

# Requirement Validation with Stakeholders: An Experiment to Study the Pertinence of Comments

## Data analysis

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## 1 Analysis of Pertinence

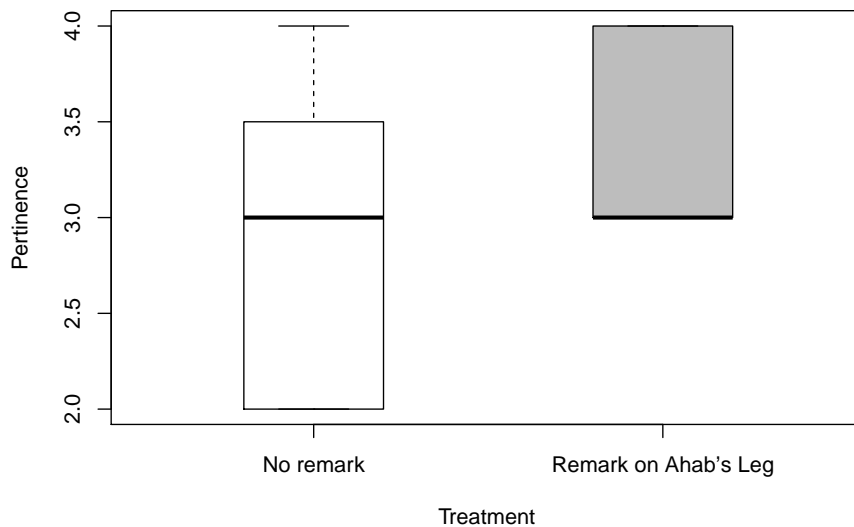


Figure 1: Boxplot of Pertinence.

	name	mean	median	sd	p.value	effect.size
1	No mention	2.82	3.00	0.87		
2	Mention to A.L.	3.45	3.00	0.52		
3	Difference	0.64	1.00	1.12	0.049	0.57

Table 1: Descriptive statistics and paired analysis of pertinence of comments (Mann-Whitney's test).

## 2 Analysis of Secondary-Factors and Co-factors

Co-factor $C_i$	p-value influence	p-value interaction
Lab	0.95	0.46
Application	0.92	0.36
Scenario	0.30	0.56
Question kind	0.20	0.79
Merit	0.59	0.18
Background	0.84	0.92
Re.Experience	0.91	0.57
Dev.Experience	0.91	0.57

Table 2: Two-way ANOVA of Pertinence of comments by Treatment & co-factor  $C_i$

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Treatment	1	2.23	2.23	3.40	0.0864
Lab	1	0.00	0.00	0.00	0.9579
Application	1	0.01	0.01	0.01	0.9107
Treatment:Lab	1	0.32	0.32	0.49	0.4959
Treatment:Application	1	0.33	0.33	0.50	0.4906
Lab:Application	1	0.46	0.46	0.70	0.4164
Treatment:Lab:Application	1	0.08	0.08	0.12	0.7336
Residuals	14	9.17	0.65		

Table 3: ANOVA of Pertinence of comments by Treatment, Lab & System

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Treatment	1	2.23	2.23	3.99	0.0610
Lab	1	0.00	0.00	0.00	0.9542
Treatment:Lab	1	0.32	0.32	0.57	0.4586
Residuals	18	10.04	0.56		

Table 4: ANOVA of Pertinence of comments by Treatment & Lab

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Treatment	1	2.23	2.23	4.06	0.0590
Application	1	0.01	0.01	0.01	0.9174
Treatment:Application	1	0.49	0.49	0.90	0.3565
Residuals	18	9.87	0.55		

Table 5: ANOVA of Pertinence of comments by Treatment & System

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Treatment	1	2.23	2.23	4.35	0.0514
Merit	1	0.15	0.15	0.30	0.5907
Treatment:Merit	1	1.00	1.00	1.96	0.1787
Residuals	18	9.21	0.51		

Table 6: ANOVA of Pertinence of comments by Treatment & Merit

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Treatment	1	2.23	2.23	3.88	0.0645
Background	1	0.02	0.02	0.04	0.8395
Treatment:Background	1	0.01	0.01	0.01	0.9193
Residuals	18	10.33	0.57		

Table 7: ANOVA of Pertinence of comments by Treatment & Background

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Treatment	1	2.23	2.23	3.94	0.0625
Re.Experience	1	0.01	0.01	0.01	0.9091
Treatment:Re.Experience	1	0.19	0.19	0.34	0.5697
Residuals	18	10.17	0.56		

Table 8: ANOVA of Pertinence of comments by Treatment & Requirement Experience

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Treatment	1	2.23	2.23	3.94	0.0625
Dev.Experience	1	0.01	0.01	0.01	0.9091
Treatment:Dev.Experience	1	0.19	0.19	0.34	0.5697
Residuals	18	10.17	0.56		

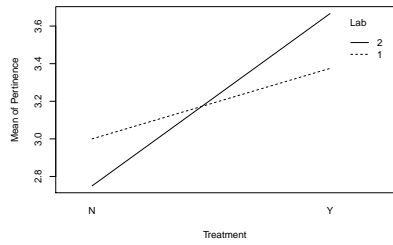
Table 9: ANOVA of Pertinence of comments by Treatment & Development Experience

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
treatment	1	0.56	0.56	3.32	0.0721
scenario	1	0.18	0.18	1.10	0.2980
treatment:scenario	1	0.06	0.06	0.34	0.5623
Residuals	84	14.10	0.17		

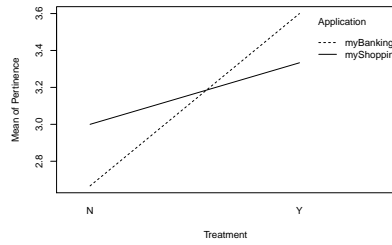
Table 10: ANOVA of Pertinence of comments by Treatment & Scenario

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
treatment	1	0.56	0.56	3.33	0.0716
kind	1	0.28	0.28	1.70	0.1960
treatment:kind	1	0.01	0.01	0.07	0.7950
Residuals	84	14.05	0.17		

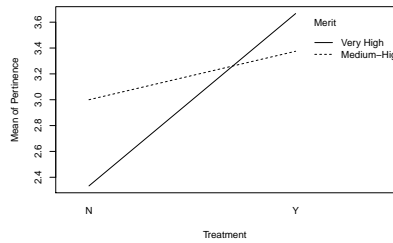
Table 11: ANOVA of Pertinence of comments by Treatment & Kind of question



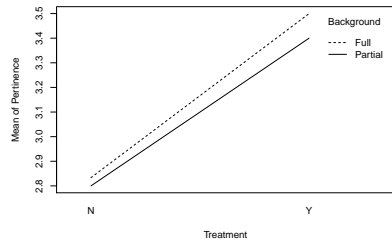
(a) Treatment & Lab



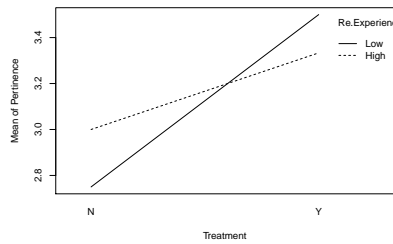
(b) Treatment & System



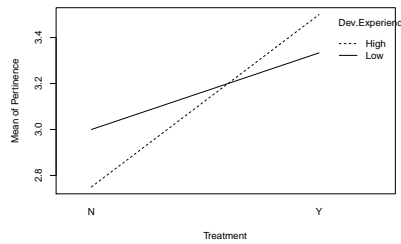
(c) Treatment & Merit



(d) Treatment & background



(e) Treatment & Requirement Experience



(f) Treatment & Development Experience

Figure 2: Interaction plots of pertinence of comments.

### 3 Analysis of post-questionnaire

Question	Median	Meaning	P-value
Q <sub>1</sub>	2	Strongly agree	< <b>0.01</b>
Q <sub>2</sub>	1	Agree	< <b>0.01</b>
Q <sub>3</sub>	1	Agree	<b>0.01</b>
Q <sub>4</sub>	1	Agree	< <b>0.01</b>
Q <sub>5</sub>	0	Not certain	0.12
Q <sub>6</sub>	1	Agree	0.17

Table 12: Analysis of post quest. Mann-Whitney test for the null hypothesis  $median(Qx) \leq 0$