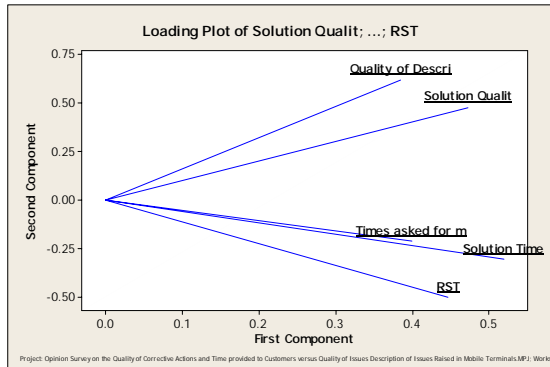


Fig. 5 Principal Component Analysis
RST = Resolution time for issues

Principal Component Analysis: Solution Qua; Solution Tim; Quality of D; Times asked ; RST

Eigenanalysis of the Correlation Matrix

Eigenvalue	2.1503	1.1831	0.7857	0.4553	0.4256
Proportion	0.430	0.237	0.157	0.091	0.085
Cumulative	0.430	0.667	0.824	0.915	1.000

Variable	PC1	PC2	PC3
Solution Qualit	0.473	0.478	-0.107
Solution Time	0.519	-0.303	0.320
Quality of Descri	0.384	0.621	0.210
Times asked for m	0.399	-0.211	-0.858
RST	0.447	-0.500	0.326

In Principal Component Analysis, first two components explain 66% of total variation in survey data. Eigenvalue of third component less than 1, so no additional components calculated.

Conclusion: Quality of Description is associated most with Solution Quality.

In Multiple Correspondence Analysis, first two components explain 52% of total variation in survey data.

Multiple Correspondence Analysis: Solution Qua; Solution Tim; Quality of Description

Analysis of Indicator Matrix

Axis	Inertia	Proportion	Cumulative	Histogram
1	0.5881	0.2941	0.2941	*****
2	0.4548	0.2274	0.5215	*****
3	0.3284	0.1642	0.6857	*****
4	0.2669	0.1335	0.8192	*****
5	0.2228	0.1114	0.9306	*****
6	0.1389	0.0694	1.0000	*****
Total	2.0000			

Column Contributions

ID	Name	Qual	Mass	Inert	Component 1		Component 2			
					Coord	Contr	Coord	Contr		
1	Q1	0.692	0.231	0.031	-0.552	0.691	0.120	0.014	0.000	0.000
2	Q2	0.543	0.019	0.157	0.827	0.060	0.022	2.925	0.503	0.348
3	Q3	0.765	0.083	0.125	1.348	0.606	0.258	-0.690	0.159	0.087
4	T1	0.437	0.056	0.139	-1.379	0.380	0.180	-0.533	0.057	0.035
5	T2	0.184	0.093	0.120	0.134	0.007	0.003	0.678	0.177	0.094
6	T3	0.190	0.185	0.074	0.347	0.150	0.038	-0.179	0.040	0.013
7	D1	0.635	0.167	0.083	-0.681	0.464	0.131	-0.414	0.171	0.063
8	D2	0.586	0.139	0.097	0.392	0.110	0.036	0.817	0.476	0.204
9	D3	0.644	0.028	0.193	2.125	0.410	0.213	-1.601	0.233	0.157

Supplementary Columns

ID	Name	Qual	Mass	Inert	Component 1		Component 2			
					Coord	Contr	Coord	Contr		
1	0	0.072	0.065	0.134	-0.185	0.008	0.004	0.516	0.064	0.038
2	1	0.119	0.074	0.130	-0.612	0.107	0.047	-0.203	0.012	0.007
3	2	0.125	0.065	0.134	0.691	0.115	0.053	-0.197	0.009	0.006
4	3	0.032	0.037	0.148	-0.325	0.013	0.007	-0.392	0.019	0.013
5	4	0.081	0.065	0.134	-0.077	0.001	0.001	0.575	0.080	0.047
6	5	0.035	0.009	0.162	0.575	0.009	0.005	-0.940	0.025	0.018
7	6	0.159	0.009	0.162	2.045	0.119	0.066	-1.182	0.040	0.028
8	7	0.035	0.009	0.162	0.575	0.009	0.005	-0.940	0.025	0.018

Conclusions:

Quality of Description is associated most with perceived Solution Quality.
Resolution time is associated with perceived Solution Quality.
1 time of asking more information is tolerated without effecting perceived Solution Quality.

Multiple Correspondence Analysis

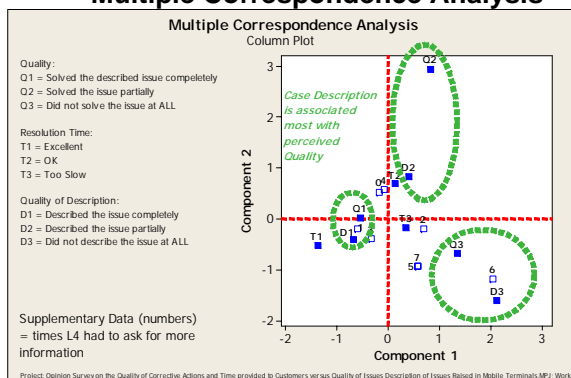


Figure 6: Multiple Correspondence Analysis

Final words: In this work different statistical methods were used, correlation, regression, Principal Component Analysis and Multiple Correspondence Analysis. All led to the same conclusion: Quality of Description is associated most with perceived Solution Quality. All mentioned, good descriptions in issues provides faster solution times and better solution quality.

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References

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Analysis of Corrective Action's Quality provided to Customers with Mobile Terminals Using Self-Organizing Maps ICEP 2007
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