CHAPTER VI

CONCLUSION AND SUGGESTION

6.1. Conclusion

1. The main problem in the display of "Kumala" shuttlecocks is in the cap design which is not comfortable for the customer.
2. The attributes which influence customer satisfaction:
   a. Easiness to open
   b. Easiness to close
   c. Finger comfort in opening and closing
   d. Hand movement comfort
   e. Form of cap
   f. Cap material
   g. Cap product manufacturing smoothness
   h. Emboss of logo or product name
   i. Cap grip strength towards the package
3. Based on the questionnaires, the best new design for the "Kumala" shuttlecocks is prototype C with the score ranking of AHP is 0.3889. The new design of the cap is designed based on the prototype C main design.

6.2. Suggestion for the Next Research

In this research, the writer focused the objective to the redesign of the new cap. The writer realizes that this research is still far from perfect, because the research is only focused in the cap design. For the next research, the writer suggests the redesign of overall display of "Kumala" shuttlecocks, by considering cost analysis, or design of shuttlecock product itself.

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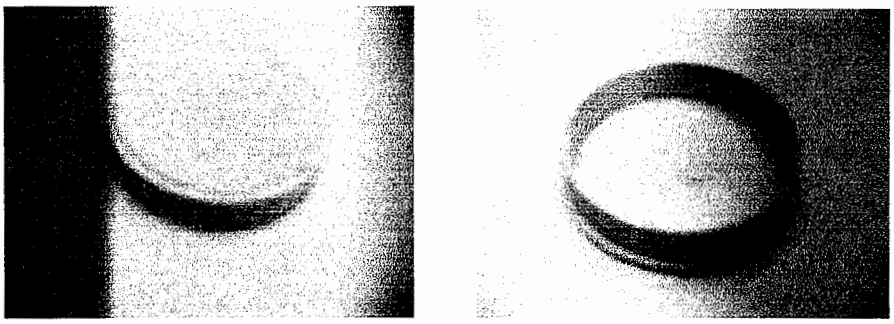
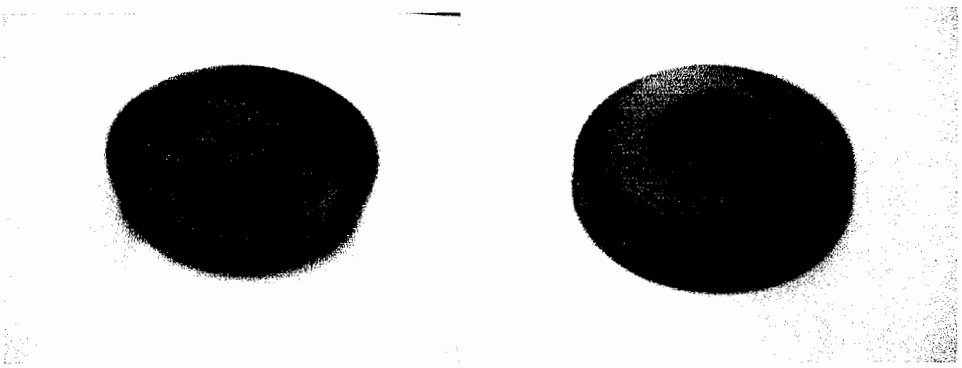
Appendix A: First Questionnaire Pictures

"Kumala" Package Display

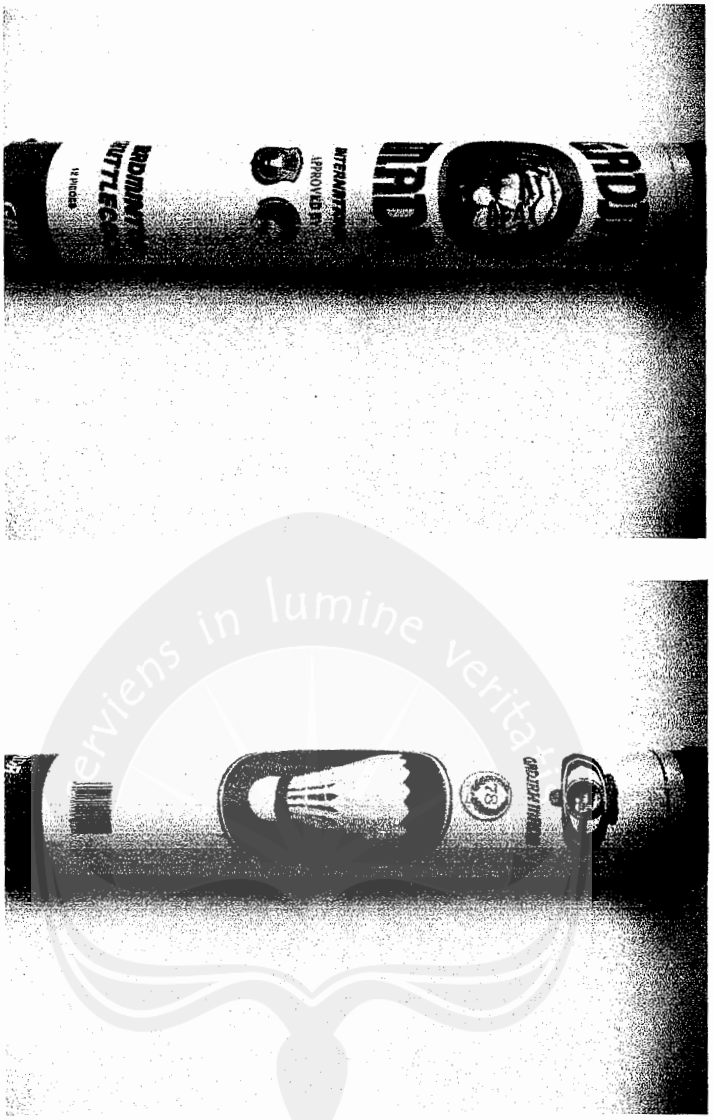


"Kumala" Cap Design

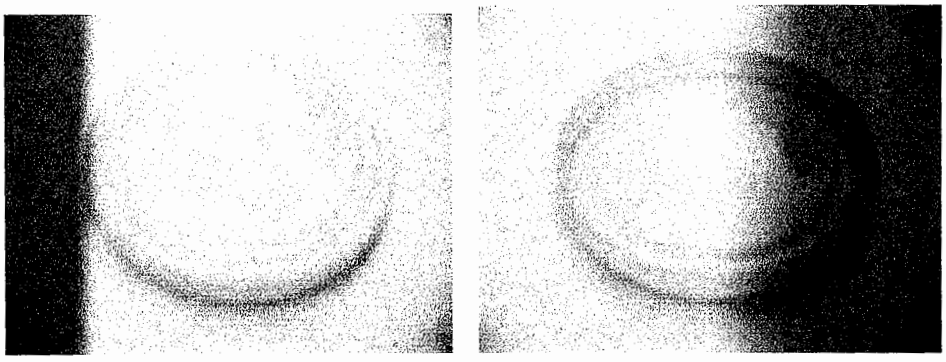
"Romeo" Package Display



"Romeo" Cap Design



"Gadjah Mada" Cap Display



"Gadjah Mada" Cap Design

Appendix B: First Questionnaire Result

B.1. Questionnaire Format

Kuesioner Tugas Akhir

Dengan tujuan untuk menyelesaikan perkuliahan penulis di Program Studi Teknik Industri kelas Internasional, Fakultas Teknologi Industri, Universitas Atma Jaya Yogyakarta, penulis bermaksud melakukan penelitian untuk Tugas Akhir dengam judul "DESIGN OF "KUMALA" SHUTTLECOCK PACKAGE USING RATIONAL DESIGN METHOD". Saya:

Nama : Jimmy Kurniawan

NIM : 03690

Meminta bantuan anda untuk menjawab beberapa pertanyaan. Semua pertanyaan hanya akan digunakan dalam penelitian ini, dan kerahasiaan jawaban akan dijamin. Sebelum dan sesudah mengisi kuesioner ini, penulis mengucapkan banyak terima kasih atas perhatiannya.

Pengujian dan pengisian kuesioner ini terbagi menjadi 2 tahap, tahap pertama adalah pengujian Blind Test, pengujian perbandingan produk yang akan didesain dengan produk kompetitor dengan terlebih dahulu menghilangkan label merek masing-masing produk. Setelah melakukan pengujian, anda diharapkan menjawab kuesioner. Tahap kedua adalah perbandingan penampilan produk dengan kompetitor. Tahap ini dilakukan tanpa Blind Test.

1. Tahap I

   Pada bagian ini, pertanyaan difokuskan pada atribut desain tutup kemasan 3 produk yang berbeda. Masing-masing label produk telah ditutup, dan diwakili oleh huruf A, B, dan C untuk masing2 produk.

   Instruksi: Berilah nilai skala prioritas (1-3) di attribut yang telah diberikan. Skala 1 berarti baik, skala 2 berarti sedang, skala 3 berarti kurang baik, di antara 3 produk yang diperbandingkan.

Atribut Tutup	A	B	C
Kemudahan membuka tutup			
Kemudahan menutup kembali			
Kenyamanan jari dalam membuka			
Kekencangan tutup terhadap tabung			

2. Bagian II

Pada bagian ini, pertanyaan difokuskan pada tampilan label beberapa produk shuttlecock.

Instruksi: Berilah nilai skala prioritas (1-3) di attribut yang telah diberikan. Skala 1 berarti baik, skala 2 berarti sedang, skala 3 berarti kurang baik, di antara 3 produk yang diperbandingkan.

Atribut Label	X	Y	Z
Penampilan label keseluruhan			
Identitas/merk			
Kombinasi warna			
Kombinasi huruf			
Kejelasan identitas produsen			
Tampilan logo			
Tambahan informasi			

X: Kumala

Y: Romeo

Z: Gadjah Mada

B.2. "Kumala" Performance Questionnaires Result (Qualitative Data)

Respondent	1	2	3	4	5	6	7	8	9	10	11
1	Best	Worst	Medium	Best	Medium	Worst	Best	Medium	Medium	Best	Medium
2	Worst	Worst	Worst	Worst	Worst	Worst	Worst	Worst	Worst	Worst	Worst
3	Worst	Worst	Medium	Best	Worst	Medium	Medium	Worst	Worst	Worst	Medium
4	Worst	Worst	Worst	Best	Medium	Worst	Worst	Medium	Worst	Worst	Medium
5	Worst	Worst	Worst	Best	Medium	Worst	Medium	Worst	Worst	Worst	Medium
6	Worst	Medium	Medium	Best	Best	Best	Best	Medium	Worst	Best	Medium
7	Medium	Best	Worst	Best	Best	Best	Medium	Best	Medium	Best	Medium
8	Medium	Worst	Medium	Best	Best	Best	Best	Worst	Worst	Best	Medium
9	Worst	Worst	Worst	Best	Worst	Best	Medium	Medium	Worst	Worst	Medium
10	Worst	Worst	Worst	Worst	Worst	Worst	Worst	Worst	Worst	Worst	Worst
11	Worst	Worst	Worst	Best	Worst	Medium	Medium	Medium	Worst	Worst	Best
12	Worst	Worst	Worst	Best	Worst	Medium	Medium	Medium	Worst	Medium	Medium
13	Worst	Medium	Worst	Best	Medium	Worst	Medium	Medium	Medium	Medium	Best
14	Worst	Medium	Worst	Best	Medium	Worst	Medium	Medium	Worst	Medium	Medium
15	Worst	Worst	Worst	Medium	Medium	Worst	Medium	Worst	Worst	Medium	Medium
16	Worst	Worst	Worst	Medium	Medium	Medium	Medium	Best	Medium	Worst	Medium
17	Medium	Worst	Worst	Best	Medium	Worst	Medium	Best	Worst	Best	Medium
18	Worst	Worst	Worst	Best	Medium	Worst	Worst	Worst	Worst	Worst	Medium
19	Worst	Worst	Worst	Best	Worst	Medium	Worst	Medium	Medium	Medium	Worst
20	Worst	Worst	Worst	Best	Medium	Medium	Medium	Medium	Medium	Medium	Medium
21	Worst	Worst	Worst	Best	Worst	Worst	Worst	Worst	Worst	Worst	Worst
22	Worst	Worst	Worst	Best	Best	Best	Best	Best	Best	Worst	Medium
23	Worst	Worst	Worst	Medium	Worst	Worst	Worst	Medium	Worst	Worst	Worst
24	Worst	Worst	Worst	Best	Worst	Worst	Medium	Worst	Medium	Worst	Medium
25	Medium	Worst	Worst	Best	Medium	Medium	Medium	Medium	Medium	Medium	Medium
26	Medium	Worst	Worst	Medium	Medium	Best	Medium	Best	Best	Medium	Medium

27	Worst	Medium	Worst	Best	Medium	Worst	Medium	Medium	Worst	Worst	Worst
28	Worst	Medium	Worst	Best	Medium	Medium	Medium	Best	Medium	Worst	Medium
29	Worst	Worst	Worst	Best	Medium	Worst	Best	Best	Worst	Best	Medium
30	Worst	Worst	Worst	Best	Medium	Best	Medium	Medium	Worst	Best	Medium

B.3. "Kumala" Performance Questionnaires Result (Quantitative Data)

Respondent	1	2	3	4	5	6	7	8	9	10	11	Sum	Category
1	3	1	2	3	2	1	3	2	2	3	2	24	3
2	1	1	1	1	1	1	1	1	1	1	1	11	1
3	1	1	2	3	1	2	2	1	1	1	2	17	2
4	1	1	1	3	2	1	1	2	1	1	2	16	2
5	1	1	1	3	2	1	2	1	1	1	2	16	2
6	1	2	2	3	3	3	3	2	1	3	2	25	3
7	2	3	1	3	3	3	2	3	2	3	2	27	3
8	2	1	2	3	3	3	3	1	1	3	2	24	3
9	1	1	1	3	1	3	2	2	1	1	2	18	2
10	1	1	1	1	1	1	1	1	1	1	1	11	1
11	1	1	1	3	1	2	2	2	1	1	3	18	2
12	1	1	1	3	1	2	2	2	1	2	2	18	2
13	1	2	1	3	2	1	2	2	2	2	3	21	2
14	1	2	1	3	2	1	2	2	1	2	2	19	2
15	1	1	1	2	2	1	2	1	1	2	2	16	2
16	1	1	1	2	2	2	2	3	2	1	2	19	2
17	2	1	1	3	2	1	2	3	1	3	2	21	2
18	1	1	1	3	2	1	1	1	1	1	2	15	1
19	1	1	1	3	1	2	1	2	2	2	1	17	2
20	1	1	1	3	2	2	2	2	2	2	2	20	2

21	1	1	1	3	1	1	1	1	1	1	1	13	1
22	1	1	1	3	3	3	3	3	3	1	2	24	3
23	1	1	1	2	1	1	1	2	1	1	1	13	1
24	1	1	1	3	1	1	2	1	2	1	2	16	2
25	2	1	1	3	2	2	2	2	2	2	2	21	2
26	2	1	1	2	2	3	2	3	3	2	2	23	3
27	1	2	1	3	2	1	2	2	1	1	1	17	2
28	1	2	1	3	2	2	2	3	2	1	2	21	2
29	1	1	1	3	2	1	3	3	1	3	2	21	2
30	1	1	1	3	2	3	2	2	1	3	2	21	2
Sum												563	
Mean	1.233	1.233	1.133	2.733	1.800	1.733	1.933	1.933	1.433	1.733	1.867		

B.4. "Romeo" Performance Questionnaires Result (Qualitative Data)

Respondent	1	2	3	4	5	6	7	8	9	10	11
1	Medium	Best	Best	Medium	Best	Best	Medium	Best	Best	Medium	Best
2	Medium	Medium	Medium	Best	Medium	Medium	Medium	Medium	Best	Medium	Medium
3	Medium	Medium	Worst	Worst	Medium	Best	Worst	Best	Best	Best	Worst
4	Medium	Medium	Medium	Medium	Best	Medium	Medium	Worst	Medium	Medium	Worst
5	Medium	Medium	Medium	Medium	Worst	Best	Worst	Medium	Medium	Best	Worst
6	Medium	Worst	Worst	Medium	Medium	Worst	Worst	Worst	Medium	Worst	Worst
7	Worst	Medium	Medium	Medium	Worst	Medium	Worst	Worst	Best	Worst	Worst
8	Worst	Medium	Worst	Worst	Worst	Worst	Worst	Medium	Medium	Medium	Worst
9	Best	Best	Medium	Medium	Medium	Worst	Worst	Worst	Best	Best	Worst
10	Medium	Medium	Medium	Best	Medium	Medium	Medium	Medium	Medium	Medium	Medium
11	Medium	Best	Medium	Medium	Medium	Worst	Worst	Worst	Medium	Medium	Worst
12	Medium	Medium	Medium	Medium	Medium	Worst	Worst	Worst	Best	Worst	Worst
13	Best	Worst	Best	Medium	Worst	Medium	Worst	Worst	Worst	Best	Medium
14	Medium	Worst	Medium	Medium	Worst	Medium	Worst	Worst	Medium	Worst	Worst
15	Medium	Best	Medium	Worst	Worst	Medium	Worst	Medium	Medium	Worst	Worst
16	Medium	Medium	Medium	Best	Worst	Worst	Worst	Medium	Best	Medium	Worst
17	Best	Medium	Medium	Medium	Worst	Best	Worst	Medium	Medium	Medium	Worst
18	Medium	Medium	Medium	Medium	Worst	Medium	Medium	Medium	Best	Medium	Worst
19	Medium	Best	Medium	Medium	Medium	Worst	Best	Worst	Worst	Worst	Medium
20	Medium	Medium	Medium	Medium	Worst	Worst	Worst	Worst	Worst	Worst	Worst
21	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
22	Medium	Medium	Medium	Medium	Worst	Worst	Worst	Worst	Medium	Medium	Worst
23	Medium	Medium	Medium	Best	Medium	Medium	Medium	Best	Medium	Medium	Best
24	Medium	Best	Medium	Medium	Medium	Best	Worst	Best	Worst	Medium	Worst
25	Worst	Medium	Medium	Worst	Worst	Worst	Worst	Worst	Worst	Worst	Worst
26	Worst	Medium	Medium	Best	Worst	Worst	Worst	Worst	Medium	Best	Worst

27	Medium	Medium	Medium	Medium	Worst	Medium	Worst	Worst	Medium	Medium	Medium
28	Medium	Best	Medium	Medium	Worst	Best	Worst	Worst	Best	Medium	Worst
29	Best	Medium	Medium	Medium	Worst	Medium	Worst	Worst	Medium	Medium	Worst
30	Medium	Medium	Medium	Medium	Worst	Medium	Worst	Worst	Medium	Worst	Worst

B.5. "Romeo" Performance Questionnaires Result (Quantitative Data)

Respondent	1	2	3	4	5	6	7	8	9	10	11	Sum	Category
1	2	3	3	2	3	3	2	3	3	2	3	29	4
2	2	2	2	3	2	2	2	2	3	2	2	24	3
3	2	2	1	1	2	3	1	3	3	3	1	22	3
4	2	2	2	2	3	2	2	1	2	2	1	21	2
5	2	2	2	2	1	3	1	2	2	3	1	21	2
6	2	1	1	2	2	1	1	1	2	1	1	15	1
7	1	2	2	2	1	2	1	1	3	1	1	17	2
8	1	2	1	1	1	1	1	2	2	2	1	15	1
9	3	3	2	2	2	1	1	1	3	3	1	22	3
10	2	2	2	3	2	2	2	2	2	2	2	23	3
11	2	3	2	2	2	1	1	1	2	2	1	19	2
12	2	2	2	2	2	1	1	1	3	1	1	18	2
13	3	1	3	2	1	2	1	1	1	3	2	20	2
14	2	1	2	2	1	2	1	1	2	1	1	16	1
15	2	3	2	1	1	2	1	2	2	1	1	18	2
16	2	2	2	3	1	1	1	2	3	2	1	20	2
17	3	2	2	2	1	3	1	2	2	2	1	21	2
18	2	2	2	2	1	2	2	2	3	2	1	21	2
19	2	3	2	2	2	1	3	1	1	1	2	20	2
20	2	2	2	2	1	1	1	1	1	1	1	15	1
21	2	2	2	2	2	2	2	2	2	2	2	22	3

22	2	2	2	2	1	1	1	1	2	2	1	17	2
23	2	2	2	3	2	2	2	3	2	2	3	25	3
24	2	3	2	2	2	3	1	3	1	2	1	22	3
25	1	2	2	1	1	1	1	1	1	1	1	13	1
26	1	2	2	3	1	1	1	1	2	3	1	18	2
27	2	2	2	2	1	2	1	1	2	2	2	19	2
28	2	3	2	2	1	3	1	1	3	2	1	21	2
29	3	2	2	2	1	2	1	1	2	2	1	19	2
30	2	2	2	2	1	2	1	1	2	1	1	17	2
												590	
Sum	2.000	2.133	1.967	2.033	1.500	1.833	1.300	1.567	2.133	1.867	1.333		

B.6. "Gadjah Mada" Performance Questionnaires Result (Qualitative Data)

Respondent	1	2	3	4	5	6	7	8	9	10	11
1	Worst	Medium	Worst	Worst	Worst	Medium	Worst	Worst	Worst	Worst	Worst
2	Best	Best	Best	Medium	Best	Best	Best	Best	Medium	Best	Best
3	Best	Best	Best	Medium	Best	Worst	Best	Medium	Medium	Medium	Best
4	Best	Best	Best	Worst	Worst	Best	Best	Best	Best	Best	Best
5	Best	Best	Best	Worst	Best	Medium	Best	Best	Best	Medium	Best
6	Best	Best	Best	Worst	Worst	Medium	Medium	Best	Best	Medium	Best
7	Best	Worst	Best	Worst	Medium	Worst	Best	Medium	Worst	Medium	Best
8	Best	Best	Best	Medium	Medium	Medium	Medium	Best	Best	Worst	Best
9	Medium	Medium	Best	Worst	Best	Medium	Best	Best	Medium	Medium	Best
10	Best	Best	Best	Medium	Best	Best	Best	Best	Best	Best	Best
11	Best	Medium	Best	Worst	Best	Best	Best	Best	Best	Best	Medium
12	Best	Best	Best	Worst	Best	Best	Best	Best	Medium	Best	Best
13	Medium	Best	Medium	Worst	Best	Best	Best	Best	Best	Worst	Worst
14	Best	Best	Best	Worst	Best	Best	Best	Best	Best	Best	Best
15	Best	Medium	Best	Best	Best	Best	Best	Best	Best	Best	Best
16	Best	Best	Best	Worst	Best	Best	Best	Worst	Worst	Best	Best
17	Worst	Best	Best	Worst	Best	Medium	Best	Worst	Best	Worst	Best
18	Best	Best	Best	Worst	Best	Best	Best	Best	Medium	Best	Best
19	Best	Medium	Best	Worst	Best	Best	Medium	Best	Best	Best	Best
20	Best	Best	Best	Worst	Best	Best	Best	Best	Best	Best	Best
21	Best	Best	Best	Worst	Best	Best	Best	Best	Best	Best	Best
22	Best	Best	Best	Worst	Medium	Medium	Medium	Medium	Worst	Best	Best
23	Best	Best	Best	Worst	Best	Best	Best	Worst	Best	Best	Medium
24	Best	Medium	Best	Worst	Best	Medium	Best	Medium	Best	Best	Best

25	Best	Best	Best	Medium	Best	Best	Best	Best	Best	Best	Best
26	Best	Best	Best	Worst	Best	Medium	Best	Medium	Worst	Worst	Best
27	Best	Best	Best	Worst	Best	Best	Best	Best	Best	Best	Best
28	Best	Worst	Best	Worst	Best	Worst	Best	Medium	Worst	Best	Best
29	Medium	Best	Best	Worst	Best	Best	Medium	Medium	Best	Worst	Best
30	Best	Best	Best	Worst	Best	Worst	Best	Best	Best	Medium	Best

B.7. "Gadjah Mada" Performance Questionnaires Result (Quantitative Data)

Respondent	1	2	3	4	5	6	7	8	9	10	11	Y	Category
1	1	2	1	1	1	2	1	1	1	1	1	13	1
2	3	3	3	2	3	3	3	3	2	3	3	31	4
3	3	3	3	2	3	1	3	2	2	2	3	27	3
4	3	3	3	1	1	3	3	3	3	3	3	29	4
5	3	3	3	1	3	2	3	3	3	2	3	29	4
6	3	3	3	1	1	2	2	3	3	2	3	26	3
7	3	1	3	1	2	1	3	2	1	2	3	22	3
8	3	3	3	2	2	2	2	3	3	1	3	27	3
9	2	2	3	1	3	2	3	3	2	2	3	26	3
10	3	3	3	2	3	3	3	3	3	3	3	32	4
11	3	2	3	1	3	3	3	3	3	3	2	29	4
12	3	3	3	1	3	3	3	3	2	3	3	30	4
13	2	3	2	1	3	3	3	3	3	1	1	25	3
14	3	3	3	1	3	3	3	3	3	3	3	31	4
15	3	2	3	3	3	3	3	3	3	3	3	32	4
16	3	3	3	1	3	3	3	1	1	3	3	27	3
17	1	3	3	1	3	2	3	1	3	1	3	24	3
18	3	3	3	1	3	3	3	3	2	3	3	30	4
19	3	2	3	1	3	3	2	3	3	3	3	29	4

20	3	3	3	1	3	3	3	3	3	3	3	31	4
21	3	3	3	1	3	3	3	3	3	3	3	31	4
22	3	3	3	1	2	2	2	2	1	3	3	25	3
23	3	3	3	1	3	3	3	1	3	3	2	28	4
24	3	2	3	1	3	2	3	2	3	3	3	28	4
25	3	3	3	2	3	3	3	3	3	3	3	32	4
26	3	3	3	1	3	2	3	2	1	1	3	25	3
27	3	3	3	1	3	3	3	3	3	3	3	31	4
28	3	1	3	1	3	1	3	2	1	3	3	24	3
29	2	3	3	1	3	3	2	2	3	1	3	26	3
30	3	3	3	1	3	1	3	3	3	2	3	28	4
Sum												828	
Mean	2.767	2.667	2.900	1.233	2.700	2.433	2.767	2.500	2.433	2.400	2.800		

Appendix C: Tests for First Questionnaire: "Kumala" Performance

C.1. Validity Tests for "Kumala" performance

Attribute 1: Easiness to open

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	24	576	72
2	1	1	11	121	11
3	1	1	17	289	17
4	1	1	16	256	16
5	1	1	16	256	16
6	1	1	25	625	25
7	2	4	27	729	54
8	2	4	24	576	48
9	1	1	18	324	18
10	1	1	11	121	11
11	1	1	18	324	18
12	1	1	18	324	18
13	1	1	21	441	21
14	1	1	19	361	19
15	1	1	16	256	16
16	1	1	19	361	19
17	2	4	21	441	42
18	1	1	15	225	15
19	1	1	17	289	17
20	1	1	20	400	20
21	1	1	13	169	13
22	1	1	24	576	24
23	1	1	13	169	13
24	1	1	16	256	16
25	2	4	21	441	42
26	2	4	23	529	46
27	1	1	17	289	17
28	1	1	21	441	21
29	1	1	21	441	21
30	1	1	21	441	21
Sum	37	53	563	11047	727

Rxy= 0.54801 Varians= 0.24556

Attribute 2: Easiness to close

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	1	1	24	576	24
2	1	1	11	121	11
3	1	1	17	289	17
4	1	1	16	256	16
5	1	1	16	256	16
6	2	4	25	625	50
7	3	9	27	729	81
8	1	1	24	576	24
9	1	1	18	324	18
10	1	1	11	121	11
11	1	1	18	324	18
12	1	1	18	324	18
13	2	4	21	441	42
14	2	4	19	361	38
15	1	1	16	256	16
16	1	1	19	361	19
17	1	1	21	441	21
18	1	1	15	225	15
19	1	1	17	289	17
20	1	1	20	400	20
21	1	1	13	169	13
22	1	1	24	576	24
23	1	1	13	169	13
24	1	1	16	256	16
25	1	1	21	441	21
26	1	1	23	529	23
27	2	4	17	289	34
28	2	4	21	441	42
29	1	1	21	441	21
30	1	1	21	441	21
Sum	37	53	563	11047	720

Rxy 0.43046 Varians= 0.24556

Attribute 3: Finger Comfort in opening and closing the cap

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	24	576	48
2	1	1	11	121	11
3	2	4	17	289	34

4	1	1	16	256	16
5	1	1	16	256	16
6	2	4	25	625	50
7	1	1	27	729	27
8	2	4	24	576	48
9	1	1	18	324	18
10	1	1	11	121	11
11	1	1	18	324	18
12	1	1	18	324	18
13	1	1	21	441	21
14	1	1	19	361	19
15	1	1	16	256	16
16	1	1	19	361	19
17	1	1	21	441	21
18	1	1	15	225	15
19	1	1	17	289	17
20	1	1	20	400	20
21	1	1	13	169	13
22	1	1	24	576	24
23	1	1	13	169	13
24	1	1	16	256	16
25	1	1	21	441	21
26	1	1	23	529	23
27	1	1	17	289	17
28	1	1	21	441	21
29	1	1	21	441	21
30	1	1	21	441	21
sum	34	42	563	11047	653

Rxy 0.36556 Varians= 0.11556

Attribute 4: The cap grip strength towards the package

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	24	576	72
2	1	1	11	121	11
3	3	9	17	289	51
4	3	9	16	256	48
5	3	9	16	256	48
6	3	9	25	625	75
7	3	9	27	729	81
8	3	9	24	576	72
9	3	9	18	324	54
10	1	1	11	121	11

11	3	9	18	324	54
12	3	9	18	324	54
13	3	9	21	441	63
14	3	9	19	361	57
15	2	4	16	256	32
16	2	4	19	361	38
17	3	9	21	441	63
18	3	9	15	225	45
19	3	9	17	289	51
20	3	9	20	400	60
21	3	9	13	169	39
22	3	9	24	576	72
23	2	4	13	169	26
24	3	9	16	256	48
25	3	9	21	441	63
26	2	4	23	529	46
27	3	9	17	289	51
28	3	9	21	441	63
29	3	9	21	441	63
30	3	9	21	441	63
sum	82	234	563	11047	1574

Rxy= 0.5098 Varians= 0.32889

Attribute 5: Label overall design

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	24	576	48
2	1	1	11	121	11
3	1	1	17	289	17
4	2	4	16	256	32
5	2	4	16	256	32
6	3	9	25	625	75
7	3	9	27	729	81
8	3	9	24	576	72
9	1	1	18	324	18
10	1	1	11	121	11
11	1	1	18	324	18
12	1	1	18	324	18
13	2	4	21	441	42
14	2	4	19	361	38
15	2	4	16	256	32
16	2	4	19	361	38
17	2	4	21	441	42

18	2	4	15	225	30
19	1	1	17	289	17
20	2	4	20	400	40
21	1	1	13	169	13
22	3	9	24	576	72
23	1	1	13	169	13
24	1	1	16	256	16
25	2	4	21	441	42
26	2	4	23	529	46
27	2	4	17	289	34
28	2	4	21	441	42
29	2	4	21	441	42
30	2	4	21	441	42
sum	54	110	563	11047	1074

Rxy= 0.77202 Varians= 0.42667

Attribute 6: The mark (identity of the product)

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	1	1	24	576	24
2	1	1	11	121	11
3	2	4	17	289	34
4	1	1	16	256	16
5	1	1	16	256	16
6	3	9	25	625	75
7	3	9	27	729	81
8	3	9	24	576	72
9	3	9	18	324	54
10	1	1	11	121	11
11	2	4	18	324	36
12	2	4	18	324	36
13	1	1	21	441	21
14	1	1	19	361	19
15	1	1	16	256	16
16	2	4	19	361	38
17	1	1	21	441	21
18	1	1	15	225	15
19	2	4	17	289	34
20	2	4	20	400	40
21	1	1	13	169	13
22	3	9	24	576	72
23	1	1	13	169	13
24	1	1	16	256	16

25	2	4	21	441	42
26	3	9	23	529	69
27	1	1	17	289	17
28	2	4	21	441	42
29	1	1	21	441	21
30	3	9	21	441	63
sum	52	110	563	11047	1038

Rxy= 0.63537 Varians= 0.66222

Attribute 7: Color combination

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	24	576	72
2	1	1	11	121	11
3	2	4	17	289	34
4	1	1	16	256	16
5	2	4	16	256	32
6	3	9	25	625	75
7	2	4	27	729	54
8	3	9	24	576	72
9	2	4	18	324	36
10	1	1	11	121	11
11	2	4	18	324	36
12	2	4	18	324	36
13	2	4	21	441	42
14	2	4	19	361	38
15	2	4	16	256	32
16	2	4	19	361	38
17	2	4	21	441	42
18	1	1	15	225	15
19	1	1	17	289	17
20	2	4	20	400	40
21	1	1	13	169	13
22	3	9	24	576	72
23	1	1	13	169	13
24	2	4	16	256	32
25	2	4	21	441	42
26	2	4	23	529	46
27	2	4	17	289	34
28	2	4	21	441	42
29	3	9	21	441	63
30	2	4	21	441	42
sum	58	124	563	11047	1148

Rxy= 0.78769 Varians= 0.39556

Attribute 8: Letter combination

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	24	576	48
2	1	1	11	121	11
3	1	1	17	289	17
4	2	4	16	256	32
5	1	1	16	256	16
6	2	4	25	625	50
7	3	9	27	729	81
8	1	1	24	576	24
9	2	4	18	324	36
10	1	1	11	121	11
11	2	4	18	324	36
12	2	4	18	324	36
13	2	4	21	441	42
14	2	4	19	361	38
15	1	1	16	256	16
16	3	9	19	361	57
17	3	9	21	441	63
18	1	1	15	225	15
19	2	4	17	289	34
20	2	4	20	400	40
21	1	1	13	169	13
22	3	9	24	576	72
23	2	4	13	169	26
24	1	1	16	256	16
25	2	4	21	441	42
26	3	9	23	529	69
27	2	4	17	289	34
28	3	9	21	441	63
29	3	9	21	441	63
30	2	4	21	441	42
sum	58	128	563	11047	1143

Rxy= 0.624 Varians= 0.52889

Attribute 9: Manufacturer identity

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	24	576	48
2	1	1	11	121	11
3	1	1	17	289	17
4	1	1	16	256	16
5	1	1	16	256	16
6	1	1	25	625	25
7	2	4	27	729	54
8	1	1	24	576	24
9	1	1	18	324	18
10	1	1	11	121	11
11	1	1	18	324	18
12	1	1	18	324	18
13	2	4	21	441	42
14	1	1	19	361	19
15	1	1	16	256	16
16	2	4	19	361	38
17	1	1	21	441	21
18	1	1	15	225	15
19	2	4	17	289	34
20	2	4	20	400	40
21	1	1	13	169	13
22	3	9	24	576	72
23	1	1	13	169	13
24	2	4	16	256	32
25	2	4	21	441	42
26	3	9	23	529	69
27	1	1	17	289	17
28	2	4	21	441	42
29	1	1	21	441	21
30	1	1	21	441	21
sum	43	73	563	11047	843

Rxy 0.48714 Varians= 0.37889

Attribute 10: Logo Design

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	24	576	72
2	1	1	11	121	11
3	1	1	17	289	17
4	1	1	16	256	16

5	1	1	16	256	16
6	3	9	25	625	75
7	3	9	27	729	81
8	3	9	24	576	72
9	1	1	18	324	18
10	1	1	11	121	11
11	1	1	18	324	18
12	2	4	18	324	36
13	2	4	21	441	42
14	2	4	19	361	38
15	2	4	16	256	32
16	1	1	19	361	19
17	3	9	21	441	63
18	1	1	15	225	15
19	2	4	17	289	34
20	2	4	20	400	40
21	1	1	13	169	13
22	1	1	24	576	24
23	1	1	13	169	13
24	1	1	16	256	16
25	2	4	21	441	42
26	2	4	23	529	46
27	1	1	17	289	17
28	1	1	21	441	21
29	3	9	21	441	63
30	3	9	21	441	63
sum	52	110	563	11047	1044

Rxy 0.69672 Varians= 0.66222

Attribute 11: Additional Information

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	24	576	48
2	1	1	11	121	11
3	2	4	17	289	34
4	2	4	16	256	32
5	2	4	16	256	32
6	2	4	25	625	50
7	2	4	27	729	54
8	2	4	24	576	48
9	2	4	18	324	36
10	1	1	11	121	11
11	3	9	18	324	54

12	2	4	18	324	36
13	3	9	21	441	63
14	2	4	19	361	38
15	2	4	16	256	32
16	2	4	19	361	38
17	2	4	21	441	42
18	2	4	15	225	30
19	1	1	17	289	17
20	2	4	20	400	40
21	1	1	13	169	13
22	2	4	24	576	48
23	1	1	13	169	13
24	2	4	16	256	32
25	2	4	21	441	42
26	2	4	23	529	46
27	1	1	17	289	17
28	2	4	21	441	42
29	2	4	21	441	42
30	2	4	21	441	42
sum	56	112	563	11047	1083

Rxy 0.53488 Varians= 0.24889

C.2. Uniformity Tests for "Kumala" Performance

Attribute 1: Easiness to open

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	2	1	1	2	1.8	Uniform	1
2	1	2	1	1	2	1.4	Uniform	1
3	1	1	1	1	1	1	Uniform	1
4	1	1	1	1	1	1	Uniform	1
5	1	1	2	1	1	1.2	Uniform	1
6	1	1	1	1	1	1	Uniform	1
Subgroup Average Total						7.4		6
Total Xi						37		
Total Xi^2						1369		

$(Xi)^2$				
9	4	1	1	4
1	4	1	1	4
1	1	1	1	1
1	1	1	1	1
1	1	4	1	1
1	1	1	1	1
Total $(Xi)^2$				53

Subgroup Average Value 1.233
Deviation Standard 0.504

Uniformity Test
Standard Average 0.225
Lower Control Limit 0.557
Upper Control Limit 1.910
Remarks : Data Uniform

Attribute 2: Easiness to close

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	1	3	2	1	1	1.6	Uniform	1
2	1	1	2	1	1	1.2	Uniform	1
3	1	1	1	1	2	1.2	Uniform	1
4	1	1	1	1	2	1.2	Uniform	1
5	1	1	1	1	1	1	Uniform	1
6	2	1	1	1	1	1.2	Uniform	1
Subgroup Average Total						7.4		6
Total Xi						37		
Total Xi^2						1369		

$(Xi)^2$				
1	9	4	1	1
1	1	4	1	1
1	1	1	1	4
1	1	1	1	4
1	1	1	1	1
4	1	1	1	1
Total $(Xi)^2$				53

Subgroup Average Value 1.23333
Deviation Standard 0.504

Uniformity Test
Standard Average 0.225
Lower Control Limit 0.557
Upper Control Limit 1.910
Remarks : Data Uniform

Attribute 3: Finger comfort in opening and closing cap

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	2	1	1	1	1	1.2	Uniform
2	1	2	1	1	1	1.2	Uniform
3	2	1	1	1	1	1.2	Uniform
4	1	1	1	1	1	1	Uniform
5	1	1	1	1	1	1	Uniform
6	2	1	1	1	1	1.2	Uniform
Subgroup Average Total						6.8	
Total Xi						34	
Total Xi^2						1156	

	$(Xi)^2$				
1	4	1	1	1	1
1	1	4	1	1	1
1	4	1	1	1	1
1	1	1	1	1	1
1	1	1	1	1	1
1	4	1	1	1	1
6	Total $(Xi)^2$				42

Subgroup Average Value 1.133
Deviation Standard 0.346

Uniformity Test
Standard Average 0.155
Lower Control Limit 0.669
Upper Control Limit 1.597
Remarks : Data Uniform

Attribute 4: The cap grip strength towards the package

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	3	3	3	3	3	3	Uniform
2	1	3	3	3	2	2.4	Uniform
3	3	3	2	3	3	2.8	Uniform
4	3	1	2	3	3	2.4	Uniform
5	3	3	3	2	3	2.8	Uniform
6	3	3	3	3	3	3	Uniform
Subgroup Average Total						16.4	
Total Xi						82	
Total Xi^2						6724	

	$(Xi)^2$				
1	9	9	9	9	9
1	1	9	9	9	4
1	9	9	4	9	9
1	9	1	4	9	9
1	9	9	9	4	9
1	9	9	9	9	9
6	Total $(Xi)^2$				234

Subgroup Average Value 2.733
Deviation Standard 0.583

Uniformity Test
Standard Average 0.261
Lower Control Limit 1.951
Upper Control Limit 3.516
Remarks : Data Uniform

Attribute 5: Label overall design

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	2	3	2	1	2	2	Uniform
2	1	3	2	2	2	2	Uniform
3	1	1	2	1	2	1.4	Uniform
4	2	1	2	3	2	2	Uniform
5	2	1	2	1	2	1.6	Uniform
6	3	1	2	1	2	1.8	Uniform
Subgroup Average Total						10.8	
Total Xi						54	
Total Xi^2						2916	

	$(Xi)^2$				
1	4	9	4	1	4
1	1	9	4	4	4
1	1	1	4	1	4
1	4	1	4	9	4
1	4	1	4	1	4
1	9	1	4	1	4
6	Total $(Xi)^2$				110

Subgroup Average Value 1.800
Deviation Standard 0.664

Uniformity Test
Standard Average 0.297
Lower Control Limit 0.909
Upper Control Limit 2.691
Remarks : Data Uniform

Attribute 6: The mark (identity of the product)

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	1	3	1	2	2	1.8	Uniform
2	1	3	1	2	3	2	Uniform
3	2	3	1	1	1	1.6	Uniform
4	1	1	2	3	2	1.8	Uniform
5	1	2	1	1	1	1.2	Uniform
6	3	2	1	1	3	2	Uniform
Subgroup Average Total						10.4	
Total Xi						52	
Total Xi^2						2704	

	$(Xi)^2$				
1	1	9	1	4	4
1	1	9	1	4	9
1	4	9	1	1	1
1	1	1	4	9	4
1	1	4	1	1	1
1	9	4	1	1	9
6	Total $(Xi)^2$				110

Subgroup Average Value 1.73333
Deviation Standard 0.828

Uniformity Test
Standard Average 0.370
Lower Control Limit 0.623
Upper Control Limit 2.844
Remarks : Data Uniform

Attribute 7: Color combination

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	2	2	1	2	2	Uniform	1
2	1	3	2	2	2	2	Uniform	1
3	2	2	2	1	2	1.8	Uniform	1
4	1	1	2	3	2	1.8	Uniform	1
5	2	2	2	1	3	2	Uniform	1
6	3	2	1	2	2	2	Uniform	1
Subgroup Average Total						11.6		6
Total Xi						58		
Total Xi^2						3364		

$(Xi)^2$				
9	4	4	1	4
1	9	4	4	4
4	4	4	1	4
1	1	4	9	4
4	4	4	1	9
9	4	1	4	4
Total $(Xi)^2$				124

Subgroup Average Value 1.933
Deviation Standard 0.640

Uniformity Test
Standard Average 0.286
Lower Control Limit 1.075
Upper Control Limit 2.792
Remarks : Data Uniform

Attribute 8: Letter combination

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	3	2	2	2	2.2	Uniform	1
2	1	1	2	2	3	1.8	Uniform	1
3	1	2	1	1	2	1.4	Uniform	1
4	2	1	3	3	3	2.4	Uniform	1
5	1	2	3	2	3	2.2	Uniform	1
6	2	2	1	1	2	1.6	Uniform	1
Subgroup Average Total						11.6		6
Total Xi						58		
Total Xi^2						3364		

$(Xi)^2$				
4	9	4	4	4
1	1	4	4	9
1	4	1	1	4
4	1	9	9	9
1	4	9	4	9
4	4	1	1	4
Total $(Xi)^2$				128

Subgroup Average Value 1.933
Deviation Standard 0.740

Uniformity Test
Standard Average 0.331
Lower Control Limit 0.941
Upper Control Limit 2.926
Remarks : Data Uniform

Attribute 9: Manufacturer identity

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	2	2	2	2	2	Uniform	1
2	1	1	1	2	3	1.6	Uniform	1
3	1	1	1	1	1	1	Uniform	1
4	1	1	2	3	2	1.8	Uniform	1
5	1	1	1	1	1	1	Uniform	1
6	1	1	1	2	1	1.2	Uniform	1
Subgroup Average Total						8.6		6
Total Xi						43		
Total Xi^2						1849		

$(Xi)^2$				
4	4	4	4	4
1	1	1	4	9
1	1	1	1	1
1	1	4	9	4
1	1	1	1	1
1	1	1	4	1
Total $(Xi)^2$				73

Subgroup Average Value 1.433
Deviation Standard 0.626

Uniformity Test
Standard Average 0.280
Lower Control Limit 0.593
Upper Control Limit 2.273
Remarks : Data Uniform

Attribute 10: Logo Design

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	3	2	2	2	2.4	Uniform	1
2	1	3	2	2	2	2	Uniform	1
3	1	1	2	1	1	1.2	Uniform	1
4	1	1	1	1	1	1	Uniform	1
5	1	1	3	1	3	1.8	Uniform	1
6	3	2	1	1	3	2	Uniform	1
Subgroup Average Total						10.4		6
Total Xi						52		
Total Xi^2						2704		

$(Xi)^2$				
9	9	4	4	4
1	9	4	4	4
1	1	4	1	1
1	1	1	1	1
1	1	9	1	9
9	4	1	1	9
Total $(Xi)^2$				110

Subgroup Average Value 1.733
Deviation Standard 0.828

Uniformity Test
Standard Average 0.370
Lower Control Limit 0.623
Upper Control Limit 2.844
Remarks : Data Uniform

Attribute 11: Additional Information

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	2	3	1	2	2	Uniform	1
2	1	2	2	2	2	1.8	Uniform	1
3	2	2	2	1	1	1.6	Uniform	1
4	2	1	2	2	2	1.8	Uniform	1
5	2	3	2	1	2	2	Uniform	1
6	2	2	2	2	2	2	Uniform	1
Subgroup Average Total						11.2		6
Total Xi						56		
Total Xi^2						3136		

$(Xi)^2$				
4	4	9	1	4
1	4	4	4	4
4	4	4	1	1
4	1	4	4	4
4	9	4	1	4
4	4	4	4	4
Total $(Xi)^2$				112

Subgroup Average Value 1.867
Deviation Standard 0.507

Uniformity Test
Standard Average 0.227
Lower Control Limit 1.186
Upper Control Limit 2.547
Remarks : Data Uniform

C.3. Reliability Test for "Kumala" Performance

Item no	Varians
Easiness to open	0.246
Easiness to close	0.246
Finger comfort to open and close the cap	0.116
The cap's grip strength towards the package	0.329
Label's overall design	0.427
The mark (identity of the product)	0.662
Color combination	0.396
Letter combination	0.529
Manufacturer's identity	0.379
Logo Design	0.662
Additional information	0.249
sum	3.328

Total Varians

No	Yi	Yi^2
1	24	576
2	11	121
3	17	289
4	16	256
5	16	256
6	25	625
7	27	729
8	24	576
9	18	324
10	11	121
11	18	324
12	18	324
13	21	441
14	19	361
15	16	256
16	19	361
17	21	441
18	15	225
19	17	289
20	20	400
21	13	169
22	24	576
23	13	169
24	16	256

25	21	441
26	23	529
27	17	289
28	21	441
29	21	441
30	21	441
sum	563	11047

Varians= 16.046

Calculate Alpha

Alpha Cronbach	r table	Remarks
0.872	0.349	Reliable

Appendix D: Tests for First Questionnaire: "Romeo" Performance

D.1. Validity Tests for "Romeo" Performance

Attribute 1: Easiness to open

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	29	841	58
2	2	4	24	576	48
3	2	4	22	484	44
4	2	4	21	441	42
5	2	4	21	441	42
6	2	4	15	225	30
7	1	1	17	289	17
8	1	1	15	225	15
9	3	9	22	484	66
10	2	4	23	529	46
11	2	4	19	361	38
12	2	4	18	324	36
13	3	9	20	400	60
14	2	4	16	256	32
15	2	4	18	324	36
16	2	4	20	400	40
17	3	9	21	441	63
18	2	4	21	441	42
19	2	4	20	400	40
20	2	4	15	225	30
21	2	4	22	484	44
22	2	4	17	289	34
23	2	4	25	625	50
24	2	4	22	484	44
25	1	1	13	169	13
26	1	1	18	324	18
27	2	4	19	361	38
28	2	4	21	441	42
29	3	9	19	361	57
30	2	4	17	289	34
Sum	60	128	590	11934	1199

Rxy= 0.36941 Varians= 0.26667

Attribute 2: Easiness to close

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	29	841	87
2	2	4	24	576	48
3	2	4	22	484	44
4	2	4	21	441	42
5	2	4	21	441	42
6	1	1	15	225	15
7	2	4	17	289	34
8	2	4	15	225	30
9	3	9	22	484	66
10	2	4	23	529	46
11	3	9	19	361	57
12	2	4	18	324	36
13	1	1	20	400	20
14	1	1	16	256	16
15	3	9	18	324	54
16	2	4	20	400	40
17	2	4	21	441	42
18	2	4	21	441	42
19	3	9	20	400	60
20	2	4	15	225	30
21	2	4	22	484	44
22	2	4	17	289	34
23	2	4	25	625	50
24	3	9	22	484	66
25	2	4	13	169	26
26	2	4	18	324	36
27	2	4	19	361	38
28	3	9	21	441	63
29	2	4	19	361	38
30	2	4	17	289	34
Sum	64	146	590	11934	1280

Rxy 0.3813 Varians= 0.31556

Attribute 3: Finger comfort in opening and closing cap

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	29	841	87
2	2	4	24	576	48
3	1	1	22	484	22
4	2	4	21	441	42

5	2	4	21	441	42
6	1	1	15	225	15
7	2	4	17	289	34
8	1	1	15	225	15
9	2	4	22	484	44
10	2	4	23	529	46
11	2	4	19	361	38
12	2	4	18	324	36
13	3	9	20	400	60
14	2	4	16	256	32
15	2	4	18	324	36
16	2	4	20	400	40
17	2	4	21	441	42
18	2	4	21	441	42
19	2	4	20	400	40
20	2	4	15	225	30
21	2	4	22	484	44
22	2	4	17	289	34
23	2	4	25	625	50
24	2	4	22	484	44
25	2	4	13	169	26
26	2	4	18	324	36
27	2	4	19	361	38
28	2	4	21	441	42
29	2	4	19	361	38
30	2	4	17	289	34
sum	59	121	590	11934	1177

Rxy 0.41126 Varians= 0.16556

Attribute 4: The cap grip strength towards the package

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	29	841	58
2	3	9	24	576	72
3	1	1	22	484	22
4	2	4	21	441	42
5	2	4	21	441	42
6	2	4	15	225	30
7	2	4	17	289	34
8	1	1	15	225	15
9	2	4	22	484	44
10	3	9	23	529	69
11	2	4	19	361	38

12	2	4	18	324	36
13	2	4	20	400	40
14	2	4	16	256	32
15	1	1	18	324	18
16	3	9	20	400	60
17	2	4	21	441	42
18	2	4	21	441	42
19	2	4	20	400	40
20	2	4	15	225	30
21	2	4	22	484	44
22	2	4	17	289	34
23	3	9	25	625	75
24	2	4	22	484	44
25	1	1	13	169	13
26	3	9	18	324	54
27	2	4	19	361	38
28	2	4	21	441	42
29	2	4	19	361	38
30	2	4	17	289	34
sum	61	133	590	11934	1222

Rxy= 0.41015 Varians= 0.29889

Attribute 5: Label overall design

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	29	841	87
2	2	4	24	576	48
3	2	4	22	484	44
4	3	9	21	441	63
5	1	1	21	441	21
6	2	4	15	225	30
7	1	1	17	289	17
8	1	1	15	225	15
9	2	4	22	484	44
10	2	4	23	529	46
11	2	4	19	361	38
12	2	4	18	324	36
13	1	1	20	400	20
14	1	1	16	256	16
15	1	1	18	324	18
16	1	1	20	400	20
17	1	1	21	441	21
18	1	1	21	441	21

19	2	4	20	400	40
20	1	1	15	225	15
21	2	4	22	484	44
22	1	1	17	289	17
23	2	4	25	625	50
24	2	4	22	484	44
25	1	1	13	169	13
26	1	1	18	324	18
27	1	1	19	361	19
28	1	1	21	441	21
29	1	1	19	361	19
30	1	1	17	289	17
sum	45	79	590	11934	922

Rxy= 0.60001 Varians= 0.38333

Attribute 6: The mark (identity of the product)

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	29	841	87
2	2	4	24	576	48
3	3	9	22	484	66
4	2	4	21	441	42
5	3	9	21	441	63
6	1	1	15	225	15
7	2	4	17	289	34
8	1	1	15	225	15
9	1	1	22	484	22
10	2	4	23	529	46
11	1	1	19	361	19
12	1	1	18	324	18
13	2	4	20	400	40
14	2	4	16	256	32
15	2	4	18	324	36
16	1	1	20	400	20
17	3	9	21	441	63
18	2	4	21	441	42
19	1	1	20	400	20
20	1	1	15	225	15
21	2	4	22	484	44
22	1	1	17	289	17
23	2	4	25	625	50
24	3	9	22	484	66
25	1	1	13	169	13

26	1	1	18	324	18
27	2	4	19	361	38
28	3	9	21	441	63
29	2	4	19	361	38
30	2	4	17	289	34
sum	55	117	590	11934	1124

Rxy= 0.579 Varians= 0.53889

Attribute 7: Color combination

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	29	841	58
2	2	4	24	576	48
3	1	1	22	484	22
4	2	4	21	441	42
5	1	1	21	441	21
6	1	1	15	225	15
7	1	1	17	289	17
8	1	1	15	225	15
9	1	1	22	484	22
10	2	4	23	529	46
11	1	1	19	361	19
12	1	1	18	324	18
13	1	1	20	400	20
14	1	1	16	256	16
15	1	1	18	324	18
16	1	1	20	400	20
17	1	1	21	441	21
18	2	4	21	441	42
19	3	9	20	400	60
20	1	1	15	225	15
21	2	4	22	484	44
22	1	1	17	289	17
23	2	4	25	625	50
24	1	1	22	484	22
25	1	1	13	169	13
26	1	1	18	324	18
27	1	1	19	361	19
28	1	1	21	441	21
29	1	1	19	361	19
30	1	1	17	289	17
sum	39	59	590	11934	795

Rxy= 0.53447 Varians= 0.27667

Attribute 8: Letter combination

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	29	841	87
2	2	4	24	576	48
3	3	9	22	484	66
4	1	1	21	441	21
5	2	4	21	441	42
6	1	1	15	225	15
7	1	1	17	289	17
8	2	4	15	225	30
9	1	1	22	484	22
10	2	4	23	529	46
11	1	1	19	361	19
12	1	1	18	324	18
13	1	1	20	400	20
14	1	1	16	256	16
15	2	4	18	324	36
16	2	4	20	400	40
17	2	4	21	441	42
18	2	4	21	441	42
19	1	1	20	400	20
20	1	1	15	225	15
21	2	4	22	484	44
22	1	1	17	289	17
23	3	9	25	625	75
24	3	9	22	484	66
25	1	1	13	169	13
26	1	1	18	324	18
27	1	1	19	361	19
28	1	1	21	441	21
29	1	1	19	361	19
30	1	1	17	289	17
sum	47	89	590	11934	971

Rxy= 0.65467 Varians= 0.51222

Attribute 9: Manufacturer identity

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	29	841	87
2	3	9	24	576	72
3	3	9	22	484	66
4	2	4	21	441	42

5	2	4	21	441	42
6	2	4	15	225	30
7	3	9	17	289	51
8	2	4	15	225	30
9	3	9	22	484	66
10	2	4	23	529	46
11	2	4	19	361	38
12	3	9	18	324	54
13	1	1	20	400	20
14	2	4	16	256	32
15	2	4	18	324	36
16	3	9	20	400	60
17	2	4	21	441	42
18	3	9	21	441	63
19	1	1	20	400	20
20	1	1	15	225	15
21	2	4	22	484	44
22	2	4	17	289	34
23	2	4	25	625	50
24	1	1	22	484	22
25	1	1	13	169	13
26	2	4	18	324	36
27	2	4	19	361	38
28	3	9	21	441	63
29	2	4	19	361	38
30	2	4	17	289	34
sum	64	150	590	11934	1284

Rxy 0.37964 Varians= 0.44889

Attribute 10: Logo Design

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	29	841	58
2	2	4	24	576	48
3	3	9	22	484	66
4	2	4	21	441	42
5	3	9	21	441	63
6	1	1	15	225	15
7	1	1	17	289	17
8	2	4	15	225	30
9	3	9	22	484	66
10	2	4	23	529	46
11	2	4	19	361	38

12	1	1	18	324	18
13	3	9	20	400	60
14	1	1	16	256	16
15	1	1	18	324	18
16	2	4	20	400	40
17	2	4	21	441	42
18	2	4	21	441	42
19	1	1	20	400	20
20	1	1	15	225	15
21	2	4	22	484	44
22	2	4	17	289	34
23	2	4	25	625	50
24	2	4	22	484	44
25	1	1	13	169	13
26	3	9	18	324	54
27	2	4	19	361	38
28	2	4	21	441	42
29	2	4	19	361	38
30	1	1	17	289	17
sum	56	118	590	11934	1134

Rxy 0.48953 Varians= 0.44889

Attribute 11: Additional Information

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	1	1	29	841	29
2	2	4	24	576	48
3	1	1	22	484	22
4	1	1	21	441	21
5	1	1	21	441	21
6	1	1	15	225	15
7	1	1	17	289	17
8	1	1	15	225	15
9	1	1	22	484	22
10	2	4	23	529	46
11	1	1	19	361	19
12	1	1	18	324	18
13	2	4	20	400	40
14	1	1	16	256	16
15	1	1	18	324	18
16	1	1	20	400	20
17	1	1	21	441	21
18	1	1	21	441	21

19	2	4	20	400	40
20	1	1	15	225	15
21	2	4	22	484	44
22	1	1	17	289	17
23	3	9	25	625	75
24	1	1	22	484	22
25	1	1	13	169	13
26	1	1	18	324	18
27	2	4	19	361	38
28	1	1	21	441	21
29	1	1	19	361	19
30	1	1	17	289	17
sum	38	56	590	11934	768

Rxy 0.40521 Varians= 0.26222

D.3. Uniformity Tests for "Romeo" Performance

Attribute 1: Easiness to open

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	2	1	3	2	1	1.8	Uniform
2	2	1	2	2	1	1.6	Uniform
3	2	3	2	2	2	2.2	Uniform
4	2	2	2	2	2	2	Uniform
5	2	2	3	2	3	2.4	Uniform
6	2	2	2	2	2	2	Uniform
Subgroup Average Total						12	
Total Xi						60	
Total Xi^2						3600	

	$(Xi)^2$				
1	4	1	9	4	1
1	4	1	4	4	1
1	4	9	4	4	4
1	4	4	4	4	4
1	4	4	9	4	9
1	4	4	4	4	4
6	Total $(Xi)^2$				128

Subgroup Average Value 2.000
Deviation Standard 0.525

Uniformity Test
Standard Average 0.235
Lower Control Limit 1.295
Upper Control Limit 2.705
Remarks : Data Uniform

Attribute 2: Easiness to close

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	3	2	1	3	2	2.2	Uniform
2	2	2	1	2	2	1.8	Uniform
3	2	3	3	2	2	2.4	Uniform
4	2	2	2	2	3	2.2	Uniform
5	2	3	2	2	2	2.2	Uniform
6	1	2	2	3	2	2	Uniform
Subgroup Average Total						12.8	
Total Xi						64	
Total Xi^2						4096	

	$(Xi)^2$				
1	9	4	1	9	4
1	4	4	1	4	4
1	4	9	9	4	4
1	4	4	4	4	9
1	4	9	4	4	4
1	1	4	4	9	4
6	Total $(Xi)^2$				146

Subgroup Average Value 2.13333
Deviation Standard 0.571

Uniformity Test
Standard Average 0.256
Lower Control Limit 1.367
Upper Control Limit 2.900
Remarks : Data Uniform

Attribute 3: Finger comfort in opening and closing cap

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	3	2	3	2	2	2.4	Uniform
2	2	1	2	2	2	1.8	Uniform
3	1	2	2	2	2	1.8	Uniform
4	2	2	2	2	2	2	Uniform
5	2	2	2	2	2	2	Uniform
6	1	2	2	2	2	1.8	Uniform
Subgroup Average Total						11.8	
Total Xi						59	
Total Xi^2						3481	

	$(Xi)^2$				
1	9	4	9	4	4
1	4	1	4	4	4
1	1	4	4	4	4
1	4	4	4	4	4
1	4	4	4	4	4
1	1	4	4	4	4
6	Total $(Xi)^2$				121

Subgroup Average Value 1.967
Deviation Standard 0.414

Uniformity Test
Standard Average 0.185
Lower Control Limit 1.411
Upper Control Limit 2.522
Remarks : Data Uniform

Attribute 4: The cap grip strength towards the package

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	2	2	2	2	1	1.8	Uniform
2	3	1	2	2	3	2.2	Uniform
3	1	2	1	2	2	1.6	Uniform
4	2	3	3	2	2	2.4	Uniform
5	2	2	2	3	2	2.2	Uniform
6	2	2	2	2	2	2	Uniform
Subgroup Average Total						12.2	
Total Xi						61	
Total Xi^2						3721	

	$(Xi)^2$				
1	4	4	4	4	1
1	9	1	4	4	9
1	1	4	1	4	4
1	4	9	9	4	4
1	4	4	4	9	4
1	4	4	4	4	4
6	Total $(Xi)^2$				133

Subgroup Average Value 2.033
Deviation Standard 0.556

Uniformity Test
Standard Average 0.249
Lower Control Limit 1.287
Upper Control Limit 2.779
Remarks : Data Uniform

Attribute 5: Label overall design

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	3	1	1	2	1	1.6	Uniform
2	2	1	1	1	1	1.2	Uniform
3	2	2	1	2	1	1.6	Uniform
4	3	2	1	1	1	1.6	Uniform
5	1	2	1	2	1	1.4	Uniform
6	2	2	1	2	1	1.6	Uniform
Subgroup Average Total						9	
Total Xi						45	
Total Xi^2						2025	

	$(Xi)^2$				
1	9	1	1	4	1
1	4	1	1	1	1
1	4	4	1	4	1
1	9	4	1	1	1
1	1	4	1	4	1
1	4	4	1	4	1
6	Total $(Xi)^2$				79

Subgroup Average Value 1.500
Deviation Standard 0.630

Uniformity Test
Standard Average 0.282
Lower Control Limit 0.655
Upper Control Limit 2.345
Remarks : Data Uniform

Attribute 6: The mark (identity of the product)

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	3	2	2	1	1	1.8	Uniform
2	2	1	2	1	1	1.4	Uniform
3	3	1	2	2	2	2	Uniform
4	2	2	1	1	3	1.8	Uniform
5	3	1	3	2	2	2.2	Uniform
6	1	1	2	3	2	1.8	Uniform
Subgroup Average Total						11	
Total Xi						55	
Total Xi^2						3025	

	$(Xi)^2$				
1	9	4	4	1	1
1	4	1	4	1	1
1	9	1	4	4	4
1	4	4	1	1	9
1	9	1	9	4	4
1	1	1	4	9	4
6	Total $(Xi)^2$				117

Subgroup Average Value 1.83333
Deviation Standard 0.747

Uniformity Test
Standard Average 0.334
Lower Control Limit 0.832
Upper Control Limit 2.835
Remarks : Data Uniform

Attribute 7: Color combination

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks		$(Xi)^2$					
1	2	1	1	3	1	1.6	Uniform	1	4	1	1	9	1	
2	2	1	1	1	1	1.2	Uniform	1	4	1	1	1	1	
3	1	1	1	2	1	1.2	Uniform	1	1	1	1	4	1	
4	2	2	1	1	1	1.4	Uniform	1	4	4	1	1	1	
5	1	1	1	2	1	1.2	Uniform	1	1	1	1	4	1	
6	1	1	2	1	1	1.2	Uniform	1	1	1	4	1	1	
Subgroup Average Total						7.8		6	Total $(Xi)^2$					59
Total Xi						39								
Total Xi^2						1521								

Subgroup Average Value 1.300
Deviation Standard 0.535

Uniformity Test
Standard Average 0.239
Lower Control Limit 0.582
Upper Control Limit 2.018
Remarks : Data Uniform

Attribute 8: Letter combination

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks		$(Xi)^2$					
1	3	1	1	1	1	1.4	Uniform	1	9	1	1	1	1	
2	2	2	1	1	1	1.4	Uniform	1	4	4	1	1	1	
3	3	1	2	2	1	1.8	Uniform	1	9	1	4	4	1	
4	1	2	2	1	1	1.4	Uniform	1	1	4	4	1	1	
5	2	1	2	3	1	1.8	Uniform	1	4	1	4	9	1	
6	1	1	2	3	1	1.6	Uniform	1	1	1	4	9	1	
Subgroup Average Total						9.4		6	Total $(Xi)^2$					89
Total Xi						47								
Total Xi^2						2209								

Subgroup Average Value 1.567
Deviation Standard 0.728

Uniformity Test
Standard Average 0.326
Lower Control Limit 0.590
Upper Control Limit 2.543
Remarks : Data Uniform

Attribute 9: Manufacturer identity

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	3	3	1	1	1	1.8	Uniform
2	3	2	2	1	2	2	Uniform
3	3	3	2	2	2	2.4	Uniform
4	2	2	3	2	3	2.4	Uniform
5	2	2	2	2	2	2	Uniform
6	2	3	3	1	2	2.2	Uniform
Subgroup Average Total						12.8	
Total Xi						64	
Total Xi^2						4096	

	$(Xi)^2$				
1	9	9	1	1	1
1	9	4	4	1	4
1	9	9	4	4	4
1	4	4	9	4	9
1	4	4	4	4	4
1	4	9	9	1	4
6	Total $(Xi)^2$				150

Subgroup Average Value 2.133
Deviation Standard 0.681

Uniformity Test
Standard Average 0.305
Lower Control Limit 1.219
Upper Control Limit 3.048
Remarks : Data Uniform

Attribute 10: Logo Design

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	2	1	3	1	1	1.6	Uniform
2	2	2	1	1	3	1.8	Uniform
3	3	3	1	2	2	2.2	Uniform
4	2	2	2	2	2	2	Uniform
5	3	2	2	2	2	2.2	Uniform
6	1	1	2	2	1	1.4	Uniform
Subgroup Average Total						11.2	
Total Xi						56	
Total Xi^2						3136	

	$(Xi)^2$				
1	4	1	9	1	1
1	4	4	1	1	9
1	9	9	1	4	4
1	4	4	4	4	4
1	9	4	4	4	4
1	1	1	4	4	1
6	Total $(Xi)^2$				118

Subgroup Average Value 1.867
Deviation Standard 0.681

Uniformity Test
Standard Average 0.305
Lower Control Limit 0.952
Upper Control Limit 2.781
Remarks : Data Uniform

Attribute 11: Additional Information

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	1	1	2	2	1	1.4	Uniform
2	2	1	1	1	1	1.2	Uniform
3	1	1	1	2	2	1.4	Uniform
4	1	2	1	1	1	1.2	Uniform
5	1	1	1	3	1	1.4	Uniform
6	1	1	1	1	1	1	Uniform
Subgroup Average Total						7.6	
Total Xi						38	
Total Xi^2						1444	

	$(Xi)^2$				
1	1	1	4	4	1
1	4	1	1	1	1
1	1	1	1	4	4
1	1	4	1	1	1
1	1	1	1	9	1
1	1	1	1	1	1
6	Total $(Xi)^2$				56

Subgroup Average Value 1.267
Deviation Standard 0.521

Uniformity Test
Standard Average 0.233
Lower Control Limit 0.568
Upper Control Limit 1.965
Remarks : Data Uniform

D.4. Reliability Tests for "Romeo" Performance

Item no	Varians
Easiness to open	0.267
Easiness to close	0.316
Finger comfort to open and close the cap	0.166
The cap's grip strength towards the package	0.299
Label's overall design	0.383
The mark (identity of the product)	0.539
Color combination	0.277
Letter combination	0.512
Manufacturer's identity	0.449
Logo Design	0.449
Additional information	0.262
sum	3.207

Total Varians

No	Yi	Yi^2
1	29	841
2	24	576
3	22	484
4	21	441
5	21	441
6	15	225
7	17	289
8	15	225
9	22	484
10	23	529
11	19	361
12	18	324
13	20	400
14	16	256
15	18	324
16	20	400
17	21	441
18	21	441
19	20	400
20	15	225
21	22	484
22	17	289
23	25	625
24	22	484

25	13	169
26	18	324
27	19	361
28	21	441
29	19	361
30	17	289
sum	590	11934

Varians= 11.022

Calculate Alpha

Alpha Cronbach	r table	Remarks
0.780	0.349	Reliable

Appendix E: Tests for First Questionnaire: "Gadjah Mada" Performance

E.1. Validity Tests for "Gadjah Mada" Performance

Attribute 1: Easiness to open

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	1	1	13	169	13
2	3	9	31	961	93
3	3	9	27	729	81
4	3	9	29	841	87
5	3	9	29	841	87
6	3	9	26	676	78
7	3	9	22	484	66
8	3	9	27	729	81
9	2	4	26	676	52
10	3	9	32	1024	96
11	3	9	29	841	87
12	3	9	30	900	90
13	2	4	25	625	50
14	3	9	31	961	93
15	3	9	32	1024	96
16	3	9	27	729	81
17	1	1	24	576	24
18	3	9	30	900	90
19	3	9	29	841	87
20	3	9	31	961	93
21	3	9	31	961	93
22	3	9	25	625	75
23	3	9	28	784	84
24	3	9	28	784	84
25	3	9	32	1024	96
26	3	9	25	625	75
27	3	9	31	961	93
28	3	9	24	576	72
29	2	4	26	676	52
30	3	9	28	784	84
Sum	83	239	828	23288	2333

Rxy= 0.66096 Varians= 0.31222

Attribute 2: Easiness to close

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	13	169	26

2	3	9	31	961	93
3	3	9	27	729	81
4	3	9	29	841	87
5	3	9	29	841	87
6	3	9	26	676	78
7	1	1	22	484	22
8	3	9	27	729	81
9	2	4	26	676	52
10	3	9	32	1024	96
11	2	4	29	841	58
12	3	9	30	900	90
13	3	9	25	625	75
14	3	9	31	961	93
15	2	4	32	1024	64
16	3	9	27	729	81
17	3	9	24	576	72
18	3	9	30	900	90
19	2	4	29	841	58
20	3	9	31	961	93
21	3	9	31	961	93
22	3	9	25	625	75
23	3	9	28	784	84
24	2	4	28	784	56
25	3	9	32	1024	96
26	3	9	25	625	75
27	3	9	31	961	93
28	1	1	24	576	24
29	3	9	26	676	78
30	3	9	28	784	84
Sum	80	224	828	23288	2235

Rxy 0.39628 Varians= 0.35556

Attribute 3: Finger comfort in opening and closing cap

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	1	1	13	169	13
2	3	9	31	961	93
3	3	9	27	729	81
4	3	9	29	841	87
5	3	9	29	841	87
6	3	9	26	676	78
7	3	9	22	484	66
8	3	9	27	729	81
9	3	9	26	676	78

10	3	9	32	1024	96
11	3	9	29	841	87
12	3	9	30	900	90
13	2	4	25	625	50
14	3	9	31	961	93
15	3	9	32	1024	96
16	3	9	27	729	81
17	3	9	24	576	72
18	3	9	30	900	90
19	3	9	29	841	87
20	3	9	31	961	93
21	3	9	31	961	93
22	3	9	25	625	75
23	3	9	28	784	84
24	3	9	28	784	84
25	3	9	32	1024	96
26	3	9	25	625	75
27	3	9	31	961	93
28	3	9	24	576	72
29	3	9	26	676	78
30	3	9	28	784	84
sum	87	257	828	23288	2433

Rxy 0.70313 Varians= 0.15667

Attribute 4: The cap grip strength towards the package

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	1	1	13	169	13
2	2	4	31	961	62
3	2	4	27	729	54
4	1	1	29	841	29
5	1	1	29	841	29
6	1	1	26	676	26
7	1	1	22	484	22
8	2	4	27	729	54
9	1	1	26	676	26
10	2	4	32	1024	64
11	1	1	29	841	29
12	1	1	30	900	30
13	1	1	25	625	25
14	1	1	31	961	31
15	3	9	32	1024	96
16	1	1	27	729	27
17	1	1	24	576	24

18	1	1	30	900	30
19	1	1	29	841	29
20	1	1	31	961	31
21	1	1	31	961	31
22	1	1	25	625	25
23	1	1	28	784	28
24	1	1	28	784	28
25	2	4	32	1024	64
26	1	1	25	625	25
27	1	1	31	961	31
28	1	1	24	576	24
29	1	1	26	676	26
30	1	1	28	784	28
sum	37	53	828	23288	1041

Rxy= 0.34969 Varians= 0.24556

Attribute 5: Label overall design

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	1	1	13	169	13
2	3	9	31	961	93
3	3	9	27	729	81
4	1	1	29	841	29
5	3	9	29	841	87
6	1	1	26	676	26
7	2	4	22	484	44
8	2	4	27	729	54
9	3	9	26	676	78
10	3	9	32	1024	96
11	3	9	29	841	87
12	3	9	30	900	90
13	3	9	25	625	75
14	3	9	31	961	93
15	3	9	32	1024	96
16	3	9	27	729	81
17	3	9	24	576	72
18	3	9	30	900	90
19	3	9	29	841	87
20	3	9	31	961	93
21	3	9	31	961	93
22	2	4	25	625	50
23	3	9	28	784	84
24	3	9	28	784	84
25	3	9	32	1024	96

26	3	9	25	625	75
27	3	9	31	961	93
28	3	9	24	576	72
29	3	9	26	676	78
30	3	9	28	784	84
sum	81	231	828	23288	2274

Rxy= 0.52485 Varians= 0.41

Attribute 6: The mark (identity of the product)

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	13	169	26
2	3	9	31	961	93
3	1	1	27	729	27
4	3	9	29	841	87
5	2	4	29	841	58
6	2	4	26	676	52
7	1	1	22	484	22
8	2	4	27	729	54
9	2	4	26	676	52
10	3	9	32	1024	96
11	3	9	29	841	87
12	3	9	30	900	90
13	3	9	25	625	75
14	3	9	31	961	93
15	3	9	32	1024	96
16	3	9	27	729	81
17	2	4	24	576	48
18	3	9	30	900	90
19	3	9	29	841	87
20	3	9	31	961	93
21	3	9	31	961	93
22	2	4	25	625	50
23	3	9	28	784	84
24	2	4	28	784	56
25	3	9	32	1024	96
26	2	4	25	625	50
27	3	9	31	961	93
28	1	1	24	576	24
29	3	9	26	676	78
30	1	1	28	784	28
sum	73	193	828	23288	2059

Rxy= 0.54049 Varians= 0.51222

Attribute 7: Color combination

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	1	1	13	169	13
2	3	9	31	961	93
3	3	9	27	729	81
4	3	9	29	841	87
5	3	9	29	841	87
6	2	4	26	676	52
7	3	9	22	484	66
8	2	4	27	729	54
9	3	9	26	676	78
10	3	9	32	1024	96
11	3	9	29	841	87
12	3	9	30	900	90
13	3	9	25	625	75
14	3	9	31	961	93
15	3	9	32	1024	96
16	3	9	27	729	81
17	3	9	24	576	72
18	3	9	30	900	90
19	2	4	29	841	58
20	3	9	31	961	93
21	3	9	31	961	93
22	2	4	25	625	50
23	3	9	28	784	84
24	3	9	28	784	84
25	3	9	32	1024	96
26	3	9	25	625	75
27	3	9	31	961	93
28	3	9	24	576	72
29	2	4	26	676	52
30	3	9	28	784	84
sum	83	237	828	23288	2325

Rxy= 0.60401 Varians= 0.24556

Attribute 8: Letter combination

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	1	1	13	169	13
2	3	9	31	961	93
3	2	4	27	729	54
4	3	9	29	841	87

5	3	9	29	841	87
6	3	9	26	676	78
7	2	4	22	484	44
8	3	9	27	729	81
9	3	9	26	676	78
10	3	9	32	1024	96
11	3	9	29	841	87
12	3	9	30	900	90
13	3	9	25	625	75
14	3	9	31	961	93
15	3	9	32	1024	96
16	1	1	27	729	27
17	1	1	24	576	24
18	3	9	30	900	90
19	3	9	29	841	87
20	3	9	31	961	93
21	3	9	31	961	93
22	2	4	25	625	50
23	1	1	28	784	28
24	2	4	28	784	56
25	3	9	32	1024	96
26	2	4	25	625	50
27	3	9	31	961	93
28	2	4	24	576	48
29	2	4	26	676	52
30	3	9	28	784	84
sum	75	203	828	23288	2123

Rxy= 0.64531 Varians= 0.51667

Attribute 9: Manufacturer identity

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	1	1	13	169	13
2	2	4	31	961	62
3	2	4	27	729	54
4	3	9	29	841	87
5	3	9	29	841	87
6	3	9	26	676	78
7	1	1	22	484	22
8	3	9	27	729	81
9	2	4	26	676	52
10	3	9	32	1024	96
11	3	9	29	841	87

12	2	4	30	900	60
13	3	9	25	625	75
14	3	9	31	961	93
15	3	9	32	1024	96
16	1	1	27	729	27
17	3	9	24	576	72
18	2	4	30	900	60
19	3	9	29	841	87
20	3	9	31	961	93
21	3	9	31	961	93
22	1	1	25	625	25
23	3	9	28	784	84
24	3	9	28	784	84
25	3	9	32	1024	96
26	1	1	25	625	25
27	3	9	31	961	93
28	1	1	24	576	24
29	3	9	26	676	78
30	3	9	28	784	84
sum	73	197	828	23288	2068

Rxy 0.57948 Varians= 0.64556

Attribute 10: Logo Design

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	1	1	13	169	13
2	3	9	31	961	93
3	2	4	27	729	54
4	3	9	29	841	87
5	2	4	29	841	58
6	2	4	26	676	52
7	2	4	22	484	44
8	1	1	27	729	27
9	2	4	26	676	52
10	3	9	32	1024	96
11	3	9	29	841	87
12	3	9	30	900	90
13	1	1	25	625	25
14	3	9	31	961	93
15	3	9	32	1024	96
16	3	9	27	729	81
17	1	1	24	576	24
18	3	9	30	900	90

19	3	9	29	841	87
20	3	9	31	961	93
21	3	9	31	961	93
22	3	9	25	625	75
23	3	9	28	784	84
24	3	9	28	784	84
25	3	9	32	1024	96
26	1	1	25	625	25
27	3	9	31	961	93
28	3	9	24	576	72
29	1	1	26	676	26
30	2	4	28	784	56
sum	72	192	828	23288	2046

Rxy 0.64325 Varians= 0.64

Attribute 11: Additional Information

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	1	1	13	169	13
2	3	9	31	961	93
3	3	9	27	729	81
4	3	9	29	841	87
5	3	9	29	841	87
6	3	9	26	676	78
7	3	9	22	484	66
8	3	9	27	729	81
9	3	9	26	676	78
10	3	9	32	1024	96
11	2	4	29	841	58
12	3	9	30	900	90
13	1	1	25	625	25
14	3	9	31	961	93
15	3	9	32	1024	96
16	3	9	27	729	81
17	3	9	24	576	72
18	3	9	30	900	90
19	3	9	29	841	87
20	3	9	31	961	93
21	3	9	31	961	93
22	3	9	25	625	75
23	2	4	28	784	56
24	3	9	28	784	84
25	3	9	32	1024	96
26	3	9	25	625	75

27	3	9	31	961	93
28	3	9	24	576	72
29	3	9	26	676	78
30	3	9	28	784	84
sum	84	244	828	23288	2351

Rxy 0.52678 Varians= 0.29333

E.2. Uniformity Tests for "Gadjah Mada" Performance

Attribute 1: Easiness to open

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	1	3	2	3	3	2.4	Uniform
2	3	3	3	3	3	3	Uniform
3	3	2	3	3	3	2.8	Uniform
4	3	3	3	3	3	3	Uniform
5	3	3	1	3	2	2.4	Uniform
6	3	3	3	3	3	3	Uniform
Subgroup Average Total						16.6	
Total Xi						83	
Total Xi^2						6889	

	$(Xi)^2$				
1	1	9	4	9	9
1	9	9	9	9	9
1	9	4	9	9	9
1	9	9	9	9	9
1	9	9	1	9	4
1	9	9	9	9	9
6	Total $(Xi)^2$				239

Subgroup Average Value 2.767
Deviation Standard 0.568

Uniformity Test
Standard Average 0.254
Lower Control Limit 2.004
Upper Control Limit 3.529
Remarks : Data Uniform

Attribute 2: Easiness to close

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	2	1	3	2	3	2.2	Uniform
2	3	3	3	3	3	3	Uniform
3	3	2	2	3	3	2.6	Uniform
4	3	3	3	3	1	2.6	Uniform
5	3	2	3	3	3	2.8	Uniform
6	3	3	3	2	3	2.8	Uniform
Subgroup Average Total						16	
Total Xi						80	
Total Xi^2						6400	

	$(Xi)^2$				
1	4	1	9	4	9
1	9	9	9	9	9
1	9	4	4	9	9
1	9	9	9	9	1
1	9	4	9	9	9
1	9	9	9	4	9
6	Total $(Xi)^2$				224

Subgroup Average Value 2.66667
Deviation Standard 0.606

Uniformity Test
Standard Average 0.271
Lower Control Limit 1.853
Upper Control Limit 3.480
Remarks : Data Uniform

Attribute 3: Finger comfort in opening and closing cap

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	1	3	2	3	3	2.4	Uniform
2	3	3	3	3	3	3	Uniform
3	3	3	3	3	3	3	Uniform
4	3	3	3	3	3	3	Uniform
5	3	3	3	3	3	3	Uniform
6	3	3	3	3	3	3	Uniform
Subgroup Average Total						17.4	
Total Xi						87	
Total Xi^2						7569	

	$(Xi)^2$				
1	1	9	4	9	9
1	9	9	9	9	9
1	9	9	9	9	9
1	9	9	9	9	9
1	9	9	9	9	9
1	9	9	9	9	9
6	Total $(Xi)^2$				257

Subgroup Average Value 2.900
Deviation Standard 0.403

Uniformity Test
Standard Average 0.180
Lower Control Limit 2.360
Upper Control Limit 3.440
Remarks : Data Uniform

Attribute 4: The cap grip strength towards the package

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	1	1	1	1	2	1.2	Uniform
2	2	2	1	1	1	1.4	Uniform
3	2	1	3	1	1	1.6	Uniform
4	1	2	1	1	1	1.2	Uniform
5	1	1	1	1	1	1	Uniform
6	1	1	1	1	1	1	Uniform
Subgroup Average Total						7.4	
Total Xi						37	
Total Xi^2						1369	

	$(Xi)^2$				
1	1	1	1	1	4
1	4	4	1	1	1
1	4	1	9	1	1
1	1	4	1	1	1
1	1	1	1	1	1
1	1	1	1	1	1
6	Total $(Xi)^2$				53

Subgroup Average Value 1.233
Deviation Standard 0.504

Uniformity Test
Standard Average 0.225
Lower Control Limit 0.557
Upper Control Limit 1.910
Remarks : Data Uniform

Attribute 5: Label overall design

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	1	2	3	3	3	2.4	Uniform
2	3	2	3	3	3	2.8	Uniform
3	3	3	3	3	3	3	Uniform
4	1	3	3	2	3	2.4	Uniform
5	3	3	3	3	3	3	Uniform
6	1	3	3	3	3	2.6	Uniform
Subgroup Average Total						16.2	
Total Xi						81	
Total Xi^2						6561	

	$(Xi)^2$				
1	1	4	9	9	9
1	9	4	9	9	9
1	9	9	9	9	9
1	1	9	9	4	9
1	9	9	9	9	9
1	1	9	9	9	9
6	Total $(Xi)^2$				231

Subgroup Average Value 2.700
Deviation Standard 0.651

Uniformity Test
Standard Average 0.291
Lower Control Limit 1.826
Upper Control Limit 3.574
Remarks : Data Uniform

Attribute 6: The mark (identity of the product)

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	2	1	3	3	3	2.4	Uniform
2	3	2	3	3	2	2.6	Uniform
3	1	2	3	3	3	2.4	Uniform
4	3	3	3	2	1	2.4	Uniform
5	2	3	2	3	3	2.6	Uniform
6	2	3	3	2	1	2.2	Uniform
Subgroup Average Total						14.6	
Total Xi						73	
Total Xi^2						5329	

	$(Xi)^2$				
1	4	1	9	9	9
1	9	4	9	9	4
1	1	4	9	9	9
1	9	9	9	4	1
1	4	9	4	9	9
1	4	9	9	4	1
6	Total $(Xi)^2$				193

Subgroup Average Value 2.43333
Deviation Standard 0.728

Uniformity Test
Standard Average 0.326
Lower Control Limit 1.457
Upper Control Limit 3.410
Remarks : Data Uniform

Attribute 7: Color combination

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	1	3	3	2	3	2.4	Uniform
2	3	2	3	3	3	2.8	Uniform
3	3	3	3	3	3	3	Uniform
4	3	3	3	2	3	2.8	Uniform
5	3	3	3	3	2	2.8	Uniform
6	2	3	3	3	3	2.8	Uniform
Subgroup Average Total						16.6	
Total Xi						83	
Total Xi^2						6889	

	$(Xi)^2$				
1	1	9	9	4	9
1	9	4	9	9	9
1	9	9	9	9	9
1	9	9	9	4	9
1	9	9	9	9	4
1	4	9	9	9	9
6	Total $(Xi)^2$				237

Subgroup Average Value 2.767
Deviation Standard 0.504

Uniformity Test
Standard Average 0.225
Lower Control Limit 2.090
Upper Control Limit 3.443
Remarks : Data Uniform

Attribute 8: Letter combination

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	1	2	3	3	3	2.4	Uniform
2	3	3	3	3	2	2.8	Uniform
3	2	3	3	3	3	2.8	Uniform
4	3	3	1	2	2	2.2	Uniform
5	3	3	1	1	2	2	Uniform
6	3	3	3	2	3	2.8	Uniform
Subgroup Average Total						15	
Total Xi						75	
Total Xi^2						5625	

	$(Xi)^2$				
1	1	4	9	9	9
1	9	9	9	9	4
1	4	9	9	9	9
1	9	9	1	4	4
1	9	9	1	1	4
1	9	9	9	4	9
6	Total $(Xi)^2$				203

Subgroup Average Value 2.500
Deviation Standard 0.731

Uniformity Test
Standard Average 0.327
Lower Control Limit 1.519
Upper Control Limit 3.481
Remarks : Data Uniform

Attribute 9: Manufacturer identity

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	1	1	3	3	3	2.2	Uniform
2	2	3	3	3	1	2.4	Uniform
3	2	2	3	3	3	2.6	Uniform
4	3	3	1	1	1	1.8	Uniform
5	3	3	3	3	3	3	Uniform
6	3	2	2	3	3	2.6	Uniform
Subgroup Average Total						14.6	
Total Xi						73	
Total Xi^2						5329	

	$(Xi)^2$				
1	1	1	9	9	9
1	4	9	9	9	1
1	4	4	9	9	9
1	9	9	1	1	1
1	9	9	9	9	9
1	9	4	4	9	9
6	Total $(Xi)^2$				197

Subgroup Average Value 2.433
Deviation Standard 0.817

Uniformity Test
Standard Average 0.365
Lower Control Limit 1.337
Upper Control Limit 3.530
Remarks : Data Uniform

Attribute 10: Logo Design

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	1	2	1	3	3	2	Uniform
2	3	1	3	3	1	2.2	Uniform
3	2	2	3	3	3	2.6	Uniform
4	3	3	3	3	3	3	Uniform
5	2	3	1	3	1	2	Uniform
6	2	3	3	3	2	2.6	Uniform
Subgroup Average Total						14.4	
Total Xi						72	
Total Xi^2						5184	

	$(Xi)^2$				
1	1	4	1	9	9
1	9	1	9	9	1
1	4	4	9	9	9
1	9	9	9	9	9
1	4	9	1	9	1
1	4	9	9	9	4
6	Total $(Xi)^2$				192

Subgroup Average Value 2.400
Deviation Standard 0.814

Uniformity Test
Standard Average 0.364
Lower Control Limit 1.308
Upper Control Limit 3.492
Remarks : Data Uniform

Attribute 11: Additional Information

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	1	3	1	3	3	2.2	Uniform
2	3	3	3	3	3	3	Uniform
3	3	3	3	3	3	3	Uniform
4	3	3	3	3	3	3	Uniform
5	3	2	3	2	3	2.6	Uniform
6	3	3	3	3	3	3	Uniform
Subgroup Average Total						16.8	
Total Xi						84	
Total Xi^2						7056	

	$(Xi)^2$				
1	1	9	1	9	9
1	9	9	9	9	9
1	9	9	9	9	9
1	9	9	9	9	9
1	9	4	9	4	9
1	9	9	9	9	9
6	Total $(Xi)^2$				244

Subgroup Average Value 2.800
Deviation Standard 0.551

Uniformity Test
Standard Average 0.246
Lower Control Limit 2.061
Upper Control Limit 3.539
Remarks : Data Uniform

E.3. Reliability Tests for "Gadjah Mada" Performance

Item no	Varians
Easiness to open	0.312
Easiness to close	0.356
Finger comfort to open and close the cap	0.157
The cap's grip strength towards the package	0.246
Label's overall design	0.410
The mark (identity of the product)	0.512
Color combination	0.246
Letter combination	0.517
Manufacturer's identity	0.646
Logo Design	0.449
Additional information	0.293
sum	3.400

Total Varians

No	Yi	Yi^2
1	13	169
2	31	961
3	27	729
4	29	841
5	29	841
6	26	676
7	22	484
8	27	729
9	26	676
10	32	1024
11	29	841
12	30	900
13	25	625
14	31	961
15	32	1024
16	27	729
17	24	576
18	30	900
19	29	841
20	31	961
21	31	961
22	25	625
23	28	784
24	28	784
25	32	1024

26	25	625
27	31	961
28	24	576
29	26	676
30	28	784
sum	828	23288

Varians= 14.507

Calculate Alpha

Alpha Cronbach	r table	Remarks
0.842	0.349	Reliable

Appendix F: Second Questionnaire Result

F.1. Second Questionnaire Format

Kuesioner Tugas Akhir

Dengan tujuan untuk menyelesaikan perkuliahan penulis di Program Studi Teknik Industri kelas Internasional, Fakultas Teknologi Industri, Universitas Atma Jaya Yogyakarta, penulis bermaksud melakukan penelitian untuk Tugas Akhir dengam judul "DESIGN OF "KUMALA" SHUTTLECOCK PACKAGING CAP USING RATIONAL DESIGN METHOD". Saya:

Nama : Jimmy Kurniawan

NIM : 03690

Meminta bantuan anda untuk menjawab beberapa pertanyaan. Semua pertanyaan hanya akan digunakan dalam penelitian ini, dan kerahasiaan jawaban akan dijamin. Sebelum dan sesudah mengisi kuesioner ini, penulis mengucapkan banyak terima kasih atas perhatiannya.

Pengisian kuesioner ini ditujukan untuk mengetahui tingkat kepentingan dari beberapa atribut (harapan responden) dan perbandingan atribut-atribut tersebut untuk masing-masing dari 3 produk yang diperbandingkan. Kuesioner ini dibagi menjadi 3 tahap.

1. Tahap I

Pada bagian ini, pertanyaan difokuskan pada pendapat responden mengenai tingkat kepentingan atribut-atribut. Penulis meminta pendapat mengenai tingkat kepentingan masing-masing atribut dalam rangka desain ulang tutup kemasan produk.

Instruksi: Berilah tanda centang (√) pada kolom yang menunjukkan skala prioritas atribut yang berarti:

STP : Sangat Tidak Penting
TP : Tidak Penting
N : Normal
P : Penting
SP : Sangat Penting

Atribut yang sudah ada	Harapan Responden				
	STP	TP	N	P	SP
Kemudahan membuka tutup					
Kemudahan menutup kembali					
Kenyamanan jari dalam membuka					
Kenyamanan gerakan tangan					
Bentuk tutup					
Bahan pembuat tutup					
Kehalusan pembuatan produk tutup					
Adanya emboss nama atau logo produk					
Kekencangan tutup terhadap tabung					

2. Tahap II

Pada tahap ini, pertanyaan difokuskan mengenai pendapat responden mengenai *performa* masing-masing atribut tutup pengepakan dari 3 produk yang diperbandingkan.

Instruksi: Berilah tanda centang (√) pada kolom yang menunjukkan skala prioritas atribut yang berarti:

1	: Sangat jelek	4	: Baik
2	: Jelek	5	: Sangat Baik
3	: Netral		

3. Tahap III

Pada bagian ini, pertanyaan difokuskan pada atribut-atribut pengepakan yang belum dimiliki oleh produk-produk yang diperbandingkan. Penulis meminta pendapat mengenai tingkat kepentingan masing-masing atribut dalam rangka desain ulang tutup kemasan produk.

Instruksi: Berilah tanda centang (√) pada kolom yang menunjukkan skala prioritas atribut yang berarti:

STP	: Sangat Tidak Penting	P	: Penting
TP	: Tidak Penting	SP	:Sangat Penting
N	: Normal		

Atribut yang disarankan	Harapan Responden				
	STP	TP	N	P	SP
Adanya tambahan fitur (ulir, pop-off, dsb.) yang mendukung fungsi tutup *					
Adanya pegangan untuk membuka **					
Adanya tambahan fitur yang berfungsi agar tutup tidak mudah hilang ***					

Untuk mempermudah penginderaan mengenai fitur-fitur yang belum ada, penulis memberikan analogi perbandingan dengan produk lain yang berbeda jenis.

* Ulir seperti dalam tutup kemasan produk pasta gigi, pop-off seperti dalam beberapa kemasan

produk supplemen makanan dalam bentuk tablet effervescent.

** Pegangan untuk membuka seperti pegangan di atas tutup panci.

*** Berupa semacam penghubung tutup dengan tabung kemasan, seperti dalam tutup produk botol saus tomat dan botol kecap.

Atribut yang sudah ada	Performa "Kumala"					Performa "Romeo"					Performa "Gadjah Mada"				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Kemudahan membuka tutup															
Kemudahan menutup kembali															
Kenyamanan jari dalam membuka															
Kenyamanan gerakan tangan															
Bentuk tutup															
Bahan pembuat tutup															
Kehalusan pembuatan produk tutup															
Adanya emboss nama atau logo produk															
Kekencangan tutup terhadap tabung															

Keterangan:

1 : Sangat jelek
2 : Jelek
3 : Netral
4 : Baik
5 : Sangat Baik

F.2. Second Questionnaires Importance Result

Respondents	1	2	3	4	5	6	7	8	9	Sum
1	4	4	4	2	2	3	3	4	2	28
2	4	2	4	2	2	2	4	4	4	28
3	4	4	4	3	2	2	3	3	3	28
4	5	5	4	4	2	3	3	1	4	31
5	2	2	4	4	4	3	4	5	4	32
6	4	4	3	2	2	2	5	2	4	28
7	4	4	3	2	4	2	3	4	3	29
8	4	4	4	3	3	3	4	3	5	33
9	5	5	4	5	3	3	5	3	4	37
10	4	4	4	4	5	4	5	2	4	36
11	4	3	4	3	5	2	2	3	4	30
12	5	4	4	4	4	3	4	3	5	36
13	4	4	4	5	5	5	5	5	4	41
14	5	3	5	4	1	1	2	4	5	30
15	5	5	4	4	2	2	3	1	4	30
16	5	5	5	5	4	4	5	5	5	43
17	4	5	5	3	4	2	5	4	5	37
18	5	5	5	5	2	2	2	5	5	36
19	4	4	5	3	2	2	3	3	4	30
20	4	3	5	2	2	1	4	3	5	29
21	5	5	5	3	4	4	3	5	4	38
22	5	5	1	1	5	4	4	1	4	30
23	5	5	4	3	2	2	2	2	4	29
24	5	5	2	3	4	4	4	3	2	32
25	4	4	3	2	2	2	4	4	4	29

26	5	5	5	4	2	2	4	4	5	36
27	5	3	5	2	2	1	3	2	4	27
28	4	4	4	4	4	4	4	4	4	36
29	2	3	2	2	1	1	4	3	4	22
30	5	5	4	4	4	4	4	5	4	39
31	4	4	3	3	2	3	3	4	4	30
32	5	5	4	4	2	3	3	1	4	31
33	4	4	4	5	4	3	3	2	3	32
34	4	3	4	4	2	2	2	2	2	25
35	4	4	5	5	3	4	4	5	2	36
36	2	2	4	3	2	2	2	4	2	23
37	3	3	4	4	3	3	4	3	4	31
38	1	1	2	1	2	2	3	4	1	17
39	3	3	3	3	3	3	3	3	3	27
40	4	4	5	5	4	3	3	3	4	35
41	4	5	4	4	4	1	1	3	4	30
42	4	4	4	4	4	3	4	4	4	35
43	5	5	4	1	3	3	3	3	5	32
44	4	4	3	4	4	3	4	3	4	33
45	5	5	4	2	4	4	4	2	4	34
46	3	3	3	4	3	3	4	4	3	30
47	4	4	3	5	2	2	4	4	4	32
48	3	3	4	3	4	3	3	3	4	30
49	4	3	4	2	3	2	4	4	4	30
50	4	4	3	4	3	4	4	3	4	33
51	4	4	4	4	3	2	2	2	4	29
52	3	3	2	3	3	4	3	1	4	26
53	4	5	5	5	2	2	2	2	5	32

54	3	3	4	4	4	4	4	3	3	32
55	4	3	3	3	4	4	4	4	4	33
56	3	3	4	4	4	2	2	2	2	26
57	4	4	3	3	3	3	3	3	3	29
58	4	4	5	5	2	2	4	2	4	32
59	4	4	3	3	3	4	3	4	3	31
60	4	4	3	3	2	2	4	2	4	28
61	4	4	3	4	5	5	5	5	5	40
62	4	4	3	3	4	4	2	2	2	28
63	3	3	4	4	3	4	2	3	4	30
64	4	3	4	3	4	3	2	2	3	28
65	4	4	2	2	2	2	2	3	3	24
66	4	5	4	2	4	2	2	4	4	31
67	4	3	4	4	2	2	4	2	4	29
68	4	4	3	3	3	3	3	3	3	29
69	4	4	3	4	3	3	4	2	4	31
70	4	3	4	4	4	3	2	2	4	30
Sum										970
Mean	4.33	4.10	3.97	3.23	3.00	2.63	3.67	3.33	4.07	

F.3. Second Questionnaires "Kumala" Performance Result

Respondents	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Sum**
1	2	2	2	3	2	3	4	3	2	23
2	1	4	2	2	3	2	2	1	4	21

3	2	3	2	3	3	3	2	1	4	23
4	1	4	1	1	2	3	2	1	4	19
5	1	1	1	1	3	3	4	1	4	19
6	3	4	3	3	5	3	3	3	5	32
7	3	3	3	4	4	2	2	3	3	27
8	2	3	3	3	3	4	3	1	5	27
9	3	4	3	3	3	4	4	3	4	31
10	2	3	3	3	3	2	3	2	5	26
11	2	2	1	3	2	3	2	3	2	20
12	2	2	1	1	3	3	2	2	5	21
13	1	2	2	1	1	1	1	2	3	14
14	2	2	1	3	2	3	1	1	4	19
15	2	2	2	3	4	3	3	1	5	25
16	1	1	1	1	2	1	1	1	4	13
17	1	1	2	2	3	4	5	3	5	26
18	2	3	2	1	3	3	3	3	5	25
19	3	3	2	3	3	3	2	2	4	25
20	1	1	1	3	2	2	1	1	3	15
21	3	4	2	4	3	4	2	3	5	30
22	3	4	3	2	3	4	3	2	5	29
23	4	4	2	2	3	3	3	2	5	28
24	2	3	2	3	3	3	4	2	5	27
25	2	3	3	3	2	3	2	3	4	25
26	1	1	1	2	2	2	3	1	5	18
27	3	3	2	3	3	3	3	2	4	26
28	1	3	2	2	4	4	4	3	5	28
29	2	2	2	3	4	1	1	3	4	22
30	2	2	4	4	3	3	4	3	4	29

31	2	2	2	2	3	4	2	2	4	23
32	1	1	1	1	2	2	3	1	4	16
33	2	1	1	1	2	3	3	3	5	21
34	2	2	1	1	2	2	2	2	3	17
35	1	3	3	1	3	1	2	4	4	22
36	2	4	2	3	3	2	2	4	5	27
37	2	1	2	1	3	4	3	2	4	22
38	2	3	2	1	3	3	1	4	4	23
39	2	3	3	3	2	2	2	2	4	23
40	2	1	1	2	3	3	3	3	4	22
41	3	2	2	1	3	4	4	3	5	27
42	1	1	2	1	3	3	2	3	4	20
43	2	2	2	3	3	4	2	2	5	25
44	2	2	1	2	3	2	2	3	4	21
45	3	4	2	3	2	4	2	5	5	30
46	3	3	3	3	2	3	3	3	3	26
47	3	2	1	1	1	2	2	2	4	18
48	3	3	3	3	4	2	2	3	3	26
49	3	3	2	3	3	3	2	2	4	25
50	2	2	2	2	3	2	2	3	4	22
51	2	2	1	1	2	3	3	2	4	20
52	1	1	2	2	3	3	4	2	3	21
53	2	1	2	2	4	4	4	4	5	28
54	2	1	2	1	2	2	2	1	3	16
55	2	2	3	2	3	3	3	2	4	24
56	2	3	3	3	2	3	3	3	4	26
57	3	3	2	2	3	2	2	3	3	23
58	1	1	1	1	2	4	2	4	5	21

59	3	3	4	3	4	3	4	4	3	31
60	4	3	3	3	3	4	3	3	3	29
61	2	2	1	2	3	4	4	3	4	25
62	2	2	3	2	4	4	4	2	3	26
63	3	3	4	3	3	3	2	3	3	27
64	2	2	2	2	2	2	2	2	3	19
65	1	1	1	2	2	2	2	2	2	15
66	1	2	3	2	1	2	2	3	4	20
67	2	2	1	1	2	2	3	2	4	19
68	1	1	2	1	3	3	3	3	4	21
69	2	3	2	2	1	1	1	2	4	18
70	2	3	2	3	2	2	2	2	4	22
Sum										713
Mean	2.00	2.63	2.03	2.50	2.87	2.83	2.63	2.07	4.20	

F.4. Second Questionnaires "Romeo" Performance Result

Respondents	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Sum**
1	4	4	3	3	3	4	3	4	3	31
2	4	4	3	3	4	4	3	4	4	33

3	2	3	2	3	3	3	3	3	3	25
4	3	4	2	1	3	3	3	3	4	26
5	5	5	5	5	4	4	4	5	5	42
6	3	3	3	3	2	2	2	2	3	23
7	3	3	3	3	4	2	2	3	3	26
8	3	2	2	3	2	3	3	4	3	25
9	1	1	1	3	1	3	2	2	1	15
10	4	5	4	4	5	5	3	3	5	38
11	4	4	3	3	4	3	2	3	4	30
12	3	3	3	3	3	3	4	3	4	29
13	3	3	5	3	3	3	3	3	4	30
14	4	5	5	5	3	3	3	3	5	36
15	4	4	3	3	3	2	2	3	4	28
16	2	1	1	1	2	1	1	1	5	15
17	5	5	5	5	4	3	4	4	4	39
18	4	4	4	4	3	2	2	4	3	30
19	4	4	3	3	3	3	3	2	4	29
20	2	5	2	3	4	4	4	5	2	31
21	4	4	4	2	5	5	4	4	2	34
22	5	5	3	2	4	4	3	4	4	34
23	4	4	3	3	4	3	4	5	4	34
24	4	3	3	3	4	3	4	4	4	32
25	4	4	3	3	4	4	4	4	3	33
26	2	4	2	2	2	1	4	4	4	25
27	3	3	2	2	3	4	3	4	3	27
28	1	5	1	1	4	3	2	4	1	22
29	4	5	5	4	4	3	4	3	4	36
30	4	4	4	4	4	3	4	4	4	35

31	3	2	3	2	2	2	2	4	4	24
32	3	4	2	3	2	1	2	4	4	25
33	4	3	3	3	4	4	2	4	3	30
34	2	2	1	1	2	2	2	2	3	17
35	3	4	4	4	4	4	3	2	4	32
36	4	4	3	3	4	2	4	2	4	30
37	2	4	3	4	3	2	2	2	4	26
38	4	4	3	3	2	3	4	1	4	28
39	4	3	4	3	4	4	4	4	3	33
40	4	3	4	4	4	5	4	3	4	35
41	3	3	3	3	4	4	4	4	4	32
42	3	2	4	3	3	2	3	3	4	27
43	4	3	4	3	4	3	4	4	3	32
44	4	3	4	4	3	4	3	4	3	32
45	4	4	3	3	3	3	4	4	4	32
46	3	3	3	2	2	3	3	3	4	26
47	4	3	4	4	3	4	3	3	4	32
48	3	3	3	3	2	2	2	4	3	25
49	4	4	3	3	3	3	3	2	3	28
50	3	3	2	3	3	2	3	4	4	27
51	3	3	4	4	2	2	1	1	3	23
52	4	3	4	4	4	3	3	3	3	31
53	4	3	4	3	2	2	2	4	4	28
54	3	3	3	2	2	4	4	4	4	29
55	3	3	4	4	3	3	4	4	4	32
56	4	4	2	2	2	2	2	4	3	25
57	4	2	2	4	4	4	2	2	4	28
58	3	3	4	4	4	4	4	4	4	34

59	3	3	3	3	3	2	3	4	3	27
60	4	3	3	3	2	3	3	3	3	27
61	4	4	2	2	4	4	2	3	3	28
62	4	3	3	3	4	4	4	4	3	32
63	3	4	4	3	2	3	2	3	4	28
64	4	3	4	4	3	4	3	4	4	33
65	4	3	3	3	3	3	4	4	4	31
66	3	3	4	4	3	3	4	3	3	30
67	3	4	3	4	4	4	3	4	3	32
68	3	4	4	3	3	3	4	3	4	31
69	4	3	4	4	3	3	3	4	4	32
70	3	4	5	4	4	2	3	4	4	33
Sum										2060
Mean	3.40	3.77	3.07	3.00	3.37	3.10	3.07	3.47	3.53	

F.5. Second Questionnaires "Gadjah Mada" Performance Result

Respondents	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Sum**
1	5	5	5	5	5	5	5	5	4	44
2	5	5	5	4	3	4	4	4	2	36
3	3	3	4	4	3	3	3	3	2	28
4	5	5	4	5	4	3	4	5	4	39
5	5	5	5	5	4	5	5	5	2	41
6	4	3	3	3	4	4	4	4	1	30
7	3	3	4	3	4	4	4	4	3	32
8	4	4	5	4	4	4	5	5	2	37
9	4	3	4	4	3	4	4	4	3	33

10	5	4	5	4	4	4	5	3	3	37
11	4	4	4	3	4	3	2	3	3	30
12	5	5	5	5	3	4	4	3	2	36
13	5	3	5	5	5	5	5	5	3	41
14	5	1	5	3	5	3	5	5	1	33
15	4	4	4	3	4	4	4	1	3	31
16	5	5	5	5	5	5	5	5	4	44
17	3	4	3	3	5	5	5	5	4	37
18	5	5	5	5	3	5	5	5	3	41
19	4	4	4	4	4	4	4	4	3	35
20	5	4	5	5	5	5	5	4	1	39
21	5	4	4	4	4	5	5	4	4	39
22	2	3	3	2	3	4	4	3	1	25
23	4	4	3	3	3	3	4	4	4	32
24	4	3	3	3	4	3	4	2	1	27
25	4	4	3	3	4	4	4	5	3	34
26	5	5	5	4	5	4	5	5	1	39
27	4	3	4	3	3	3	3	4	2	29
28	5	5	5	5	3	4	2	3	1	33
29	4	4	4	4	5	3	4	3	3	34
30	5	5	5	5	4	4	5	5	3	41
31	4	2	4	4	4	4	4	4	2	32
32	5	5	5	5	5	5	4	4	3	41
33	5	4	4	3	3	4	5	4	1	33
34	4	3	4	4	4	5	4	2	1	31
35	3	5	4	3	3	4	3	5	1	31
36	4	4	4	3	5	3	5	4	2	34
37	4	5	5	4	4	3	4	3	2	34

38	4	3	4	4	2	3	4	4	2	30
39	5	5	5	5	5	5	5	5	3	43
40	5	5	4	4	4	5	5	5	2	39
41	5	4	5	5	4	4	4	3	2	36
42	5	5	4	5	4	3	4	4	3	37
43	4	3	4	3	4	3	3	4	3	31
44	5	5	4	5	4	4	3	4	2	36
45	4	4	3	3	3	3	4	2	4	30
46	3	3	3	3	4	4	3	3	4	30
47	5	5	4	5	3	4	4	4	2	36
48	3	3	3	3	4	3	3	3	3	28
49	4	4	3	3	3	4	4	4	4	33
50	4	5	4	4	3	4	4	4	2	34
51	5	4	4	4	4	3	4	4	3	35
52	3	3	4	4	2	2	3	3	1	25
53	5	4	5	5	4	3	4	4	3	37
54	4	4	4	4	4	4	4	4	4	36
55	5	5	4	5	4	4	4	4	3	38
56	5	5	5	4	4	4	4	2	4	37
57	4	5	5	4	3	2	4	4	4	35
58	5	5	5	5	5	5	4	3	2	39
59	4	4	4	3	4	3	4	4	4	34
60	4	4	4	3	4	4	3	4	4	34
61	4	4	4	4	4	4	4	4	2	34
62	5	4	4	4	5	5	4	3	4	38
63	3	4	3	4	3	3	3	4	4	31
64	4	4	5	4	4	3	4	4	5	37
65	4	4	3	3	2	3	2	2	2	25

66	5	5	4	4	3	4	4	4	5	38
67	4	5	4	5	5	4	5	4	2	38
68	4	4	4	4	4	4	4	4	2	34
69	5	4	3	3	4	4	4	4	2	33
70	4	5	5	5	4	4	4	4	5	40
Sum										2434
Mean	4.33	3.97	4.27	3.93	3.97	4.00	4.23	4.00	2.53	

F.6. Second Questionnaires Customer's Suggestion Result

Respondents	1	2	3	Sum
1	5	2	2	9
2	4	4	2	10
3	4	2	4	10
4	4	4	4	12
5	4	5	5	14
6	2	4	4	10
7	4	2	2	8
8	3	4	4	11
9	3	2	3	8
10	5	4	2	11
11	2	2	4	8
12	3	3	3	9
13	4	4	4	12
14	4	2	5	11
15	4	2	5	11
16	5	1	5	11
17	5	4	5	14
18	1	1	5	7
19	2	1	2	5
20	1	1	5	7
21	4	4	4	12
22	3	5	3	11
23	4	4	3	11
24	4	4	3	11
25	3	4	2	9
26	4	4	2	10
27	4	4	2	10
28	5	4	2	11
29	3	2	1	6
30	3	3	3	9
31	4	3	3	10
32	2	2	4	8
33	4	4	4	12
34	2	4	4	10
35	4	4	5	13
36	3	2	3	8
37	4	4	4	12
38	4	2	4	10
39	5	4	4	13
40	3	3	4	10
41	4	4	4	12
42	4	4	4	12

43	5	5	4	14
44	2	2	2	6
45	5	5	5	15
46	3	3	3	9
47	2	2	3	7
48	4	3	4	11
49	3	4	3	10
50	4	3	3	10
51	2	2	2	6
52	2	2	2	6
53	4	4	3	11
54	5	5	4	14
55	2	3	4	9
56	4	4	3	11
57	3	4	3	10
58	2	3	3	8
59	4	2	3	9
60	3	2	2	7
61	3	4	2	9
62	2	2	4	8
63	3	2	4	9
64	4	4	4	12
65	4	4	4	12
66	2	2	2	6
67	4	4	3	11
68	4	4	5	13
69	5	4	3	12
70	3	3	2	8
Sum				298
Mean	3.53	3.07	3.33	

F.7. Attributes Importance Weightings Details

Attribute 1: Easiness to open

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Important	5	17	85
Important	4	41	164
Normal	3	8	24
Unimportant	2	3	6
Very Unimportant	1	1	1
Sum		70	280
Average Weight			4.00

Attribute 2: Easiness to close

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Important	5	18	90
Important	4	29	116
Normal	3	19	57
Unimportant	2	3	6
Very Unimportant	1	1	1
Sum		70	270
Average Weight			3.86

Attribute 3: Finger comfort in opening and closing

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Important	5	13	65
Important	4	34	136
Normal	3	17	51
Unimportant	2	5	10
Very Unimportant	1	1	1
Sum		70	263
Average Weight			3.76

Attribute 4: Hand movement comfort

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Important	5	10	50
Important	4	25	100
Normal	3	20	60
Unimportant	2	12	24
Very Unimportant	1	3	3
Sum		70	237
Average Weight			3.39

Attribute 5: Form of cap

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Important	5	5	25
Important	4	23	92
Normal	3	16	48
Unimportant	2	24	13
Very Unimportant	1	2	2
Sum		70	180
Average Weight			2.57

Attribute 6: Cap material

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Important	5	2	10
Important	4	16	64
Normal	3	22	66
Unimportant	2	25	13
Very Unimportant	1	5	5
Sum		70	158
Average Weight			2.26

Attribute 7: Cap product manufacturing smoothness

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Important	5	7	35
Important	4	27	108
Normal	3	20	60
Unimportant	2	15	13
Very Unimportant	1	1	1
Sum		70	217
Average Weight			3.10

Attribute 8: Emboss of logo or product name

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Important	5	8	40
Important	4	18	72
Normal	3	22	66
Unimportant	2	17	13
Very Unimportant	1	5	5
Sum		70	196
Average Weight			2.80

Attribute 9: Cap's grip strength towards the package

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Important	5	11	55
Important	4	40	160
Normal	3	11	33
Unimportant	2	7	13
Very Unimportant	1	1	1
Sum		70	262
Average Weight			3.74

F.8. "Kumala" Performance Weighting Details

Attribute 1: Easiness to open

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	0	0
Good	4	2	8
Normal	3	16	48
Bad	2	35	70
Very Bad	1	17	17
Sum		70	143
Average Weight			2.04

Attribute 2: Easiness to close

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	0	0
Good	4	9	36
Normal	3	23	69
Bad	2	22	44
Very Bad	1	16	16
Sum		70	165
Average Weight			2.36

Attribute 3: Finger comfort in opening and closing

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	0	0
Good	4	3	12
Normal	3	16	48
Bad	2	32	64
Very Bad	1	19	19
Sum		70	143
Average Weight			2.04

Attribute 4: Hand movement comfort

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	0	0
Good	4	2	8
Normal	3	28	84
Bad	2	19	38
Very Bad	1	21	21
Sum		70	151
Average Weight			2.16

Attribute 5: Form of cap

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	1	5
Good	4	8	32
Normal	3	22	66
Bad	2	35	70
Very Bad	1	4	4
Sum		70	177
Average Weight			2.53

Attribute 6: Cap Material

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	0	0
Good	4	16	64
Normal	3	29	87
Bad	2	20	40
Very Bad	1	5	5
Sum		70	196
Average Weight			2.80

Attribute 7: Cap product manufacturing smoothness

Attributes		No. of Respondents	Weight
Importance scale	Score		
Very Good	5	1	5
Good	4	12	48
Normal	3	20	60
Bad	2	30	60
Very Bad	1	7	7
Sum		70	180
Average Weight			2.57

Attribute 8: Emboss of logo or product name

Attributes		No. of Respondents	Weight
Importance scale	Score		
Very Good	5	1	5
Good	4	6	24
Normal	3	27	81
Bad	2	24	48
Very Bad	1	12	12
Sum		70	170
Average Weight			2.43

Attribute 9: Cap's grip strength towards the package

Attributes		No. of Respondents	Weight
Importance scale	Score		
Very Good	5	20	100
Good	4	34	136
Normal	3	14	42
Bad	2	2	4
Very Bad	1	0	0
Sum		70	282
Average Weight			4.03

F.9. "Romeo" Performance Weighting Details

Attribute 1: Easiness to open

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	3	15
Good	4	34	136
Normal	3	25	75
Bad	2	6	12
Very Bad	1	2	2
Sum		70	240
Average Weight			3.43

Attribute 2: Easiness to close

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	8	40
Good	4	25	100
Normal	3	30	90
Bad	2	5	10
Very Bad	1	2	2
Sum		70	242
Average Weight			3.46

Attribute 3: Finger comfort in opening and closing

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	6	30
Good	4	21	84
Normal	3	28	84
Bad	2	11	22
Very Bad	1	4	4
Sum		70	224
Average Weight			3.20

Attribute 4: Hand movement comfort

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	3	15
Good	4	19	76
Normal	3	35	105
Bad	2	9	18
Very Bad	1	4	4
Sum		70	218
Average Weight			3.11

Attribute 5: Form of cap

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	2	10
Good	4	27	108
Normal	3	24	72
Bad	2	16	32
Very Bad	1	1	1
Sum		70	223
Average Weight			3.19

Attribute 6: Cap Material

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	3	15
Good	4	20	80
Normal	3	28	84
Bad	2	16	32
Very Bad	1	3	3
Sum		70	214
Average Weight			3.06

Attribute 7: Cap product manufacturing smoothness

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	3	15
Good	4	35	140
Normal	3	20	60
Bad	2	9	18
Very Bad	1	3	3
Sum		70	236
Average Weight			3.37

Attribute 8: Emboss of logo or product name

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	3	15
Good	4	35	140
Normal	3	20	60
Bad	2	9	18
Very Bad	1	3	3
Sum		70	236
Average Weight			3.37

Attribute 9: Cap's grip strength towards the package

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	4	20
Good	4	38	152
Normal	3	24	72
Bad	2	2	4
Very Bad	1	2	2
Sum		70	250
Average Weight			3.57

F.10. "Gadjah Mada" Performance Weighting Details

Attribute 1: Easiness to open

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	31	155
Good	4	30	120
Normal	3	8	24
Bad	2	1	2
Very Bad	1	0	0
Sum		70	301
Average Weight			4.30

Attribute 2: Easiness to close

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	26	130
Good	4	28	112
Normal	3	14	42
Bad	2	1	2
Very Bad	1	1	1
Sum		70	287
Average Weight			4.10

Attribute 3: Finger comfort in opening and closing

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	24	120
Good	4	33	132
Normal	3	13	39
Bad	2	0	0
Very Bad	1	0	0
Sum		70	291
Average Weight			4.16

Attribute 4: Hand movement comfort

Attributes		No. of Respondents	Weight
Importance scale	Score		
Very Good	5	21	105
Good	4	26	104
Normal	3	22	66
Bad	2	1	2
Very Bad	1	0	0
Sum		70	277
Average Weight			3.96

Attribute 5: Form of cap

Attributes		No. of Respondents	Weight
Importance scale	Score		
Very Good	5	14	70
Good	4	35	140
Normal	3	18	54
Bad	2	3	6
Very Bad	1	0	0
Sum		70	270
Average Weight			3.86

Attribute 6: Cap Material

Attributes		No. of Respondents	Weight
Importance scale	Score		
Very Good	5	14	70
Good	4	33	132
Normal	3	21	63
Bad	2	2	4
Very Bad	1	0	0
Sum		70	269
Average Weight			3.84

Attribute 7: Cap product manufacturing smoothness

Attributes		No. of Respondents	Weight
Importance scale	Score		
Very Good	5	18	90
Good	4	39	156
Normal	3	10	30
Bad	2	3	6
Very Bad	1	0	0
Sum		70	282
Average Weight			4.03

Attribute 8: Emboss of logo or product name

Attributes		No. of Respondents	Weight
Importance scale	Score		
Very Good	5	15	75
Good	4	35	140
Normal	3	14	42
Bad	2	5	10
Very Bad	1	1	1
Sum		70	268
Average Weight			3.83

Attribute 9: Cap's grip strength towards the package

Attributes		No. of Respondents	Weight
Importance scale	Score		
Very Good	5	3	15
Good	4	16	64
Normal	3	19	57
Bad	2	21	42
Very Bad	1	11	11
Sum		70	189
Average Weight			2.70

F.11. Attributes Suggestion Weighting Details

Attribute 1: Additional features (thread, pop-off, etc.) which support the function of the cap.

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Important	5	10	50
Important	4	29	116
Normal	3	16	48
Unimportant	2	13	26
Very Unimportant	1	2	2
Sum		70	242
Average Weight			3.46

Attribute 2: Additional handle to open

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Important	5	5	25
Important	4	31	124
Normal	3	10	30
Unimportant	2	20	40
Very Unimportant	1	4	4
Sum		70	223
Average Weight			3.19

Attribute 3: Additional features which function is to avoid the loss of the cap

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Important	5	10	50
Important	4	24	96
Normal	3	19	57
Unimportant	2	16	32
Very Unimportant	1	1	1
Sum		70	236
Average Weight			3.37

Appendix G: Second Questionnaire: Attributes Importance Tests

G.1. Validity Tests for Attributes Importance

Attribute 1: Easiness to open

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	28	784	112
2	4	16	28	784	112
3	4	16	28	784	112
4	5	25	31	961	155
5	2	4	32	1024	64
6	4	16	28	784	112
7	4	16	29	841	116
8	4	16	33	1089	132
9	5	25	37	1369	185
10	4	16	36	1296	144
11	4	16	30	900	120
12	5	25	36	1296	180
13	4	16	41	1681	164
14	5	25	30	900	150
15	5	25	30	900	150
16	5	25	43	1849	215
17	4	16	37	1369	148
18	5	25	36	1296	180
19	4	16	30	900	120
20	4	16	29	841	116
21	5	25	38	1444	190
22	5	25	30	900	150
23	5	25	29	841	145
24	5	25	32	1024	160
25	4	16	29	841	116
26	5	25	36	1296	180
27	5	25	27	729	135
28	4	16	36	1296	144
29	2	4	22	484	44
30	5	25	39	1521	195
31	4	16	30	900	120
32	5	25	31	961	155
33	4	16	32	1024	128
34	4	16	25	625	100
35	4	16	36	1296	144
36	2	4	23	529	46
37	3	9	31	961	93

38	1	1	17	289	17
39	3	9	27	729	81
40	4	16	35	1225	140
41	4	16	30	900	120
42	4	16	35	1225	140
43	5	25	32	1024	160
44	4	16	33	1089	132
45	5	25	34	1156	170
46	3	9	30	900	90
47	4	16	32	1024	128
48	3	9	30	900	90
49	4	16	30	900	120
50	4	16	33	1089	132
51	4	16	29	841	116
52	3	9	26	676	78
53	4	16	32	1024	128
54	3	9	32	1024	96
55	4	16	33	1089	132
56	3	9	26	676	78
57	4	16	29	841	116
58	4	16	32	1024	128
59	4	16	31	961	124
60	4	16	28	784	112
61	4	16	40	1600	160
62	4	16	28	784	112
63	3	9	30	900	90
64	4	16	28	784	112
65	4	16	24	576	96
66	4	16	31	961	124
67	4	16	29	841	116
68	4	16	29	841	116
69	4	16	31	961	124
70	4	16	30	900	120
Sum	280	1166	2174	68858	8830

Rxy= 0.53977 Varians= 0.65714

Attribute 2: Easiness to close

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	28	784	112
2	2	4	28	784	56
3	4	16	28	784	112
4	5	25	31	961	155

5	2	4	32	1024	64
6	4	16	28	784	112
7	4	16	29	841	116
8	4	16	33	1089	132
9	5	25	37	1369	185
10	4	16	36	1296	144
11	3	9	30	900	90
12	4	16	36	1296	144
13	4	16	41	1681	164
14	3	9	30	900	90
15	5	25	30	900	150
16	5	25	43	1849	215
17	5	25	37	1369	185
18	5	25	36	1296	180
19	4	16	30	900	120
20	3	9	29	841	87
21	5	25	38	1444	190
22	5	25	30	900	150
23	5	25	29	841	145
24	5	25	32	1024	160
25	4	16	29	841	116
26	5	25	36	1296	180
27	3	9	27	729	81
28	4	16	36	1296	144
29	3	9	22	484	66
30	5	25	39	1521	195
31	4	16	30	900	120
32	5	25	31	961	155
33	4	16	32	1024	128
34	3	9	25	625	75
35	4	16	36	1296	144
36	2	4	23	529	46
37	3	9	31	961	93
38	1	1	17	289	17
39	3	9	27	729	81
40	4	16	35	1225	140
41	5	25	30	900	150
42	4	16	35	1225	140
43	5	25	32	1024	160
44	4	16	33	1089	132
45	5	25	34	1156	170
46	3	9	30	900	90
47	4	16	32	1024	128
48	3	9	30	900	90
49	3	9	30	900	90

50	4	16	33	1089	132
51	4	16	29	841	116
52	3	9	26	676	78
53	5	25	32	1024	160
54	3	9	32	1024	96
55	3	9	33	1089	99
56	3	9	26	676	78
57	4	16	29	841	116
58	4	16	32	1024	128
59	4	16	31	961	124
60	4	16	28	784	112
61	4	16	40	1600	160
62	4	16	28	784	112
63	3	9	30	900	90
64	3	9	28	784	84
65	4	16	24	576	96
66	5	25	31	961	155
67	3	9	29	841	87
68	4	16	29	841	116
69	4	16	31	961	124
70	3	9	30	900	90
Sum	270	1098	2174	68858	8542

Rxy= 0.56872 Varians= 0.80816

Attribute 3: Finger comfort in opening and closing

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	28	784	112
2	4	16	28	784	112
3	4	16	28	784	112
4	4	16	31	961	124
5	4	16	32	1024	128
6	3	9	28	784	84
7	3	9	29	841	87
8	4	16	33	1089	132
9	4	16	37	1369	148
10	4	16	36	1296	144
11	4	16	30	900	120
12	4	16	36	1296	144
13	4	16	41	1681	164
14	5	25	30	900	150
15	4	16	30	900	120
16	5	25	43	1849	215

17	5	25	37	1369	185
18	5	25	36	1296	180
19	5	25	30	900	150
20	5	25	29	841	145
21	5	25	38	1444	190
22	1	1	30	900	30
23	4	16	29	841	116
24	2	4	32	1024	64
25	3	9	29	841	87
26	5	25	36	1296	180
27	5	25	27	729	135
28	4	16	36	1296	144
29	2	4	22	484	44
30	4	16	39	1521	156
31	3	9	30	900	90
32	4	16	31	961	124
33	4	16	32	1024	128
34	4	16	25	625	100
35	5	25	36	1296	180
36	4	16	23	529	92
37	4	16	31	961	124
38	2	4	17	289	34
39	3	9	27	729	81
40	5	25	35	1225	175
41	4	16	30	900	120
42	4	16	35	1225	140
43	4	16	32	1024	128
44	3	9	33	1089	99
45	4	16	34	1156	136
46	3	9	30	900	90
47	3	9	32	1024	96
48	4	16	30	900	120
49	4	16	30	900	120
50	3	9	33	1089	99
51	4	16	29	841	116
52	2	4	26	676	52
53	5	25	32	1024	160
54	4	16	32	1024	128
55	3	9	33	1089	99
56	4	16	26	676	104
57	3	9	29	841	87
58	5	25	32	1024	160
59	3	9	31	961	93
60	3	9	28	784	84
61	3	9	40	1600	120

62	3	9	28	784	84
63	4	16	30	900	120
64	4	16	28	784	112
65	2	4	24	576	48
66	4	16	31	961	124
67	4	16	29	841	116
68	3	9	29	841	87
69	3	9	31	961	93
70	4	16	30	900	120
Sum	263	1043	2174	68858	8285

Rxy= 0.43141 Varians= 0.78388

Attribute 4: Hand movement comfort

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	28	784	56
2	2	4	28	784	56
3	3	9	28	784	84
4	4	16	31	961	124
5	4	16	32	1024	128
6	2	4	28	784	56
7	2	4	29	841	58
8	3	9	33	1089	99
9	5	25	37	1369	185
10	4	16	36	1296	144
11	3	9	30	900	90
12	4	16	36	1296	144
13	5	25	41	1681	205
14	4	16	30	900	120
15	4	16	30	900	120
16	5	25	43	1849	215
17	3	9	37	1369	111
18	5	25	36	1296	180
19	3	9	30	900	90
20	2	4	29	841	58
21	3	9	38	1444	114
22	1	1	30	900	30
23	3	9	29	841	87
24	3	9	32	1024	96
25	2	4	29	841	58
26	4	16	36	1296	144
27	2	4	27	729	54
28	4	16	36	1296	144

29	2	4	22	484	44
30	4	16	39	1521	156
31	3	9	30	900	90
32	4	16	31	961	124
33	5	25	32	1024	160
34	4	16	25	625	100
35	5	25	36	1296	180
36	3	9	23	529	69
37	4	16	31	961	124
38	1	1	17	289	17
39	3	9	27	729	81
40	5	25	35	1225	175
41	4	16	30	900	120
42	4	16	35	1225	140
43	1	1	32	1024	32
44	4	16	33	1089	132
45	2	4	34	1156	68
46	4	16	30	900	120
47	5	25	32	1024	160
48	3	9	30	900	90
49	2	4	30	900	60
50	4	16	33	1089	132
51	4	16	29	841	116
52	3	9	26	676	78
53	5	25	32	1024	160
54	4	16	32	1024	128
55	3	9	33	1089	99
56	4	16	26	676	104
57	3	9	29	841	87
58	5	25	32	1024	160
59	3	9	31	961	93
60	3	9	28	784	84
61	4	16	40	1600	160
62	3	9	28	784	84
63	4	16	30	900	120
64	3	9	28	784	84
65	2	4	24	576	48
66	2	4	31	961	62
67	4	16	29	841	116
68	3	9	29	841	87
69	4	16	31	961	124
70	4	16	30	900	120
Sum	237	881	2174	68858	7538

Rxy= 0.5469 Varians= 1.12265

Attribute 5: Form of cap

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	28	784	56
2	2	4	28	784	56
3	2	4	28	784	56
4	2	4	31	961	62
5	4	16	32	1024	128
6	2	4	28	784	56
7	4	16	29	841	116
8	3	9	33	1089	99
9	3	9	37	1369	111
10	5	25	36	1296	180
11	5	25	30	900	150
12	4	16	36	1296	144
13	5	25	41	1681	205
14	1	1	30	900	30
15	2	4	30	900	60
16	4	16	43	1849	172
17	4	16	37	1369	148
18	2	4	36	1296	72
19	2	4	30	900	60
20	2	4	29	841	58
21	4	16	38	1444	152
22	5	25	30	900	150
23	2	4	29	841	58
24	4	16	32	1024	128
25	2	4	29	841	58
26	2	4	36	1296	72
27	2	4	27	729	54
28	4	16	36	1296	144
29	1	1	22	484	22
30	4	16	39	1521	156
31	2	4	30	900	60
32	2	4	31	961	62
33	4	16	32	1024	128
34	2	4	25	625	50
35	3	9	36	1296	108
36	2	4	23	529	46
37	3	9	31	961	93
38	2	4	17	289	34
39	3	9	27	729	81
40	4	16	35	1225	140
41	4	16	30	900	120
42	4	16	35	1225	140

43	3	9	32	1024	96
44	4	16	33	1089	132
45	4	16	34	1156	136
46	3	9	30	900	90
47	2	4	32	1024	64
48	4	16	30	900	120
49	3	9	30	900	90
50	3	9	33	1089	99
51	3	9	29	841	87
52	3	9	26	676	78
53	2	4	32	1024	64
54	4	16	32	1024	128
55	4	16	33	1089	132
56	4	16	26	676	104
57	3	9	29	841	87
58	2	4	32	1024	64
59	3	9	31	961	93
60	2	4	28	784	56
61	5	25	40	1600	200
62	4	16	28	784	112
63	3	9	30	900	90
64	4	16	28	784	112
65	2	4	24	576	48
66	4	16	31	961	124
67	2	4	29	841	58
68	3	9	29	841	87
69	3	9	31	961	93
70	4	16	30	900	120
Sum	215	735	2174	68858	6839

Rxy= 0.51137 Varians= 1.06633

Attribute 6: Cap material

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	28	784	84
2	2	4	28	784	56
3	2	4	28	784	56
4	3	9	31	961	93
5	3	9	32	1024	96
6	2	4	28	784	56
7	2	4	29	841	58
8	3	9	33	1089	99
9	3	9	37	1369	111

10	4	16	36	1296	144
11	2	4	30	900	60
12	3	9	36	1296	108
13	5	25	41	1681	205
14	1	1	30	900	30
15	2	4	30	900	60
16	4	16	43	1849	172
17	2	4	37	1369	74
18	2	4	36	1296	72
19	2	4	30	900	60
20	1	1	29	841	29
21	4	16	38	1444	152
22	4	16	30	900	120
23	2	4	29	841	58
24	4	16	32	1024	128
25	2	4	29	841	58
26	2	4	36	1296	72
27	1	1	27	729	27
28	4	16	36	1296	144
29	1	1	22	484	22
30	4	16	39	1521	156
31	3	9	30	900	90
32	3	9	31	961	93
33	3	9	32	1024	96
34	2	4	25	625	50
35	4	16	36	1296	144
36	2	4	23	529	46
37	3	9	31	961	93
38	2	4	17	289	34
39	3	9	27	729	81
40	3	9	35	1225	105
41	1	1	30	900	30
42	3	9	35	1225	105
43	3	9	32	1024	96
44	3	9	33	1089	99
45	4	16	34	1156	136
46	3	9	30	900	90
47	2	4	32	1024	64
48	3	9	30	900	90
49	2	4	30	900	60
50	4	16	33	1089	132
51	2	4	29	841	58
52	4	16	26	676	104
53	2	4	32	1024	64
54	4	16	32	1024	128

55	4	16	33	1089	132
56	2	4	26	676	52
57	3	9	29	841	87
58	2	4	32	1024	64
59	4	16	31	961	124
60	2	4	28	784	56
61	5	25	40	1600	200
62	4	16	28	784	112
63	4	16	30	900	120
64	3	9	28	784	84
65	2	4	24	576	48
66	2	4	31	961	62
67	2	4	29	841	58
68	3	9	29	841	87
69	3	9	31	961	93
70	3	9	30	900	90
Sum	195	609	2174	68858	6217

Rxy= 0.54183 Varians= 0.9398

Attribute 7: Cap product manufacturing smoothness

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	28	784	84
2	4	16	28	784	112
3	3	9	28	784	84
4	3	9	31	961	93
5	4	16	32	1024	128
6	5	25	28	784	140
7	3	9	29	841	87
8	4	16	33	1089	132
9	5	25	37	1369	185
10	5	25	36	1296	180
11	2	4	30	900	60
12	4	16	36	1296	144
13	5	25	41	1681	205
14	2	4	30	900	60
15	3	9	30	900	90
16	5	25	43	1849	215
17	5	25	37	1369	185
18	2	4	36	1296	72
19	3	9	30	900	90
20	4	16	29	841	116
21	3	9	38	1444	114

22	4	16	30	900	120
23	2	4	29	841	58
24	4	16	32	1024	128
25	4	16	29	841	116
26	4	16	36	1296	144
27	3	9	27	729	81
28	4	16	36	1296	144
29	4	16	22	484	88
30	4	16	39	1521	156
31	3	9	30	900	90
32	3	9	31	961	93
33	3	9	32	1024	96
34	2	4	25	625	50
35	4	16	36	1296	144
36	2	4	23	529	46
37	4	16	31	961	124
38	3	9	17	289	51
39	3	9	27	729	81
40	3	9	35	1225	105
41	1	1	30	900	30
42	4	16	35	1225	140
43	3	9	32	1024	96
44	4	16	33	1089	132
45	4	16	34	1156	136
46	4	16	30	900	120
47	4	16	32	1024	128
48	3	9	30	900	90
49	4	16	30	900	120
50	4	16	33	1089	132
51	2	4	29	841	58
52	3	9	26	676	78
53	2	4	32	1024	64
54	4	16	32	1024	128
55	4	16	33	1089	132
56	2	4	26	676	52
57	3	9	29	841	87
58	4	16	32	1024	128
59	3	9	31	961	93
60	4	16	28	784	112
61	5	25	40	1600	200
62	2	4	28	784	56
63	2	4	30	900	60
64	2	4	28	784	56
65	2	4	24	576	48
66	2	4	31	961	62

67	4	16	29	841	116
68	3	9	29	841	87
69	4	16	31	961	124
70	2	4	30	900	60
Sum	234	848	2174	68858	7416

Rxy= 0.50069 Varians= 0.93959

Attribute 8: Emboss of logo or product name

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	28	784	112
2	4	16	28	784	112
3	3	9	28	784	84
4	1	1	31	961	31
5	5	25	32	1024	160
6	2	4	28	784	56
7	4	16	29	841	116
8	3	9	33	1089	99
9	3	9	37	1369	111
10	2	4	36	1296	72
11	3	9	30	900	90
12	3	9	36	1296	108
13	5	25	41	1681	205
14	4	16	30	900	120
15	1	1	30	900	30
16	5	25	43	1849	215
17	4	16	37	1369	148
18	5	25	36	1296	180
19	3	9	30	900	90
20	3	9	29	841	87
21	5	25	38	1444	190
22	1	1	30	900	30
23	2	4	29	841	58
24	3	9	32	1024	96
25	4	16	29	841	116
26	4	16	36	1296	144
27	2	4	27	729	54
28	4	16	36	1296	144
29	3	9	22	484	66
30	5	25	39	1521	195
31	4	16	30	900	120
32	1	1	31	961	31
33	2	4	32	1024	64

34	2	4	25	625	50
35	5	25	36	1296	180
36	4	16	23	529	92
37	3	9	31	961	93
38	4	16	17	289	68
39	3	9	27	729	81
40	3	9	35	1225	105
41	3	9	30	900	90
42	4	16	35	1225	140
43	3	9	32	1024	96
44	3	9	33	1089	99
45	2	4	34	1156	68
46	4	16	30	900	120
47	4	16	32	1024	128
48	3	9	30	900	90
49	4	16	30	900	120
50	3	9	33	1089	99
51	2	4	29	841	58
52	1	1	26	676	26
53	2	4	32	1024	64
54	3	9	32	1024	96
55	4	16	33	1089	132
56	2	4	26	676	52
57	3	9	29	841	87
58	2	4	32	1024	64
59	4	16	31	961	124
60	2	4	28	784	56
61	5	25	40	1600	200
62	2	4	28	784	56
63	3	9	30	900	90
64	2	4	28	784	56
65	3	9	24	576	72
66	4	16	31	961	124
67	2	4	29	841	58
68	3	9	29	841	87
69	2	4	31	961	62
70	2	4	30	900	60
Sum	217	759	2174	68858	6877

Rxy= 0.40467 Varians= 1.23286

Attribute 9: Cap grip strength towards the package

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	28	784	56
2	4	16	28	784	112
3	3	9	28	784	84
4	4	16	31	961	124
5	4	16	32	1024	128
6	4	16	28	784	112
7	3	9	29	841	87
8	5	25	33	1089	165
9	4	16	37	1369	148
10	4	16	36	1296	144
11	4	16	30	900	120
12	5	25	36	1296	180
13	4	16	41	1681	164
14	5	25	30	900	150
15	4	16	30	900	120
16	5	25	43	1849	215
17	5	25	37	1369	185
18	5	25	36	1296	180
19	4	16	30	900	120
20	5	25	29	841	145
21	4	16	38	1444	152
22	4	16	30	900	120
23	4	16	29	841	116
24	2	4	32	1024	64
25	4	16	29	841	116
26	5	25	36	1296	180
27	4	16	27	729	108
28	4	16	36	1296	144
29	4	16	22	484	88
30	4	16	39	1521	156
31	4	16	30	900	120
32	4	16	31	961	124
33	3	9	32	1024	96
34	2	4	25	625	50
35	2	4	36	1296	72
36	2	4	23	529	46
37	4	16	31	961	124
38	1	1	17	289	17
39	3	9	27	729	81
40	4	16	35	1225	140
41	4	16	30	900	120
42	4	16	35	1225	140

43	5	25	32	1024	160
44	4	16	33	1089	132
45	4	16	34	1156	136
46	3	9	30	900	90
47	4	16	32	1024	128
48	4	16	30	900	120
49	4	16	30	900	120
50	4	16	33	1089	132
51	4	16	29	841	116
52	4	16	26	676	104
53	5	25	32	1024	160
54	3	9	32	1024	96
55	4	16	33	1089	132
56	2	4	26	676	52
57	3	9	29	841	87
58	4	16	32	1024	128
59	3	9	31	961	93
60	4	16	28	784	112
61	5	25	40	1600	200
62	2	4	28	784	56
63	4	16	30	900	120
64	3	9	28	784	84
65	3	9	24	576	72
66	4	16	31	961	124
67	4	16	29	841	116
68	3	9	29	841	87
69	4	16	31	961	124
70	4	16	30	900	120
Sum	263	1043	2174	68858	8314

Rxy= 0.53837 Varians= 0.78388

G.2. Uniformity and Data Sufficiency Tests for Attributes Importance

Attribute 1: Easiness to open

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	4	5	2	5	4	4	Uniform	1
2	4	5	5	4	4	4.4	Uniform	1
3	4	4	4	5	4	4.2	Uniform	1
4	5	5	5	3	4	4.4	Uniform	1
5	2	4	4	4	4	3.6	Uniform	1
6	4	4	4	3	4	3.8	Uniform	1
7	4	5	4	4	3	4	Uniform	1
8	4	5	2	4	4	3.8	Uniform	1
9	5	5	3	4	4	4.2	Uniform	1
10	4	5	1	3	4	3.4	Uniform	1
11	4	4	3	4	4	3.8	Uniform	1
12	5	5	4	3	4	4.2	Uniform	1
13	4	5	4	4	4	4.2	Uniform	1
14	5	4	4	3	4	4	Uniform	1
Subgroup Average Total						56		14
Total Xi						280		
Total Xi^2						78400		

$(Xi)^2$				
16	25	4	25	16
16	25	25	16	16
16	16	16	25	16
25	25	25	9	16
4	16	16	16	16
16	16	16	9	16
16	25	16	16	9
16	25	4	16	16
25	25	9	16	16
16	25	1	9	16
16	16	9	16	16
25	25	16	9	16
16	25	16	16	16
25	16	16	9	16
Total $(Xi)^2$				1166

Subgroup Average Value 4.000
Deviation Standard 0.816

Uniformity Test
Standard Average 0.365
Lower Control Limit 2.905
Upper Control Limit 5.095
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 16.4286

Attribute 2: Easiness to close

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	4	5	3	5	4	4.2	Uniform	1
2	2	5	5	4	4	4	Uniform	1
3	4	5	4	5	4	4.4	Uniform	1
4	5	5	5	3	4	4.4	Uniform	1
5	2	4	4	4	4	3.6	Uniform	1
6	4	3	3	3	4	3.4	Uniform	1
7	4	5	4	3	3	3.8	Uniform	1
8	4	5	2	4	3	3.6	Uniform	1
9	5	5	3	4	4	4.2	Uniform	1
10	4	5	1	3	5	3.6	Uniform	1
11	3	4	3	5	3	3.6	Uniform	1
12	4	5	4	3	4	4	Uniform	1
13	4	3	5	3	4	3.8	Uniform	1
14	3	4	4	3	3	3.4	Uniform	1
Subgroup Average Total						54		14
Total Xi						270		
Total Xi^2						72900		

$(Xi)^2$				
16	25	9	25	16
4	25	25	16	16
16	25	16	25	16
25	25	25	9	16
4	16	16	16	16
16	9	9	9	16
16	25	16	9	9
16	25	4	16	9
25	25	9	16	16
16	25	1	9	25
9	16	9	25	9
16	25	16	9	16
16	9	25	9	16
9	16	16	9	9
Total $(Xi)^2$				1098

Subgroup Average Value 3.857
Deviation Standard 0.905

Uniformity Test
Standard Average 0.405
Lower Control Limit 2.642
Upper Control Limit 5.072
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 21.7284

Attribute 3: Finger comfort in opening and closing

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	4	4	2	4	3	3.4	Uniform	1
2	4	5	4	3	5	4.2	Uniform	1
3	4	5	3	4	3	3.8	Uniform	1
4	4	5	4	3	3	3.8	Uniform	1
5	4	5	4	3	3	3.8	Uniform	1
6	3	5	4	4	3	3.8	Uniform	1
7	3	5	5	4	4	4.2	Uniform	1
8	4	1	4	3	4	3.2	Uniform	1
9	4	4	4	4	2	3.6	Uniform	1
10	4	2	2	2	4	2.8	Uniform	1
11	4	3	3	5	4	3.8	Uniform	1
12	4	5	5	4	3	4.2	Uniform	1
13	4	5	4	3	3	3.8	Uniform	1
14	5	4	4	4	4	4.2	Uniform	1
Subgroup Average Total						52.6		14
Total Xi						263		
Total Xi^2						69169		

$(Xi)^2$				
16	16	4	16	9
16	25	16	9	25
16	25	9	16	9
16	25	16	9	9
16	25	16	9	9
9	25	16	16	9
9	25	25	16	16
16	1	16	9	16
16	16	16	16	4
16	4	4	4	16
16	9	9	25	16
16	25	25	16	9
16	25	16	9	9
25	16	16	16	16
Total $(Xi)^2$				1043

Subgroup Average Value 3.757
Deviation Standard 0.892

Uniformity Test
Standard Average 0.399
Lower Control Limit 2.561
Upper Control Limit 4.954
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 22.2123

Attribute 4: Hand movement comfort

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	4	2	1	3	2.4	Uniform	1
2	2	5	4	4	5	4	Uniform	1
3	3	3	3	2	3	2.8	Uniform	1
4	4	5	4	4	3	4	Uniform	1
5	4	3	5	5	4	4.2	Uniform	1
6	2	2	4	3	3	2.8	Uniform	1
7	2	3	5	2	4	3.2	Uniform	1
8	3	1	3	4	3	2.8	Uniform	1
9	5	3	4	4	2	3.6	Uniform	1
10	4	3	1	3	2	2.6	Uniform	1
11	3	2	3	5	4	3.4	Uniform	1
12	4	4	5	4	3	4	Uniform	1
13	5	2	4	3	4	3.6	Uniform	1
14	4	4	4	4	4	4	Uniform	1
Subgroup Average Total						47.4		14
Total Xi						237		
Total Xi^2						56169		

$(Xi)^2$				
4	16	4	1	9
4	25	16	16	25
9	9	9	4	9
16	25	16	16	9
16	9	25	25	16
4	4	16	9	9
4	9	25	4	16
9	1	9	16	9
25	9	16	16	4
16	9	1	9	4
9	4	9	25	16
16	16	25	16	9
25	4	16	9	16
16	16	16	16	16
Total $(Xi)^2$				881

Subgroup Average Value 3.386
Deviation Standard 1.067

Uniformity Test
Standard Average 0.477
Lower Control Limit 1.954
Upper Control Limit 4.818
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 39.1746

Attribute 5: Form of cap

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	2	1	3	3	2.2	Uniform	1
2	2	4	4	4	2	3.2	Uniform	1
3	2	4	2	4	3	3	Uniform	1
4	2	2	2	3	2	2.2	Uniform	1
5	4	2	4	2	5	3.4	Uniform	1
6	2	2	2	4	4	2.8	Uniform	1
7	4	4	3	3	3	3.4	Uniform	1
8	3	5	2	3	4	3.4	Uniform	1
9	3	2	3	3	2	2.6	Uniform	1
10	5	4	2	3	4	3.6	Uniform	1
11	5	2	3	2	2	2.8	Uniform	1
12	4	2	4	4	3	3.4	Uniform	1
13	5	2	4	4	3	3.6	Uniform	1
14	1	4	4	4	4	3.4	Uniform	1
Subgroup Average Total						43		14
Total Xi						215		
Total Xi^2						46225		

$(Xi)^2$				
4	4	1	9	9
4	16	16	16	4
4	16	4	16	9
4	4	4	9	4
16	4	16	4	25
4	4	4	16	16
16	16	9	9	9
9	25	4	9	16
9	4	9	9	4
25	16	4	9	16
25	4	9	4	4
16	4	16	16	9
25	4	16	16	9
1	16	16	16	16
Total $(Xi)^2$				735

Subgroup Average Value 3.071
Deviation Standard 1.040

Uniformity Test
Standard Average 0.465
Lower Control Limit 1.676
Upper Control Limit 4.467
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 45.2136

Attribute 6: Cap material

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	2	1	3	3	2.4	Uniform	1
2	2	4	4	3	2	3	Uniform	1
3	2	2	3	4	4	3	Uniform	1
4	3	2	3	3	2	2.6	Uniform	1
5	3	2	3	2	5	3	Uniform	1
6	2	1	2	3	4	2.4	Uniform	1
7	2	4	4	2	4	3.2	Uniform	1
8	3	4	2	4	3	3.2	Uniform	1
9	3	2	3	2	2	2.4	Uniform	1
10	4	4	2	4	2	3.2	Uniform	1
11	2	2	3	2	2	2.2	Uniform	1
12	3	2	3	4	3	3	Uniform	1
13	5	1	1	4	3	2.8	Uniform	1
14	1	4	3	2	3	2.6	Uniform	1
Subgroup Average Total						39		14
Total Xi						195		
Total Xi^2						38025		

$(Xi)^2$				
9	4	1	9	9
4	16	16	9	4
4	4	9	16	16
9	4	9	9	4
9	4	9	4	25
4	1	4	9	16
4	16	16	4	16
9	16	4	16	9
9	4	9	4	4
16	16	4	16	4
4	4	9	4	4
9	4	9	16	9
25	1	1	16	9
1	16	9	4	9
Total $(Xi)^2$				609

Subgroup Average Value 2.786
Deviation Standard 0.976

Uniformity Test
Standard Average 0.437
Lower Control Limit 1.476
Upper Control Limit 4.096
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 48.4418

Attribute 7: Cap product manufacturing smoothness

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	3	4	3	3	3.2	Uniform	1
2	4	5	4	4	4	4.2	Uniform	1
3	3	5	3	4	3	3.6	Uniform	1
4	3	2	3	4	4	3.2	Uniform	1
5	4	3	3	4	5	3.8	Uniform	1
6	5	4	2	3	2	3.2	Uniform	1
7	3	3	4	4	2	3.2	Uniform	1
8	4	4	2	4	2	3.2	Uniform	1
9	5	2	4	2	2	3	Uniform	1
10	5	4	3	3	2	3.4	Uniform	1
11	2	4	3	2	4	3	Uniform	1
12	4	4	3	4	3	3.6	Uniform	1
13	5	3	1	4	4	3.4	Uniform	1
14	2	4	4	2	2	2.8	Uniform	1
Subgroup Average Total						46.8		14
Total Xi						234		
Total Xi^2						54756		

$(Xi)^2$				
9	9	16	9	9
16	25	16	16	16
9	25	9	16	9
9	4	9	16	16
16	9	9	16	25
25	16	4	9	4
9	9	16	16	4
16	16	4	16	4
25	4	16	4	4
25	16	9	9	4
4	16	9	4	16
16	16	9	16	9
25	9	1	16	16
4	16	16	4	4
Total $(Xi)^2$				848

Subgroup Average Value 3.343
Deviation Standard 0.976

Uniformity Test
Standard Average 0.437
Lower Control Limit 2.033
Upper Control Limit 4.653
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 33.6328

Attribute 8: Emboss of logo or product name

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	4	1	3	3	3	2.8	Uniform	1
2	4	5	5	3	2	3.8	Uniform	1
3	3	4	4	2	4	3.4	Uniform	1
4	1	5	1	4	2	2.6	Uniform	1
5	5	3	2	4	5	3.8	Uniform	1
6	2	3	2	3	2	2.4	Uniform	1
7	4	5	5	4	3	4.2	Uniform	1
8	3	1	4	3	2	2.6	Uniform	1
9	3	2	3	2	3	2.6	Uniform	1
10	2	3	4	1	4	2.8	Uniform	1
11	3	4	3	2	2	2.8	Uniform	1
12	3	4	3	3	3	3.2	Uniform	1
13	5	2	3	4	2	3.2	Uniform	1
14	4	4	4	2	2	3.2	Uniform	1
Subgroup Average Total						43.4		14
Total Xi						217		
Total Xi^2						47089		

$(Xi)^2$				
16	1	9	9	9
16	25	25	9	4
9	16	16	4	16
1	25	1	16	4
25	9	4	16	25
4	9	4	9	4
16	25	25	16	9
9	1	16	9	4
9	4	9	4	9
4	9	16	1	16
9	16	9	4	4
9	16	9	9	9
25	4	9	16	4
16	16	16	4	4
Total $(Xi)^2$				759

Subgroup Average Value 3.100
Deviation Standard 1.118

Uniformity Test
Standard Average 0.500
Lower Control Limit 1.600
Upper Control Limit 4.600
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 51.3156

Attribute 9: Cap's grip strength towards the package

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	4	4	5	3	3.6	Uniform	1
2	4	5	4	4	4	4.2	Uniform	1
3	3	5	4	4	3	3.8	Uniform	1
4	4	5	4	3	4	4	Uniform	1
5	4	4	3	4	5	4	Uniform	1
6	4	5	2	4	2	3.4	Uniform	1
7	3	4	2	4	4	3.4	Uniform	1
8	5	4	2	4	3	3.6	Uniform	1
9	4	4	4	4	3	3.8	Uniform	1
10	4	2	1	4	4	3	Uniform	1
11	4	4	3	5	4	4	Uniform	1
12	5	5	4	3	3	4	Uniform	1
13	4	4	4	4	4	4	Uniform	1
14	5	4	4	2	4	3.8	Uniform	1
Subgroup Average Total						52.6		14
Total Xi						263		
Total Xi^2						69169		

$(Xi)^2$				
4	16	16	25	9
16	25	16	16	16
9	25	16	16	9
16	25	16	9	16
16	16	9	16	25
16	25	4	16	4
9	16	4	16	16
25	16	4	16	9
16	16	16	16	9
16	4	1	16	16
16	16	9	25	16
25	25	16	9	9
16	16	16	16	16
25	16	16	4	16
Total $(Xi)^2$				1043

Subgroup Average Value 3.757
Deviation Standard 0.892

Uniformity Test
Standard Average 0.399
Lower Control Limit 2.561
Upper Control Limit 4.954
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 22.2123

G.3. Reliability Test for Attribute Importance

Attributes	Varians
Easiness to open	0.657
Easiness to close	0.808
Finger's comfort in opening and closing	0.784
Hand moving comfort	1.123
Form of cap	1.066
Cap material	0.940
Cap product manufacturing smoothness	0.940
Emboss of logo or product name	1.233
Cap grip strength towards the package	0.784
Sum	8.334

Total Varians

No	Yi	Yi^2
1	28	784
2	28	784
3	28	784
4	31	961
5	32	1024
6	28	784
7	29	841
8	33	1089
9	37	1369
10	36	1296
11	30	900
12	36	1296
13	41	1681
14	30	900
15	30	900
16	43	1849
17	37	1369
18	36	1296
19	30	900
20	29	841
21	38	1444
22	30	900
23	29	841
24	32	1024
25	29	841
26	36	1296
27	27	729
28	36	1296

29	22	484
30	39	1521
31	30	900
32	31	961
33	32	1024
34	25	625
35	36	1296
36	23	529
37	31	961
38	17	289
39	27	729
40	35	1225
41	30	900
42	35	1225
43	32	1024
44	33	1089
45	34	1156
46	30	900
47	32	1024
48	30	900
49	30	900
50	33	1089
51	29	841
52	26	676
53	32	1024
54	32	1024
55	33	1089
56	26	676
57	29	841
58	32	1024
59	31	961
60	28	784
61	40	1600
62	28	784
63	30	900
64	28	784
65	24	576
66	31	961
67	29	841
68	29	841
69	31	961
70	30	900
sum	2174	68858

Varians= 19.140

Calculate Alpha

Alpha Cronbach	r table	Remarks
0.635	0.232	Reliable

Appendix H: Second Questionnaire: "Kumala" Performance Tests

H.1. Validity Tests for "Kumala" Performance

Attribute 1: Easiness to open

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	23	529	46
2	1	1	21	441	21
3	2	4	23	529	46
4	1	1	19	361	19
5	1	1	19	361	19
6	3	9	32	1024	96
7	3	9	27	729	81
8	2	4	27	729	54
9	3	9	31	961	93
10	2	4	26	676	52
11	2	4	20	400	40
12	2	4	21	441	42
13	1	1	14	196	14
14	2	4	19	361	38
15	2	4	25	625	50
16	1	1	13	169	13
17	1	1	26	676	26
18	2	4	25	625	50
19	3	9	25	625	75
20	1	1	15	225	15
21	3	9	30	900	90
22	3	9	29	841	87
23	4	16	28	784	112
24	2	4	27	729	54
25	2	4	25	625	50
26	1	1	18	324	18
27	3	9	26	676	78
28	1	1	28	784	28
29	2	4	22	484	44
30	2	4	29	841	58
31	2	4	23	529	46
32	1	1	16	256	16
33	2	4	21	441	42
34	2	4	17	289	34
35	1	1	22	484	22
36	2	4	27	729	54
37	2	4	22	484	44

38	2	4	23	529	46
39	2	4	23	529	46
40	2	4	22	484	44
41	3	9	27	729	81
42	1	1	20	400	20
43	2	4	25	625	50
44	2	4	21	441	42
45	3	9	30	900	90
46	3	9	26	676	78
47	3	9	18	324	54
48	3	9	26	676	78
49	3	9	25	625	75
50	2	4	22	484	44
51	2	4	20	400	40
52	1	1	21	441	21
53	2	4	28	784	56
54	2	4	16	256	32
55	2	4	24	576	48
56	2	4	26	676	52
57	3	9	23	529	69
58	1	1	21	441	21
59	3	9	31	961	93
60	4	16	29	841	116
61	2	4	25	625	50
62	2	4	26	676	52
63	3	9	27	729	81
64	2	4	19	361	38
65	1	1	15	225	15
66	1	1	20	400	20
67	2	4	19	361	38
68	1	1	21	441	21
69	2	4	18	324	36
70	2	4	22	484	44
Sum	143	333	1620	38836	3458

Rxy= 0.63377 Varians= 0.58388

Attribute 2: Easiness to close

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	23	529	46
2	4	16	21	441	84
3	3	9	23	529	69
4	4	16	19	361	76

5	1	1	19	361	19
6	4	16	32	1024	128
7	3	9	27	729	81
8	3	9	27	729	81
9	4	16	31	961	124
10	3	9	26	676	78
11	2	4	20	400	40
12	2	4	21	441	42
13	2	4	14	196	28
14	2	4	19	361	38
15	2	4	25	625	50
16	1	1	13	169	13
17	1	1	26	676	26
18	3	9	25	625	75
19	3	9	25	625	75
20	1	1	15	225	15
21	4	16	30	900	120
22	4	16	29	841	116
23	4	16	28	784	112
24	3	9	27	729	81
25	3	9	25	625	75
26	1	1	18	324	18
27	3	9	26	676	78
28	3	9	28	784	84
29	2	4	22	484	44
30	2	4	29	841	58
31	2	4	23	529	46
32	1	1	16	256	16
33	1	1	21	441	21
34	2	4	17	289	34
35	3	9	22	484	66
36	4	16	27	729	108
37	1	1	22	484	22
38	3	9	23	529	69
39	3	9	23	529	69
40	1	1	22	484	22
41	2	4	27	729	54
42	1	1	20	400	20
43	2	4	25	625	50
44	2	4	21	441	42
45	4	16	30	900	120
46	3	9	26	676	78
47	2	4	18	324	36
48	3	9	26	676	78
49	3	9	25	625	75

50	2	4	22	484	44
51	2	4	20	400	40
52	1	1	21	441	21
53	1	1	28	784	28
54	1	1	16	256	16
55	2	4	24	576	48
56	3	9	26	676	78
57	3	9	23	529	69
58	1	1	21	441	21
59	3	9	31	961	93
60	3	9	29	841	87
61	2	4	25	625	50
62	2	4	26	676	52
63	3	9	27	729	81
64	2	4	19	361	38
65	1	1	15	225	15
66	2	4	20	400	40
67	2	4	19	361	38
68	1	1	21	441	21
69	3	9	18	324	54
70	3	9	22	484	66
Sum	165	455	1620	38836	4000

Rxy= 0.60871 Varians= 0.94388

Attribute 3: Finger comfort in opening and closing

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	23	529	46
2	2	4	21	441	42
3	2	4	23	529	46
4	1	1	19	361	19
5	1	1	19	361	19
6	3	9	32	1024	96
7	3	9	27	729	81
8	3	9	27	729	81
9	3	9	31	961	93
10	3	9	26	676	78
11	1	1	20	400	20
12	1	1	21	441	21
13	2	4	14	196	28
14	1	1	19	361	19
15	2	4	25	625	50
16	1	1	13	169	13

17	2	4	26	676	52
18	2	4	25	625	50
19	2	4	25	625	50
20	1	1	15	225	15
21	2	4	30	900	60
22	3	9	29	841	87
23	2	4	28	784	56
24	2	4	27	729	54
25	3	9	25	625	75
26	1	1	18	324	18
27	2	4	26	676	52
28	2	4	28	784	56
29	2	4	22	484	44
30	4	16	29	841	116
31	2	4	23	529	46
32	1	1	16	256	16
33	1	1	21	441	21
34	1	1	17	289	17
35	3	9	22	484	66
36	2	4	27	729	54
37	2	4	22	484	44
38	2	4	23	529	46
39	3	9	23	529	69
40	1	1	22	484	22
41	2	4	27	729	54
42	2	4	20	400	40
43	2	4	25	625	50
44	1	1	21	441	21
45	2	4	30	900	60
46	3	9	26	676	78
47	1	1	18	324	18
48	3	9	26	676	78
49	2	4	25	625	50
50	2	4	22	484	44
51	1	1	20	400	20
52	2	4	21	441	42
53	2	4	28	784	56
54	2	4	16	256	32
55	3	9	24	576	72
56	3	9	26	676	78
57	2	4	23	529	46
58	1	1	21	441	21
59	4	16	31	961	124
60	3	9	29	841	87
61	1	1	25	625	25

62	3	9	26	676	78
63	4	16	27	729	108
64	2	4	19	361	38
65	1	1	15	225	15
66	3	9	20	400	60
67	1	1	19	361	19
68	2	4	21	441	42
69	2	4	18	324	36
70	2	4	22	484	44
Sum	143	339	1620	38836	3474

Rxy= 0.65555 Varians= 0.66959

Attribute 4: Hand movement comfort

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	23	529	69
2	2	4	21	441	42
3	3	9	23	529	69
4	1	1	19	361	19
5	1	1	19	361	19
6	3	9	32	1024	96
7	4	16	27	729	108
8	3	9	27	729	81
9	3	9	31	961	93
10	3	9	26	676	78
11	3	9	20	400	60
12	1	1	21	441	21
13	1	1	14	196	14
14	3	9	19	361	57
15	3	9	25	625	75
16	1	1	13	169	13
17	2	4	26	676	52
18	1	1	25	625	25
19	3	9	25	625	75
20	3	9	15	225	45
21	4	16	30	900	120
22	2	4	29	841	58
23	2	4	28	784	56
24	3	9	27	729	81
25	3	9	25	625	75
26	2	4	18	324	36
27	3	9	26	676	78
28	2	4	28	784	56

29	3	9	22	484	66
30	4	16	29	841	116
31	2	4	23	529	46
32	1	1	16	256	16
33	1	1	21	441	21
34	1	1	17	289	17
35	1	1	22	484	22
36	3	9	27	729	81
37	1	1	22	484	22
38	1	1	23	529	23
39	3	9	23	529	69
40	2	4	22	484	44
41	1	1	27	729	27
42	1	1	20	400	20
43	3	9	25	625	75
44	2	4	21	441	42
45	3	9	30	900	90
46	3	9	26	676	78
47	1	1	18	324	18
48	3	9	26	676	78
49	3	9	25	625	75
50	2	4	22	484	44
51	1	1	20	400	20
52	2	4	21	441	42
53	2	4	28	784	56
54	1	1	16	256	16
55	2	4	24	576	48
56	3	9	26	676	78
57	2	4	23	529	46
58	1	1	21	441	21
59	3	9	31	961	93
60	3	9	29	841	87
61	2	4	25	625	50
62	2	4	26	676	52
63	3	9	27	729	81
64	2	4	19	361	38
65	2	4	15	225	30
66	2	4	20	400	40
67	1	1	19	361	19
68	1	1	21	441	21
69	2	4	18	324	36
70	3	9	22	484	66
Sum	153	391	1620	38836	3701

Rxy= 0.58058 Varians= 0.80837

Attribute 5: Form of cap

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	23	529	46
2	3	9	21	441	63
3	3	9	23	529	69
4	2	4	19	361	38
5	3	9	19	361	57
6	5	25	32	1024	160
7	4	16	27	729	108
8	3	9	27	729	81
9	3	9	31	961	93
10	3	9	26	676	78
11	2	4	20	400	40
12	3	9	21	441	63
13	1	1	14	196	14
14	2	4	19	361	38
15	4	16	25	625	100
16	2	4	13	169	26
17	3	9	26	676	78
18	3	9	25	625	75
19	3	9	25	625	75
20	2	4	15	225	30
21	3	9	30	900	90
22	3	9	29	841	87
23	3	9	28	784	84
24	3	9	27	729	81
25	2	4	25	625	50
26	2	4	18	324	36
27	3	9	26	676	78
28	4	16	28	784	112
29	4	16	22	484	88
30	3	9	29	841	87
31	3	9	23	529	69
32	2	4	16	256	32
33	2	4	21	441	42
34	2	4	17	289	34
35	3	9	22	484	66
36	3	9	27	729	81
37	3	9	22	484	66
38	3	9	23	529	69
39	2	4	23	529	46
40	3	9	22	484	66
41	3	9	27	729	81

42	3	9	20	400	60
43	3	9	25	625	75
44	3	9	21	441	63
45	2	4	30	900	60
46	2	4	26	676	52
47	1	1	18	324	18
48	4	16	26	676	104
49	3	9	25	625	75
50	3	9	22	484	66
51	2	4	20	400	40
52	3	9	21	441	63
53	4	16	28	784	112
54	2	4	16	256	32
55	3	9	24	576	72
56	2	4	26	676	52
57	3	9	23	529	69
58	2	4	21	441	42
59	4	16	31	961	124
60	3	9	29	841	87
61	3	9	25	625	75
62	4	16	26	676	104
63	3	9	27	729	81
64	2	4	19	361	38
65	2	4	15	225	30
66	1	1	20	400	20
67	2	4	19	361	38
68	3	9	21	441	63
69	1	1	18	324	18
70	2	4	22	484	44
Sum	190	560	1620	38836	4554

Rxy= 0.64281 Varians= 0.63265

Attribute 6: Cap material

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	23	529	69
2	2	4	21	441	42
3	3	9	23	529	69
4	3	9	19	361	57
5	3	9	19	361	57
6	3	9	32	1024	96
7	2	4	27	729	54
8	4	16	27	729	108

9	4	16	31	961	124
10	2	4	26	676	52
11	3	9	20	400	60
12	3	9	21	441	63
13	1	1	14	196	14
14	3	9	19	361	57
15	3	9	25	625	75
16	1	1	13	169	13
17	4	16	26	676	104
18	3	9	25	625	75
19	3	9	25	625	75
20	2	4	15	225	30
21	4	16	30	900	120
22	4	16	29	841	116
23	3	9	28	784	84
24	3	9	27	729	81
25	3	9	25	625	75
26	2	4	18	324	36
27	3	9	26	676	78
28	4	16	28	784	112
29	1	1	22	484	22
30	3	9	29	841	87
31	4	16	23	529	92
32	2	4	16	256	32
33	3	9	21	441	63
34	2	4	17	289	34
35	1	1	22	484	22
36	2	4	27	729	54
37	4	16	22	484	88
38	3	9	23	529	69
39	2	4	23	529	46
40	3	9	22	484	66
41	4	16	27	729	108
42	3	9	20	400	60
43	4	16	25	625	100
44	2	4	21	441	42
45	4	16	30	900	120
46	3	9	26	676	78
47	2	4	18	324	36
48	2	4	26	676	52
49	3	9	25	625	75
50	2	4	22	484	44
51	3	9	20	400	60
52	3	9	21	441	63
53	4	16	28	784	112

54	2	4	16	256	32
55	3	9	24	576	72
56	3	9	26	676	78
57	2	4	23	529	46
58	4	16	21	441	84
59	3	9	31	961	93
60	4	16	29	841	116
61	4	16	25	625	100
62	4	16	26	676	104
63	3	9	27	729	81
64	2	4	19	361	38
65	2	4	15	225	30
66	2	4	20	400	40
67	2	4	19	361	38
68	3	9	21	441	63
69	1	1	18	324	18
70	2	4	22	484	44
Sum	196	602	1620	38836	4698

Rxy= 0.60571 Varians= 0.76

Attribute 7: Cap product manufacturing smoothness

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	23	529	92
2	2	4	21	441	42
3	2	4	23	529	46
4	2	4	19	361	38
5	4	16	19	361	76
6	3	9	32	1024	96
7	2	4	27	729	54
8	3	9	27	729	81
9	4	16	31	961	124
10	3	9	26	676	78
11	2	4	20	400	40
12	2	4	21	441	42
13	1	1	14	196	14
14	1	1	19	361	19
15	3	9	25	625	75
16	1	1	13	169	13
17	5	25	26	676	130
18	3	9	25	625	75
19	2	4	25	625	50
20	1	1	15	225	15

21	2	4	30	900	60
22	3	9	29	841	87
23	3	9	28	784	84
24	4	16	27	729	108
25	2	4	25	625	50
26	3	9	18	324	54
27	3	9	26	676	78
28	4	16	28	784	112
29	1	1	22	484	22
30	4	16	29	841	116
31	2	4	23	529	46
32	3	9	16	256	48
33	3	9	21	441	63
34	2	4	17	289	34
35	2	4	22	484	44
36	2	4	27	729	54
37	3	9	22	484	66
38	1	1	23	529	23
39	2	4	23	529	46
40	3	9	22	484	66
41	4	16	27	729	108
42	2	4	20	400	40
43	2	4	25	625	50
44	2	4	21	441	42
45	2	4	30	900	60
46	3	9	26	676	78
47	2	4	18	324	36
48	2	4	26	676	52
49	2	4	25	625	50
50	2	4	22	484	44
51	3	9	20	400	60
52	4	16	21	441	84
53	4	16	28	784	112
54	2	4	16	256	32
55	3	9	24	576	72
56	3	9	26	676	78
57	2	4	23	529	46
58	2	4	21	441	42
59	4	16	31	961	124
60	3	9	29	841	87
61	4	16	25	625	100
62	4	16	26	676	104
63	2	4	27	729	54
64	2	4	19	361	38
65	2	4	15	225	30

66	2	4	20	400	40
67	3	9	19	361	57
68	3	9	21	441	63
69	1	1	18	324	18
70	2	4	22	484	44
Sum	180	524	1620	38836	4306

Rxy= 0.48927 Varians= 0.87347

Attribute 8: Emboss of logo or product name

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	23	529	69
2	1	1	21	441	21
3	1	1	23	529	23
4	1	1	19	361	19
5	1	1	19	361	19
6	3	9	32	1024	96
7	3	9	27	729	81
8	1	1	27	729	27
9	3	9	31	961	93
10	2	4	26	676	52
11	3	9	20	400	60
12	2	4	21	441	42
13	2	4	14	196	28
14	1	1	19	361	19
15	1	1	25	625	25
16	1	1	13	169	13
17	3	9	26	676	78
18	3	9	25	625	75
19	2	4	25	625	50
20	1	1	15	225	15
21	3	9	30	900	90
22	2	4	29	841	58
23	2	4	28	784	56
24	2	4	27	729	54
25	3	9	25	625	75
26	1	1	18	324	18
27	2	4	26	676	52
28	3	9	28	784	84
29	3	9	22	484	66
30	3	9	29	841	87
31	2	4	23	529	46
32	1	1	16	256	16

33	3	9	21	441	63
34	2	4	17	289	34
35	4	16	22	484	88
36	4	16	27	729	108
37	2	4	22	484	44
38	4	16	23	529	92
39	2	4	23	529	46
40	3	9	22	484	66
41	3	9	27	729	81
42	3	9	20	400	60
43	2	4	25	625	50
44	3	9	21	441	63
45	5	25	30	900	150
46	3	9	26	676	78
47	2	4	18	324	36
48	3	9	26	676	78
49	2	4	25	625	50
50	3	9	22	484	66
51	2	4	20	400	40
52	2	4	21	441	42
53	4	16	28	784	112
54	1	1	16	256	16
55	2	4	24	576	48
56	3	9	26	676	78
57	3	9	23	529	69
58	4	16	21	441	84
59	4	16	31	961	124
60	3	9	29	841	87
61	3	9	25	625	75
62	2	4	26	676	52
63	3	9	27	729	81
64	2	4	19	361	38
65	2	4	15	225	30
66	3	9	20	400	60
67	2	4	19	361	38
68	3	9	21	441	63
69	2	4	18	324	36
70	2	4	22	484	44
Sum	170	472	1620	38836	4077

Rxy= 0.50609 Varians= 0.8449

Attribute 9: Cap grip strength towards the package

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	23	529	46
2	4	16	21	441	84
3	4	16	23	529	92
4	4	16	19	361	76
5	4	16	19	361	76
6	5	25	32	1024	160
7	3	9	27	729	81
8	5	25	27	729	135
9	4	16	31	961	124
10	5	25	26	676	130
11	2	4	20	400	40
12	5	25	21	441	105
13	3	9	14	196	42
14	4	16	19	361	76
15	5	25	25	625	125
16	4	16	13	169	52
17	5	25	26	676	130
18	5	25	25	625	125
19	4	16	25	625	100
20	3	9	15	225	45
21	5	25	30	900	150
22	5	25	29	841	145
23	5	25	28	784	140
24	5	25	27	729	135
25	4	16	25	625	100
26	5	25	18	324	90
27	4	16	26	676	104
28	5	25	28	784	140
29	4	16	22	484	88
30	4	16	29	841	116
31	4	16	23	529	92
32	4	16	16	256	64
33	5	25	21	441	105
34	3	9	17	289	51
35	4	16	22	484	88
36	5	25	27	729	135
37	4	16	22	484	88
38	4	16	23	529	92
39	4	16	23	529	92
40	4	16	22	484	88
41	5	25	27	729	135
42	4	16	20	400	80

43	5	25	25	625	125
44	4	16	21	441	84
45	5	25	30	900	150
46	3	9	26	676	78
47	4	16	18	324	72
48	3	9	26	676	78
49	4	16	25	625	100
50	4	16	22	484	88
51	4	16	20	400	80
52	3	9	21	441	63
53	5	25	28	784	140
54	3	9	16	256	48
55	4	16	24	576	96
56	4	16	26	676	104
57	3	9	23	529	69
58	5	25	21	441	105
59	3	9	31	961	93
60	3	9	29	841	87
61	4	16	25	625	100
62	3	9	26	676	78
63	3	9	27	729	81
64	3	9	19	361	57
65	2	4	15	225	30
66	4	16	20	400	80
67	4	16	19	361	76
68	4	16	21	441	84
69	4	16	18	324	72
70	4	16	22	484	88
Sum	280	1166	1620	38836	6568

Rxy= 0.35384 Varians= 0.65714

H.2. Uniformity and Data Sufficiency Test for "Kumala" Performance

Attribute 1: Easiness to open

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	2	2	2	3	2.2	Uniform	1
2	1	1	2	2	1	1.4	Uniform	1
3	2	1	2	3	3	2.2	Uniform	1
4	1	2	1	3	4	2.2	Uniform	1
5	1	3	2	3	2	2.2	Uniform	1
6	3	1	2	3	2	2.2	Uniform	1
7	3	3	1	3	3	2.6	Uniform	1
8	2	3	2	2	2	2.2	Uniform	1
9	3	4	2	2	1	2.4	Uniform	1
10	2	2	2	1	1	1.6	Uniform	1
11	2	2	2	2	2	2	Uniform	1
12	2	1	2	2	1	1.6	Uniform	1
13	1	3	3	2	2	2.2	Uniform	1
14	2	1	1	2	2	1.6	Uniform	1
Subgroup Average Total						28.6		14
Total Xi						143		
Total Xi^2						20449		

$(Xi)^2$				
4	4	4	4	9
1	1	4	4	1
4	1	4	9	9
1	4	1	9	16
1	9	4	9	4
9	1	4	9	4
9	9	1	9	9
4	9	4	4	4
9	16	4	4	1
4	4	4	1	1
4	4	4	4	4
4	1	4	4	1
1	9	9	4	4
4	1	1	4	4
Total $(Xi)^2$				333

Subgroup Average Value 2.043
Deviation Standard 0.770

Uniformity Test
Standard Average 0.344
Lower Control Limit 1.010
Upper Control Limit 3.075
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 55.9636

Attribute 2: Easiness to close

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	2	2	2	3	2.2	Uniform	1
2	4	1	2	2	1	2	Uniform	1
3	3	1	2	4	3	2.6	Uniform	1
4	4	3	1	3	3	2.8	Uniform	1
5	1	3	1	2	2	1.8	Uniform	1
6	4	1	2	3	2	2.4	Uniform	1
7	3	4	3	3	3	3.2	Uniform	1
8	3	4	4	2	2	3	Uniform	1
9	4	4	1	2	1	2.4	Uniform	1
10	3	3	3	1	2	2.4	Uniform	1
11	2	3	3	1	2	2.2	Uniform	1
12	2	1	1	1	1	1.2	Uniform	1
13	2	3	2	2	3	2.4	Uniform	1
14	2	3	1	3	3	2.4	Uniform	1
Subgroup Average Total						33		14
Total Xi						165		
Total Xi^2						27225		

$(Xi)^2$				
4	4	4	4	9
16	1	4	4	1
9	1	4	16	9
16	9	1	9	9
1	9	1	4	4
16	1	4	9	4
9	16	9	9	9
9	16	16	4	4
16	16	1	4	1
9	9	9	1	4
4	9	9	1	4
4	1	1	1	1
4	9	4	4	9
4	9	1	9	9
Total $(Xi)^2$				455

Subgroup Average Value 2.357
Deviation Standard 0.979

Uniformity Test
Standard Average 0.438
Lower Control Limit 1.044
Upper Control Limit 3.670
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 67.9522

Attribute 3: Finger comfort in opening and closing

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	2	2	2	2	2	Uniform	1
2	2	1	4	1	1	1.8	Uniform	1
3	2	2	2	2	4	2.4	Uniform	1
4	1	2	1	3	3	2	Uniform	1
5	1	2	1	1	1	1.2	Uniform	1
6	3	1	1	3	3	2.2	Uniform	1
7	3	2	3	2	4	2.8	Uniform	1
8	3	3	2	2	2	2.4	Uniform	1
9	3	2	2	1	1	1.8	Uniform	1
10	3	2	2	2	3	2.4	Uniform	1
11	1	3	3	2	1	2	Uniform	1
12	1	1	1	2	2	1.4	Uniform	1
13	2	2	2	3	2	2.2	Uniform	1
14	1	2	2	3	2	2	Uniform	1
Subgroup Average Total						28.6		14
Total Xi						143		
Total Xi^2						20449		

$(Xi)^2$				
4	4	4	4	4
4	1	16	1	1
4	4	4	4	16
1	4	1	9	9
1	4	1	1	1
9	1	1	9	9
9	4	9	4	16
9	9	4	4	4
9	4	4	1	1
9	4	4	4	9
1	9	9	4	1
1	1	1	4	4
4	4	4	9	4
1	4	4	9	4
Total $(Xi)^2$				339

Subgroup Average Value 2.043
Deviation Standard 0.824

Uniformity Test
Standard Average 0.369
Lower Control Limit 0.937
Upper Control Limit 3.149
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 64.1792

Attribute 4: Hand movement comfort

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	3	3	3	2	2.8	Uniform	1
2	2	1	4	2	1	2	Uniform	1
3	3	2	2	3	3	2.6	Uniform	1
4	1	1	1	3	3	1.8	Uniform	1
5	1	3	1	1	2	1.6	Uniform	1
6	3	3	1	3	2	2.4	Uniform	1
7	4	4	1	3	3	3	Uniform	1
8	3	2	3	2	2	2.4	Uniform	1
9	3	2	1	1	2	1.8	Uniform	1
10	3	3	1	2	2	2.2	Uniform	1
11	3	3	3	2	1	2.4	Uniform	1
12	1	2	2	1	1	1.4	Uniform	1
13	1	3	1	2	2	1.8	Uniform	1
14	3	2	1	3	3	2.4	Uniform	1
Subgroup Average Total						30.6		14
Total Xi						153		
Total Xi^2						23409		

$(Xi)^2$				
9	9	9	9	4
4	1	16	4	1
9	4	4	9	9
1	1	1	9	9
1	9	1	1	4
9	9	1	9	4
16	16	1	9	9
9	4	9	4	4
9	4	1	1	4
9	9	1	4	4
9	9	9	4	1
1	4	4	1	1
1	9	1	4	4
9	4	1	9	9
Total $(Xi)^2$				391

Subgroup Average Value 2.186
Deviation Standard 0.906

Uniformity Test
Standard Average 0.405
Lower Control Limit 0.971
Upper Control Limit 3.401
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 67.6834

Attribute 5: Form of cap

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	4	4	3	3	3.2	Uniform	1
2	3	2	3	3	2	2.6	Uniform	1
3	3	3	3	2	4	3	Uniform	1
4	2	3	2	2	3	2.4	Uniform	1
5	3	3	2	1	3	2.4	Uniform	1
6	5	2	2	4	4	3.4	Uniform	1
7	4	3	3	3	3	3.2	Uniform	1
8	3	3	3	3	2	2.8	Uniform	1
9	3	3	3	2	2	2.6	Uniform	1
10	3	3	3	3	1	2.6	Uniform	1
11	2	2	2	4	2	2.4	Uniform	1
12	3	2	3	2	3	2.6	Uniform	1
13	1	3	3	3	1	2.2	Uniform	1
14	2	4	3	2	2	2.6	Uniform	1
Subgroup Average Total						38		14
Total Xi						190		
Total Xi^2						36100		

$(Xi)^2$				
4	16	16	9	9
9	4	9	9	4
9	9	9	4	16
4	9	4	4	9
9	9	4	1	9
25	4	4	16	16
16	9	9	9	9
9	9	9	9	4
9	9	9	4	4
9	9	9	9	1
4	4	4	16	4
9	4	9	4	9
1	9	9	9	1
4	16	9	4	4
Total $(Xi)^2$				560

Subgroup Average Value 2.714
Deviation Standard 0.801

Uniformity Test
Standard Average 0.358
Lower Control Limit 1.639
Upper Control Limit 3.789
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 34.349

Attribute 6: Cap material

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	3	1	4	2	2.6	Uniform	1
2	2	1	3	2	4	2.4	Uniform	1
3	3	4	4	4	3	3.6	Uniform	1
4	3	3	2	3	4	3	Uniform	1
5	3	3	3	2	4	3	Uniform	1
6	3	2	2	2	4	2.6	Uniform	1
7	2	4	1	3	3	2.6	Uniform	1
8	4	4	2	2	2	2.8	Uniform	1
9	4	3	4	3	2	3.2	Uniform	1
10	2	3	3	3	2	2.6	Uniform	1
11	3	3	2	4	2	2.8	Uniform	1
12	3	2	3	2	3	2.6	Uniform	1
13	1	3	4	3	1	2.4	Uniform	1
14	3	4	3	3	2	3	Uniform	1
Subgroup Average Total						39.2		14
Total Xi						196		
Total Xi^2						38416		

$(Xi)^2$				
9	9	1	16	4
4	1	9	4	16
9	16	16	16	9
9	9	4	9	16
9	9	9	4	16
9	4	4	4	16
4	16	1	9	9
16	16	4	4	4
16	9	16	9	4
4	9	9	9	4
9	9	4	16	4
9	4	9	4	9
1	9	16	9	1
9	16	9	9	4
Total $(Xi)^2$				602

Subgroup Average Value 2.800
Deviation Standard 0.878

Uniformity Test
Standard Average 0.393
Lower Control Limit 1.622
Upper Control Limit 3.978
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 38.7755

Attribute 7: Cap product manufacturing smoothness

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	4	3	1	2	2	2.4	Uniform	1
2	2	1	4	2	2	2.2	Uniform	1
3	2	5	2	2	4	3	Uniform	1
4	2	3	3	3	3	2.8	Uniform	1
5	4	2	3	2	4	3	Uniform	1
6	3	1	2	2	4	2.4	Uniform	1
7	2	2	2	2	2	2	Uniform	1
8	3	3	2	2	2	2.4	Uniform	1
9	4	3	3	3	2	3	Uniform	1
10	3	4	1	4	2	2.8	Uniform	1
11	2	2	2	4	3	2.6	Uniform	1
12	2	3	3	2	3	2.6	Uniform	1
13	1	3	4	3	1	2.4	Uniform	1
14	1	4	2	3	2	2.4	Uniform	1
Subgroup Average Total						36		14
Total Xi						180		
Total Xi^2						32400		

$(Xi)^2$				
16	9	1	4	4
4	1	16	4	4
4	25	4	4	16
4	9	9	9	9
16	4	9	4	16
9	1	4	4	16
4	4	4	4	4
9	9	4	4	4
16	9	9	9	4
9	16	1	16	4
4	4	4	16	9
4	9	9	4	9
1	9	16	9	1
1	16	4	9	4
Total $(Xi)^2$				524

Subgroup Average Value 2.571
Deviation Standard 0.941

Uniformity Test
Standard Average 0.421
Lower Control Limit 1.308
Upper Control Limit 3.834
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 52.8395

Attribute 8: Emboss of logo or product name

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	1	3	2	3	2.4	Uniform	1
2	1	1	3	3	4	2.4	Uniform	1
3	1	3	2	5	4	3	Uniform	1
4	1	3	1	3	3	2.2	Uniform	1
5	1	2	3	2	3	2.2	Uniform	1
6	3	1	2	3	2	2.2	Uniform	1
7	3	3	4	2	3	3	Uniform	1
8	1	2	4	3	2	2.4	Uniform	1
9	3	2	2	2	2	2.2	Uniform	1
10	2	2	4	2	3	2.6	Uniform	1
11	3	3	2	4	2	2.8	Uniform	1
12	2	1	3	1	3	2	Uniform	1
13	2	2	3	2	2	2.2	Uniform	1
14	1	3	3	3	2	2.4	Uniform	1
Subgroup Average Total						34		14
Total Xi						170		
Total Xi^2						28900		

$(Xi)^2$				
9	1	9	4	9
1	1	9	9	16
1	9	4	25	16
1	9	1	9	9
1	4	9	4	9
9	1	4	9	4
9	9	16	4	9
1	4	16	9	4
9	4	4	4	4
4	4	16	4	9
9	9	4	16	4
4	1	9	1	9
4	4	9	4	4
1	9	9	9	4
Total $(Xi)^2$				472

Subgroup Average Value 2.429
Deviation Standard 0.926

Uniformity Test
Standard Average 0.414
Lower Control Limit 1.186
Upper Control Limit 3.671
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 57.301

Attribute 9: Cap grip strength towards the package

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	5	4	5	3	3.8	Uniform	1
2	4	4	4	4	5	4.2	Uniform	1
3	4	5	4	5	3	4.2	Uniform	1
4	4	5	4	3	3	3.8	Uniform	1
5	4	4	5	4	4	4.2	Uniform	1
6	5	3	3	3	3	3.4	Uniform	1
7	3	5	4	4	3	3.8	Uniform	1
8	5	5	5	4	3	4.4	Uniform	1
9	4	5	4	4	2	3.8	Uniform	1
10	5	5	4	3	4	4.2	Uniform	1
11	2	4	4	5	4	3.8	Uniform	1
12	5	5	4	3	4	4.2	Uniform	1
13	3	4	5	4	4	4	Uniform	1
14	4	5	4	4	4	4.2	Uniform	1
Subgroup Average Total						56		14
Total Xi						280		
Total Xi^2						78400		

$(Xi)^2$				
4	25	16	25	9
16	16	16	16	25
16	25	16	25	9
16	25	16	9	9
16	16	25	16	16
25	9	9	9	9
9	25	16	16	9
25	25	25	16	9
16	25	16	16	4
25	25	16	9	16
4	16	16	25	16
25	25	16	9	16
9	16	25	16	16
16	25	16	16	16
Total $(Xi)^2$				1166

Subgroup Average Value 4.000
Deviation Standard 0.816

Uniformity Test
Standard Average 0.365
Lower Control Limit 2.905
Upper Control Limit 5.095
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 16.4286

H.3. Reliability Test for "Kumala" Performance

Attributes	Varians
Easy to open	0.584
Easy to close	0.944
Finger's comfort in opening and closing	0.670
Hand moving comfort	0.808
Form of cap	0.633
Cap material	0.760
Cap product manufacturing smoothness	0.873
Emboss of logo or product name	0.845
Cap grip strength towards the package	0.657
sum	6.774

Total Varians

No	Yi	Yi^2
1	23	529
2	21	441
3	23	529
4	19	361
5	19	361
6	32	1024
7	27	729
8	27	729
9	31	961
10	26	676
11	20	400
12	21	441
13	14	196
14	19	361
15	25	625
16	13	169
17	26	676
18	25	625
19	25	625
20	15	225
21	30	900
22	29	841
23	28	784
24	27	729
25	25	625
26	18	324
27	26	676

28	28	784
29	22	484
30	29	841
31	23	529
32	16	256
33	21	441
34	17	289
35	22	484
36	27	729
37	22	484
38	23	529
39	23	529
40	22	484
41	27	729
42	20	400
43	25	625
44	21	441
45	30	900
46	26	676
47	18	324
48	26	676
49	25	625
50	22	484
51	20	400
52	21	441
53	28	784
54	16	256
55	24	576
56	26	676
57	23	529
58	21	441
59	31	961
60	29	841
61	25	625
62	26	676
63	27	729
64	19	361
65	15	225
66	20	400
67	19	361
68	21	441
69	18	324
70	22	484
sum	1620	38836

Varians= 19.208

Calculate Alpha

Alpha Cronbach	r table	Remarks
0.728	0.232	Reliable

Appendix I: Second Questionnaire: "Romeo" Performance Tests

I.1. Validity Tests for "Romeo" Performance

Attribute 1: Easiness to open

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	31	961	124
2	4	16	33	1089	132
3	2	4	25	625	50
4	3	9	26	676	78
5	5	25	42	1764	210
6	3	9	23	529	69
7	3	9	26	676	78
8	3	9	25	625	75
9	1	1	15	225	15
10	4	16	38	1444	152
11	4	16	30	900	120
12	3	9	29	841	87
13	3	9	30	900	90
14	4	16	36	1296	144
15	4	16	28	784	112
16	2	4	15	225	30
17	5	25	39	1521	195
18	4	16	30	900	120
19	4	16	29	841	116
20	2	4	31	961	62
21	4	16	34	1156	136
22	5	25	34	1156	170
23	4	16	34	1156	136
24	4	16	32	1024	128
25	4	16	33	1089	132
26	2	4	25	625	50
27	3	9	27	729	81
28	1	1	22	484	22
29	4	16	36	1296	144
30	4	16	35	1225	140
31	3	9	24	576	72
32	3	9	25	625	75
33	4	16	30	900	120
34	2	4	17	289	34
35	3	9	32	1024	96
36	4	16	30	900	120
37	2	4	26	676	52

38	4	16	28	784	112
39	4	16	33	1089	132
40	4	16	35	1225	140
41	3	9	32	1024	96
42	3	9	27	729	81
43	4	16	32	1024	128
44	4	16	32	1024	128
45	4	16	32	1024	128
46	3	9	26	676	78
47	4	16	32	1024	128
48	3	9	25	625	75
49	4	16	28	784	112
50	3	9	27	729	81
51	3	9	23	529	69
52	4	16	31	961	124
53	4	16	28	784	112
54	3	9	29	841	87
55	3	9	32	1024	96
56	4	16	25	625	100
57	4	16	28	784	112
58	3	9	34	1156	102
59	3	9	27	729	81
60	4	16	27	729	108
61	4	16	28	784	112
62	4	16	32	1024	128
63	3	9	28	784	84
64	4	16	33	1089	132
65	4	16	31	961	124
66	3	9	30	900	90
67	3	9	32	1024	96
68	3	9	31	961	93
69	4	16	32	1024	128
70	3	9	33	1089	99
Sum	240	870	2060	62276	7263

Rxy= 0.71693 Varians= 0.67347

Attribute 2: Easiness to close

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	31	961	124
2	4	16	33	1089	132
3	3	9	25	625	75
4	4	16	26	676	104

5	5	25	42	1764	210
6	3	9	23	529	69
7	3	9	26	676	78
8	2	4	25	625	50
9	1	1	15	225	15
10	5	25	38	1444	190
11	4	16	30	900	120
12	3	9	29	841	87
13	3	9	30	900	90
14	5	25	36	1296	180
15	4	16	28	784	112
16	1	1	15	225	15
17	5	25	39	1521	195
18	4	16	30	900	120
19	4	16	29	841	116
20	5	25	31	961	155
21	4	16	34	1156	136
22	5	25	34	1156	170
23	4	16	34	1156	136
24	3	9	32	1024	96
25	4	16	33	1089	132
26	4	16	25	625	100
27	3	9	27	729	81
28	5	25	22	484	110
29	5	25	36	1296	180
30	4	16	35	1225	140
31	2	4	24	576	48
32	4	16	25	625	100
33	3	9	30	900	90
34	2	4	17	289	34
35	4	16	32	1024	128
36	4	16	30	900	120
37	4	16	26	676	104
38	4	16	28	784	112
39	3	9	33	1089	99
40	3	9	35	1225	105
41	3	9	32	1024	96
42	2	4	27	729	54
43	3	9	32	1024	96
44	3	9	32	1024	96
45	4	16	32	1024	128
46	3	9	26	676	78
47	3	9	32	1024	96
48	3	9	25	625	75
49	4	16	28	784	112

50	3	9	27	729	81
51	3	9	23	529	69
52	3	9	31	961	93
53	3	9	28	784	84
54	3	9	29	841	87
55	3	9	32	1024	96
56	4	16	25	625	100
57	2	4	28	784	56
58	3	9	34	1156	102
59	3	9	27	729	81
60	3	9	27	729	81
61	4	16	28	784	112
62	3	9	32	1024	96
63	4	16	28	784	112
64	3	9	33	1089	99
65	3	9	31	961	93
66	3	9	30	900	90
67	4	16	32	1024	128
68	4	16	31	961	124
69	3	9	32	1024	96
70	4	16	33	1089	132
Sum	242	892	2060	62276	7301

Rxy= 0.59258 Varians= 0.79102

Attribute 3: Finger comfort in opening and closing

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	31	961	93
2	3	9	33	1089	99
3	2	4	25	625	50
4	2	4	26	676	52
5	5	25	42	1764	210
6	3	9	23	529	69
7	3	9	26	676	78
8	2	4	25	625	50
9	1	1	15	225	15
10	4	16	38	1444	152
11	3	9	30	900	90
12	3	9	29	841	87
13	5	25	30	900	150
14	5	25	36	1296	180
15	3	9	28	784	84
16	1	1	15	225	15

17	5	25	39	1521	195
18	4	16	30	900	120
19	3	9	29	841	87
20	2	4	31	961	62
21	4	16	34	1156	136
22	3	9	34	1156	102
23	3	9	34	1156	102
24	3	9	32	1024	96
25	3	9	33	1089	99
26	2	4	25	625	50
27	2	4	27	729	54
28	1	1	22	484	22
29	5	25	36	1296	180
30	4	16	35	1225	140
31	3	9	24	576	72
32	2	4	25	625	50
33	3	9	30	900	90
34	1	1	17	289	17
35	4	16	32	1024	128
36	3	9	30	900	90
37	3	9	26	676	78
38	3	9	28	784	84
39	4	16	33	1089	132
40	4	16	35	1225	140
41	3	9	32	1024	96
42	4	16	27	729	108
43	4	16	32	1024	128
44	4	16	32	1024	128
45	3	9	32	1024	96
46	3	9	26	676	78
47	4	16	32	1024	128
48	3	9	25	625	75
49	3	9	28	784	84
50	2	4	27	729	54
51	4	16	23	529	92
52	4	16	31	961	124
53	4	16	28	784	112
54	3	9	29	841	87
55	4	16	32	1024	128
56	2	4	25	625	50
57	2	4	28	784	56
58	4	16	34	1156	136
59	3	9	27	729	81
60	3	9	27	729	81
61	2	4	28	784	56

62	3	9	32	1024	96
63	4	16	28	784	112
64	4	16	33	1089	132
65	3	9	31	961	93
66	4	16	30	900	120
67	3	9	32	1024	96
68	4	16	31	961	124
69	4	16	32	1024	128
70	5	25	33	1089	165
Sum	224	786	2060	62276	6844

Rxy= 0.74506 Varians= 0.98857

Attribute 4: Hand movement comfort

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	31	961	93
2	3	9	33	1089	99
3	3	9	25	625	75
4	1	1	26	676	26
5	5	25	42	1764	210
6	3	9	23	529	69
7	3	9	26	676	78
8	3	9	25	625	75
9	3	9	15	225	45
10	4	16	38	1444	152
11	3	9	30	900	90
12	3	9	29	841	87
13	3	9	30	900	90
14	5	25	36	1296	180
15	3	9	28	784	84
16	1	1	15	225	15
17	5	25	39	1521	195
18	4	16	30	900	120
19	3	9	29	841	87
20	3	9	31	961	93
21	2	4	34	1156	68
22	2	4	34	1156	68
23	3	9	34	1156	102
24	3	9	32	1024	96
25	3	9	33	1089	99
26	2	4	25	625	50
27	2	4	27	729	54
28	1	1	22	484	22

29	4	16	36	1296	144
30	4	16	35	1225	140
31	2	4	24	576	48
32	3	9	25	625	75
33	3	9	30	900	90
34	1	1	17	289	17
35	4	16	32	1024	128
36	3	9	30	900	90
37	4	16	26	676	104
38	3	9	28	784	84
39	3	9	33	1089	99
40	4	16	35	1225	140
41	3	9	32	1024	96
42	3	9	27	729	81
43	3	9	32	1024	96
44	4	16	32	1024	128
45	3	9	32	1024	96
46	2	4	26	676	52
47	4	16	32	1024	128
48	3	9	25	625	75
49	3	9	28	784	84
50	3	9	27	729	81
51	4	16	23	529	92
52	4	16	31	961	124
53	3	9	28	784	84
54	2	4	29	841	58
55	4	16	32	1024	128
56	2	4	25	625	50
57	4	16	28	784	112
58	4	16	34	1156	136
59	3	9	27	729	81
60	3	9	27	729	81
61	2	4	28	784	56
62	3	9	32	1024	96
63	3	9	28	784	84
64	4	16	33	1089	132
65	3	9	31	961	93
66	4	16	30	900	120
67	4	16	32	1024	128
68	3	9	31	961	93
69	4	16	32	1024	128
70	4	16	33	1089	132
Sum	218	734	2060	62276	6606

Rxy= 0.63151 Varians= 0.78694

Attribute 5: Form of cap

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	31	961	93
2	4	16	33	1089	132
3	3	9	25	625	75
4	3	9	26	676	78
5	4	16	42	1764	168
6	2	4	23	529	46
7	4	16	26	676	104
8	2	4	25	625	50
9	1	1	15	225	15
10	5	25	38	1444	190
11	4	16	30	900	120
12	3	9	29	841	87
13	3	9	30	900	90
14	3	9	36	1296	108
15	3	9	28	784	84
16	2	4	15	225	30
17	4	16	39	1521	156
18	3	9	30	900	90
19	3	9	29	841	87
20	4	16	31	961	124
21	5	25	34	1156	170
22	4	16	34	1156	136
23	4	16	34	1156	136
24	4	16	32	1024	128
25	4	16	33	1089	132
26	2	4	25	625	50
27	3	9	27	729	81
28	4	16	22	484	88
29	4	16	36	1296	144
30	4	16	35	1225	140
31	2	4	24	576	48
32	2	4	25	625	50
33	4	16	30	900	120
34	2	4	17	289	34
35	4	16	32	1024	128
36	4	16	30	900	120
37	3	9	26	676	78
38	2	4	28	784	56
39	4	16	33	1089	132
40	4	16	35	1225	140
41	4	16	32	1024	128
42	3	9	27	729	81

43	4	16	32	1024	128
44	3	9	32	1024	96
45	3	9	32	1024	96
46	2	4	26	676	52
47	3	9	32	1024	96
48	2	4	25	625	50
49	3	9	28	784	84
50	3	9	27	729	81
51	2	4	23	529	46
52	4	16	31	961	124
53	2	4	28	784	56
54	2	4	29	841	58
55	3	9	32	1024	96
56	2	4	25	625	50
57	4	16	28	784	112
58	4	16	34	1156	136
59	3	9	27	729	81
60	2	4	27	729	54
61	4	16	28	784	112
62	4	16	32	1024	128
63	2	4	28	784	56
64	3	9	33	1089	99
65	3	9	31	961	93
66	3	9	30	900	90
67	4	16	32	1024	128
68	3	9	31	961	93
69	3	9	32	1024	96
70	4	16	33	1089	132
Sum	223	763	2060	62276	6770

Rxy= 0.70352 Varians= 0.75122

Attribute 6: Cap material

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	31	961	124
2	4	16	33	1089	132
3	3	9	25	625	75
4	3	9	26	676	78
5	4	16	42	1764	168
6	2	4	23	529	46
7	2	4	26	676	52
8	3	9	25	625	75
9	3	9	15	225	45

10	5	25	38	1444	190
11	3	9	30	900	90
12	3	9	29	841	87
13	3	9	30	900	90
14	3	9	36	1296	108
15	2	4	28	784	56
16	1	1	15	225	15
17	3	9	39	1521	117
18	2	4	30	900	60
19	3	9	29	841	87
20	4	16	31	961	124
21	5	25	34	1156	170
22	4	16	34	1156	136
23	3	9	34	1156	102
24	3	9	32	1024	96
25	4	16	33	1089	132
26	1	1	25	625	25
27	4	16	27	729	108
28	3	9	22	484	66
29	3	9	36	1296	108
30	3	9	35	1225	105
31	2	4	24	576	48
32	1	1	25	625	25
33	4	16	30	900	120
34	2	4	17	289	34
35	4	16	32	1024	128
36	2	4	30	900	60
37	2	4	26	676	52
38	3	9	28	784	84
39	4	16	33	1089	132
40	5	25	35	1225	175
41	4	16	32	1024	128
42	2	4	27	729	54
43	3	9	32	1024	96
44	4	16	32	1024	128
45	3	9	32	1024	96
46	3	9	26	676	78
47	4	16	32	1024	128
48	2	4	25	625	50
49	3	9	28	784	84
50	2	4	27	729	54
51	2	4	23	529	46
52	3	9	31	961	93
53	2	4	28	784	56
54	4	16	29	841	116

55	3	9	32	1024	96
56	2	4	25	625	50
57	4	16	28	784	112
58	4	16	34	1156	136
59	2	4	27	729	54
60	3	9	27	729	81
61	4	16	28	784	112
62	4	16	32	1024	128
63	3	9	28	784	84
64	4	16	33	1089	132
65	3	9	31	961	93
66	3	9	30	900	90
67	4	16	32	1024	128
68	3	9	31	961	93
69	3	9	32	1024	96
70	2	4	33	1089	66
Sum	214	714	2060	62276	6483

Rxy= 0.58944 Varians= 0.85388

Attribute 7: Cap product manufacturing smoothness

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	31	961	93
2	3	9	33	1089	99
3	3	9	25	625	75
4	3	9	26	676	78
5	4	16	42	1764	168
6	2	4	23	529	46
7	2	4	26	676	52
8	3	9	25	625	75
9	2	4	15	225	30
10	3	9	38	1444	114
11	2	4	30	900	60
12	4	16	29	841	116
13	3	9	30	900	90
14	3	9	36	1296	108
15	2	4	28	784	56
16	1	1	15	225	15
17	4	16	39	1521	156
18	2	4	30	900	60
19	3	9	29	841	87
20	4	16	31	961	124
21	4	16	34	1156	136

22	3	9	34	1156	102
23	4	16	34	1156	136
24	4	16	32	1024	128
25	4	16	33	1089	132
26	4	16	25	625	100
27	3	9	27	729	81
28	2	4	22	484	44
29	4	16	36	1296	144
30	4	16	35	1225	140
31	2	4	24	576	48
32	2	4	25	625	50
33	2	4	30	900	60
34	2	4	17	289	34
35	3	9	32	1024	96
36	4	16	30	900	120
37	2	4	26	676	52
38	4	16	28	784	112
39	4	16	33	1089	132
40	4	16	35	1225	140
41	4	16	32	1024	128
42	3	9	27	729	81
43	4	16	32	1024	128
44	3	9	32	1024	96
45	4	16	32	1024	128
46	3	9	26	676	78
47	3	9	32	1024	96
48	2	4	25	625	50
49	3	9	28	784	84
50	3	9	27	729	81
51	1	1	23	529	23
52	3	9	31	961	93
53	2	4	28	784	56
54	4	16	29	841	116
55	4	16	32	1024	128
56	2	4	25	625	50
57	2	4	28	784	56
58	4	16	34	1156	136
59	3	9	27	729	81
60	3	9	27	729	81
61	2	4	28	784	56
62	4	16	32	1024	128
63	2	4	28	784	56
64	3	9	33	1089	99
65	4	16	31	961	124
66	4	16	30	900	120

67	3	9	32	1024	96
68	4	16	31	961	124
69	3	9	32	1024	96
70	3	9	33	1089	99
Sum	213	699	2060	62276	6457

Rxy= 0.65075 Varians= 0.72673

Attribute 8: Emboss of logo or product name

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	31	961	124
2	4	16	33	1089	132
3	3	9	25	625	75
4	3	9	26	676	78
5	5	25	42	1764	210
6	2	4	23	529	46
7	3	9	26	676	78
8	4	16	25	625	100
9	2	4	15	225	30
10	3	9	38	1444	114
11	3	9	30	900	90
12	3	9	29	841	87
13	3	9	30	900	90
14	3	9	36	1296	108
15	3	9	28	784	84
16	1	1	15	225	15
17	4	16	39	1521	156
18	4	16	30	900	120
19	2	4	29	841	58
20	5	25	31	961	155
21	4	16	34	1156	136
22	4	16	34	1156	136
23	5	25	34	1156	170
24	4	16	32	1024	128
25	4	16	33	1089	132
26	4	16	25	625	100
27	4	16	27	729	108
28	4	16	22	484	88
29	3	9	36	1296	108
30	4	16	35	1225	140
31	4	16	24	576	96
32	4	16	25	625	100
33	4	16	30	900	120

34	2	4	17	289	34
35	2	4	32	1024	64
36	2	4	30	900	60
37	2	4	26	676	52
38	1	1	28	784	28
39	4	16	33	1089	132
40	3	9	35	1225	105
41	4	16	32	1024	128
42	3	9	27	729	81
43	4	16	32	1024	128
44	4	16	32	1024	128
45	4	16	32	1024	128
46	3	9	26	676	78
47	3	9	32	1024	96
48	4	16	25	625	100
49	2	4	28	784	56
50	4	16	27	729	108
51	1	1	23	529	23
52	3	9	31	961	93
53	4	16	28	784	112
54	4	16	29	841	116
55	4	16	32	1024	128
56	4	16	25	625	100
57	2	4	28	784	56
58	4	16	34	1156	136
59	4	16	27	729	108
60	3	9	27	729	81
61	3	9	28	784	84
62	4	16	32	1024	128
63	3	9	28	784	84
64	4	16	33	1089	132
65	4	16	31	961	124
66	3	9	30	900	90
67	4	16	32	1024	128
68	3	9	31	961	93
69	4	16	32	1024	128
70	4	16	33	1089	132
Sum	236	854	2060	62276	7094

Rxy= 0.47931 Varians= 0.83347

Attribute 9: Cap grip strength towards the package

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	31	961	93
2	4	16	33	1089	132
3	3	9	25	625	75
4	4	16	26	676	104
5	5	25	42	1764	210
6	3	9	23	529	69
7	3	9	26	676	78
8	3	9	25	625	75
9	1	1	15	225	15
10	5	25	38	1444	190
11	4	16	30	900	120
12	4	16	29	841	116
13	4	16	30	900	120
14	5	25	36	1296	180
15	4	16	28	784	112
16	5	25	15	225	75
17	4	16	39	1521	156
18	3	9	30	900	90
19	4	16	29	841	116
20	2	4	31	961	62
21	2	4	34	1156	68
22	4	16	34	1156	136
23	4	16	34	1156	136
24	4	16	32	1024	128
25	3	9	33	1089	99
26	4	16	25	625	100
27	3	9	27	729	81
28	1	1	22	484	22
29	4	16	36	1296	144
30	4	16	35	1225	140
31	4	16	24	576	96
32	4	16	25	625	100
33	3	9	30	900	90
34	3	9	17	289	51
35	4	16	32	1024	128
36	4	16	30	900	120
37	4	16	26	676	104
38	4	16	28	784	112
39	3	9	33	1089	99
40	4	16	35	1225	140
41	4	16	32	1024	128
42	4	16	27	729	108

43	3	9	32	1024	96
44	3	9	32	1024	96
45	4	16	32	1024	128
46	4	16	26	676	104
47	4	16	32	1024	128
48	3	9	25	625	75
49	3	9	28	784	84
50	4	16	27	729	108
51	3	9	23	529	69
52	3	9	31	961	93
53	4	16	28	784	112
54	4	16	29	841	116
55	4	16	32	1024	128
56	3	9	25	625	75
57	4	16	28	784	112
58	4	16	34	1156	136
59	3	9	27	729	81
60	3	9	27	729	81
61	3	9	28	784	84
62	3	9	32	1024	96
63	4	16	28	784	112
64	4	16	33	1089	132
65	4	16	31	961	124
66	3	9	30	900	90
67	3	9	32	1024	96
68	4	16	31	961	124
69	4	16	32	1024	128
70	4	16	33	1089	132
Sum	250	934	2060	62276	7458

Rxy= 0.38673 Varians= 0.58776

I.2. Uniformity and Data Sufficiency Tests for "Romeo" Performance

Attribute 1: Easiness to open

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	4	4	4	4	4	4	Uniform	1
2	4	2	4	4	3	3.4	Uniform	1
3	2	5	3	4	3	3.4	Uniform	1
4	3	4	3	3	4	3.4	Uniform	1
5	5	4	4	4	4	4.2	Uniform	1
6	3	2	2	3	4	2.8	Uniform	1
7	3	4	3	4	3	3.4	Uniform	1
8	3	5	4	3	4	3.8	Uniform	1
9	1	4	2	3	4	2.8	Uniform	1
10	4	4	4	4	3	3.8	Uniform	1
11	4	4	4	4	3	3.8	Uniform	1
12	3	2	4	3	3	3	Uniform	1
13	3	3	3	3	4	3.2	Uniform	1
14	4	1	3	4	3	3	Uniform	1
Subgroup Average Total						48		14
Total Xi						240		
Total Xi^2						57600		

	$(Xi)^2$				
	16	16	16	16	16
	16	4	16	16	9
	4	25	9	16	9
	9	16	9	9	16
	25	16	16	16	16
	9	4	4	9	16
	9	16	9	16	9
	9	25	16	9	16
	1	16	4	9	16
	16	16	16	16	9
	16	16	16	16	9
	9	4	16	9	9
	9	9	9	9	16
	16	1	9	16	9
	Total $(Xi)^2$				870

Subgroup Average Value 3.429
Deviation Standard 0.827

Uniformity Test
Standard Average 0.370
Lower Control Limit 2.320
Upper Control Limit 4.538
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 22.9167

Attribute 2: Easiness to close

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	4	4	5	3	2	3.6	Uniform	1
2	4	1	4	3	3	3	Uniform	1
3	3	5	2	4	3	3.4	Uniform	1
4	4	4	4	3	3	3.6	Uniform	1
5	5	4	3	3	4	3.8	Uniform	1
6	3	5	2	3	3	3.2	Uniform	1
7	3	4	4	4	4	3.8	Uniform	1
8	2	5	4	3	3	3.4	Uniform	1
9	1	4	4	3	3	3	Uniform	1
10	5	3	4	3	3	3.6	Uniform	1
11	4	4	3	3	4	3.6	Uniform	1
12	3	4	3	3	4	3.4	Uniform	1
13	3	3	3	3	3	3	Uniform	1
14	5	5	2	4	4	4	Uniform	1
Subgroup Average Total						48.4		14
Total Xi						242		
Total Xi^2						58564		

$(Xi)^2$				
16	16	25	9	4
16	1	16	9	9
9	25	4	16	9
16	16	16	9	9
25	16	9	9	16
9	25	4	9	9
9	16	16	16	16
4	25	16	9	9
1	16	16	9	9
25	9	16	9	9
16	16	9	9	16
9	16	9	9	16
9	9	9	9	9
25	25	4	16	16
Total $(Xi)^2$				892

Subgroup Average Value 3.457
Deviation Standard 0.896

Uniformity Test
Standard Average 0.401
Lower Control Limit 2.255
Upper Control Limit 4.659
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 26.4736

Attribute 3: Finger comfort in opening and closing

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	3	5	4	2	3.4	Uniform	1
2	3	1	4	4	4	3.2	Uniform	1
3	2	5	3	3	3	3.2	Uniform	1
4	2	4	2	3	3	2.8	Uniform	1
5	5	3	3	4	2	3.4	Uniform	1
6	3	2	1	3	3	2.4	Uniform	1
7	3	4	4	3	4	3.6	Uniform	1
8	2	3	3	2	4	2.8	Uniform	1
9	1	3	3	4	3	2.8	Uniform	1
10	4	3	3	4	4	3.6	Uniform	1
11	3	3	4	4	3	3.4	Uniform	1
12	3	2	4	3	4	3.2	Uniform	1
13	5	2	3	4	4	3.6	Uniform	1
14	5	1	4	2	5	3.4	Uniform	1
Subgroup Average Total						44.8		14
Total Xi						224		
Total Xi^2						50176		

$(Xi)^2$				
9	9	25	16	4
9	1	16	16	16
4	25	9	9	9
4	16	4	9	9
25	9	9	16	4
9	4	1	9	9
9	16	16	9	16
4	9	9	4	16
1	9	9	16	9
16	9	9	16	16
9	9	16	16	9
9	4	16	9	16
25	4	9	16	16
25	1	16	4	25
Total $(Xi)^2$				786

Subgroup Average Value 3.200
Deviation Standard 1.001

Uniformity Test
Standard Average 0.448
Lower Control Limit 1.856
Upper Control Limit 4.544
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 38.6161

Attribute 4: Hand movement comfort

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	3	4	3	4	3.4	Uniform	1
2	3	1	4	4	4	3.2	Uniform	1
3	3	5	2	3	3	3.2	Uniform	1
4	1	4	3	2	3	2.6	Uniform	1
5	5	3	3	4	2	3.4	Uniform	1
6	3	3	1	3	3	2.6	Uniform	1
7	3	2	4	3	3	3	Uniform	1
8	3	2	3	3	4	3	Uniform	1
9	3	3	4	4	3	3.4	Uniform	1
10	4	3	3	4	4	3.6	Uniform	1
11	3	3	3	3	4	3.2	Uniform	1
12	3	2	4	2	3	2.8	Uniform	1
13	3	2	3	4	4	3.2	Uniform	1
14	5	1	3	2	4	3	Uniform	1
Subgroup Average Total						43.6		14
Total Xi						218		
Total Xi^2						47524		

$(Xi)^2$				
9	9	16	9	16
9	1	16	16	16
9	25	4	9	9
1	16	9	4	9
25	9	9	16	4
9	9	1	9	9
9	4	16	9	9
9	4	9	9	16
9	9	16	16	9
16	9	9	16	16
9	9	9	9	16
9	4	16	4	9
9	4	9	16	16
25	1	9	4	16
Total $(Xi)^2$				734

Subgroup Average Value 3.114
Deviation Standard 0.894

Uniformity Test
Standard Average 0.400
Lower Control Limit 1.916
Upper Control Limit 4.313
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 32.4552

Attribute 5: Form of cap

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	3	4	4	4	3.6	Uniform	1
2	4	2	4	3	4	3.4	Uniform	1
3	3	4	2	3	3	3	Uniform	1
4	3	3	2	2	2	2.4	Uniform	1
5	4	3	4	3	4	3.6	Uniform	1
6	2	4	2	2	4	2.8	Uniform	1
7	4	5	4	3	2	3.6	Uniform	1
8	2	4	4	3	3	3.2	Uniform	1
9	1	4	3	2	3	2.6	Uniform	1
10	5	4	2	4	3	3.6	Uniform	1
11	4	4	4	2	4	3.6	Uniform	1
12	3	2	4	2	3	2.8	Uniform	1
13	3	3	4	3	3	3.2	Uniform	1
14	3	4	3	2	4	3.2	Uniform	1
Subgroup Average Total						44.6		14
Total Xi						223		
Total Xi^2						49729		

$(Xi)^2$				
9	9	16	16	16
16	4	16	9	16
9	16	4	9	9
9	9	4	4	4
16	9	16	9	16
4	16	4	4	16
16	25	16	9	4
4	16	16	9	9
1	16	9	4	9
25	16	4	16	9
16	16	16	4	16
9	4	16	4	9
9	9	16	9	9
9	16	9	4	16
Total $(Xi)^2$				763

Subgroup Average Value 3.186
Deviation Standard 0.873

Uniformity Test
Standard Average 0.390
Lower Control Limit 2.014
Upper Control Limit 4.357
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 29.6085

Attribute 6: Cap material

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks		$(Xi)^2$				
1	4	2	3	3	4	3.2	Uniform	1	16	4	9	9	16
2	4	1	3	4	4	3.2	Uniform	1	16	1	9	16	16
3	3	3	2	3	2	2.6	Uniform	1	9	9	4	9	4
4	3	2	1	3	3	2.4	Uniform	1	9	4	1	9	9
5	4	3	4	4	4	3.8	Uniform	1	16	9	16	16	16
6	2	4	2	2	4	2.8	Uniform	1	4	16	4	4	16
7	2	5	4	3	3	3.4	Uniform	1	4	25	16	9	9
8	3	4	2	2	4	3	Uniform	1	9	16	4	4	16
9	3	3	2	2	3	2.6	Uniform	1	9	9	4	4	9
10	5	3	3	3	3	3.4	Uniform	1	25	9	9	9	9
11	3	4	4	2	4	3.4	Uniform	1	9	16	16	4	16
12	3	1	5	4	3	3.2	Uniform	1	9	1	25	16	9
13	3	4	4	3	3	3.4	Uniform	1	9	16	16	9	9
14	3	3	2	2	2	2.4	Uniform	1	9	9	4	4	4
Subgroup Average Total						42.8		14	Total $(Xi)^2$				714
Total Xi						214							
Total Xi^2						45796							

Subgroup Average Value 3.057
Deviation Standard 0.931

Uniformity Test
Standard Average 0.416
Lower Control Limit 1.808
Upper Control Limit 4.306
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 36.5447

Attribute 7: Cap product manufacturing smoothness

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	2	4	4	2	3	Uniform	1
2	3	1	4	3	4	3	Uniform	1
3	3	4	2	4	3	3.2	Uniform	1
4	3	2	2	3	3	2.6	Uniform	1
5	4	3	2	3	2	2.8	Uniform	1
6	2	4	2	2	4	2.8	Uniform	1
7	2	4	3	3	2	2.8	Uniform	1
8	3	3	4	3	3	3.2	Uniform	1
9	2	4	2	1	4	2.6	Uniform	1
10	3	4	4	3	4	3.6	Uniform	1
11	2	4	4	2	3	3	Uniform	1
12	4	4	4	4	4	4	Uniform	1
13	3	3	4	4	3	3.4	Uniform	1
14	3	2	3	2	3	2.6	Uniform	1
Subgroup Average Total						42.6		14
Total Xi						213		
Total Xi^2						45369		

$(Xi)^2$				
9	4	16	16	4
9	1	16	9	16
9	16	4	16	9
9	4	4	9	9
16	9	4	9	4
4	16	4	4	16
4	16	9	9	4
9	9	16	9	9
4	16	4	1	16
9	16	16	9	16
4	16	16	4	9
16	16	16	16	16
9	9	16	16	9
9	4	9	4	9
Total $(Xi)^2$				699

Subgroup Average Value 3.043
Deviation Standard 0.859

Uniformity Test
Standard Average 0.384
Lower Control Limit 1.891
Upper Control Limit 4.195
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 31.3959

Attribute 8: Emboss of logo or product name

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	4	3	3	4	2	3.2	Uniform	1
2	4	1	4	4	4	3.4	Uniform	1
3	3	4	4	4	4	3.8	Uniform	1
4	3	4	4	3	3	3.4	Uniform	1
5	5	2	4	3	3	3.4	Uniform	1
6	2	5	2	4	4	3.4	Uniform	1
7	3	4	2	2	3	2.8	Uniform	1
8	4	4	2	4	4	3.6	Uniform	1
9	2	5	2	1	4	2.8	Uniform	1
10	3	4	1	3	3	2.8	Uniform	1
11	3	4	4	4	4	3.8	Uniform	1
12	3	4	3	4	3	3.4	Uniform	1
13	3	4	4	4	4	3.8	Uniform	1
14	3	4	3	4	4	3.6	Uniform	1
Subgroup Average Total						47.2		14
Total Xi						236		
Total Xi^2						55696		

$(Xi)^2$				
16	9	9	16	4
16	1	16	16	16
9	16	16	16	16
9	16	16	9	9
25	4	16	9	9
4	25	4	16	16
9	16	4	4	9
16	16	4	16	16
4	25	4	1	16
9	16	1	9	9
9	16	16	16	16
9	16	9	16	9
9	16	16	16	16
9	16	9	16	16
Total $(Xi)^2$				854

Subgroup Average Value 3.371
Deviation Standard 0.920

Uniformity Test
Standard Average 0.411
Lower Control Limit 2.138
Upper Control Limit 4.605
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 29.3307

Attribute 9: Cap grip strength towards the package

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	4	4	3	4	3.6	Uniform	1
2	4	5	4	3	4	4	Uniform	1
3	3	4	4	4	3	3.6	Uniform	1
4	4	3	4	4	3	3.6	Uniform	1
5	5	4	3	4	3	3.8	Uniform	1
6	3	2	3	3	3	2.8	Uniform	1
7	3	2	4	3	4	3.2	Uniform	1
8	3	4	4	4	4	3.8	Uniform	1
9	1	4	4	3	4	3.2	Uniform	1
10	5	4	4	3	3	3.8	Uniform	1
11	4	3	3	4	3	3.4	Uniform	1
12	4	4	4	4	4	4	Uniform	1
13	4	3	4	4	4	3.8	Uniform	1
14	5	1	4	3	4	3.4	Uniform	1
Subgroup Average Total						50		14
Total Xi						250		
Total Xi^2						62500		

$(Xi)^2$				
9	16	16	9	16
16	25	16	9	16
9	16	16	16	9
16	9	16	16	9
25	16	9	16	9
9	4	9	9	9
9	4	16	9	16
9	16	16	16	16
1	16	16	9	16
25	16	16	9	9
16	9	9	16	9
16	16	16	16	16
16	9	16	16	16
25	1	16	9	16
Total $(Xi)^2$				934

Subgroup Average Value 3.571
Deviation Standard 0.772

Uniformity Test
Standard Average 0.345
Lower Control Limit 2.535
Upper Control Limit 4.607
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 18.432

I.3. Reliability Test for "Romeo" Performance

Attributes	Varians
Easy to open	0.673
Easy to close	0.791
Finger's comfort in opening and closing	0.989
Hand moving comfort	0.787
Form of cap	0.751
Cap material	0.854
Cap product manufacturing smoothness	0.727
Emboss of logo or product name	0.833
Cap grip strength towards the package	0.588
sum	6.993

Total Varians

No	Yi	Yi^2
1	31	961
2	33	1089
3	25	625
4	26	676
5	42	1764
6	23	529
7	26	676
8	25	625
9	15	225
10	38	1444
11	30	900
12	29	841
13	30	900
14	36	1296
15	28	784
16	15	225
17	39	1521
18	30	900
19	29	841
20	31	961
21	34	1156
22	34	1156
23	34	1156
24	32	1024
25	33	1089
26	25	625
27	27	729
28	22	484

29	36	1296
30	35	1225
31	24	576
32	25	625
33	30	900
34	17	289
35	32	1024
36	30	900
37	26	676
38	28	784
39	33	1089
40	35	1225
41	32	1024
42	27	729
43	32	1024
44	32	1024
45	32	1024
46	26	676
47	32	1024
48	25	625
49	28	784
50	27	729
51	23	529
52	31	961
53	28	784
54	29	841
55	32	1024
56	25	625
57	28	784
58	34	1156
59	27	729
60	27	729
61	28	784
62	32	1024
63	28	784
64	33	1089
65	31	961
66	30	900
67	32	1024
68	31	961
69	32	1024
70	33	1089
sum	2060	62276

Varians= 23.616

Calculate Alpha

Alpha Cronbach	r table	Remarks
0.792	0.232	Reliable

Appendix J: Second Questionnaire: "Gadjah Mada" Performance Tests

J.1. Validity Tests for "Gadjah Mada" Performance

Attribute 1: Easiness to open

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	5	25	44	1936	220
2	5	25	36	1296	180
3	3	9	28	784	84
4	5	25	39	1521	195
5	5	25	41	1681	205
6	4	16	30	900	120
7	3	9	32	1024	96
8	4	16	37	1369	148
9	4	16	33	1089	132
10	5	25	37	1369	185
11	4	16	30	900	120
12	5	25	36	1296	180
13	5	25	41	1681	205
14	5	25	33	1089	165
15	4	16	31	961	124
16	5	25	44	1936	220
17	3	9	37	1369	111
18	5	25	41	1681	205
19	4	16	35	1225	140
20	5	25	39	1521	195
21	5	25	39	1521	195
22	2	4	25	625	50
23	4	16	32	1024	128
24	4	16	27	729	108
25	4	16	34	1156	136
26	5	25	39	1521	195
27	4	16	29	841	116
28	5	25	33	1089	165
29	4	16	34	1156	136
30	5	25	41	1681	205
31	4	16	32	1024	128
32	5	25	41	1681	205
33	5	25	33	1089	165
34	4	16	31	961	124
35	3	9	31	961	93
36	4	16	34	1156	136
37	4	16	34	1156	136

38	4	16	30	900	120
39	5	25	43	1849	215
40	5	25	39	1521	195
41	5	25	36	1296	180
42	5	25	37	1369	185
43	4	16	31	961	124
44	5	25	36	1296	180
45	4	16	30	900	120
46	3	9	30	900	90
47	5	25	36	1296	180
48	3	9	28	784	84
49	4	16	33	1089	132
50	4	16	34	1156	136
51	5	25	35	1225	175
52	3	9	25	625	75
53	5	25	37	1369	185
54	4	16	36	1296	144
55	5	25	38	1444	190
56	5	25	37	1369	185
57	4	16	35	1225	140
58	5	25	39	1521	195
59	4	16	34	1156	136
60	4	16	34	1156	136
61	4	16	34	1156	136
62	5	25	38	1444	190
63	3	9	31	961	93
64	4	16	37	1369	148
65	4	16	25	625	100
66	5	25	38	1444	190
67	4	16	38	1444	152
68	4	16	34	1156	136
69	5	25	33	1089	165
70	4	16	40	1600	160
Sum	301	1331	2434	85990	10623

Rxy= 0.70279 Varians= 0.52429

Attribute 2: Easiness to close

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	5	25	44	1936	220
2	5	25	36	1296	180
3	3	9	28	784	84
4	5	25	39	1521	195

5	5	25	41	1681	205
6	3	9	30	900	90
7	3	9	32	1024	96
8	4	16	37	1369	148
9	3	9	33	1089	99
10	4	16	37	1369	148
11	4	16	30	900	120
12	5	25	36	1296	180
13	3	9	41	1681	123
14	1	1	33	1089	33
15	4	16	31	961	124
16	5	25	44	1936	220
17	4	16	37	1369	148
18	5	25	41	1681	205
19	4	16	35	1225	140
20	4	16	39	1521	156
21	4	16	39	1521	156
22	3	9	25	625	75
23	4	16	32	1024	128
24	3	9	27	729	81
25	4	16	34	1156	136
26	5	25	39	1521	195
27	3	9	29	841	87
28	5	25	33	1089	165
29	4	16	34	1156	136
30	5	25	41	1681	205
31	2	4	32	1024	64
32	5	25	41	1681	205
33	4	16	33	1089	132
34	3	9	31	961	93
35	5	25	31	961	155
36	4	16	34	1156	136
37	5	25	34	1156	170
38	3	9	30	900	90
39	5	25	43	1849	215
40	5	25	39	1521	195
41	4	16	36	1296	144
42	5	25	37	1369	185
43	3	9	31	961	93
44	5	25	36	1296	180
45	4	16	30	900	120
46	3	9	30	900	90
47	5	25	36	1296	180
48	3	9	28	784	84
49	4	16	33	1089	132

50	5	25	34	1156	170
51	4	16	35	1225	140
52	3	9	25	625	75
53	4	16	37	1369	148
54	4	16	36	1296	144
55	5	25	38	1444	190
56	5	25	37	1369	185
57	5	25	35	1225	175
58	5	25	39	1521	195
59	4	16	34	1156	136
60	4	16	34	1156	136
61	4	16	34	1156	136
62	4	16	38	1444	152
63	4	16	31	961	124
64	4	16	37	1369	148
65	4	16	25	625	100
66	5	25	38	1444	190
67	5	25	38	1444	190
68	4	16	34	1156	136
69	4	16	33	1089	132
70	5	25	40	1600	200
Sum	287	1229	2434	85990	10143

Rxy= 0.61425 Varians= 0.74714

Attribute 3: Finger comfort in opening and closing

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	5	25	44	1936	220
2	5	25	36	1296	180
3	4	16	28	784	112
4	4	16	39	1521	156
5	5	25	41	1681	205
6	3	9	30	900	90
7	4	16	32	1024	128
8	5	25	37	1369	185
9	4	16	33	1089	132
10	5	25	37	1369	185
11	4	16	30	900	120
12	5	25	36	1296	180
13	5	25	41	1681	205
14	5	25	33	1089	165
15	4	16	31	961	124
16	5	25	44	1936	220

17	3	9	37	1369	111
18	5	25	41	1681	205
19	4	16	35	1225	140
20	5	25	39	1521	195
21	4	16	39	1521	156
22	3	9	25	625	75
23	3	9	32	1024	96
24	3	9	27	729	81
25	3	9	34	1156	102
26	5	25	39	1521	195
27	4	16	29	841	116
28	5	25	33	1089	165
29	4	16	34	1156	136
30	5	25	41	1681	205
31	4	16	32	1024	128
32	5	25	41	1681	205
33	4	16	33	1089	132
34	4	16	31	961	124
35	4	16	31	961	124
36	4	16	34	1156	136
37	5	25	34	1156	170
38	4	16	30	900	120
39	5	25	43	1849	215
40	4	16	39	1521	156
41	5	25	36	1296	180
42	4	16	37	1369	148
43	4	16	31	961	124
44	4	16	36	1296	144
45	3	9	30	900	90
46	3	9	30	900	90
47	4	16	36	1296	144
48	3	9	28	784	84
49	3	9	33	1089	99
50	4	16	34	1156	136
51	4	16	35	1225	140
52	4	16	25	625	100
53	5	25	37	1369	185
54	4	16	36	1296	144
55	4	16	38	1444	152
56	5	25	37	1369	185
57	5	25	35	1225	175
58	5	25	39	1521	195
59	4	16	34	1156	136
60	4	16	34	1156	136
61	4	16	34	1156	136

62	4	16	38	1444	152
63	3	9	31	961	93
64	5	25	37	1369	185
65	3	9	25	625	75
66	4	16	38	1444	152
67	4	16	38	1444	152
68	4	16	34	1156	136
69	3	9	33	1089	99
70	5	25	40	1600	200
Sum	291	1245	2434	85990	10262

Rxy= 0.65614 Varians= 0.50388

Attribute 4: Hand movement comfort

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	5	25	44	1936	220
2	4	16	36	1296	144
3	4	16	28	784	112
4	5	25	39	1521	195
5	5	25	41	1681	205
6	3	9	30	900	90
7	3	9	32	1024	96
8	4	16	37	1369	148
9	4	16	33	1089	132
10	4	16	37	1369	148
11	3	9	30	900	90
12	5	25	36	1296	180
13	5	25	41	1681	205
14	3	9	33	1089	99
15	3	9	31	961	93
16	5	25	44	1936	220
17	3	9	37	1369	111
18	5	25	41	1681	205
19	4	16	35	1225	140
20	5	25	39	1521	195
21	4	16	39	1521	156
22	2	4	25	625	50
23	3	9	32	1024	96
24	3	9	27	729	81
25	3	9	34	1156	102
26	4	16	39	1521	156
27	3	9	29	841	87
28	5	25	33	1089	165

29	4	16	34	1156	136
30	5	25	41	1681	205
31	4	16	32	1024	128
32	5	25	41	1681	205
33	3	9	33	1089	99
34	4	16	31	961	124
35	3	9	31	961	93
36	3	9	34	1156	102
37	4	16	34	1156	136
38	4	16	30	900	120
39	5	25	43	1849	215
40	4	16	39	1521	156
41	5	25	36	1296	180
42	5	25	37	1369	185
43	3	9	31	961	93
44	5	25	36	1296	180
45	3	9	30	900	90
46	3	9	30	900	90
47	5	25	36	1296	180
48	3	9	28	784	84
49	3	9	33	1089	99
50	4	16	34	1156	136
51	4	16	35	1225	140
52	4	16	25	625	100
53	5	25	37	1369	185
54	4	16	36	1296	144
55	5	25	38	1444	190
56	4	16	37	1369	148
57	4	16	35	1225	140
58	5	25	39	1521	195
59	3	9	34	1156	102
60	3	9	34	1156	102
61	4	16	34	1156	136
62	4	16	38	1444	152
63	4	16	31	961	124
64	4	16	37	1369	148
65	3	9	25	625	75
66	4	16	38	1444	152
67	5	25	38	1444	190
68	4	16	34	1156	136
69	3	9	33	1089	99
70	5	25	40	1600	200
Sum	277	1143	2434	85990	9815

Rxy= 0.72704 Varians= 0.66959

Attribute 5: Form of cap

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	5	25	44	1936	220
2	3	9	36	1296	108
3	3	9	28	784	84
4	4	16	39	1521	156
5	4	16	41	1681	164
6	4	16	30	900	120
7	4	16	32	1024	128
8	4	16	37	1369	148
9	3	9	33	1089	99
10	4	16	37	1369	148
11	4	16	30	900	120
12	3	9	36	1296	108
13	5	25	41	1681	205
14	5	25	33	1089	165
15	4	16	31	961	124
16	5	25	44	1936	220
17	5	25	37	1369	185
18	3	9	41	1681	123
19	4	16	35	1225	140
20	5	25	39	1521	195
21	4	16	39	1521	156
22	3	9	25	625	75
23	3	9	32	1024	96
24	4	16	27	729	108
25	4	16	34	1156	136
26	5	25	39	1521	195
27	3	9	29	841	87
28	3	9	33	1089	99
29	5	25	34	1156	170
30	4	16	41	1681	164
31	4	16	32	1024	128
32	5	25	41	1681	205
33	3	9	33	1089	99
34	4	16	31	961	124
35	3	9	31	961	93
36	5	25	34	1156	170
37	4	16	34	1156	136
38	2	4	30	900	60
39	5	25	43	1849	215
40	4	16	39	1521	156
41	4	16	36	1296	144
42	4	16	37	1369	148

43	4	16	31	961	124
44	4	16	36	1296	144
45	3	9	30	900	90
46	4	16	30	900	120
47	3	9	36	1296	108
48	4	16	28	784	112
49	3	9	33	1089	99
50	3	9	34	1156	102
51	4	16	35	1225	140
52	2	4	25	625	50
53	4	16	37	1369	148
54	4	16	36	1296	144
55	4	16	38	1444	152
56	4	16	37	1369	148
57	3	9	35	1225	105
58	5	25	39	1521	195
59	4	16	34	1156	136
60	4	16	34	1156	136
61	4	16	34	1156	136
62	5	25	38	1444	190
63	3	9	31	961	93
64	4	16	37	1369	148
65	2	4	25	625	50
66	3	9	38	1444	114
67	5	25	38	1444	190
68	4	16	34	1156	136
69	4	16	33	1089	132
70	4	16	40	1600	160
Sum	270	1084	2434	85990	9526

Rxy= 0.57311 Varians= 0.60816

Attribute 6: Cap material

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	5	25	44	1936	220
2	4	16	36	1296	144
3	3	9	28	784	84
4	3	9	39	1521	117
5	5	25	41	1681	205
6	4	16	30	900	120
7	4	16	32	1024	128
8	4	16	37	1369	148
9	4	16	33	1089	132

10	4	16	37	1369	148
11	3	9	30	900	90
12	4	16	36	1296	144
13	5	25	41	1681	205
14	3	9	33	1089	99
15	4	16	31	961	124
16	5	25	44	1936	220
17	5	25	37	1369	185
18	5	25	41	1681	205
19	4	16	35	1225	140
20	5	25	39	1521	195
21	5	25	39	1521	195
22	4	16	25	625	100
23	3	9	32	1024	96
24	3	9	27	729	81
25	4	16	34	1156	136
26	4	16	39	1521	156
27	3	9	29	841	87
28	4	16	33	1089	132
29	3	9	34	1156	102
30	4	16	41	1681	164
31	4	16	32	1024	128
32	5	25	41	1681	205
33	4	16	33	1089	132
34	5	25	31	961	155
35	4	16	31	961	124
36	3	9	34	1156	102
37	3	9	34	1156	102
38	3	9	30	900	90
39	5	25	43	1849	215
40	5	25	39	1521	195
41	4	16	36	1296	144
42	3	9	37	1369	111
43	3	9	31	961	93
44	4	16	36	1296	144
45	3	9	30	900	90
46	4	16	30	900	120
47	4	16	36	1296	144
48	3	9	28	784	84
49	4	16	33	1089	132
50	4	16	34	1156	136
51	3	9	35	1225	105
52	2	4	25	625	50
53	3	9	37	1369	111
54	4	16	36	1296	144

55	4	16	38	1444	152
56	4	16	37	1369	148
57	2	4	35	1225	70
58	5	25	39	1521	195
59	3	9	34	1156	102
60	4	16	34	1156	136
61	4	16	34	1156	136
62	5	25	38	1444	190
63	3	9	31	961	93
64	3	9	37	1369	111
65	3	9	25	625	75
66	4	16	38	1444	152
67	4	16	38	1444	152
68	4	16	34	1156	136
69	4	16	33	1089	132
70	4	16	40	1600	160
Sum	269	1075	2434	85990	9498

Rxy= 0.61068 Varians= 0.58959

Attribute 7: Cap product manufacturing smoothness

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	5	25	44	1936	220
2	4	16	36	1296	144
3	3	9	28	784	84
4	4	16	39	1521	156
5	5	25	41	1681	205
6	4	16	30	900	120
7	4	16	32	1024	128
8	5	25	37	1369	185
9	4	16	33	1089	132
10	5	25	37	1369	185
11	2	4	30	900	60
12	4	16	36	1296	144
13	5	25	41	1681	205
14	5	25	33	1089	165
15	4	16	31	961	124
16	5	25	44	1936	220
17	5	25	37	1369	185
18	5	25	41	1681	205
19	4	16	35	1225	140
20	5	25	39	1521	195
21	5	25	39	1521	195

22	4	16	25	625	100
23	4	16	32	1024	128
24	4	16	27	729	108
25	4	16	34	1156	136
26	5	25	39	1521	195
27	3	9	29	841	87
28	2	4	33	1089	66
29	4	16	34	1156	136
30	5	25	41	1681	205
31	4	16	32	1024	128
32	4	16	41	1681	164
33	5	25	33	1089	165
34	4	16	31	961	124
35	3	9	31	961	93
36	5	25	34	1156	170
37	4	16	34	1156	136
38	4	16	30	900	120
39	5	25	43	1849	215
40	5	25	39	1521	195
41	4	16	36	1296	144
42	4	16	37	1369	148
43	3	9	31	961	93
44	3	9	36	1296	108
45	4	16	30	900	120
46	3	9	30	900	90
47	4	16	36	1296	144
48	3	9	28	784	84
49	4	16	33	1089	132
50	4	16	34	1156	136
51	4	16	35	1225	140
52	3	9	25	625	75
53	4	16	37	1369	148
54	4	16	36	1296	144
55	4	16	38	1444	152
56	4	16	37	1369	148
57	4	16	35	1225	140
58	4	16	39	1521	156
59	4	16	34	1156	136
60	3	9	34	1156	102
61	4	16	34	1156	136
62	4	16	38	1444	152
63	3	9	31	961	93
64	4	16	37	1369	148
65	2	4	25	625	50
66	4	16	38	1444	152

67	5	25	38	1444	190
68	4	16	34	1156	136
69	4	16	33	1089	132
70	4	16	40	1600	160
Sum	282	1176	2434	85990	9957

Rxy= 0.65071 Varians= 0.57061

Attribute 8: Emboss of logo or product name

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	5	25	44	1936	220
2	4	16	36	1296	144
3	3	9	28	784	84
4	5	25	39	1521	195
5	5	25	41	1681	205
6	4	16	30	900	120
7	4	16	32	1024	128
8	5	25	37	1369	185
9	4	16	33	1089	132
10	3	9	37	1369	111
11	3	9	30	900	90
12	3	9	36	1296	108
13	5	25	41	1681	205
14	5	25	33	1089	165
15	1	1	31	961	31
16	5	25	44	1936	220
17	5	25	37	1369	185
18	5	25	41	1681	205
19	4	16	35	1225	140
20	4	16	39	1521	156
21	4	16	39	1521	156
22	3	9	25	625	75
23	4	16	32	1024	128
24	2	4	27	729	54
25	5	25	34	1156	170
26	5	25	39	1521	195
27	4	16	29	841	116
28	3	9	33	1089	99
29	3	9	34	1156	102
30	5	25	41	1681	205
31	4	16	32	1024	128
32	4	16	41	1681	164
33	4	16	33	1089	132

34	2	4	31	961	62
35	5	25	31	961	155
36	4	16	34	1156	136
37	3	9	34	1156	102
38	4	16	30	900	120
39	5	25	43	1849	215
40	5	25	39	1521	195
41	3	9	36	1296	108
42	4	16	37	1369	148
43	4	16	31	961	124
44	4	16	36	1296	144
45	2	4	30	900	60
46	3	9	30	900	90
47	4	16	36	1296	144
48	3	9	28	784	84
49	4	16	33	1089	132
50	4	16	34	1156	136
51	4	16	35	1225	140
52	3	9	25	625	75
53	4	16	37	1369	148
54	4	16	36	1296	144
55	4	16	38	1444	152
56	2	4	37	1369	74
57	4	16	35	1225	140
58	3	9	39	1521	117
59	4	16	34	1156	136
60	4	16	34	1156	136
61	4	16	34	1156	136
62	3	9	38	1444	114
63	4	16	31	961	124
64	4	16	37	1369	148
65	2	4	25	625	50
66	4	16	38	1444	152
67	4	16	38	1444	152
68	4	16	34	1156	136
69	4	16	33	1089	132
70	4	16	40	1600	160
Sum	268	1082	2434	85990	9474

Rxy= 0.56363 Varians= 0.79918

Attribute 9: Cap grip strength towards the package

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	44	1936	176
2	2	4	36	1296	72
3	2	4	28	784	56
4	4	16	39	1521	156
5	2	4	41	1681	82
6	1	1	30	900	30
7	3	9	32	1024	96
8	2	4	37	1369	74
9	3	9	33	1089	99
10	3	9	37	1369	111
11	3	9	30	900	90
12	2	4	36	1296	72
13	3	9	41	1681	123
14	1	1	33	1089	33
15	3	9	31	961	93
16	4	16	44	1936	176
17	4	16	37	1369	148
18	3	9	41	1681	123
19	3	9	35	1225	105
20	1	1	39	1521	39
21	4	16	39	1521	156
22	1	1	25	625	25
23	4	16	32	1024	128
24	1	1	27	729	27
25	3	9	34	1156	102
26	1	1	39	1521	39
27	2	4	29	841	58
28	1	1	33	1089	33
29	3	9	34	1156	102
30	3	9	41	1681	123
31	2	4	32	1024	64
32	3	9	41	1681	123
33	1	1	33	1089	33
34	1	1	31	961	31
35	1	1	31	961	31
36	2	4	34	1156	68
37	2	4	34	1156	68
38	2	4	30	900	60
39	3	9	43	1849	129
40	2	4	39	1521	78
41	2	4	36	1296	72
42	3	9	37	1369	111

43	3	9	31	961	93
44	2	4	36	1296	72
45	4	16	30	900	120
46	4	16	30	900	120
47	2	4	36	1296	72
48	3	9	28	784	84
49	4	16	33	1089	132
50	2	4	34	1156	68
51	3	9	35	1225	105
52	1	1	25	625	25
53	3	9	37	1369	111
54	4	16	36	1296	144
55	3	9	38	1444	114
56	4	16	37	1369	148
57	4	16	35	1225	140
58	2	4	39	1521	78
59	4	16	34	1156	136
60	4	16	34	1156	136
61	2	4	34	1156	68
62	4	16	38	1444	152
63	4	16	31	961	124
64	5	25	37	1369	185
65	2	4	25	625	50
66	5	25	38	1444	190
67	2	4	38	1444	76
68	2	4	34	1156	68
69	2	4	33	1089	66
70	5	25	40	1600	200
Sum	189	597	2434	85990	6692

Rxy= 0.35052 Varians= 1.23857

J.2. Uniformity and Data Sufficiency Tests for "Gadjah Mada" Performance

Attribute 1: Easiness to open

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks		$(Xi)^2$				
1	5	4	4	4	4	4.2	Uniform	1	25	16	16	16	16
2	5	5	5	5	5	5	Uniform	1	25	25	25	25	25
3	3	3	4	4	4	3.6	Uniform	1	9	9	16	16	16
4	5	5	5	3	4	4.4	Uniform	1	25	25	25	9	16
5	5	4	5	5	4	4.6	Uniform	1	25	16	25	25	16
6	4	5	4	3	5	4.2	Uniform	1	16	25	16	9	25
7	3	5	3	4	3	3.6	Uniform	1	9	25	9	16	9
8	4	2	4	4	4	3.6	Uniform	1	16	4	16	16	16
9	4	4	4	5	4	4.2	Uniform	1	16	16	16	25	16
10	5	4	4	3	5	4.2	Uniform	1	25	16	16	9	25
11	4	4	5	5	4	4.4	Uniform	1	16	16	25	25	16
12	5	5	5	4	4	4.6	Uniform	1	25	25	25	16	16
13	5	4	5	5	5	4.8	Uniform	1	25	16	25	25	25
14	5	5	5	5	4	4.8	Uniform	1	25	25	25	25	16
Subgroup Average Total						60.2		14	Total $(Xi)^2$				1331
Total Xi						301							
Total Xi^2						90601							

Subgroup Average Value 4.300
Deviation Standard 0.729

Uniformity Test
Standard Average 0.326
Lower Control Limit 3.322
Upper Control Limit 5.278
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 11.342

Attribute 2: Easiness to close

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	5	4	4	3	5	4.2	Uniform	1
2	5	5	5	5	5	5	Uniform	1
3	3	4	2	4	4	3.4	Uniform	1
4	5	5	5	3	4	4.4	Uniform	1
5	5	4	4	5	4	4.4	Uniform	1
6	3	4	3	3	4	3.4	Uniform	1
7	3	4	5	4	4	4	Uniform	1
8	4	3	4	5	4	4	Uniform	1
9	3	4	5	4	4	4	Uniform	1
10	4	3	3	3	5	3.6	Uniform	1
11	4	4	5	4	5	4.4	Uniform	1
12	5	5	5	4	4	4.6	Uniform	1
13	3	3	4	5	4	3.8	Uniform	1
14	1	5	5	5	5	4.2	Uniform	1
Subgroup Average Total						57.4		14
Total Xi						287		
Total Xi^2						82369		

$(Xi)^2$				
25	16	16	9	25
25	25	25	25	25
9	16	4	16	16
25	25	25	9	16
25	16	16	25	16
9	16	9	9	16
9	16	25	16	16
16	9	16	25	16
9	16	25	16	16
16	9	9	9	25
16	16	25	16	25
25	25	25	16	16
9	9	16	25	16
1	25	25	25	25
Total $(Xi)^2$				1229

Subgroup Average Value 4.100
Deviation Standard 0.871

Uniformity Test
Standard Average 0.389
Lower Control Limit 2.932
Upper Control Limit 5.268
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 17.7785

Attribute 3: Finger comfort in opening and closing

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	5	4	4	4	5	4.4	Uniform	1
2	5	5	5	4	5	4.8	Uniform	1
3	4	3	4	3	4	3.6	Uniform	1
4	4	5	5	3	4	4.2	Uniform	1
5	5	4	4	4	4	4.2	Uniform	1
6	3	5	4	3	4	3.8	Uniform	1
7	4	4	4	3	3	3.6	Uniform	1
8	5	3	4	4	5	4.2	Uniform	1
9	4	3	5	4	3	3.8	Uniform	1
10	5	3	4	4	4	4	Uniform	1
11	4	3	5	5	4	4.2	Uniform	1
12	5	5	4	4	4	4.4	Uniform	1
13	5	4	5	4	3	4.2	Uniform	1
14	5	5	4	5	5	4.8	Uniform	1
Subgroup Average Total						58.2		14
Total Xi						291		
Total Xi^2						84681		

$(Xi)^2$				
25	16	16	16	25
25	25	25	16	25
16	9	16	9	16
16	25	25	9	16
25	16	16	16	16
9	25	16	9	16
16	16	16	9	9
25	9	16	16	25
16	9	25	16	9
25	9	16	16	16
16	9	25	25	16
25	25	16	16	16
25	16	25	16	9
25	25	16	25	25
Total $(Xi)^2$				1245

Subgroup Average Value 4.157
Deviation Standard 0.715

Uniformity Test
Standard Average 0.320
Lower Control Limit 3.198
Upper Control Limit 5.116
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 11.6626

Attribute 4: Hand movement comfort

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	5	3	4	3	4	3.8	Uniform	1
2	4	5	5	5	5	4.8	Uniform	1
3	4	3	4	3	3	3.4	Uniform	1
4	5	5	5	3	3	4.2	Uniform	1
5	5	4	3	5	4	4.2	Uniform	1
6	3	5	4	3	4	3.8	Uniform	1
7	3	4	3	3	4	3.4	Uniform	1
8	4	2	3	4	4	3.4	Uniform	1
9	4	3	4	4	3	3.6	Uniform	1
10	4	3	4	4	4	3.8	Uniform	1
11	3	3	5	5	5	4.2	Uniform	1
12	5	4	4	4	4	4.2	Uniform	1
13	5	3	5	5	3	4.2	Uniform	1
14	3	5	5	4	5	4.4	Uniform	1
Subgroup Average Total						55.4		14
Total Xi						277		
Total Xi^2						76729		

$(Xi)^2$				
25	9	16	9	16
16	25	25	25	25
16	9	16	9	9
25	25	25	9	9
25	16	9	25	16
9	25	16	9	16
9	16	9	9	16
16	4	9	16	16
16	9	16	16	9
16	9	16	16	16
9	9	25	25	25
25	16	16	16	16
25	9	25	25	9
9	25	25	16	25
Total $(Xi)^2$				1143

Subgroup Average Value 3.957
Deviation Standard 0.824

Uniformity Test
Standard Average 0.369
Lower Control Limit 2.851
Upper Control Limit 5.063
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 17.1044

Attribute 5: Form of cap

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	5	4	5	4	3	4.2	Uniform	1
2	3	5	4	4	5	4.2	Uniform	1
3	3	5	4	3	4	3.8	Uniform	1
4	4	3	5	4	4	4	Uniform	1
5	4	4	3	3	4	3.6	Uniform	1
6	4	5	4	4	5	4.4	Uniform	1
7	4	4	3	3	3	3.4	Uniform	1
8	4	3	5	3	4	3.8	Uniform	1
9	3	3	4	4	2	3.2	Uniform	1
10	4	4	2	2	3	3	Uniform	1
11	4	4	5	4	5	4.4	Uniform	1
12	3	5	4	4	4	4	Uniform	1
13	5	3	4	4	4	4	Uniform	1
14	5	3	4	4	4	4	Uniform	1
Subgroup Average Total						54		14
Total Xi						270		
Total Xi^2						72900		

$(Xi)^2$				
25	16	25	16	9
9	25	16	16	25
9	25	16	9	16
16	9	25	16	16
16	16	9	9	16
16	25	16	16	25
16	16	9	9	9
16	9	25	9	16
9	9	16	16	4
16	16	4	4	9
16	16	25	16	25
9	25	16	16	16
25	9	16	16	16
25	9	16	16	16
Total $(Xi)^2$				1084

Subgroup Average Value 3.857
Deviation Standard 0.785

Uniformity Test
Standard Average 0.351
Lower Control Limit 2.803
Upper Control Limit 4.911
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 16.3512

Attribute 6: Cap material

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	5	4	3	3	2	3.4	Uniform	1
2	4	5	4	4	5	4.4	Uniform	1
3	3	5	4	3	3	3.6	Uniform	1
4	3	5	5	4	4	4.2	Uniform	1
5	5	4	4	4	4	4.2	Uniform	1
6	4	5	5	3	5	4.4	Uniform	1
7	4	5	4	4	3	4	Uniform	1
8	4	4	3	4	3	3.6	Uniform	1
9	4	3	3	3	3	3.2	Uniform	1
10	4	3	3	2	4	3.2	Uniform	1
11	3	4	5	3	4	3.8	Uniform	1
12	4	4	5	4	4	4.2	Uniform	1
13	5	3	4	4	4	4	Uniform	1
14	3	4	3	4	4	3.6	Uniform	1
Subgroup Average Total						53.8		14
Total Xi						269		
Total Xi^2						72361		

$(Xi)^2$				
25	16	9	9	4
16	25	16	16	25
9	25	16	9	9
9	25	25	16	16
25	16	16	16	16
16	25	25	9	25
16	25	16	16	9
16	16	9	16	9
16	9	9	9	9
16	9	9	4	16
9	16	25	9	16
16	16	25	16	16
25	9	16	16	16
9	16	9	16	16
Total $(Xi)^2$				1075

Subgroup Average Value 3.843
Deviation Standard 0.773

Uniformity Test
Standard Average 0.346
Lower Control Limit 2.805
Upper Control Limit 4.880
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 15.9699

Attribute 7: Cap product manufacturing smoothness

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	5	4	4	3	4	4	Uniform	1
2	4	5	5	3	4	4.2	Uniform	1
3	3	5	4	4	4	4	Uniform	1
4	4	5	4	3	3	3.8	Uniform	1
5	5	4	5	4	4	4.4	Uniform	1
6	4	5	4	3	4	4	Uniform	1
7	4	5	3	4	3	3.8	Uniform	1
8	5	4	5	4	4	4.4	Uniform	1
9	4	4	4	4	2	3.6	Uniform	1
10	5	4	4	3	4	4	Uniform	1
11	2	4	5	4	5	4	Uniform	1
12	4	5	5	4	4	4.4	Uniform	1
13	5	3	4	4	4	4	Uniform	1
14	5	2	4	4	4	3.8	Uniform	1
Subgroup Average Total						56.4		14
Total Xi						282		
Total Xi^2						79524		

$(Xi)^2$				
25	16	16	9	16
16	25	25	9	16
9	25	16	16	16
16	25	16	9	9
25	16	25	16	16
16	25	16	9	16
16	25	9	16	9
25	16	25	16	16
16	16	16	16	4
25	16	16	9	16
4	16	25	16	25
16	25	25	16	16
25	9	16	16	16
25	4	16	16	16
Total $(Xi)^2$				1176

Subgroup Average Value 4.029
Deviation Standard 0.761

Uniformity Test
Standard Average 0.340
Lower Control Limit 3.008
Upper Control Limit 5.049
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 14.0637

Attribute 8: Emboss of logo or product name

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	5	1	3	4	4	3.4	Uniform	1
2	4	5	5	4	3	4.2	Uniform	1
3	3	5	4	2	4	3.6	Uniform	1
4	5	5	4	3	4	4.2	Uniform	1
5	5	4	4	4	4	4.2	Uniform	1
6	4	4	2	3	3	3.2	Uniform	1
7	4	4	5	4	4	4.2	Uniform	1
8	5	3	4	4	4	4	Uniform	1
9	4	4	3	4	2	3.4	Uniform	1
10	3	2	4	3	4	3.2	Uniform	1
11	3	5	5	4	4	4.2	Uniform	1
12	3	5	5	4	4	4.2	Uniform	1
13	5	4	3	4	4	4	Uniform	1
14	5	3	4	2	4	3.6	Uniform	1
Subgroup Average Total						53.6		14
Total Xi						268		
Total Xi^2						71824		

$(Xi)^2$				
25	1	9	16	16
16	25	25	16	9
9	25	16	4	16
25	25	16	9	16
25	16	16	16	16
16	16	4	9	9
16	16	25	16	16
25	9	16	16	16
16	16	9	16	4
9	4	16	9	16
9	25	25	16	16
9	25	25	16	16
25	16	9	16	16
25	9	16	4	16
Total $(Xi)^2$				1082

Subgroup Average Value 3.829
Deviation Standard 0.900

Uniformity Test
Standard Average 0.403
Lower Control Limit 2.621
Upper Control Limit 5.037
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 21.8089

Attribute 9: Cap grip strength towards the package

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	4	3	3	3	4	3.4	Uniform	1
2	2	4	3	2	2	2.6	Uniform	1
3	2	4	2	4	4	3.2	Uniform	1
4	4	3	3	4	4	3.6	Uniform	1
5	2	3	1	2	2	2	Uniform	1
6	1	1	1	3	4	2	Uniform	1
7	3	4	1	4	4	3.2	Uniform	1
8	2	1	2	2	5	2.4	Uniform	1
9	3	4	2	3	2	2.8	Uniform	1
10	3	1	2	1	5	2.4	Uniform	1
11	3	3	3	3	2	2.8	Uniform	1
12	2	1	2	4	2	2.2	Uniform	1
13	3	2	2	3	2	2.4	Uniform	1
14	1	1	3	4	5	2.8	Uniform	1
Subgroup Average Total						37.8		14
Total Xi						189		
Total Xi^2						35721		

$(Xi)^2$				
16	9	9	9	16
4	16	9	4	4
4	16	4	16	16
16	9	9	16	16
4	9	1	4	4
1	1	1	9	16
9	16	1	16	16
4	1	4	4	25
9	16	4	9	4
9	1	4	1	25
9	9	9	9	4
4	1	4	16	4
9	4	4	9	4
1	1	9	16	25
Total $(Xi)^2$				597

Subgroup Average Value 2.700
Deviation Standard 1.121

Uniformity Test
Standard Average 0.501
Lower Control Limit 1.196
Upper Control Limit 4.204
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 67.96

J.4. Reliability Test for "Gadjah Mada" Performance

Attributes	Varians
Easy to open	0.524
Easy to close	0.747
Finger's comfort in opening and closing	0.504
Hand moving comfort	0.670
Form of cap	0.608
Cap material	0.590
Cap product manufacturing smoothness	0.571
Emboss of logo or product name	0.799
Cap grip strength towards the package	1.239
sum	6.251

Total Varians

No	Yi	Yi^2
1	44	1936
2	36	1296
3	28	784
4	39	1521
5	41	1681
6	30	900
7	32	1024
8	37	1369
9	33	1089
10	37	1369
11	30	900
12	36	1296
13	41	1681
14	33	1089
15	31	961
16	44	1936
17	37	1369
18	41	1681
19	35	1225
20	39	1521
21	39	1521
22	25	625
23	32	1024
24	27	729
25	34	1156
26	39	1521
27	29	841
28	33	1089

29	34	1156
30	41	1681
31	32	1024
32	41	1681
33	33	1089
34	31	961
35	31	961
36	34	1156
37	34	1156
38	30	900
39	43	1849
40	39	1521
41	36	1296
42	37	1369
43	31	961
44	36	1296
45	30	900
46	30	900
47	36	1296
48	28	784
49	33	1089
50	34	1156
51	35	1225
52	25	625
53	37	1369
54	36	1296
55	38	1444
56	37	1369
57	35	1225
58	39	1521
59	34	1156
60	34	1156
61	34	1156
62	38	1444
63	31	961
64	37	1369
65	25	625
66	38	1444
67	38	1444
68	34	1156
69	33	1089
70	40	1600
sum	2434	85990

Varians= 19.376

Calculate Alpha

Alpha Cronbach	r table	Remarks
0.762	0.232	Reliable

Appendix K: Second Questionnaire: Attribute Suggestion Tests

K.1. Validity Tests for Attributes Suggestion

Attribute 1: Additional features (thread, pop-off, etc.) which support the function of the cap.

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	5	25	9	81	45
2	4	16	10	100	40
3	4	16	10	100	40
4	4	16	12	144	48
5	4	16	14	196	56
6	2	4	10	100	20
7	4	16	8	64	32
8	3	9	11	121	33
9	3	9	8	64	24
10	5	25	11	121	55
11	2	4	8	64	16
12	3	9	9	81	27
13	4	16	12	144	48
14	4	16	11	121	44
15	4	16	11	121	44
16	5	25	11	121	55
17	5	25	14	196	70
18	1	1	7	49	7
19	2	4	5	25	10
20	1	1	7	49	7
21	4	16	12	144	48
22	3	9	11	121	33
23	4	16	11	121	44
24	4	16	11	121	44
25	3	9	9	81	27
26	4	16	10	100	40
27	4	16	10	100	40
28	5	25	11	121	55
29	3	9	6	36	18
30	3	9	9	81	27
31	4	16	10	100	40
32	2	4	8	64	16
33	4	16	12	144	48
34	2	4	10	100	20
35	4	16	13	169	52
36	3	9	8	64	24

37	4	16	12	144	48
38	4	16	10	100	40
39	5	25	13	169	65
40	3	9	10	100	30
41	4	16	12	144	48
42	4	16	12	144	48
43	5	25	14	196	70
44	2	4	6	36	12
45	5	25	15	225	75
46	3	9	9	81	27
47	2	4	7	49	14
48	4	16	11	121	44
49	3	9	10	100	30
50	4	16	10	100	40
51	2	4	6	36	12
52	2	4	6	36	12
53	4	16	11	121	44
54	5	25	14	196	70
55	2	4	9	81	18
56	4	16	11	121	44
57	3	9	10	100	30
58	2	4	8	64	16
59	4	16	9	81	36
60	3	9	7	49	21
61	3	9	9	81	27
62	2	4	8	64	16
63	3	9	9	81	27
64	4	16	12	144	48
65	4	16	12	144	48
66	2	4	6	36	12
67	4	16	11	121	44
68	4	16	13	169	52
69	5	25	12	144	60
70	3	9	8	64	24
Sum	242	912	701	7371	2549

Rxy= 0.77187 Varians= 1.07673

Attribute 2: Additional handle to open

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	9	81	18
2	4	16	10	100	40
3	2	4	10	100	20
4	4	16	12	144	48

5	5	25	14	196	70
6	4	16	10	100	40
7	2	4	8	64	16
8	4	16	11	121	44
9	2	4	8	64	16
10	4	16	11	121	44
11	2	4	8	64	16
12	3	9	9	81	27
13	4	16	12	144	48
14	2	4	11	121	22
15	2	4	11	121	22
16	1	1	11	121	11
17	4	16	14	196	56
18	1	1	7	49	7
19	1	1	5	25	5
20	1	1	7	49	7
21	4	16	12	144	48
22	5	25	11	121	55
23	4	16	11	121	44
24	4	16	11	121	44
25	4	16	9	81	36
26	4	16	10	100	40
27	4	16	10	100	40
28	4	16	11	121	44
29	2	4	6	36	12
30	3	9	9	81	27
31	3	9	10	100	30
32	2	4	8	64	16
33	4	16	12	144	48
34	4	16	10	100	40
35	4	16	13	169	52
36	2	4	8	64	16
37	4	16	12	144	48
38	2	4	10	100	20
39	4	16	13	169	52
40	3	9	10	100	30
41	4	16	12	144	48
42	4	16	12	144	48
43	5	25	14	196	70
44	2	4	6	36	12
45	5	25	15	225	75
46	3	9	9	81	27
47	2	4	7	49	14
48	3	9	11	121	33
49	4	16	10	100	40

50	3	9	10	100	30
51	2	4	6	36	12
52	2	4	6	36	12
53	4	16	11	121	44
54	5	25	14	196	70
55	3	9	9	81	27
56	4	16	11	121	44
57	4	16	10	100	40
58	3	9	8	64	24
59	2	4	9	81	18
60	2	4	7	49	14
61	4	16	9	81	36
62	2	4	8	64	16
63	2	4	9	81	18
64	4	16	12	144	48
65	4	16	12	144	48
66	2	4	6	36	12
67	4	16	11	121	44
68	4	16	13	169	52
69	4	16	12	144	48
70	3	9	8	64	24
Sum	223	795	701	7371	2367

Rxy= 0.77662 Varians= 1.20837

Attribute 3: Additional features which function is to avoid the loss of the cap.

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	9	81	18
2	2	4	10	100	20
3	4	16	10	100	40
4	4	16	12	144	48
5	5	25	14	196	70
6	4	16	10	100	40
7	2	4	8	64	16
8	4	16	11	121	44
9	3	9	8	64	24
10	2	4	11	121	22
11	4	16	8	64	32
12	3	9	9	81	27
13	4	16	12	144	48
14	5	25	11	121	55
15	5	25	11	121	55

16	5	25	11	121	55
17	5	25	14	196	70
18	5	25	7	49	35
19	2	4	5	25	10
20	5	25	7	49	35
21	4	16	12	144	48
22	3	9	11	121	33
23	3	9	11	121	33
24	3	9	11	121	33
25	2	4	9	81	18
26	2	4	10	100	20
27	2	4	10	100	20
28	2	4	11	121	22
29	1	1	6	36	6
30	3	9	9	81	27
31	3	9	10	100	30
32	4	16	8	64	32
33	4	16	12	144	48
34	4	16	10	100	40
35	5	25	13	169	65
36	3	9	8	64	24
37	4	16	12	144	48
38	4	16	10	100	40
39	4	16	13	169	52
40	4	16	10	100	40
41	4	16	12	144	48
42	4	16	12	144	48
43	4	16	14	196	56
44	2	4	6	36	12
45	5	25	15	225	75
46	3	9	9	81	27
47	3	9	7	49	21
48	4	16	11	121	44
49	3	9	10	100	30
50	3	9	10	100	30
51	2	4	6	36	12
52	2	4	6	36	12
53	3	9	11	121	33
54	4	16	14	196	56
55	4	16	9	81	36
56	3	9	11	121	33
57	3	9	10	100	30
58	3	9	8	64	24
59	3	9	9	81	27
60	2	4	7	49	14

61	2	4	9	81	18
62	4	16	8	64	32
63	4	16	9	81	36
64	4	16	12	144	48
65	4	16	12	144	48
66	2	4	6	36	12
67	3	9	11	121	33
68	5	25	13	169	65
69	3	9	12	144	36
70	2	4	8	64	16
Sum	236	870	701	7371	2455

Rxy= 0.56724 Varians= 1.06204

K.2. Uniformity and Data Sufficiency Tests for Attributes Suggestion

Attribute 1: Additional features (thread, pop-off, etc.) which support the function of the cap.

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	5	4	3	5	3	4	Uniform	1
2	4	5	3	2	2	3.2	Uniform	1
3	4	5	4	5	4	4.4	Uniform	1
4	4	1	2	3	3	2.6	Uniform	1
5	4	2	4	2	3	3	Uniform	1
6	2	1	2	4	2	2.2	Uniform	1
7	4	4	4	3	3	3.6	Uniform	1
8	3	3	3	4	4	3.4	Uniform	1
9	3	4	4	2	4	3.4	Uniform	1
10	5	4	4	2	2	3.4	Uniform	1
11	2	3	5	4	4	3.6	Uniform	1
12	3	4	3	5	4	3.8	Uniform	1
13	4	4	4	2	5	3.8	Uniform	1
14	4	5	4	4	3	4	Uniform	1
Subgroup Average Total						48.4		14
Total Xi						242		
Total Xi^2						58564		

$(Xi)^2$				
25	16	9	25	9
16	25	9	4	4
16	25	16	25	16
16	1	4	9	9
16	4	16	4	9
4	1	4	16	4
16	16	16	9	9
9	9	9	16	16
9	16	16	4	16
25	16	16	4	4
4	9	25	16	16
9	16	9	25	16
16	16	16	4	25
16	25	16	16	9
Total $(Xi)^2$				912

Subgroup Average Value 3.457
Deviation Standard 1.045

Uniformity Test
Standard Average 0.467
Lower Control Limit 2.055
Upper Control Limit 4.859
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 36.0358

Attribute 2: Additional handle to open

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	2	2	5	4	3	Uniform	1
2	4	1	3	2	3	2.6	Uniform	1
3	2	4	3	5	2	3.2	Uniform	1
4	4	1	2	3	2	2.4	Uniform	1
5	5	1	4	2	4	3.2	Uniform	1
6	4	1	4	3	2	2.8	Uniform	1
7	2	4	4	4	2	3.2	Uniform	1
8	4	5	2	3	4	3.6	Uniform	1
9	2	4	4	2	4	3.2	Uniform	1
10	4	4	2	2	2	2.8	Uniform	1
11	2	4	4	4	4	3.6	Uniform	1
12	3	4	3	5	4	3.8	Uniform	1
13	4	4	4	3	4	3.8	Uniform	1
14	2	4	4	4	3	3.4	Uniform	1
Subgroup Average Total						44.6		14
Total Xi						223		
Total Xi^2						49729		

$(Xi)^2$				
4	1	4	25	16
16	1	9	4	9
4	16	9	25	4
16	1	4	9	4
25	1	16	4	16
16	1	16	9	4
4	16	16	16	4
16	25	4	9	16
4	16	16	4	16
16	16	4	4	4
4	16	16	16	16
9	16	9	25	16
16	16	16	9	16
4	16	16	16	9
Total $(Xi)^2$				795

Subgroup Average Value 3.186
Deviation Standard 1.107

Uniformity Test
Standard Average 0.495
Lower Control Limit 1.700
Upper Control Limit 4.671
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 47.5261

Attribute 3: Additional features which function is to avoid the loss of the cap

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	5	1	4	3	3	Uniform	1
2	2	5	3	2	3	3	Uniform	1
3	4	5	3	5	3	4	Uniform	1
4	4	5	4	3	2	3.6	Uniform	1
5	5	2	4	3	2	3.2	Uniform	1
6	4	5	4	4	4	4.2	Uniform	1
7	2	4	5	3	4	3.6	Uniform	1
8	4	3	3	3	4	3.4	Uniform	1
9	3	3	4	2	4	3.2	Uniform	1
10	2	3	4	2	2	2.6	Uniform	1
11	4	2	4	3	3	3.2	Uniform	1
12	3	2	4	4	5	3.6	Uniform	1
13	4	2	4	4	3	3.4	Uniform	1
14	5	2	4	3	2	3.2	Uniform	1
Subgroup Average Total						47.2		14
Total Xi						236		
Total Xi^2						55696		

$(Xi)^2$				
4	25	1	16	9
4	25	9	4	9
16	25	9	25	9
16	25	16	9	4
25	4	16	9	4
16	25	16	16	16
4	16	25	9	16
16	9	9	9	16
9	9	16	4	16
4	9	16	4	4
16	4	16	9	9
9	4	16	16	25
16	4	16	16	9
25	4	16	9	4
Total $(Xi)^2$				870

Subgroup Average Value 3.371
Deviation Standard 1.038

Uniformity Test
Standard Average 0.464
Lower Control Limit 1.979
Upper Control Limit 4.764
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 37.3743

K.3. Reliability Tests for Attribute Suggestion

Attribute	Varians
Additional features (thread, pop-off, etc.) which support the function of the cap.	1.077
Additional handle to open	1.208
Additional features which function is to avoid the loss of the cap	1.062
sum	3.347

Total Varians

No	Yi	Yi^2
1	9	81
2	10	100
3	10	100
4	12	144
5	14	196
6	10	100
7	8	64
8	11	121
9	8	64
10	11	121
11	8	64
12	9	81
13	12	144
14	11	121
15	11	121
16	11	121
17	14	196
18	7	49
19	5	25
20	7	49
21	12	144
22	11	121
23	11	121
24	11	121
25	9	81
26	10	100
27	10	100
28	11	121
29	6	36
30	9	81
31	10	100
32	8	64
33	12	144

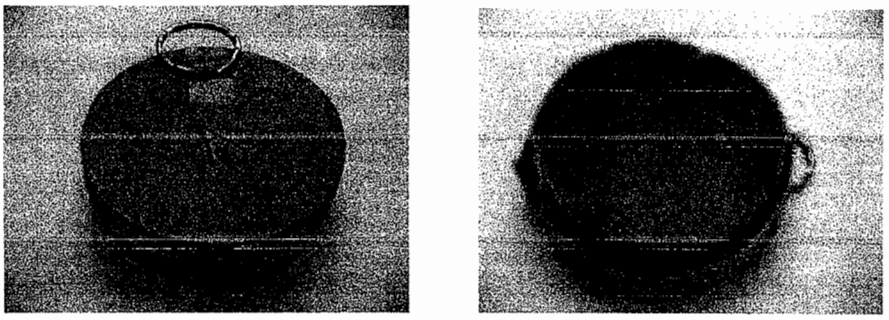
34	10	100
35	13	169
36	8	64
37	12	144
38	10	100
39	13	169
40	10	100
41	12	144
42	12	144
43	14	196
44	6	36
45	15	225
46	9	81
47	7	49
48	11	121
49	10	100
50	10	100
51	6	36
52	6	36
53	11	121
54	14	196
55	9	81
56	11	121
57	10	100
58	8	64
59	9	81
60	7	49
61	9	81
62	8	64
63	9	81
64	12	144
65	12	144
66	6	36
67	11	121
68	13	169
69	12	144
70	8	64
sum	701	7371

Varians= 5.014

Calculate Alpha

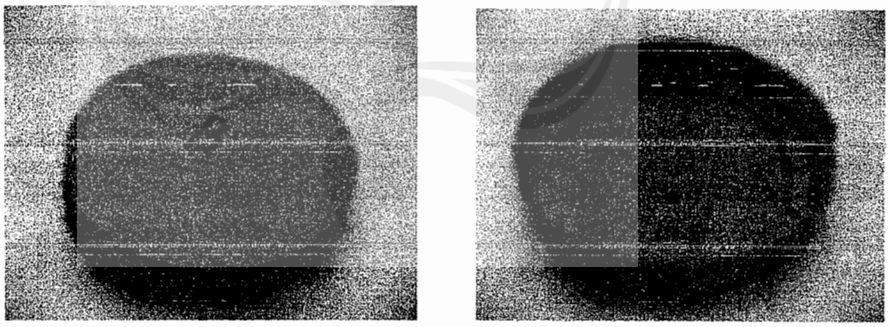
Alpha Cronbach	r table	Remarks
0.499	0.232	Reliable

Appendix L: Third Questionnaire Pictures

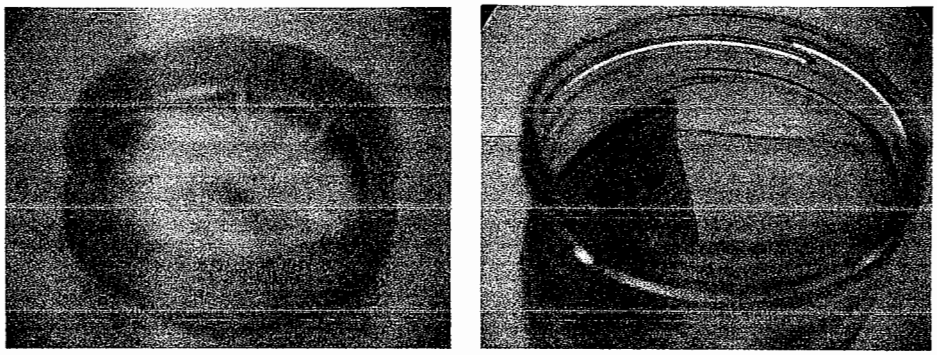


Prototype A

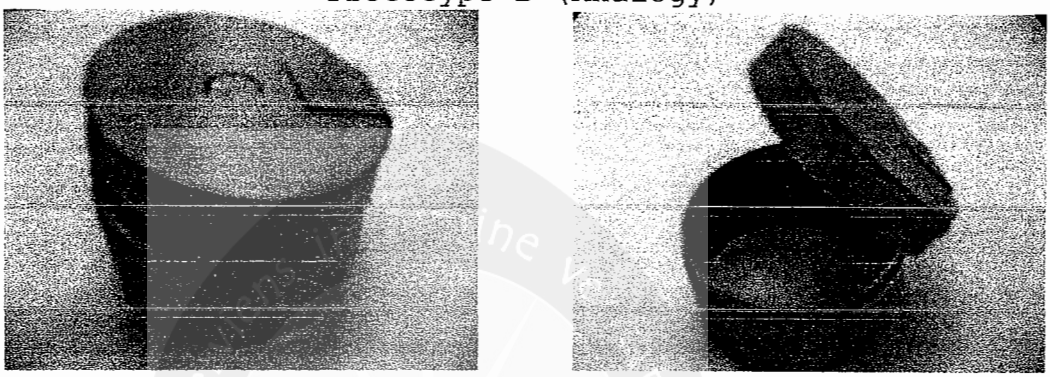
Prototype A (Analogy)



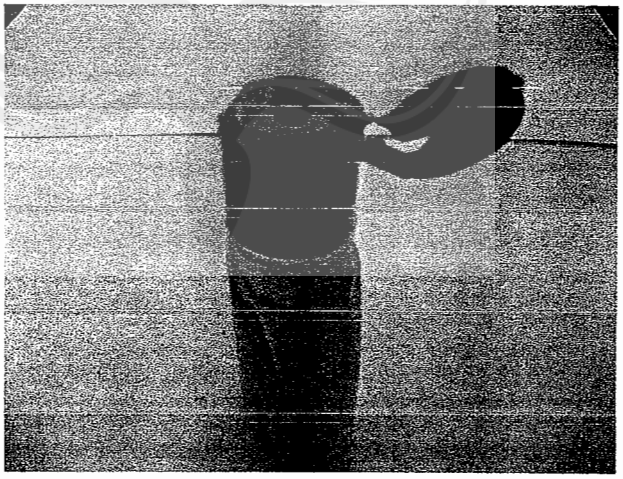
Prototype B



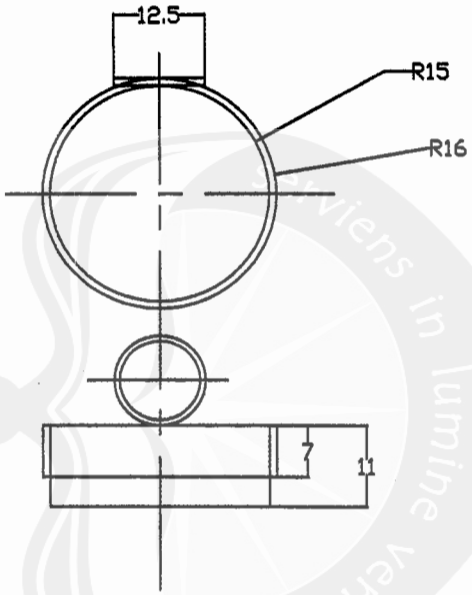
Prototype B (Analogy)



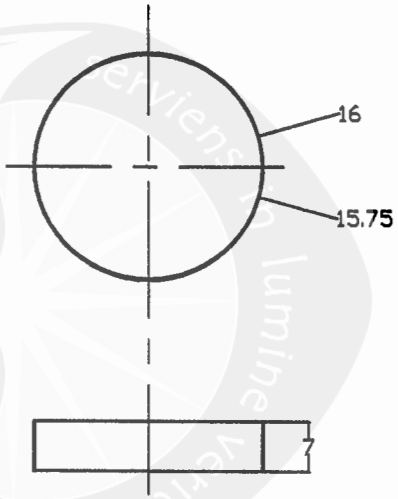
Prototype C



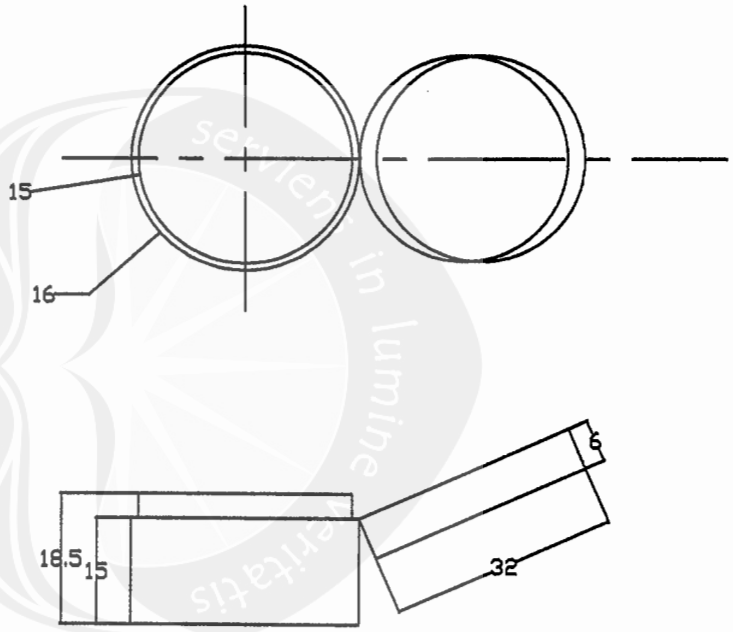
Prototype C (Analogy)



Revision Index	Drawn by: Jimmy	Scale: 1:1	
	Reg. Nr.:	Unit: mm	
	Date: May 2007	Material:	
	Checked by:	Sign.:	
	F4	PROTOTYPE A	
INDUSTRIAL ENGINEERING UAJY		Operation:	Dwg. Nr.
Origin.	Rep.	Rep. by.	SN. NS.



Revision Index	Drawn by: Jimmy	Scale: 1:1	
	Reg. Nr.:	Unit: mm	
	Date: May 2007	Material:	
	Checked by:	Sign.:	
	F4	PROTOTYPE B	
INDUSTRIAL ENGINEERING UAJY		Operation:	Dwg. Nr.
Origin.	Rep.	Rep. by.	SN. NS.



Revision Index	Drawn by: Jimmy	Scale: 1:1	
	Reg. Nr.:	Unit: mm	
	Date: May 2007	Material:	
	Checked by:	Sign.:	
	F4	PROTOTYPE C	
INDUSTRIAL ENGINEERING UAJY		Operation:	Dwg. Nr.
Origin.	Rep.	Rep. by.	SN. NS.

Appendix M: Third Questionnaire Result

M.1. Third Questionnaire Format

Kuesioner Tugas Akhir

Dengan tujuan untuk menyelesaikan perkuliahan penulis di Program Studi Teknik Industri kelas Internasional, Fakultas Teknologi Industri, Universitas Atma Jaya Yogyakarta, penulis bermaksud melakukan penelitian untuk Tugas Akhir dengam judul "REDESIGN OF "KUMALA" SHUTTLECOCK PACKAGING CAP USING RATIONAL DESIGN METHOD". Saya:

Nama : Jimmy Kurniawan

NIM : 03690

Meminta bantuan anda untuk menjawab beberapa pertanyaan. Semua pertanyaan hanya akan digunakan dalam penelitian ini, dan kerahasiaan jawaban akan dijamin. Sebelum dan sesudah mengisi kuesioner ini, penulis mengucapkan banyak terima kasih atas perhatiannya.

Pengisian kuesioner ini ditujukan untuk mengetahui tingkat performansi dari beberapa alternatif bentuk prototype desain tutup, untuk kemudian dianalisis bentuk tutup mana yang relative paling baik untuk dijadikan desain akhir tutup shuttlecock "Kumala".

Instruksi: Berilah tanda centang (√) pada kolom yang menunjukkan skala prioritas atribut yang berarti:

1	: Sangat jelek	4	: Baik
2	: Jelek	5	: Sangat Baik
3	: Netral		

Atribut yang sudah ada	Performa prototype A					Performa prototype B					Performa prototype C				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Kemudahan membuka tutup															
Kemudahan menutup															
Kenyamanan jari dalam membuka															
Kenyamanan gerakan tangan															
Kekencangan tutup terhadap tabung															

Keterangan:

1 : Sangat jelek
2 : Jelek
3 : Netral
4 : Baik
5 : Sangat Baik

M.2. Third Questionnaires Prototype A Performance Result

	1	2	3	4	5	Sum
1	4	4	3	3	4	18
2	4	5	2	4	5	20
3	2	4	2	2	5	15
4	1	5	4	4	4	18
5	3	4	4	4	5	20
6	2	4	4	3	5	18
7	2	4	2	2	4	14
8	4	4	3	3	4	18
9	1	5	2	2	5	15
10	2	4	2	2	5	15
11	3	4	4	5	3	19
12	4	4	2	3	3	16
13	5	5	4	4	4	22
14	2	2	2	2	4	12
15	4	4	4	3	5	20
16	3	4	3	4	4	18
17	4	4	4	3	3	18
18	4	4	4	3	5	20
19	4	4	3	3	4	18
20	4	2	2	2	5	15
21	4	2	2	4	5	17
22	4	2	4	4	3	17
23	4	4	1	1	4	14
24	4	5	2	2	4	17
25	4	3	4	2	4	17
26	4	4	3	4	5	20
27	4	3	4	5	5	21
28	4	3	3	4	5	19
29	4	3	4	3	4	18
30	5	4	3	2	5	19
31	4	3	4	4	4	19
32	4	2	2	2	4	14
33	2	2	3	2	3	12
34	4	3	4	3	3	17
35	4	2	2	3	4	15
36	4	4	3	3	5	19
37	3	3	4	4	3	17
38	4	4	3	4	5	20
39	3	3	2	2	5	15
40	2	2	3	3	3	13
41	4	4	5	5	5	23
42	4	4	4	3	3	18
43	5	5	3	3	4	20
44	5	5	2	2	2	16

45	4	4	3	4	3	18
46	2	2	4	4	4	16
47	3	3	4	4	3	17
48	5	5	3	3	3	19
49	2	2	2	2	3	11
50	3	3	4	4	5	19

**Shaded Area means invalid data (did not pass the Validity Test)*

M.3. Third Questionnaire Prototype B Performance Result

	1	**2**	**3**	**4**	**5**	**Sum**
1	2	2	3	3	5	15
2	2	2	4	1	3	12
3	1	1	1	1	5	9
4	2	1	2	2	4	11
5	3	3	4	4	5	19
6	3	4	4	3	5	19
7	2	2	3	3	5	15
8	2	3	3	4	4	16
9	1	1	1	2	5	10
10	1	1	2	1	5	10
11	4	2	4	5	3	18
12	2	2	2	3	5	14
13	4	4	4	3	5	20
14	2	2	2	2	4	12
15	2	2	2	3	5	14
16	2	2	3	3	5	15
17	3	3	4	3	4	17
18	3	3	3	3	5	17
19	3	3	3	3	5	17
20	2	2	4	2	5	15
21	3	3	4	3	4	17
22	4	3	4	3	5	19
23	2	2	2	4	5	15
24	2	2	2	4	5	15
25	4	3	4	4	2	17
26	3	3	5	3	3	17
27	3	3	3	2	5	16
28	3	3	2	2	5	15
29	2	2	3	3	5	15
30	2	2	3	4	5	16
31	3	2	4	4	5	18
32	3	3	3	3	4	16
33	2	2	3	2	3	12
34	4	4	3	3	2	16
35	5	4	4	3	4	20

36	3	3	3	3	4	16
37	2	2	3	3	3	13
38	3	3	2	2	4	14
39	2	2	3	3	4	14
40	4	4	3	3	4	18
41	3	3	2	2	3	13
42	2	2	3	3	4	14
43	4	4	3	3	4	18
44	4	4	4	3	3	18
45	2	2	2	4	3	13
46	3	4	4	3	2	16
47	4	4	4	5	3	20
48	4	4	2	3	3	16
49	3	3	3	3	3	15
50	2	2	3	3	3	13

**Shaded Area means invalid data (did not pass the Validity Test)*

M.4. Third Questionnaire Prototype C Result

	1	2	3	4	5	Sum
1	4	4	3	4	3	18
2	1	3	4	4	5	17
3	5	5	5	5	2	22
4	4	4	4	4	1	17
5	3	4	3	3	5	18
6	4	3	4	4	4	19
7	5	5	5	4	2	21
8	5	4	5	4	4	22
9	5	5	5	5	2	22
10	4	4	3	4	2	17
11	3	4	4	4	5	20
12	5	4	4	3	3	19
13	3	3	3	4	3	16
14	4	4	4	4	3	19
15	4	5	3	3	3	18
16	5	4	3	3	4	19
17	4	4	3	4	2	17
18	5	5	5	5	3	23
19	4	3	3	3	4	17
20	4	4	4	4	3	19
21	4	4	3	4	4	19
22	4	5	5	4	4	22
23	4	5	4	5	1	19
24	5	5	5	5	1	21
25	4	3	3	2	4	16
26	5	4	4	5	4	22

27	4	4	3	3	4	18
28	5	5	4	3	3	20
29	5	5	4	4	3	21
30	4	5	3	4	5	21
31	5	5	4	4	4	22
32	4	4	4	4	4	20
33	2	2	3	2	3	12
34	2	2	4	4	3	15
35	4	4	4	4	4	20
36	4	4	2	4	3	17
37	3	3	2	2	3	13
38	4	3	3	3	4	17
39	4	5	4	4	3	20
40	5	5	3	3	4	20
41	4	4	2	3	5	18
42	4	3	3	4	5	19
43	4	4	4	4	4	20
44	5	5	5	4	2	21
45	5	5	4	4	2	20
46	2	2	3	3	4	14
47	5	5	4	4	2	20
48	4	4	4	2	4	18
49	4	4	4	4	3	19
50	4	5	5	5	4	23

**Shaded Area means invalid data (did not pass the Validity Test)*

M.5. Prototype A Performance Weighting Details

Attribute 1: Easiness to open

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	5	25
Good	4	27	108
Normal	3	7	21
Bad	2	9	18
Very Bad	1	2	2
Sum		50	174
Average Weight			3.48

Attribute 2: Easiness to close

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	8	40
Good	4	22	88
Normal	3	10	30
Bad	2	10	20
Very Bad	1	0	0
Sum		50	178
Average Weight			3.56

Attribute 3: Finger comfort in opening and closing

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	1	5
Good	4	19	76
Normal	3	14	42
Bad	2	15	30
Very Bad	1	1	1
Sum		50	154
Average Weight			3.08

Attribute 4: Hand movement comfort

Attributes		No. of Respondents	Weight
Importance scale	Score		
Very Good	5	3	15
Good	4	16	64
Normal	3	16	48
Bad	2	14	28
Very Bad	1	1	1
Sum		50	156
Average Weight			3.12

M.6. Prototype B Performance Weighting Details

Attribute 1: Easiness to open

Attributes		No. of Respondents	Weight
Importance scale	Score		
Very Good	5	1	5
Good	4	10	40
Normal	3	16	48
Bad	2	20	40
Very Bad	1	3	3
Sum		50	136
Average Weight			2.72

Attribute 2: Easiness to close

Attributes		No. of Respondents	Weight
Importance scale	Score		
Very Good	5	0	0
Good	4	10	40
Normal	3	16	48
Bad	2	20	40
Very Bad	1	4	4
Sum		50	132
Average Weight			2.64

Attribute 3: Finger comfort in opening and closing

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	1	5
Good	4	15	60
Normal	3	20	60
Bad	2	12	24
Very Bad	1	2	2
Sum		50	151
Average Weight			3.02

Attribute 4: Hand movement comfort

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	2	10
Good	4	8	32
Normal	3	28	84
Bad	2	9	18
Very Bad	1	3	3
Sum		50	147
Average Weight			2.94

M.7. Prototype C Performance Weighting Details

Attribute 1: Easiness to open

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	16	80
Good	4	26	104
Normal	3	4	12
Bad	2	3	6
Very Bad	1	1	1
Sum		50	203
Average Weight			4.06

Attribute 2: Easiness to close

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	18	90
Good	4	21	84
Normal	3	8	24
Bad	2	3	6
Very Bad	1	0	0
Sum		50	204
Average Weight			4.08

Attribute 3: Finger comfort in opening and closing

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	9	45
Good	4	21	84
Normal	3	17	51
Bad	2	3	6
Very Bad	1	0	0
Sum		50	186
Average Weight			3.72

Attribute 4: Hand movement comfort

Attributes		No. of Respondents	Weight
Importance scale	**Score**		
Very Good	5	7	35
Good	4	28	112
Normal	3	11	33
Bad	2	4	8
Very Bad	1	0	0
Sum		50	188
Average Weight			3.76

Appendix N: Third Questionnaire Prototype A Performance Tests

N.1. Validity Tests for Prototype A Performance

Attribute 1: Easiness to open

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	14	196	56
2	4	16	15	225	60
3	2	4	10	100	20
4	1	1	14	196	14
5	3	9	15	225	45
6	2	4	13	169	26
7	2	4	10	100	20
8	4	16	14	196	56
9	1	1	10	100	10
10	2	4	10	100	20
11	3	9	16	256	48
12	4	16	13	169	52
13	5	25	18	324	90
14	2	4	8	64	16
15	4	16	15	225	60
16	3	9	14	196	42
17	4	16	15	225	60
18	4	16	15	225	60
19	4	16	14	196	56
20	4	16	10	100	40
21	4	16	12	144	48
22	4	16	14	196	56
23	4	16	10	100	40
24	4	16	13	169	52
25	4	16	13	169	52
26	4	16	15	225	60
27	4	16	16	256	64
28	4	16	14	196	56
29	4	16	14	196	56
30	5	25	14	196	70
31	4	16	15	225	60
32	4	16	10	100	40
33	2	4	9	81	18
34	4	16	14	196	56
35	4	16	11	121	44
36	4	16	14	196	56
37	3	9	14	196	42

38	4	16	15	225	60
39	3	9	10	100	30
40	2	4	10	100	20
41	4	16	18	324	72
42	4	16	15	225	60
43	5	25	16	256	80
44	5	25	14	196	70
45	4	16	15	225	60
46	2	4	12	144	24
47	3	9	14	196	42
48	5	25	16	256	80
49	2	4	8	64	16
50	3	9	14	196	42
Sum	174	658	662	9056	2377

Rxy= 0.59254 Variance= 1.0496

Attribute 2: Easiness to close

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	14	196	56
2	5	25	15	225	75
3	4	16	10	100	40
4	5	25	14	196	70
5	4	16	15	225	60
6	4	16	13	169	52
7	4	16	10	100	40
8	4	16	14	196	56
9	5	25	10	100	50
10	4	16	10	100	40
11	4	16	16	256	64
12	4	16	13	169	52
13	5	25	18	324	90
14	2	4	8	64	16
15	4	16	15	225	60
16	4	16	14	196	56
17	4	16	15	225	60
18	4	16	15	225	60
19	4	16	14	196	56
20	2	4	10	100	20
21	2	4	12	144	24
22	2	4	14	196	28
23	4	16	10	100	40
24	5	25	13	169	65

25	3	9	13	169	39
26	4	16	15	225	60
27	3	9	16	256	48
28	3	9	14	196	42
29	3	9	14	196	42
30	4	16	14	196	56
31	3	9	15	225	45
32	2	4	10	100	20
33	2	4	9	81	18
34	3	9	14	196	42
35	2	4	11	121	22
36	4	16	14	196	56
37	3	9	14	196	42
38	4	16	15	225	60
39	3	9	10	100	30
40	2	4	10	100	20
41	4	16	18	324	72
42	4	16	15	225	60
43	5	25	16	256	80
44	5	25	14	196	70
45	4	16	15	225	60
46	2	4	12	144	24
47	3	9	14	196	42
48	5	25	16	256	80
49	2	4	8	64	16
50	3	9	14	196	42
Sum	178	682	662	9056	2418

Rxy= 0.51668 Variance= 0.9664

Attribute 3: Finger comfort in opening and closing

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	14	196	42
2	2	4	15	225	30
3	2	4	10	100	20
4	4	16	14	196	56
5	4	16	15	225	60
6	4	16	13	169	52
7	2	4	10	100	20
8	3	9	14	196	42
9	2	4	10	100	20
10	2	4	10	100	20
11	4	16	16	256	64

12	2	4	13	169	26
13	4	16	18	324	72
14	2	4	8	64	16
15	4	16	15	225	60
16	3	9	14	196	42
17	4	16	15	225	60
18	4	16	15	225	60
19	3	9	14	196	42
20	2	4	10	100	20
21	2	4	12	144	24
22	4	16	14	196	56
23	1	1	10	100	10
24	2	4	13	169	26
25	4	16	13	169	52
26	3	9	15	225	45
27	4	16	16	256	64
28	3	9	14	196	42
29	4	16	14	196	56
30	3	9	14	196	42
31	4	16	15	225	60
32	2	4	10	100	20
33	3	9	9	81	27
34	4	16	14	196	56
35	2	4	11	121	22
36	3	9	14	196	42
37	4	16	14	196	56
38	3	9	15	225	45
39	2	4	10	100	20
40	3	9	10	100	30
41	5	25	18	324	90
42	4	16	15	225	60
43	3	9	16	256	48
44	2	4	14	196	28
45	3	9	15	225	45
46	4	16	12	144	48
47	4	16	14	196	56
48	3	9	16	256	48
49	2	4	8	64	16
50	4	16	14	196	56
Sum	154	516	662	9056	2114

Rxy= 0.68123 Variance= 0.8336

Attribute 4: Hand movement comfort

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	14	196	42
2	4	16	15	225	60
3	2	4	10	100	20
4	4	16	14	196	56
5	4	16	15	225	60
6	3	9	13	169	39
7	2	4	10	100	20
8	3	9	14	196	42
9	2	4	10	100	20
10	2	4	10	100	20
11	5	25	16	256	80
12	3	9	13	169	39
13	4	16	18	324	72
14	2	4	8	64	16
15	3	9	15	225	45
16	4	16	14	196	56
17	3	9	15	225	45
18	3	9	15	225	45
19	3	9	14	196	42
20	2	4	10	100	20
21	4	16	12	144	48
22	4	16	14	196	56
23	1	1	10	100	10
24	2	4	13	169	26
25	2	4	13	169	26
26	4	16	15	225	60
27	5	25	16	256	80
28	4	16	14	196	56
29	3	9	14	196	42
30	2	4	14	196	28
31	4	16	15	225	60
32	2	4	10	100	20
33	2	4	9	81	18
34	3	9	14	196	42
35	3	9	11	121	33
36	3	9	14	196	42
37	4	16	14	196	56
38	4	16	15	225	60
39	2	4	10	100	20
40	3	9	10	100	30
41	5	25	18	324	90
42	3	9	15	225	45

43	3	9	16	256	48
44	2	4	14	196	28
45	4	16	15	225	60
46	4	16	12	144	48
47	4	16	14	196	56
48	3	9	16	256	48
49	2	4	8	64	16
50	4	16	14	196	56
Sum	156	532	662	9056	2147

Rxy= 0.71038 Variance= 0.9056

N.2. Uniformity and Data Sufficiency Tests for Prototype A Performance

Attribute 1: Easiness to open

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	4	3	4	4	4	3.8	Uniform
2	4	4	4	4	4	4	Uniform
3	2	5	4	2	5	3.6	Uniform
4	1	2	4	4	5	3.2	Uniform
5	3	4	4	4	4	3.8	Uniform
6	2	3	4	4	2	3	Uniform
7	2	4	4	3	3	3.2	Uniform
8	4	4	4	4	5	4.2	Uniform
9	1	4	4	3	2	2.8	Uniform
10	2	4	5	2	3	3.2	Uniform
Subgroup Average Total						34.8	
Total Xi						174	
Total Xi^2						30276	

1	16	9	16	16	16	
1	16	16	16	16	16	
1	4	25	16	4	25	
1	1	4	16	16	25	
1	9	16	16	16	16	
1	4	9	16	16	4	
1	4	16	16	9	9	
1	16	16	16	16	25	
1	1	16	16	9	4	
1	4	16	25	4	9	
10	Total $(Xi)^2$				658	

Subgroup Average Value 3.480
Deviation Standard 1.035

Uniformity Test
Standard Average 0.463
Lower Control Limit 2.092
Upper Control Limit 4.868
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 34.6677

Attribute 2: Easiness to close

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	4	4	2	3	4	3.4	Uniform	1
2	5	4	2	2	4	3.4	Uniform	1
3	4	5	4	2	5	4	Uniform	1
4	5	2	5	3	5	4	Uniform	1
5	4	4	3	2	4	3.4	Uniform	1
6	4	4	4	4	2	3.6	Uniform	1
7	4	4	3	3	3	3.4	Uniform	1
8	4	4	3	4	5	4	Uniform	1
9	5	4	3	3	2	3.4	Uniform	1
10	4	2	4	2	3	3	Uniform	1
Subgroup Average Total						35.6		10
Total Xi						178		
Total Xi^2						31684		

$(Xi)^2$				
16	16	4	9	16
25	16	4	4	16
16	25	16	4	25
25	4	25	9	25
16	16	9	4	16
16	16	16	16	4
16	16	9	9	9
16	16	9	16	25
25	16	9	9	4
16	4	16	4	9
Total $(Xi)^2$				682

Subgroup Average Value 3.560
Deviation Standard 0.993

Uniformity Test
Standard Average 0.444
Lower Control Limit 2.228
Upper Control Limit 4.892
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 30.5012

Attribute 3: Finger comfort

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	4	2	4	5	3.6	Uniform	1
2	2	2	4	2	4	2.8	Uniform	1
3	2	4	1	3	3	2.6	Uniform	1
4	4	2	2	4	2	2.8	Uniform	1
5	4	4	4	2	3	3.4	Uniform	1
6	4	3	3	3	4	3.4	Uniform	1
7	2	4	4	4	4	3.6	Uniform	1
8	3	4	3	3	3	3.2	Uniform	1
9	2	3	4	2	2	2.6	Uniform	1
10	2	2	3	3	4	2.8	Uniform	1
Subgroup Average Total						30.8		10
Total Xi						154		
Total Xi^2						23716		

$(Xi)^2$				
9	16	4	16	25
4	4	16	4	16
4	16	1	9	9
16	4	4	16	4
16	16	16	4	9
16	9	9	9	16
4	16	16	16	16
9	16	9	9	9
4	9	16	4	4
4	4	9	9	16
Total $(Xi)^2$				516

Subgroup Average Value 3.080
Deviation Standard 0.922

Uniformity Test
Standard Average 0.412
Lower Control Limit 1.843
Upper Control Limit 4.317
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 35.1493

Attribute 4: Hand movement Comfort

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks
1	3	5	4	4	5	4.2	Uniform
2	4	3	4	2	3	3.2	Uniform
3	2	4	1	2	3	2.4	Uniform
4	4	2	2	3	2	2.6	Uniform
5	4	3	2	3	4	3.2	Uniform
6	3	4	4	3	4	3.6	Uniform
7	2	3	5	4	4	3.6	Uniform
8	3	3	4	4	3	3.4	Uniform
9	2	3	3	2	2	2.4	Uniform
10	2	2	2	3	4	2.6	Uniform
Subgroup Average Total						31.2	
Total Xi						156	
Total Xi^2						24336	

	$(Xi)^2$				
1	9	25	16	16	25
1	16	9	16	4	9
1	4	16	1	4	9
1	16	4	4	9	4
1	16	9	4	9	16
1	9	16	16	9	16
1	4	9	25	16	16
1	9	9	16	16	9
1	4	9	9	4	4
1	4	4	4	9	16
10	Total $(Xi)^2$				532

Subgroup Average Value 3.120
Deviation Standard 0.961

Uniformity Test
Standard Average 0.430
Lower Control Limit 1.830
Upper Control Limit 4.410
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 37.2124

N.3. Reliability Tests for Prototype A Performance

Attributes	Variance
Easiness to open	1.050
Easiness to close	0.966
Finger comfort	0.834
Hand movement comfort	0.906
Sum	3.755

Total Variance

No	Yi	Yi^2
1	14	196
2	15	225
3	10	100
4	14	196
5	15	225
6	13	169
7	10	100
8	14	196
9	10	100
10	10	100
11	16	256
12	13	169
13	18	324
14	8	64
15	15	225
16	14	196
17	15	225
18	15	225
19	14	196
20	10	100
21	12	144
22	14	196
23	10	100
24	13	169
25	13	169
26	15	225
27	16	256
28	14	196
29	14	196
30	14	196
31	15	225
32	10	100
33	9	81

34	14	196
35	11	121
36	14	196
37	14	196
38	15	225
39	10	100
40	10	100
41	18	324
42	15	225
43	16	256
44	14	196
45	15	225
46	12	144
47	14	196
48	16	256
49	8	64
50	14	196
Sum	662	9056

Variance= 5.822

Calculate Alpha

Alpha Cronbach	r table	Remarks
0.473	0.273	Reliable

Appendix O: Third Questionnaire Prototype B Performance Tests

O.1. Validity Tests for Prototype B Performance

Attribute 1: Easiness to open

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	10	100	20
2	2	4	9	81	18
3	1	1	4	16	4
4	2	4	7	49	14
5	3	9	14	196	42
6	3	9	14	196	42
7	2	4	10	100	20
8	2	4	12	144	24
9	1	1	5	25	5
10	1	1	5	25	5
11	4	16	15	225	60
12	2	4	9	81	18
13	4	16	15	225	60
14	2	4	8	64	16
15	2	4	9	81	18
16	2	4	10	100	20
17	3	9	13	169	39
18	3	9	12	144	36
19	3	9	12	144	36
20	2	4	10	100	20
21	3	9	13	169	39
22	4	16	14	196	56
23	2	4	10	100	20
24	2	4	10	100	20
25	4	16	15	225	60
26	3	9	14	196	42
27	3	9	11	121	33
28	3	9	10	100	30
29	2	4	10	100	20
30	2	4	11	121	22
31	3	9	13	169	39
32	3	9	12	144	36
33	2	4	9	81	18
34	4	16	14	196	56
35	5	25	16	256	80
36	3	9	12	144	36
37	2	4	10	100	20

38	3	9	10	100	30
39	2	4	10	100	20
40	4	16	14	196	56
41	3	9	10	100	30
42	2	4	10	100	20
43	4	16	14	196	56
44	4	16	15	225	60
45	2	4	10	100	20
46	3	9	14	196	42
47	4	16	17	289	68
48	4	16	13	169	52
49	3	9	12	144	36
50	2	4	10	100	20
Sum	136	412	566	6798	1654

Rxy= 0.89263 Varians= 0.8416

Attribute 2: Easiness to close

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	2	4	10	100	20
2	2	4	9	81	18
3	1	1	4	16	4
4	1	1	7	49	7
5	3	9	14	196	42
6	4	16	14	196	56
7	2	4	10	100	20
8	3	9	12	144	36
9	1	1	5	25	5
10	1	1	5	25	5
11	2	4	15	225	30
12	2	4	9	81	18
13	4	16	15	225	60
14	2	4	8	64	16
15	2	4	9	81	18
16	2	4	10	100	20
17	3	9	13	169	39
18	3	9	12	144	36
19	3	9	12	144	36
20	2	4	10	100	20
21	3	9	13	169	39
22	3	9	14	196	42
23	2	4	10	100	20
24	2	4	10	100	20
25	3	9	15	225	45

26	3	9	14	196	42
27	3	9	11	121	33
28	3	9	10	100	30
29	2	4	10	100	20
30	2	4	11	121	22
31	2	4	13	169	26
32	3	9	12	144	36
33	2	4	9	81	18
34	4	16	14	196	56
35	4	16	16	256	64
36	3	9	12	144	36
37	2	4	10	100	20
38	3	9	10	100	30
39	2	4	10	100	20
40	4	16	14	196	56
41	3	9	10	100	30
42	2	4	10	100	20
43	4	16	14	196	56
44	4	16	15	225	60
45	2	4	10	100	20
46	4	16	14	196	56
47	4	16	17	289	68
48	4	16	13	169	52
49	3	9	12	144	36
50	2	4	10	100	20
Sum	132	388	566	6798	1599

Rxy= 0.84288 Varians= 0.7904

Attribute 3: Finger comfort in opening and closing

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	10	100	30
2	4	16	9	81	36
3	1	1	4	16	4
4	2	4	7	49	14
5	4	16	14	196	56
6	4	16	14	196	56
7	3	9	10	100	30
8	3	9	12	144	36
9	1	1	5	25	5
10	2	4	5	25	10
11	4	16	15	225	60
12	2	4	9	81	18
13	4	16	15	225	60

14	2	4	8	64	16
15	2	4	9	81	18
16	3	9	10	100	30
17	4	16	13	169	52
18	3	9	12	144	36
19	3	9	12	144	36
20	4	16	10	100	40
21	4	16	13	169	52
22	4	16	14	196	56
23	2	4	10	100	20
24	2	4	10	100	20
25	4	16	15	225	60
26	5	25	14	196	70
27	3	9	11	121	33
28	2	4	10	100	20
29	3	9	10	100	30
30	3	9	11	121	33
31	4	16	13	169	52
32	3	9	12	144	36
33	3	9	9	81	27
34	3	9	14	196	42
35	4	16	16	256	64
36	3	9	12	144	36
37	3	9	10	100	30
38	2	4	10	100	20
39	3	9	10	100	30
40	3	9	14	196	42
41	2	4	10	100	20
42	3	9	10	100	30
43	3	9	14	196	42
44	4	16	15	225	60
45	2	4	10	100	20
46	4	16	14	196	56
47	4	16	17	289	68
48	2	4	13	169	26
49	3	9	12	144	36
50	3	9	10	100	30
Sum	151	495	566	6798	1804

Rxy= 0.76704 Varians= 0.7796

Attribute 4: Hand movement comfort

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	10	100	30
2	1	1	9	81	9
3	1	1	4	16	4
4	2	4	7	49	14
5	4	16	14	196	56
6	3	9	14	196	42
7	3	9	10	100	30
8	4	16	12	144	48
9	2	4	5	25	10
10	1	1	5	25	5
11	5	25	15	225	75
12	3	9	9	81	27
13	3	9	15	225	45
14	2	4	8	64	16
15	3	9	9	81	27
16	3	9	10	100	30
17	3	9	13	169	39
18	3	9	12	144	36
19	3	9	12	144	36
20	2	4	10	100	20
21	3	9	13	169	39
22	3	9	14	196	42
23	4	16	10	100	40
24	4	16	10	100	40
25	4	16	15	225	60
26	3	9	14	196	42
27	2	4	11	121	22
28	2	4	10	100	20
29	3	9	10	100	30
30	4	16	11	121	44
31	4	16	13	169	52
32	3	9	12	144	36
33	2	4	9	81	18
34	3	9	14	196	42
35	3	9	16	256	48
36	3	9	12	144	36
37	3	9	10	100	30
38	2	4	10	100	20
39	3	9	10	100	30
40	3	9	14	196	42
41	2	4	10	100	20
42	3	9	10	100	30

43	3	9	14	196	42
44	3	9	15	225	45
45	4	16	10	100	40
46	3	9	14	196	42
47	5	25	17	289	85
48	3	9	13	169	39
49	3	9	12	144	36
50	3	9	10	100	30
Sum	147	469	566	6798	1741

Rxy= 0.64151 Varians= 0.7364

O.2. Validity Tests for Prototype B Performance

Attribute 1: Easiness to open

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	4	3	3	3	3	Uniform	1
2	2	2	4	3	2	2.6	Uniform	1
3	1	4	2	2	4	2.6	Uniform	1
4	2	2	2	4	4	2.8	Uniform	1
5	3	2	4	5	2	3.2	Uniform	1
6	3	2	3	3	3	2.8	Uniform	1
7	2	3	3	2	4	2.8	Uniform	1
8	2	3	3	3	4	3	Uniform	1
9	1	3	2	2	3	2.2	Uniform	1
10	1	2	2	4	2	2.2	Uniform	1
Subgroup Average Total						27.2		10
Total Xi						136		
Total Xi^2						18496		

$(Xi)^2$				
4	16	9	9	9
4	4	16	9	4
1	16	4	4	16
4	4	4	16	16
9	4	16	25	4
9	4	9	9	9
4	9	9	4	16
4	9	9	9	16
1	9	4	4	9
1	4	4	16	4
Total $(Xi)^2$				412

Subgroup Average Value 2.720
Deviation Standard 0.927

Uniformity Test
Standard Average 0.414
Lower Control Limit 1.477
Upper Control Limit 3.963
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 45.5017

Attribute 2: Easiness to close

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	2	2	3	2	3	2.4	Uniform	1
2	2	2	3	3	2	2.4	Uniform	1
3	1	4	2	2	4	2.6	Uniform	1
4	1	2	2	4	4	2.6	Uniform	1
5	3	2	3	4	2	2.8	Uniform	1
6	4	2	3	3	4	3.2	Uniform	1
7	2	3	3	2	4	2.8	Uniform	1
8	3	3	3	3	4	3.2	Uniform	1
9	1	3	2	2	3	2.2	Uniform	1
10	1	2	2	4	2	2.2	Uniform	1
Subgroup Average Total						26.4		10
Total Xi						132		
Total Xi^2						17424		

$(Xi)^2$				
4	4	9	4	9
4	4	9	9	4
1	16	4	4	16
1	4	4	16	16
9	4	9	16	4
16	4	9	9	16
4	9	9	4	16
9	9	9	9	16
1	9	4	4	9
1	4	4	16	4
Total $(Xi)^2$				388

Subgroup Average Value 2.640
Deviation Standard 0.898

Uniformity Test
Standard Average 0.402
Lower Control Limit 1.435
Upper Control Limit 3.845
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 45.3627

Attribute 3: Finger comfort

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	4	4	4	2	3.4	Uniform	1
2	4	2	4	3	3	3.2	Uniform	1
3	1	4	2	3	3	2.6	Uniform	1
4	2	2	2	3	4	2.6	Uniform	1
5	4	2	4	4	2	3.2	Uniform	1
6	4	3	5	3	4	3.8	Uniform	1
7	3	4	3	3	4	3.4	Uniform	1
8	3	3	2	2	2	2.4	Uniform	1
9	1	3	3	3	3	2.6	Uniform	1
10	2	4	3	3	3	3	Uniform	1
Subgroup Average Total						30.2		10
Total Xi						151		
Total Xi^2						22801		

$(Xi)^2$				
9	16	16	16	4
16	4	16	9	9
1	16	4	9	9
4	4	4	9	16
16	4	16	16	4
16	9	25	9	16
9	16	9	9	16
9	9	4	4	4
1	9	9	9	9
4	16	9	9	9
Total $(Xi)^2$				495

Subgroup Average Value 3.020
Deviation Standard 0.892

Uniformity Test
Standard Average 0.399
Lower Control Limit 1.823
Upper Control Limit 4.217
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 34.1915

Attribute 4: Hand movement Comfort

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	5	3	4	2	3.4	Uniform	1
2	1	3	3	3	3	2.6	Uniform	1
3	1	3	4	2	3	2.6	Uniform	1
4	2	2	4	3	3	2.8	Uniform	1
5	4	3	4	3	4	3.6	Uniform	1
6	3	3	3	3	3	3	Uniform	1
7	3	3	2	3	5	3.2	Uniform	1
8	4	3	2	2	3	2.8	Uniform	1
9	2	3	3	3	3	2.8	Uniform	1
10	1	2	4	3	3	2.6	Uniform	1
Subgroup Average Total						29.4		10
Total Xi						147		
Total Xi^2						21609		

$(Xi)^2$				
9	25	9	16	4
1	9	9	9	9
1	9	16	4	9
4	4	16	9	9
16	9	16	9	16
9	9	9	9	9
9	9	4	9	25
16	9	4	4	9
4	9	9	9	9
1	4	16	9	9
Total $(Xi)^2$				469

Subgroup Average Value 2.940
Deviation Standard 0.867

Uniformity Test
Standard Average 0.388
Lower Control Limit 1.777
Upper Control Limit 4.103
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 34.0784

O.2. Reliability Tests for Prototype B Performance

Attributes	Varians
Easiness to open	0.842
Easiness to close	0.790
Finger comfort	0.780
Hand movement comfort	0.736
sum	3.148

Total Varians

No	Yi	Yi^2
1	10	100
2	9	81
3	4	16
4	7	49
5	14	196
6	14	196
7	10	100
8	12	144
9	5	25
10	5	25
11	15	225
12	9	81
13	15	225
14	8	64
15	9	81
16	10	100
17	13	169
18	12	144
19	12	144
20	10	100
21	13	169
22	14	196
23	10	100
24	10	100
25	15	225
26	14	196
27	11	121
28	10	100
29	10	100
30	11	121
31	13	169
32	12	144
33	9	81

34	14	196
35	16	256
36	12	144
37	10	100
38	10	100
39	10	100
40	14	196
41	10	100
42	10	100
43	14	196
44	15	225
45	10	100
46	14	196
47	17	289
48	13	169
49	12	144
50	10	100
Sum	566	6798

Varians= 7.818

Calculate Alpha

Alpha Cronbach	r table	Remarks
0.796	0.273	Reliable

Appendix P: Third Questionnaire Prototype C Performance Tests

P.1. Validity Tests for Prototype C Performance

Attribute 1: Easiness to open

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	15	225	60
2	1	1	12	144	12
3	5	25	20	400	100
4	4	16	16	256	64
5	3	9	13	169	39
6	4	16	15	225	60
7	5	25	19	361	95
8	5	25	18	324	90
9	5	25	20	400	100
10	4	16	15	225	60
11	3	9	15	225	45
12	5	25	16	256	80
13	3	9	13	169	39
14	4	16	16	256	64
15	4	16	15	225	60
16	5	25	15	225	75
17	4	16	15	225	60
18	5	25	20	400	100
19	4	16	13	169	52
20	4	16	16	256	64
21	4	16	15	225	60
22	4	16	18	324	72
23	4	16	18	324	72
24	5	25	20	400	100
25	4	16	12	144	48
26	5	25	18	324	90
27	4	16	14	196	56
28	5	25	17	289	85
29	5	25	18	324	90
30	4	16	16	256	64
31	5	25	18	324	90
32	4	16	16	256	64
33	2	4	9	81	18
34	2	4	12	144	24
35	4	16	16	256	64
36	4	16	14	196	56
37	3	9	10	100	30

38	4	16	13	169	52
39	4	16	17	289	68
40	5	25	16	256	80
41	4	16	13	169	52
42	4	16	14	196	56
43	4	16	16	256	64
44	5	25	19	361	95
45	5	25	18	324	90
46	2	4	10	100	20
47	5	25	18	324	90
48	4	16	14	196	56
49	4	16	16	256	64
50	4	16	19	361	76
Sum	203	865	781	12555	3265

Rxy= 0.78117 Varians= 0.8164

Attribute 2: Easiness to close

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	15	225	60
2	3	9	12	144	36
3	5	25	20	400	100
4	4	16	16	256	64
5	4	16	13	169	52
6	3	9	15	225	45
7	5	25	19	361	95
8	4	16	18	324	72
9	5	25	20	400	100
10	4	16	15	225	60
11	4	16	15	225	60
12	4	16	16	256	64
13	3	9	13	169	39
14	4	16	16	256	64
15	5	25	15	225	75
16	4	16	15	225	60
17	4	16	15	225	60
18	5	25	20	400	100
19	3	9	13	169	39
20	4	16	16	256	64
21	4	16	15	225	60
22	5	25	18	324	90
23	5	25	18	324	90
24	5	25	20	400	100

25	3	9	12	144	36
26	4	16	18	324	72
27	4	16	14	196	56
28	5	25	17	289	85
29	5	25	18	324	90
30	5	25	16	256	80
31	5	25	18	324	90
32	4	16	16	256	64
33	2	4	9	81	18
34	2	4	12	144	24
35	4	16	16	256	64
36	4	16	14	196	56
37	3	9	10	100	30
38	3	9	13	169	39
39	5	25	17	289	85
40	5	25	16	256	80
41	4	16	13	169	52
42	3	9	14	196	42
43	4	16	16	256	64
44	5	25	19	361	95
45	5	25	18	324	90
46	2	4	10	100	20
47	5	25	18	324	90
48	4	16	14	196	56
49	4	16	16	256	64
50	5	25	19	361	95
Sum	204	870	781	12555	3286

Rxy= 0.85954 Varians= 0.7536

Attribute 3: Finger comfort in opening and closing

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	3	9	15	225	45
2	4	16	12	144	48
3	5	25	20	400	100
4	4	16	16	256	64
5	3	9	13	169	39
6	4	16	15	225	60
7	5	25	19	361	95
8	5	25	18	324	90
9	5	25	20	400	100
10	3	9	15	225	45
11	4	16	15	225	60

12	4	16	16	256	64
13	3	9	13	169	39
14	4	16	16	256	64
15	3	9	15	225	45
16	3	9	15	225	45
17	3	9	15	225	45
18	5	25	20	400	100
19	3	9	13	169	39
20	4	16	16	256	64
21	3	9	15	225	45
22	5	25	18	324	90
23	4	16	18	324	72
24	5	25	20	400	100
25	3	9	12	144	36
26	4	16	18	324	72
27	3	9	14	196	42
28	4	16	17	289	68
29	4	16	18	324	72
30	3	9	16	256	48
31	4	16	18	324	72
32	4	16	16	256	64
33	3	9	9	81	27
34	4	16	12	144	48
35	4	16	16	256	64
36	2	4	14	196	28
37	2	4	10	100	20
38	3	9	13	169	39
39	4	16	17	289	68
40	3	9	16	256	48
41	2	4	13	169	26
42	3	9	14	196	42
43	4	16	16	256	64
44	5	25	19	361	95
45	4	16	18	324	72
46	3	9	10	100	30
47	4	16	18	324	72
48	4	16	14	196	56
49	4	16	16	256	64
50	5	25	19	361	95
Sum	186	726	781	12555	2990

Rxy= 0.76902 Varians= 0.6816

Attribute 4: Hand movement comfort

No	Xi	Xi^2	Yi	Yi^2	XiYi
1	4	16	15	225	60
2	4	16	12	144	48
3	5	25	20	400	100
4	4	16	16	256	64
5	3	9	13	169	39
6	4	16	15	225	60
7	4	16	19	361	76
8	4	16	18	324	72
9	5	25	20	400	100
10	4	16	15	225	60
11	4	16	15	225	60
12	3	9	16	256	48
13	4	16	13	169	52
14	4	16	16	256	64
15	3	9	15	225	45
16	3	9	15	225	45
17	4	16	15	225	60
18	5	25	20	400	100
19	3	9	13	169	39
20	4	16	16	256	64
21	4	16	15	225	60
22	4	16	18	324	72
23	5	25	18	324	90
24	5	25	20	400	100
25	2	4	12	144	24
26	5	25	18	324	90
27	3	9	14	196	42
28	3	9	17	289	51
29	4	16	18	324	72
30	4	16	16	256	64
31	4	16	18	324	72
32	4	16	16	256	64
33	2	4	9	81	18
34	4	16	12	144	48
35	4	16	16	256	64
36	4	16	14	196	56
37	2	4	10	100	20
38	3	9	13	169	39
39	4	16	17	289	68
40	3	9	16	256	48
41	3	9	13	169	39
42	4	16	14	196	56

43	4	16	16	256	64
44	4	16	19	361	76
45	4	16	18	324	72
46	3	9	10	100	30
47	4	16	18	324	72
48	2	4	14	196	28
49	4	16	16	256	64
50	5	25	19	361	95
Sum	188	738	781	12555	3014

Rxy= 0.73596 Varians= 0.6224

P.2. Uniformity and Data Sufficiency Tests for Prototype C Performance

Attribute 1: Easiness to open

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	4	3	4	5	4	4	Uniform	1
2	1	5	4	4	4	3.6	Uniform	1
3	5	3	4	2	4	3.6	Uniform	1
4	4	4	5	2	5	4	Uniform	1
5	3	4	4	4	5	4	Uniform	1
6	4	5	5	4	2	4	Uniform	1
7	5	4	4	3	5	4.2	Uniform	1
8	5	5	5	4	4	4.6	Uniform	1
9	5	4	5	4	4	4.4	Uniform	1
10	4	4	4	5	4	4.2	Uniform	1
Subgroup Average Total						40.6		10
Total Xi						203		
Total Xi^2						41209		

$(Xi)^2$				
16	9	16	25	16
1	25	16	16	16
25	9	16	4	16
16	16	25	4	25
9	16	16	16	25
16	25	25	16	4
25	16	16	9	25
25	25	25	16	16
25	16	25	16	16
16	16	16	25	16
Total $(Xi)^2$				865

Subgroup Average Value 4.060
Deviation Standard 0.913

Uniformity Test
Standard Average 0.408
Lower Control Limit 2.835
Upper Control Limit 5.285
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 19.8112

Attribute 2: Easiness to close

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	4	4	4	5	4	4.2	Uniform	1
2	3	4	5	4	3	3.8	Uniform	1
3	5	3	5	2	4	3.8	Uniform	1
4	4	4	5	2	5	4	Uniform	1
5	4	5	3	4	5	4.2	Uniform	1
6	3	4	4	4	2	3.4	Uniform	1
7	5	4	4	3	5	4.2	Uniform	1
8	4	5	5	3	4	4.2	Uniform	1
9	5	3	5	5	4	4.4	Uniform	1
10	4	4	5	5	5	4.6	Uniform	1
Subgroup Average Total						40.8		10
Total Xi						204		
Total Xi^2						41616		

$(Xi)^2$				
16	16	16	25	16
9	16	25	16	9
25	9	25	4	16
16	16	25	4	25
16	25	9	16	25
9	16	16	16	4
25	16	16	9	25
16	25	25	9	16
25	9	25	25	16
16	16	25	25	25
Total $(Xi)^2$				870

Subgroup Average Value 4.080
Deviation Standard 0.877

Uniformity Test
Standard Average 0.392
Lower Control Limit 2.903
Upper Control Limit 5.257
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 18.1084

Attribute 3: Finger comfort

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	3	4	3	4	2	3.2	Uniform	1
2	4	4	5	4	3	4	Uniform	1
3	5	3	4	3	4	3.8	Uniform	1
4	4	4	5	4	5	4.4	Uniform	1
5	3	3	3	4	4	3.4	Uniform	1
6	4	3	4	2	3	3.2	Uniform	1
7	5	3	3	2	4	3.4	Uniform	1
8	5	5	4	3	4	4.2	Uniform	1
9	5	3	4	4	4	4	Uniform	1
10	3	4	3	3	5	3.6	Uniform	1
Subgroup Average Total						37.2		10
Total Xi						186		
Total Xi^2						34596		

$(Xi)^2$				
9	16	9	16	4
16	16	25	16	9
25	9	16	9	16
16	16	25	16	25
9	9	9	16	16
16	9	16	4	9
25	9	9	4	16
25	25	16	9	16
25	9	16	16	16
9	16	9	9	25
Total $(Xi)^2$				726

Subgroup Average Value 3.720
Deviation Standard 0.834

Uniformity Test
Standard Average 0.373
Lower Control Limit 2.601
Upper Control Limit 4.839
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 19.7017

Attribute 4: Hand movement Comfort

Subgroup Average Value Table

Subgroup	Data (Xi)					Average	Remarks	
1	4	4	4	4	3	3.8	Uniform	1
2	4	3	4	4	4	3.8	Uniform	1
3	5	4	5	2	4	4	Uniform	1
4	4	4	5	4	4	4.2	Uniform	1
5	3	3	2	4	4	3.2	Uniform	1
6	4	3	5	4	3	3.8	Uniform	1
7	4	4	3	2	4	3.4	Uniform	1
8	4	5	3	3	2	3.4	Uniform	1
9	5	3	4	4	4	4	Uniform	1
10	4	4	4	3	5	4	Uniform	1
Subgroup Average Total						37.6		10
Total Xi						188		
Total Xi^2						35344		

$(Xi)^2$				
16	16	16	16	9
16	9	16	16	16
25	16	25	4	16
16	16	25	16	16
9	9	4	16	16
16	9	25	16	9
16	16	9	4	16
16	25	9	9	4
25	9	16	16	16
16	16	16	9	25
Total $(Xi)^2$				738

Subgroup Average Value 3.760
Deviation Standard 0.797

Uniformity Test
Standard Average 0.356
Lower Control Limit 2.691
Upper Control Limit 4.829
Remarks : Data Uniform

Data Sufficiency Test
Confidence level 95%
Accuracy Level = 10%
N'= 17.6098

P.3. Reliability Tests for Prototype C Performance

Attributes	Varians
Easiness to open	0.816
Easiness to close	0.754
Finger comfort	0.682
Hand movement comfort	0.622
sum	2.874

Total Varians

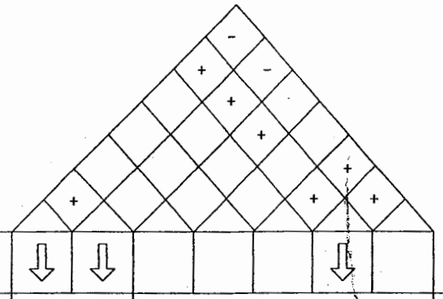
No	Yi	Yi^2
1	15	225
2	12	144
3	20	400
4	16	256
5	13	169
6	15	225
7	19	361
8	18	324
9	20	400
10	15	225
11	15	225
12	16	256
13	13	169
14	16	256
15	15	225
16	15	225
17	15	225
18	20	400
19	13	169
20	16	256
21	15	225
22	18	324
23	18	324
24	20	400
25	12	144
26	18	324
27	14	196
28	17	289
29	18	324
30	16	256
31	18	324
32	16	256
33	9	81

34	12	144
35	16	256
36	14	196
37	10	100
38	13	169
39	17	289
40	16	256
41	13	169
42	14	196
43	16	256
44	19	361
45	18	324
46	10	100
47	18	324
48	14	196
49	16	256
50	19	361
Sum	781	12555

Varians= 7.116

Calculate Alpha

Alpha Cronbach	r table	Remarks
0.795	0.273	Reliable



Key to roof / interrelationship matrix symbol

\+ Positive / supporting

\- Negative / tradeoffs

Direction of Improvement			⇩	⇩				⇩	
Engineering characteristics / Customer requirement		Importance to customer	Energy		Cap Design				
			Energy to open	Energy to close	Dimension	Type of Cap (Internal or External)	Material	Weight	Basic Form
Comfortability	Easiness to open	4.00	●		■	▲	▲	▲	▲
	Easiness to close	3.86		●	■	▲	▲	▲	▲
	Finger comfort in opening and closing	3.76	■	■	▲	●	▲		■
	Hand movement comfort	3.39	■	■	▲	■	▲	▲	■
Cap Design	Form of cap	2.57	▲	▲	●	▲	■	▲	●
	Cap material	2.26	▲	▲		▲	●	■	
	Cap product manufacturing smoothness	3.10			▲		■		■
	Emboss of logo or product name	2.80					▲		▲
Cap grip strength towards the package		3.74	■	■	■	▲	■		■
Technical Priority			127.3	120.6	115.9	106.1	109.2	34.7	130.2
Percentage of Total			17.1	16.2	15.6	14.2	14.7	4.7	17.5
Technical Benchmarking	Kumala		10.1N	12.9N	D 6.4 H 1.5	Internal	Hard Plastics	0.42 g	Circle
	Romeo		6.2N	8N	D 6.6 H 1.2	Internal	Hard Plastics	0.4 g	Circle
	Gadjah Mada		2 N	2 N	D 7.1 H 0.7	External	Soft Plastics	0.5 g	Circle
Design Target			Minimum (<2N)	Minimum (<2N)	D 6.6	External	Plastics	Minimum	Circle

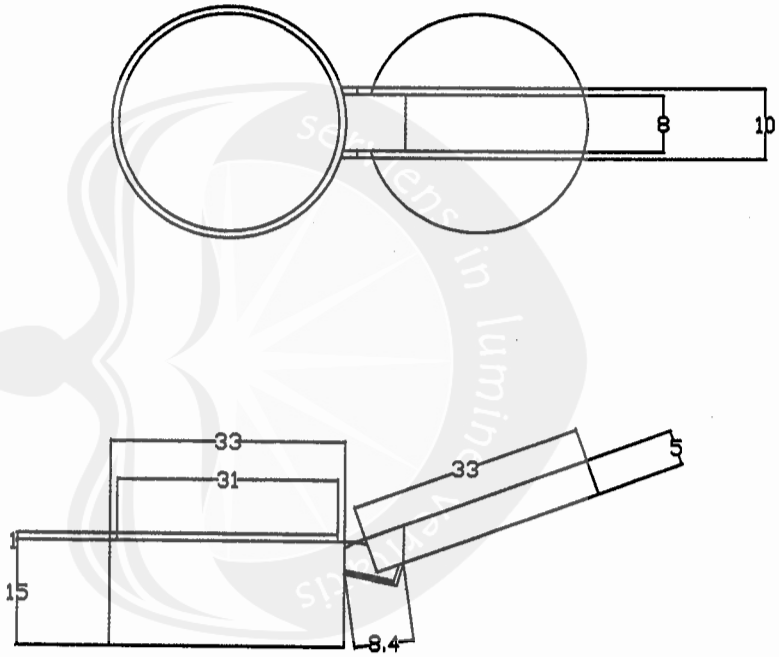
Competitive evaluation (★ Kumala, ◆ Romeo, ⬟ Gadjah Mada)	Planned Rating	Improvement Factor	Sales Point	Overall Weighing	Percentage of Total
1 2 3 4	4	1.39	1.5	7.07	14.1
	4	1.33	1.2	6.32	12.6
	4	1.39	1.5	6.73	13.4
	4	1.37	1.5	6.13	12.3
	4	1.29	1.2	4.53	9.0
	3	1.04	1.2	3.55	7.0
	4	1.29	1.2	5.19	10.4
	4	1.31	1.2	4.88	9.7
	5	1.19	1.2	5.67	11.3

Key to interrelationship matrix symbol

● Strong Relationship

■ Medium Relationship

▲ Weak Relationship



Revision Index	Drawn by: Jimmy	Scale: 1:1	
	Reg. Nr.:	Unit: mm	
	Date: May 2007	Material:	
	Checked by:	Sign.:	
	A4	FINAL DESIGN 2D	
INDUSTRIAL ENGINEERING UAJY		Operation:	Dwg. Nr.
Origin.	Rep.	Rep. by.	SN. NS.

Appendix S: Critical Value of r Product Moment

db	R value in significance:	
	95%	99%
1	0.997	1.000
2	0.950	0.990
3	0.878	0.959
4	0.811	0.917
5	0.754	0.874
6	0.707	0.834
7	0.666	0.798
8	0.632	0.765
9	0.602	0.735
10	0.576	0.708
11	0.553	0.684
12	0.532	0.661
13	0.514	0.641
14	0.497	0.623
15	0.482	0.606
16	0.468	0.590
17	0.456	0.575
18	0.444	0.561
19	0.433	0.549
20	0.423	0.537
21	0.413	0.526
22	0.404	0.515
23	0.396	0.505

db	R value in significance:	
	95%	99%
24	0.388	0.496
25	0.381	0.487
26	0.374	0.478
27	0.367	0.470
28	0.361	0.463
29	0.355	0.456
30	0.349	0.449
35	0.325	0.418
40	0.304	0.393
45	0.288	0.372
50	0.273	0.354
60	0.25	0.325
70	0.232	0.302
80	0.217	0.283
90	0.205	0.267
100	0.195	0.254
125	0.174	0.228
150	0.159	0.208
200	0.138	0.181
300	0.113	0.148
400	0.098	0.128
500	0.088	0.115
1000	0.062	0.081