Appendix A: Questionnaire Survey

This questionnaire is part of the PhD Design Research, Department of Design, Brunel University.

Section 1 General Question

1. Age:

□ 16-20 years old □ 21-25 years old □ 26-30 years old □ 31-35 years old □ Over 35

2. Occupation: .....

(Please specify your subject area, e.g. design management, fashion design, product design, etc.)

3. Personality: (Please choose only one box.)

□ Fashion-conscious □ Sporty/Health-concerned □ High tech □ Businessman




□ Fun/Adventurous □ Practical/Price-concerned □ Diva/Clubber □ Other.....




4. Role model or favourite celebrity: .....

(Please name your most favourite celebrity, top athlete, politician, or public person.)

5. The reason you choose this person as your role model: (Please choose only one box.)

□ Physical appearance □ Personality □ Expertise □ Success

□ Lifestyle □ Money and Possession □ Fame □ Other.....

6. What is your favourite object and why? .....

(Please name the most favourite object you possess and the reason.)

7. What is your most desired object and why? .....

(Please name the most desirable object you want to possess and the reason.)

Section 2 Purchasing Criteria

8. How often you buy mobile phone? (Please choose only one box.)

□ Every time they launch a new model □ More than 2 times a year □ Once a year

□ Every 2-3 years □ When the old one is broken □ Other.....

9. Which mobile phone do you prefer? (Please choose only one box.)

□ Samsung □ Panasonic □ Sony Ericsson □ Siemens

□ Nokia □ Sharp □ Motorola □ NEC

□ Other.....

10. Criteria for mobile phone: (Please choose the most important reason – one only.)

□ Good design □ Practical functions □ Newness and Novelty

□ Reliability and High quality □ Match your lifestyle □ Value for money

□ Famous brand □ Multifunction due to various technologies and features

□ Other.....

11. What is the most 'undesirable factor' that makes you reject particular mobile phone?

(Please choose the most important reason – one only.)

□ Unattractive design □ Difficult to use □ Dated or old model

□ Low quality and Unreliable □ Do not fit your lifestyle □ Unreasonable price

□ No-name brand □ No new features □ Other.....

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12. How often you buy new clothes? (Please choose only one box.)

□ Every week □ Every 2-3 weeks □ Once a month

□ Once every 2-3 months □ Every season □ Less than 4 times a year

□ When the old one is worn out □ Special occasion □ Other.....

13. Which fashion brand do you prefer? (Please choose only one brand.)

□ DKNY

□ Next

□ Topshop/Topman

□ Marks & Spencer

□ Gap

□ Matalan

□ Versace

□ H&M

□ Other.....

14. Criteria for clothes: (Please choose the most important reason – one only.)

□ Good design □ Practical and Easy to look after □ Newness and Trendiness

□ High quality □ Match your lifestyle and personality □ Value for money

□ Famous brand □ Multipurpose (e.g. suitable to wear in many occasions)

□ Other.....

15. What is the most 'undesirable factor' that makes you reject particular fashion brand?

(Please choose the most important reason – one only.)

□ Unattractive design □ Impractical and Difficult to look after □ Outdate or last-season style

□ Low quality □ Do not fit your lifestyle □ Unreasonable price

□ No-name brand □ Can be worn only limited occasions □ Other.....

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16. Which sport brand do you prefer? (Please choose only one brand.)

□ Reebok □ Adidas □ Nike □ Mizuno


□ Ellesse □ Converse □ Fila □ Puma

□ Other.....

17. Criteria for sport shoes: (Please choose the most important reason – one only.)

□ Good design □ Practical functions □ Newness and Trendiness

□ High quality □ Match your lifestyle □ Value for money

□ Famous brand □ Multifunction due to various technologies and features

□ Other.....

18. What is the most 'undesirable factor' that makes you reject particular sport shoes?

(Please choose the most important reason – one only.)

□ Unattractive design □ Impractical function □ Old-fashioned model

□ Low quality □ Do not fit your lifestyle □ Unreasonable price

□ No-name brand □ Outdate technology □ Other.....

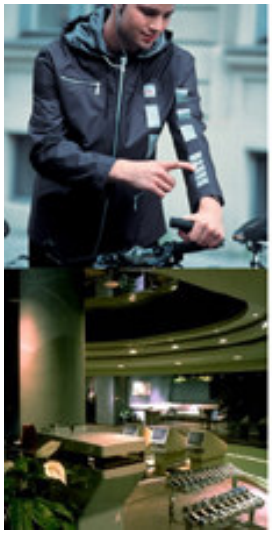
Section 3 Vision of Future

19. In your opinion, which one is considered 'desirable future'? (Please choose only one box.)

□ Avant-garde design □ Robot/Gadget era □ Environmental-friendly □ Safety/Protection (from Crime/Pollution)




□ Health/Quality of life □ Computer/Network □ Sensory connect or communication □ Science fiction




□ Other.....

Thank you very much for your time and co-operation,

Busayawan Ariyatum

Appendix B: Questionnaire Results

Table B-1: Personalities of the respondents

Personality	Respondents	Percentage
Sporty/Health-concern	13	18.6%
Other	13	18.6%
Practical/Price-concern	12	17.1%
Fashion Conscious	10	14.3%
Fun/Adventurous	9	12.9%
High-tech	8	11.4%
Businessman/woman	3	4.3%
Diva/Clubber	2	2.9%
Total	70	100.0%

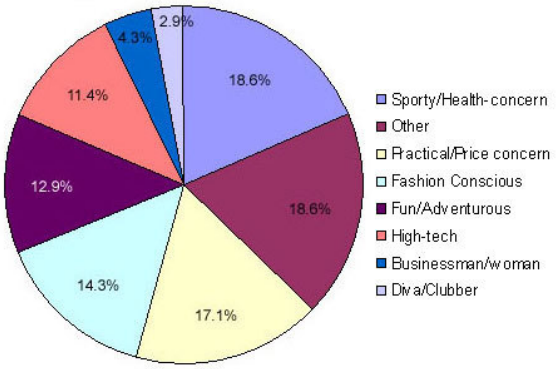


Figure B-1: Pie chart demonstrating personalities of the respondents

Table B-2: Role models of the respondents

Role models	Respondents	Percentage
Celebrities	22	31.4%
Other	14	20.0%
Top athletes	14	20.0%
Successful professional	14	20.0%
Politicians	6	8.6%
Total	70	100.0%

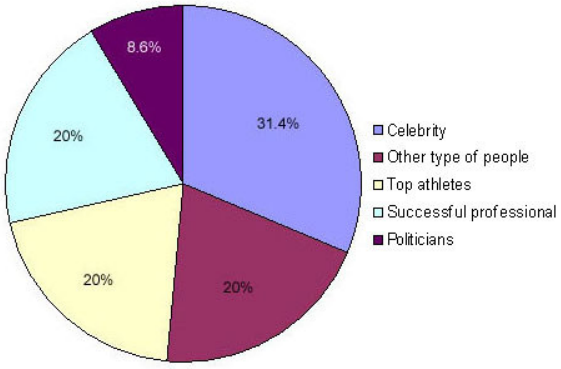


Figure B-2: Pie chart demonstrating role models of the respondents

Table B-3: Reasons that the respondents selected particular role models

Personality	Respondents	Percentage
Personality	22	31.4%
Other	15	21.4%
Success	11	15.7%
Physical Appearance	8	11.4%
Lifestyle	7	10.0%
Expertise	6	5.6%
Fame	1	1.4%
Total	70	100.0%

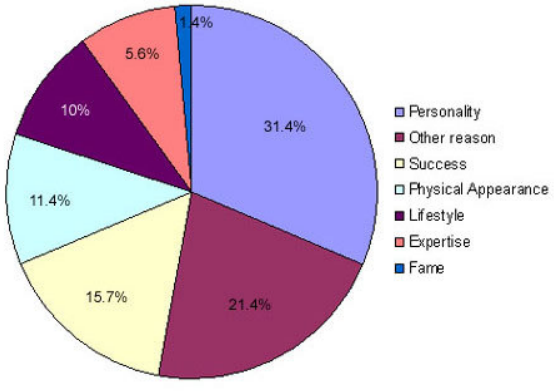


Figure B-3: Pie chart illustrating reasons that the respondents chose role models

Table B-4: Favourite objects of the respondents

Personality	Respondents	Percentage
Fashion items: clothes, jewellery, etc	17	24.3%
Personal electronic devices: PDA, etc	15	21.4%
Work-related devices: PC and laptop	13	18.6%
Entertainment: book, CD, toy, games	10	14.3%
Other: gift, car, stationary, etc	9	12.9%
Home appliances and furniture	6	8.6%
Total	70	100.0%

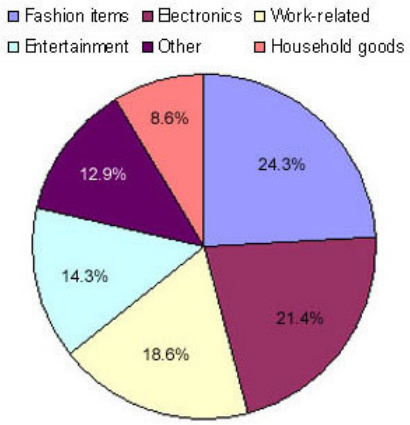


Figure B-4: Favourite objects of the respondents

Table B-5: Reasons that the respondents chose their favourite objects

Personality	Respondents	Percentage
Useful, reliable and practical function	26	37.1%
Personal values (e.g. engagement ring)	14	20.0%
Unique design and beauty	13	18.6%
Pleasure, enjoyment and satisfaction	7	10.0%
Other, e.g. hi-tech features, etc	6	8.6%
Express desirable status and lifestyle	4	5.7%
Total	70	100.0%

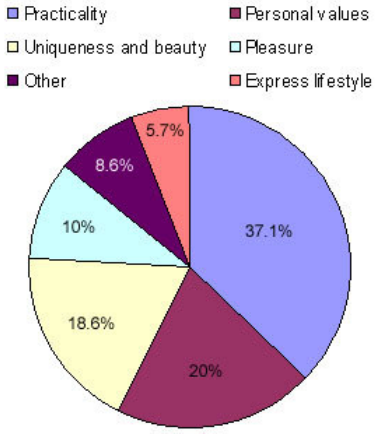


Figure B-5: Reasons to choose favourite objects

Table B-6: Vision of the future lifestyle of the respondents

Future lifestyle	Respondents	Percentage
Health/Quality of life	31	44.3%
Environmental-friendly	16	22.9%
Sensory connect and communication	7	10.0%
Science fiction	4	5.7%
Computer/Network	4	5.7%
Avant-garde design	2	2.9%
Robot/Gadget era	2	2.9%
Safety/Protection from crime/pollution	2	2.9%
Other	2	2.9%
Total	70	100.0%

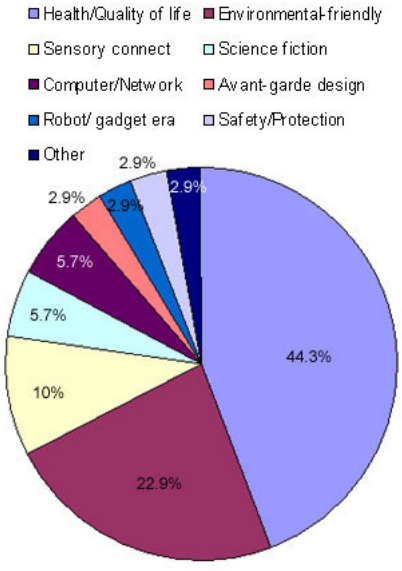


Figure B-6: Vision of future lifestyle

Appendix C: Statistical Analysis

Table C-1: Case processing summary of product categories * purchasing criteria

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Product categories * Purchasing criteria	210	100.0%	0	.0%	210	100.0%

Table C-2: Contingency table of product categories * purchasing criteria

Product categories * Purchasing criteria Crosstabulation

			Purchasing criteria								
			Good design	Practicality	Newness	High quality	Match user lifestyle	Value for money	Multi-purpose	Other	Total
Product categories	Mobile phone	Count	22	12	1	4	8	5	16	2	70
		Expected Count	22.7	8.3	1.0	5.3	17.0	5.3	8.7	1.7	70.0
	Fashion garment	Count	15	2	2	4	36	4	6	1	70
		Expected Count	22.7	8.3	1.0	5.3	17.0	5.3	8.7	1.7	70.0
	Sport shoes	Count	31	11	0	8	7	7	4	2	70
		Expected Count	22.7	8.3	1.0	5.3	17.0	5.3	8.7	1.7	70.0
Total		Count	68	25	3	16	51	16	26	5	210
		Expected Count	68.0	25.0	3.0	16.0	51.0	16.0	26.0	5.0	210.0

Table C-3: Chi-square value of product categories * purchasing criteria

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	59.652(a)	14	.000
Likelihood Ratio	59.378	14	.000
Linear-by-Linear Association	5.221	1	.022
N of Valid Cases	210		

Table C-4: Product of a chi-square test (product categories * purchasing criteria)

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.533	.000
	Cramer's V	.377	.000
N of Valid Cases		210	

Table C-5: Rank of mobile phone * fashion garment in a wilcoxon test

Ranks

		N	Mean Rank	Sum of Ranks
Fashion criteria - Mobile criteria	Negative Ranks	24[a]	27.52	660.50
	Positive Ranks	31[b]	28.37	879.50
	Ties	15[c]		
	Total	70		

a. Fashion criteria < Mobile criteria

b. Fashion criteria > Mobile criteria

c. Fashion criteria = Mobile criteria

Table C-6: Z value (or W value) of mobile phone * fashion garment from a wilcoxon test

Test Statistics[b]

	Fashion criteria - Mobile criteria
Z	-.922[a]
Asymp. Sig. (2-tailed)	.356

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

Table C-7: Rank of fashion garment * sport shoes in a wilcoxon test

Ranks

		N	Mean Rank	Sum of Ranks
Sportswear criteria - Fashion criteria	Negative Ranks	39[a]	29.73	1159.50
	Positive Ranks	16[b]	23.78	380.50
	Ties	15[c]		
	Total	70		

a. Sportswear criteria < Fashion criteria

b. Sportswear criteria > Fashion criteria

c. Sportswear criteria = Fashion criteria

Table C-8: Z value (or W value) of fashion garment * sport shoes from a wilcoxon test

Test Statistics[b]

	Sportswear criteria - Fashion criteria
Z	-3.292[a]
Asymp. Sig. (2-tailed)	.001

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

Table C-9: Rank of mobile phone * sport shoes in a wilcoxon test

Ranks

		N	Mean Rank	Sum of Ranks
Sportswear criteria - Mobile criteria	Negative Ranks	32[a]	26.55	849.50
	Positive Ranks	17[b]	22.09	375.50
	Ties	21[c]		
	Total	70		

a. Sportswear criteria < Mobile criteria

b. Sportswear criteria > Mobile criteria

c. Sportswear criteria = Mobile criteria

Table C-10: Z value (or W value) of mobile phone * sport shoes from a wilcoxon test

Test Statistics[b]

	Sportswear criteria - Mobile criteria
Z	-2.373[a]
Asymp. Sig. (2-tailed)	.018

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

Table C-11: Case processing summary of product categories * undesirable factors

Ranks

		N	Mean Rank	Sum of Ranks
Fashion undesirable factor - Mobile undesirable factor	Negative Ranks	25[a]	27.14	678.50
	Positive Ranks	34[b]	32.10	1091.50
	Ties	11[c]		
	Total	70		

a. Fashion undesirable factor < Mobile undesirable factor

b. Fashion undesirable factor > Mobile undesirable factor

c. Fashion undesirable factor = Mobile undesirable factor

Table C-12: Contingency table of product categories * undesirable factors

Product categories * Undesirable factors Crosstabulation

			Purchasing criteria									
			Un-attractive design	Not Practical	Dated	Low quality	Do not match lifestyle	Un-reasonable price	No-named brand	Limited function	Other	Total
Product categories	Mobile phone	Count	34	15	6	0	3	8	0	3	1	70
		Expected Count	27.3	7.3	4.0	8.7	7.7	10.7	1.0	2.3	1.0	70.0
	Fashion garment	Count	23	2	1	13	16	11	0	3	1	70
		Expected Count	27.3	7.3	4.0	8.7	7.7	10.7	1.0	2.3	1.0	70.0
	Sport shoes	Count	25	5	5	13	4	13	3	1	1	70
		Expected Count	27.3	7.3	4.0	8.7	7.7	10.7	1.0	2.3	1.0	70.0
Total		Count	82	22	12	26	23	32	3	7	3	210
		Expected Count	82.0	22.0	12.0	26.0	51.0	32.0	3.0	7.0	3.0	210.0

Table C-13: Chi-square value of product categories * undesirable factors

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	53.631(a)	16	.000
Likelihood Ratio	62.128	16	.000
Linear-by-Linear Association	4.99	1	.025
N of Valid Cases	210		

Table C-14: Product of a chi-square test (product categories * undesirable factors)

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.505	.000
	Cramer's V	.357	.000
N of Valid Cases		210	

Appendix D: Validation Questionnaire

This questionnaire aims to validate the results of PhD research, which provide a new method for successful collaboration for Smart Clothing development. Experts from the electronic industry, such as product designers and electronic engineers, and experts from the apparel industry, such as fashion designers and textile technicians, need to learn how to work together to bring about fully integrated outcomes of fashion design and electronic technology.

After two and a half years of extensive research the key issues which emerged as vital to influence successful integration between fashion design and electronics are as follows:

1. **A holistic view:** In this case, the holistic view refers to a situation of Smart Clothing development as a system, resulting from is a collaboration of the fashion industry and electronic sector.
2. **Participants' roles:** The roles of all participants within Smart Clothing development teams and the collaborative development process must be identified and presented.
3. **Participants' responsibilities:** Responsibilities and tasks must be precisely assigned. In this way, every participant understands what he/she has to contribute to the development team.
4. **Relationships of all participants:** The need is to explain the working relationships and show where roles and responsibilities overlap.
5. **Creative boundary extension:** The importance of each participant going beyond their normal creative boundaries is emphasised and help to identify the directions for this boundary extension is offered.

Further research was conducted in order to turn these key issues into a conceptual model, which could be applied in practice. Firstly, key elements such as research, fashion design and electronics,

were merged together to form a framework (see figure 1). Secondly, the roles and the responsibilities of all participants were allocated in the framework (see figure 2). As a result, every participant is able to understand his/her role and responsibility within the team and development process. Moreover, the relationships of all participants, which explain how each participant should collaborate with the others, were deduced. The roles and responsibilities were described in detail; thus, they can be altered easily and updated throughout the development process. Lastly, a basic boundary demonstrating the contribution of each participant was drawn and extended (see figure 3).

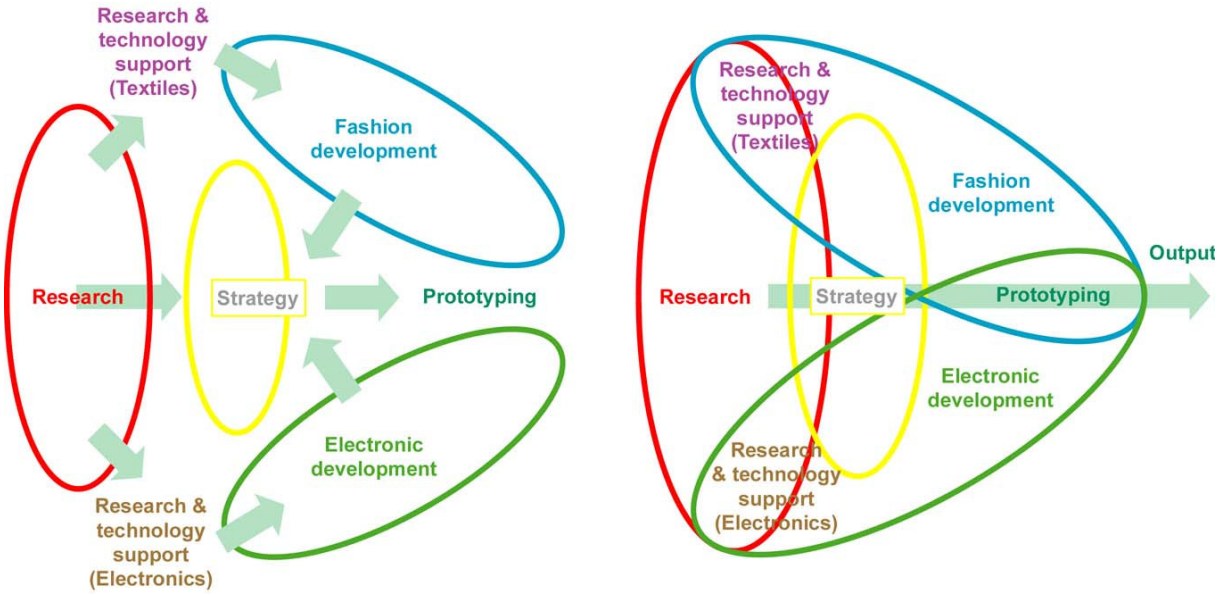


Figure 1: Key elements were merged together to form a framework.

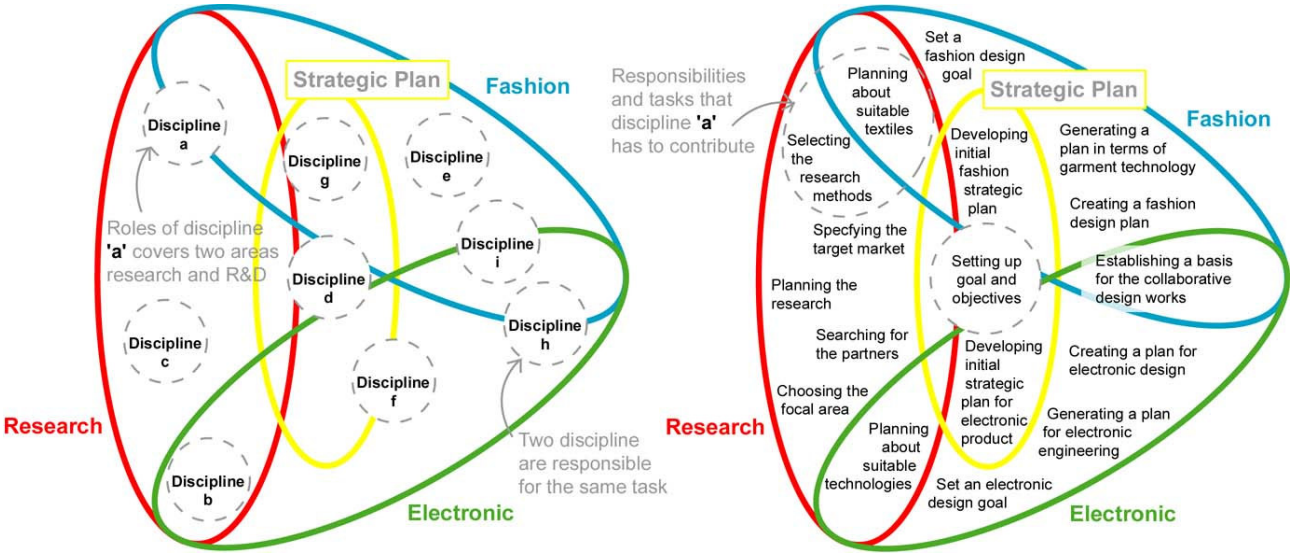


Figure 2: The roles and responsibilities are allocated according to the participants' expertises.

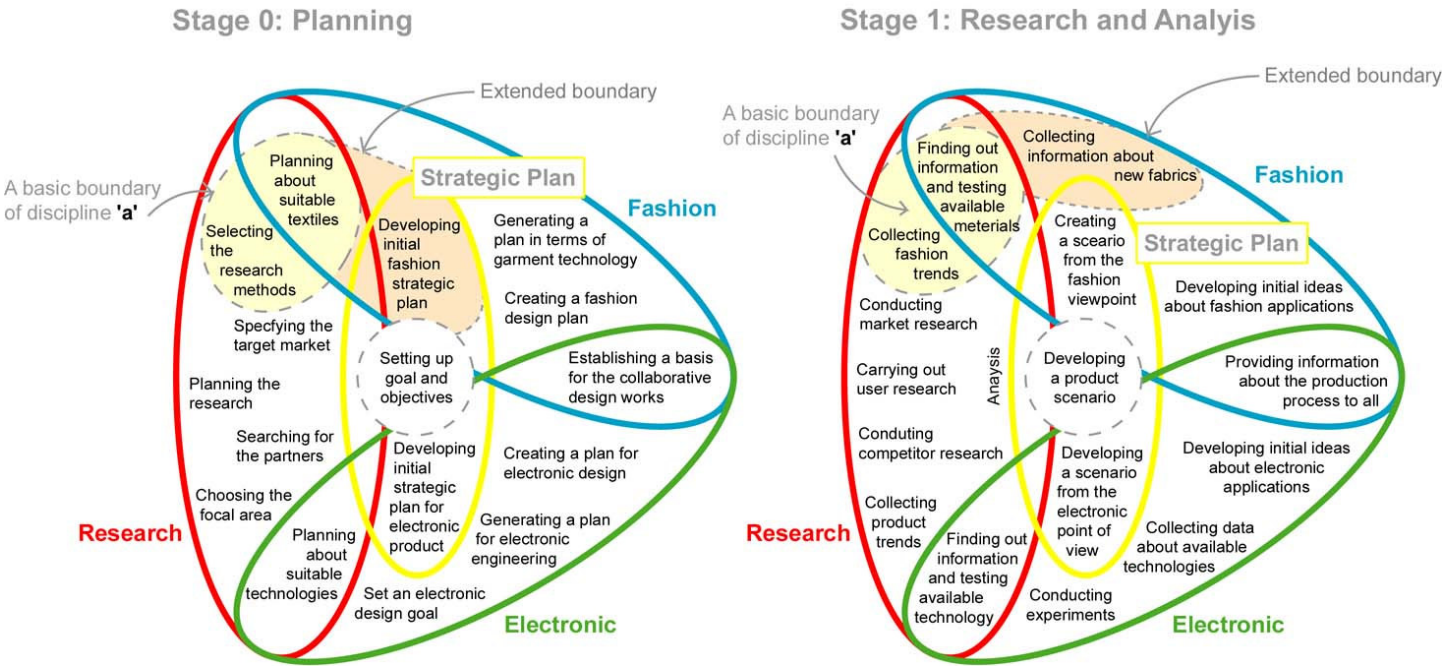


Figure 3: A basic boundary can be extended and updated according to the different stages

* This conceptual model only concentrates on the front-end of the NPD process.

Section 1: Validation of the key concepts

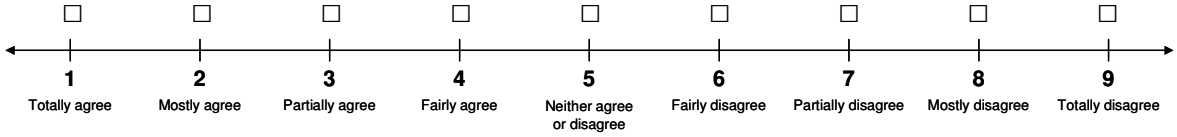
1. How important is 'providing a **holistic view** of the Smart Clothing development' to the success of the collaboration between the fashion industry and electronic industry?

☐	☐	☐	☐	☐	☐	☐	☐	☐
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Totally agree	Mostly agree	Partially agree	Fairly agree	Neither agree or disagree	Fairly disagree	Partially disagree	Mostly disagree	Totally disagree

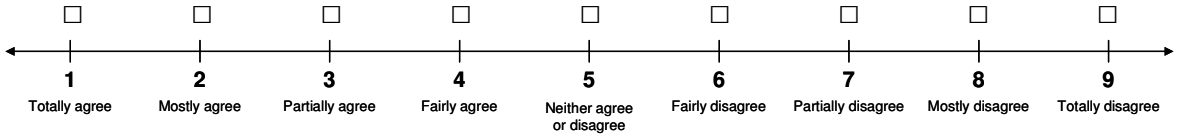
2. How important is 'clarifying the **roles of all participants involved** in Smart Clothing development' to the success of the collaboration between the fashion and electronic sectors?

☐	☐	☐	☐	☐	☐	☐	☐	☐
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Totally agree	Mostly agree	Partially agree	Fairly agree	Neither agree or disagree	Fairly disagree	Partially disagree	Mostly disagree	Totally disagree

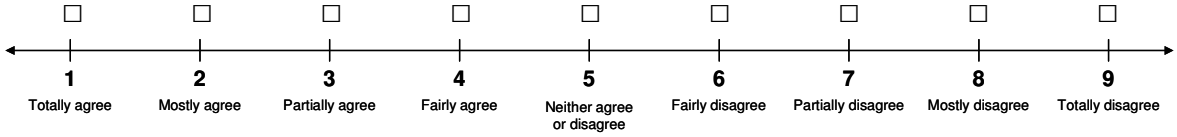
3. How important is **'**precisely describing the **responsibilities and tasks** assigned to all participants to the success of the collaboration between the fashion and electronic sectors?



4. How important is **'**explaining the **relationships of all participants in terms of role and responsibility'** to the success of the collaboration between the fashion and electronic sectors?

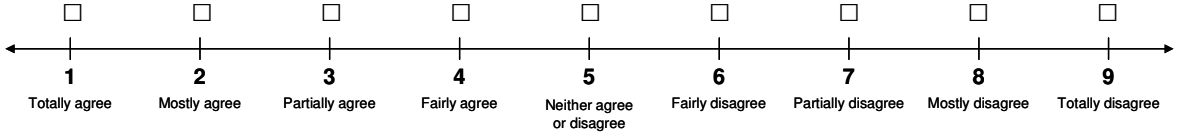


5. How important is **'**describing the related areas**,** to which the **creative boundary can be extended**' to the success of the collaboration between the fashion and electronic sectors?

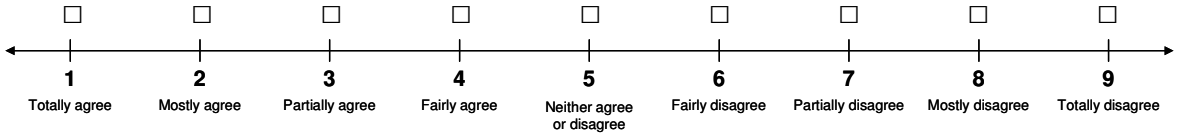


Section 2: Validation of the conceptual model

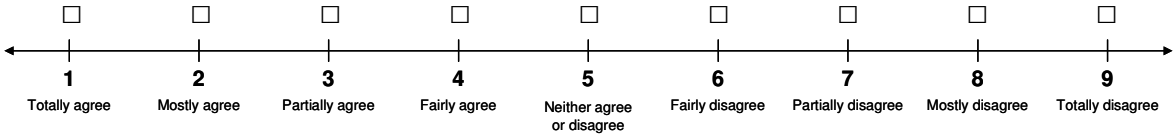
1. How practical is this conceptual model?



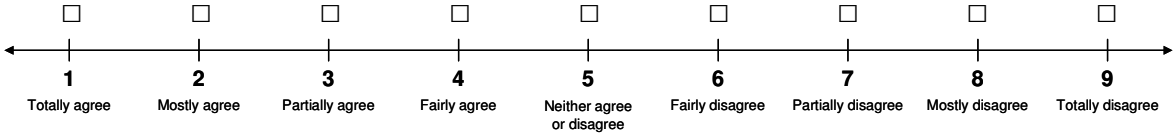
2. To what extent does it capture the **holistic view**?



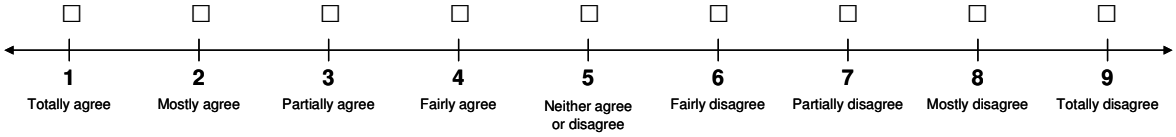
3. Does it clarify the **roles of all participants**?



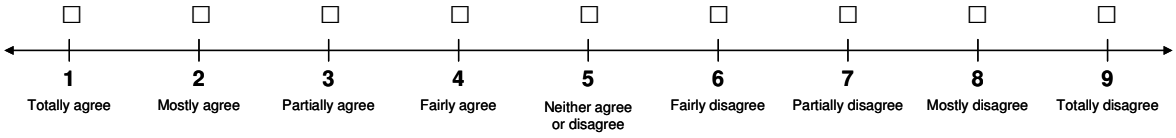
4. Does it explain the **responsibilities of all participants**?



5. Does it help to clarify the **relationships of all disciplines**?



6. Does it show how to help participants to **go beyond the creative boundaries**?



Section 3: Further Suggestion

If you have any further suggestions and/or comments, please add in this box below.

Section 4: Personal Details

Name:	Occupation:

Thank you very much for your cooperation. All information will be used for academic purpose only.

Appendix E: Profiles of the Experts

1. Mikko Malmivaara

Expertise: Concept Designer

Profile: Mikko currently works with Institute of Electronics at the Tampere University of Technology, which is regarded as one of the leading universities in the area of Smart Clothing research and development. His current job allows him to work with several engineers and scientists in the electronic field. His research group produces both basic and applied research (such as, a flexible circuit board for machine-wash proofing) as well as concepts and prototypes of Smart garments (for example, a garment that measures heart stroke volume). Mikko's job is to develop concepts of the applications and he has industrial experience from his time at one of the pioneer companies in the Smart Clothing area, Clothing+, from 1998 to 2003. His previous job as a Smart Clothing designer allowed him to work with multidisciplinary team including electronic engineers, software and hardware developers, textile technicians, etc. (Clothing+ is a key producer of Smart Clothing applications. Most products target sport practitioners, for instance, wearable devices for group communication for winter sport practitioners.) Moreover, his research teams have had many publications in the proceedings of major conferences in this field, such as IEEE's ISWC (see Rantanen, *et al*, 2000; Mikkonen, 2001 for example).

2. Päivi Talvenmaa

Expertise: Research Scientist

Profile: Päivi is a research scientist at Institute of Fibre Material Science at the Tampere

University of Technology. Her research team established SmartWearLab, which is a laboratory dedicated to conducting both basic research (such as, clothing physiology) and applied research (e.g. development of manufacturing methods) in the area of intelligent textiles, as well as developing practical Smart Clothing applications. These include workwear and professional clothing, clothing for elderly people and healthcare, sports and survival clothing, clothing for cold condition, and children wear. She has been working in the Smart Clothing field for more than four years and has had experience of collaborating with fashion design teams from both academic institutes (e.g. Department of Textile and Clothing Design, University of Lapland) and private companies (e.g. Clothing+). She has also collaborated with electronic engineering teams from both academic institutes (e.g. Institute of Electronic, Tampere University of Technology) and private companies (e.g. Nokia). Her job is to source out technical textile materials according to the specifications, conduct experiments to test their properties and apply materials onto prototype garments. She and her team have several publications in conference proceedings and academic journals (see Rantanen *et al*, 2000; Uotila *et al*, 2003 for example).

3. Professor Heikki Mattila

Expertise: Project Manager

Profile: Dr. Heikki Mattila, a Professor of Textile and Clothing Technology, was a founder of SmartWearLab at the Tampere University of Technology. His expertise includes: 1) International textile, garment and footwear industry and trade, 2) International business venture and feasibility study, and 3) Strategic planning. Moreover, he has more than 25 years work experience of international management consulting in the apparel and textile industry and trade (EA-Projects, 2001). His current research interests

are in three areas: Smart garments, interactive textiles, and apparel supply chain management. He was a project manager of major collaborative projects, namely 'Survey of intelligent textiles' and 'Wearcare.' While the former project aimed to find out what kind of intelligent textiles had been developed, and how they could be applied to Smart garments, the latter was set out to apply these materials to professional clothing and workwear in the areas of healthcare and heavy industry. These projects were funded by electronic companies (e.g. Nokia), textile companies (e.g. Finlayson Forssa Oy), and the National Technology Agency of Finland (TEKES). Dr Heikki has several publications in the Smart Clothing field, e.g., 'Wearable Technology for Snow Clothing' (Mattila, 2001).

4. Lucy Dunne

Expertise: Functional Apparel Design/Engineering

Profile: Lucy Dunne is a graduate of the BS Textile and Apparel, and MA Apparel Design, Cornell University. She is currently studying for a PhD in the area of Smart Clothing – pressure sensor shirts in the Department of Computer Science at the University College of Dublin. Her expertise includes functional apparel design and wearable technology. Furthermore, she has had work experience at the i-wear clothing consortium, which was an international collaboration that dedicated to investigate and develop intelligent clothing. Her applications, e.g. 'Smart Jacket', won several awards, and were exhibited in many important events, such as the 6th IEEE International Symposium on Wearable Computers, SIGRAPH's Cyberfashion show in 2003 and 2004, and the NEMO Science Museum, Amsterdam. In addition, she was invited to present her work and talk about Smart Clothing design and wearable technology at many professional meetings, e.g., the International Textile and Apparel Association pre-conference Workshop, Nike World Headquarters

Portland, US, 2004. Lucy has a number of publications in the proceedings of major conferences in this field, such as IEEE's ISWC and ICEWES (Dunne, 2004).

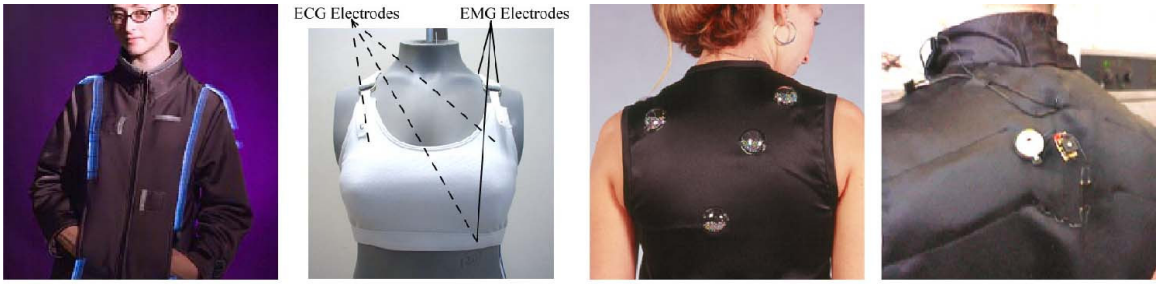


Figure E-1: Lucy Dunne's Smart garments

5. Verity Parker

Expertise: Conductive Textile Development

Profile: Verity Parker is a graduate of the BA Industrial Design and Technology at Brunel University. At present, she is studying for a PhD – 'Electronically Knitted Structures as Strain-Sensing Devices.' Her knowledge involves technical subjects (Digital/Analogue electronics, Mechanical principles, Mechatronics, Pneumatic systems, Interfacing, etc), as well as design subjects (Contextual design, Graphic Design, Anthropometrics, Ergonomics, etc). Currently, she is a teaching assistant in the areas of digital electronics, structures, pneumatics, etc. Verity has experience of research and prototype development in the area of pressure sensing using conductive woven fabrics at the Design for Life research centre, which produced many applications in Smart Textiles field, for instance, a woven circuit board that could be applied in furniture, automotive, healthcare, sport, and education. Her works were presented at important events, such as EPSRC Postgraduate Research Conference in Electronics, Phonics, Communications and Networks, and Computing Science (PREP) 2001 and 2002, and Royal Institution.

6. Francis Davis

Expertise: Business Development

Profile: Francis Davis is a business development consultant at Xybernault®, which is a pioneer in the research, development and commercialisation of wearable computer technology, hardware and related software. For example, a wearable computer reduces the time needed to track and report defects in engines at a factory. Currently, Xybernault® wearable applications are employed by the Department of Defence, US, and many leading companies, e.g. FedEx Express Air Operation and Bell Canada, which specialises in mobile communication service (Davis, 2002). Xybernault® continues expanding its applications into different areas. For instance, the company has been developing applications to reduce the time for queueing in conjunction with a lot of airlines, hotels, retail stores and fast-food restaurants. Francis presented Xybernault® works that include: research, case studies, product port folio, overview of the future products, etc, at many important events, such as IEE Eurowearable Workshop 2002 and CeBIT, which is an international trade show specialising in information and telecommunication technology. Moreover, he was invited to give a presentation at several academic institutes, including the University of Cambridge Computer Laboratory.

Design for Life (DfL)'s Sensory Fabric (1999 - 2000) | Design for Life (DfL)'s Sensory Fabric (1999 - 2000) | Xybernault's wearable computer (1999 - present) | Xybernault's wearable computer (1999 - present)

Figure E-2: Applications developed by Design for Life research centre and Xybernault®

Appendix F: Results of Model Validation

Table F-1: Responses of the experts towards the first key issue

Question: How important is **'**providing a **holistic view** of the Smart Clothing development' to the success of the collaboration between the fashion industry and electronic industry?									
Disciplines	1	2	3	4	5	6	7	8	9
Smart Clothing concept designer		X							
Technical textile research scientist		X							
Project manager		X							
Smart Clothing designer/engineer	X								
Conductive textile developer	X								
Business development consultant	X								

Table F-2: Responses of the experts towards the second key issue

Question: How important is **'**clarifying the **roles of all participants involved** in Smart Clothing development' to the success of the collaboration between the fashion and electronic sectors?									
Disciplines	1	2	3	4	5	6	7	8	9
Smart Clothing concept designer		X							
Technical textile research scientist	X								
Project manager	X								
Smart Clothing designer/engineer	X								
Conductive textile developer	X								
Business development consultant	X								

Table F-3: Responses of the experts towards the third key issue

Question: How important is **'**precisely describing the **responsibilities and tasks** assigned to all participants to the success of the collaboration between the fashion and electronic sectors?									
Disciplines	1	2	3	4	5	6	7	8	9
Smart Clothing concept designer	X								
Technical textile research scientist			X						
Project manager		X							
Smart Clothing designer/engineer	X								

Question: How important is **'**precisely describing the **responsibilities and tasks** assigned to all participants to the success of the collaboration between the fashion and electronic sectors?									
Disciplines	1	2	3	4	5	6	7	8	9
Conductive textile developer	X								
Business development consultant	X								

Table F-4: Responses of the experts towards the fourth key issue

Question: How important is **'**explaining the **relationships of all participants in terms of role and responsibility'** to the success of the collaboration between the fashion and electronic sectors?									
Disciplines	1	2	3	4	5	6	7	8	9
Smart Clothing concept designer			X						
Technical textile research scientist			X						
Project manager		X							
Smart Clothing designer/engineer	X								
Conductive textile developer	X								
Business development consultant	X								

Table F-5: Responses of the experts towards the fifth key issue

Question: How important is **'**describing the related areas**,** to which the **creative boundary can be extended**' to the success of the collaboration between the fashion and electronic sectors?									
Disciplines	1	2	3	4	5	6	7	8	9
Smart Clothing concept designer	X								
Technical textile research scientist				X					
Project manager	X								
Smart Clothing designer/engineer	X								
Conductive textile developer		X							
Business development consultant			X						

Table F-6: Responses of the experts towards the practicality of the model proposed

Question: How practical is this conceptual model?									
Disciplines	1	2	3	4	5	6	7	8	9
Smart Clothing concept designer	X								
Technical textile research scientist		X							
Project manager		X							

Question: How practical is this conceptual model?									
Disciplines	1	2	3	4	5	6	7	8	9
Smart Clothing designer/engineer				X					
Conductive textile developer		X							
Business development consultant			X						

Table F-7: Responses of the experts towards the implementation of the first issue

Question: To what extent does it capture the **holistic view**?									
Disciplines	1	2	3	4	5	6	7	8	9
Smart Clothing concept designer		X							
Technical textile research scientist		X							
Project manager	X								
Smart Clothing designer/engineer		X							
Conductive textile developer	X								
Business development consultant			X						

Table F-8: Responses of the experts towards the implementation of the second issue

Question: Does it clarify the **roles of all participants**?									
Disciplines	1	2	3	4	5	6	7	8	9
Smart Clothing concept designer		X							
Technical textile research scientist		X							
Project manager	X								
Smart Clothing designer/engineer				X					
Conductive textile developer		X							
Business development consultant				X					

Table F-9: Responses of the experts towards the implementation of the third issue

Question: Does it explain the **responsibilities of all participants**?									
Disciplines	1	2	3	4	5	6	7	8	9
Smart Clothing concept designer	X								
Technical textile research scientist			X						
Project manager		X							
Smart Clothing designer/engineer						X			
Conductive textile developer					X				

Question: Does it explain the **responsibilities of all participants**?									
Disciplines	1	2	3	4	5	6	7	8	9
Business development consultant				X					

Table F-10: Responses of the experts towards the implementation of the fourth issue

Question: Does it help to clarify the **relationships of all disciplines**?									
Disciplines	1	2	3	4	5	6	7	8	9
Smart Clothing concept designer	X								
Technical textile research scientist		X							
Project manager		X							
Smart Clothing designer/engineer				X					
Conductive textile developer		X							
Business development consultant		X							

Table F-11: Responses of the experts towards the implementation of the fifth issue

Question: Does it show how to help participants to **go beyond the creative boundaries**?									
Disciplines	1	2	3	4	5	6	7	8	9
Smart Clothing concept designer	X								
Technical textile research scientist		X							
Project manager		X							
Smart Clothing designer/engineer			X						
Conductive textile developer		X							
Business development consultant		X							

Table F-12: Further suggestions of all the experts

Disciplines	**Suggestion**
Smart Clothing concept designer	This is clearly good work! The model starts out clear and advances to even small details. I especially like the idea of going beyond the limits of creative boundaries; I understand it as giving the parties ideas as to how work around one's own direct field of expertise. This would be great if it really works and does encourage people to venture further beyond their normal routine, but as always, in practise it will be up to the individuals and possibly even more to the group leader.
Textile research scientist	No further comment or suggestion

Disciplines	Suggestion
Project manager	No further comment or suggestion
Smart Clothing designer/engineer	The main issue I find with the diagram is that it over-simplifies the component processes and allows stereotypes to be perpetuated. One of the major obstacles in inter-disciplinary collaboration is lack of any real understanding between disciplines of the other's expertise, value, and process. A more detailed model which outlined the actual processes involved might be more informative, and allow participants to appreciate the complexities of their partner's work. For instance, the heading "Fashion Design" carries many heavy connotations to outsiders that may not actually be true. In the world of apparel, "fashion" refers specifically to the artistic or aesthetic design of clothing. Apparel design (or functional apparel design) refers to the engineering process by which garments are designed taking into account physics, chemistry, textiles, and human factors. Wearable technology would probably be best designed by a clothing engineer than by a clothing artist, if that makes sense. Using the term "fashion" when communicating to engineers implies that the individual performing certain tasks is more of an artist than an engineer, a common misconception that can prevent the investigation of key wearability issues. Perhaps the model could distinguish between the engineering design of the garment or wearable structure and the aesthetic design. I also worry that there is not enough collaboration visible in the model at the early stages. The important difficulty in inter-disciplinary design is that each segment influences the design of the others. Therefore the garment structure will impact the electronic design, layout, fabrication, and vice versa. Is this meant to be contained in the "research" group? What disciplines do the members of the "research" group belong to? I would almost rather see a process where the designers and researchers are the same people, working together the entire time, and then the prototype design is handed off to a technical team for production design.
Conductive textile developer	I think language is also an important factors as in the three different disciplines outlined there are set of jargon associated – it may be necessary to develop new words to explain concepts or actions that brings together more than one discipline. This misunderstanding of language has potential to result in quite wide complications in terms of expressing concepts and explaining actions. I think this model is very necessary and will help development in this area.
Business development	No further comment or suggestion

Appendix G: Validation Result Analysis

Table G-1: Results of the Friedman test performed to assess the two-tailed prediction, that there would be a difference between the scores given to the five key issues

Ranks

	Mean Rank
Holistic view	3.08
Participants' roles	3.67
Responsibility	3.17
Relationship	2.58
Boundary extension	2.50

Test Statistics[a]

N	6
Chi-Square	3.611
df	4
Asymp. Sig.	.461

a. Friedman Test

Table G-2: Results of the Friedman test performed to assess the two-tailed prediction, that there would be a difference between the scores measuring the practicality of the implementation of five key issues within the conceptual model

Ranks

	Mean Rank
Practicality of a holistic view	3.67
Practicality of participants' roles	3.00
Practicality of responsibilities	1.75
Practicality of relationships	3.17
Practicality of boundary extension	3.42

Test Statistics[a]

N	6
Chi-Square	6.695
df	4
Asymp. Sig.	.153

a. Friedman Test