



# **A Uniform to Welcome: Identity and Style through Design and Mixed-Method Pattern Cutting Approach**

*A Human Centered Design exploration of a hospital volunteer's uniform.*

**This exegesis is submitted to Auckland University of Technology for  
the degree of Master of Art & Design, [Product Design].**

**Leona (Yuxi) Wang**

Bachelor of Art and Design (Hons) [Fashion]

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## | Attestation of authorship

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## | Abbreviations

<b>ACH</b>	Auckland City Hospital
<b>ADHB</b>	Auckland District Health Board
<b>AR</b>	Action research
<b>BVUES</b>	Bluecoat Volunteers' Uniform Expert Survey
<b>C.F</b>	Centre front
<b>DHW</b>	The Design for Health & Wellbeing Lab
<b>GH</b>	Greenlane Hospital
<b>HCD</b>	Human-centered design
<b>H &amp; F</b>	Hawes and Freer

## | Abstract

Some jobs may require having a distinctive uniform to serve the worker's role. A successful modern uniform not only brings a distinctive aesthetic to the wearer but also profiles the organisation's image. This practice-led research project explored the role of a hospital volunteer's uniform for a group called the Bluecoats, at a large city hospital, to improve the uniform experience for the visitors, patients, staff and wearers of the uniform.

This research project used a human-centered design (HCD) process with action research (AR) methodology to better understand and enhance user experience of the uniform. It also explored how traditional two-dimensional cutting techniques combined with contour cutting could be used to fit a diverse range of silhouettes and age groups through a single design.

The completion of this master's project requires both a series of practice-based outcomes and a supporting written exegesis. This highly visual, documented exegesis illustrates the design research journey from an early research phase, design concept development stages to project reflection and evaluation.

The research resulted in a set of hospital volunteers' uniforms of a design that seeks to address, through practice, the improvements and concerns I identified with respect to the current uniform.

## | Introduction

Just as fashion mirrors the dynamics of culture, economy and political changes of the society of its time, clothing reflects both the inward and outward characteristics and identity of a person or organisation. Research (Birdwhistell, 1995) shows that sixty to ninety percent of the meaning exchanged during an interaction is established through nonverbal communication, and clothing as a subliminal language is a key component of this. Although uniform is a separate category from mainstream fashion, the communication and interaction network established through uniform is far more direct, definite and intense. Compared to other clothing styles, uniform is tailored to publicise a particular type of identity and message. The message and emotion delivered by the uniform is location-specific as is revealed when the effect of the uniform in context and out of context is compared.

Krippendorff (2006) introduced the idea that the meaning communicated by design or product has always held a central role in the design professions and weighed more than function in the topic of consumer behaviour. Examples mentioned by Krippendorff (2006) include high-heeled shoes and Lamborghini cars. Although it is common sense that high heels are ergonomically unsuitable for the wearer, the motivation, for various aesthetic reasons, to wear high heels encourages the mass production and widespread adoption of this nonuser-friendly product. Thus, one approach to designing is to focus on the aesthetics.

Fashion design often employs a design approach that is more market-centered, although, in some specialisations, such as sportswear, childrenswear and clothing for the elderly, fashion may be required to accommodate the more

practical aspects. Apart from these specialisations, the designer usually focuses more emphasis on sources of inspiration, target markets and practical techniques. On the other hand, “[a] good fashion design curriculum encourages students to come up with informed, creative solutions to the problem of dressing people for their lives” stated Cabrera (2010, p. 8). Cabrera feels that an aesthetically driven approach is a misunderstanding, as designers then treat real customers and their needs as the enemy of creativity, and the end product resembles ideas rather than actual clothing.

Kelley (2002)<sup>1</sup> is also interested in real customers: “product design has become much less about the hardware and more about the user experience.” A fashion-related project with Prada New York in 2001 is presented as an example. The aim of the project was to enhance retail experience with modern technology based on user experiences. Designs created in this project, such as staff devices<sup>2</sup> and closet display<sup>3</sup> helped the customer to visualise the clothing; a liquid-crystal glass changing room<sup>4</sup> made the communication with friends or family outside more convenient; and a magic mirror<sup>5</sup> which allowed the customer to see their back view and how fabric flowed on their body in motion. These designs acknowledged the demand to design for real people and displayed the concept of solving real problems creatively and answering creative problems realistically.

My project, an exploration of the HCD process in hospital volunteers’ uniform design, focused on investigating user needs in the process of designing contemporary uniforms that are suitable for multiple users in a complex hospital

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<sup>1</sup>[https://www.ted.com/talks/david\\_kelley\\_on\\_human\\_centered\\_design](https://www.ted.com/talks/david_kelley_on_human_centered_design)

<sup>2</sup>When the customer showed interest in any product in the store, a staff member could use this device to scan the product and then it could be shown on any screen in the store. The customer could see the colour, style and how it appeared on a model or runway.

<sup>3</sup>The closet in the fitting room was connected to a 3D scanner which read all radio-frequency identification tags (RFID) in the closets. All the visual images or merchandise information were translated from the RF tag to a touch-screen in the fitting room to assist the customer gain more understanding of the product that they were interested in.

<sup>4</sup>Liquid-crystal glass becomes opaque at a touch of a switch. When switched to transparent mode, it allows for others outside to review and communicate.

<sup>5</sup>Plasma screen embedded in mirror for multi-angle viewing and there was a three-second delay in the ‘magic mirror’ which helped the customer to see how the fabric flowed in motion and also see the back view.

environment. It employed two-dimensional cutting techniques as the primary inspiration. The most significant aim of this project was to explore how a uniform may be used to help enhance feelings of welcome and safety for visitors to Auckland City Hospital (ACH) and Greenlane Hospital (GH). The design aim was to create a set of modern and aesthetically pleasing female and male 'Bluecoat' uniforms to fulfill Bluecoats' role in the ACH and GH.

The positioning statement and the reason why I conducted this project will be explained in Chapter One.

The research is contextualised by reviewing literature that is relevant to the research question or field in Chapter Two.

Chapter Three will introduce the overall methodology framework and the methods of which it is comprised, then show how each of these methods is tailored for use in addressing the research question.

The fourth chapter will present an overview of the research and design development process. In-depth analysis and interpretation of findings will be drawn from each design cycle to show how I selected the design direction and formed design decisions.

Lastly, this study will conclude with my research findings as well as reflecting and evaluating the overall design approach.



**Positioning statement**



## | Positioning statement

My interest in uniform design started about two years ago when I graduated with Honours in Fashion Design and joined Argyle Schoolwear. Since my job responsibilities are focused mainly on school uniform design, production and import, this project was a good opportunity to strengthen my knowledge in uniform design.

Traditional and ethnic cultures have always been the source of my creative inspiration. The primary focus of study for my Honours project was to experiment with two-dimensional cutting methods to create clothing appropriate for a current fashion market. I felt frustrated when the project was finished knowing that I had only just started to scratch the surface in this particular cutting method. This current project has afforded me the opportunity to revisit and advance my knowledge, developing a greater understanding of the challenges that this cutting method exposes when undertaking a complex and disciplined design brief, such as this uniform project proved to be.

In defining the project brief, my research question emerged - how does a fashion designer design a contemporary volunteers' uniform, suitable for a wide range of body shapes, for volunteers located in a complex hospital environment - with the aim of helping enhance feelings of welcome and safety for visitors. The HCD approach rather than the market-centred or aesthetically-driven approaches in which I was educated, offered a new way to explore my design process to generate designs that would comprehensively meet user needs.



# Contextual Framework

This chapter is divided into two sections. The first section begins with the exploration of the definition and types of modern uniform. Theories of motives for wearing particular clothes and their connection to the evolution of uniform are explained in the following section. The next part concentrates on the purpose of uniform in the areas of function, communication and visual recognition. It also identifies the benefits that uniform brings to both organisation and employee.

The second section focuses first on use of the volunteer uniform in a healthcare environment and includes examples of current national and international hospital volunteer uniforms, identifying how the role of the uniform is significant to the hospital and to the wearer. An overview of casual styles of uniform concludes this section.

## | The definition of uniform

According to the Oxford Dictionary, uniform is defined as a type of clothing that is closely associated with a specific group of people. Compared to other clothing genres, uniform more commonly indicates power, authority and masculinity because of its connection with militarism (Hertz, 2007). To analyse uniform from a fashion perspective, its design is often derived from a contemporary fashion or silhouette but it is altered to conform to a particular discipline or function, and then it becomes frozen in its particular mode, often continuing there long after the fashion itself has changed (Ewing, 1975).

Modern uniforms can be differentiated into two groups: unrestricted, as in figure 1, and restricted, as in figures 2 and 3. Restricted uniforms can only be worn by qualified people and are designed under a government edict, for example, for the military or the police. Examples of unrestricted uniforms include those designed for hotels, banks, schools and sports teams.



Figure 1: Henry, H. (2015). Unrestricted uniforms.



Figure 2: C@rda Post. (2016). Restricted uniform – police officer in Japan (left).

Figure 3: C@rda Post. (2016). Restricted uniform – police officer in United Kingdom (right).

Bian (2011) suggested that contemporary uniform styles can be unpacked into four groups: 'fashion uniforms' (Fig. 4), industrial workwear, professional uniforms and protective occupational uniforms. 'Fashion uniform' indicates a non-uniformed formal business outfit, which tends to be fashionable and personalised. It is usually possessed by middle to upper class office workers, such as executives, secretaries or clerks. This group has a relevant working environment to wear these high fashion clothes and also relatively good income to be able to afford them. In contrast to the professional uniforms, a fashion uniform is more a pursuit of taste but the functional characteristics of a basic uniform are still maintained.



Figure 4: Pappas, C. (2014). When fashion meets the office.

The style and silhouette of industrial workwear (Fig. 5) is designed to allow for functionality while providing protection to the workers. This uniform is an inevitable outcome of industrialization and continuous improvement in uniforms will be a certain consequence thanks to the development of technology and changes in the work environment (Bian, 2011). Compared to professional uniforms, this uniform has a wider user range such as industrial, production and outdoor workers.



Figure 5: Workwear Lancashire. (n.d). Industrial workwear.

Professional uniform (Fig. 6) is widely used by many organisations and is especially designed for the requirements of their workers. It distinguishes itself from other uniforms because of the strong connection with the identity of the enterprise, which it is advertising. It enhances the professionalism and recognition of a company or organisation. Commercial enterprises, government organisations and non-profit organisations all employ such uniforms.



Figure 6: Bywater, M. (2014). Professional uniform – flight attendant uniform for Virgin Atlantic.

Protective occupational uniform (Fig. 7) is generally used in special working environments or conditions. This type of uniform is frequently associated with advanced technologies (e.g. space suits, blast shields and protective fire clothing).



Figure 7: Bristol Uniform. (2016). Protective occupational uniform.

“Clothes do more than just keep people warm and safe, fashion and dress are active construction processes that allow individuals to present a chosen version of self”  
(Dorrance, 2011, p. 4).

*Figure 8: Yeste, T. (2015). Rose des vents: julia hafstrom by txema yeste for numéro.*



## | The evolution of uniform

The language of clothing has played a prominent role as an introductory means of communication between humans for thousands of years (Lurie,1981). Clothing is like a mirror of the wearer; it is capable of conveying multilayered messages such as emotion and social identity, and can also help differentiate people into different groups. Although clothes are necessary for survival and protection, they also present a blank canvas for creative expression.

*Please see appendix 1 for related research (p. 142).*

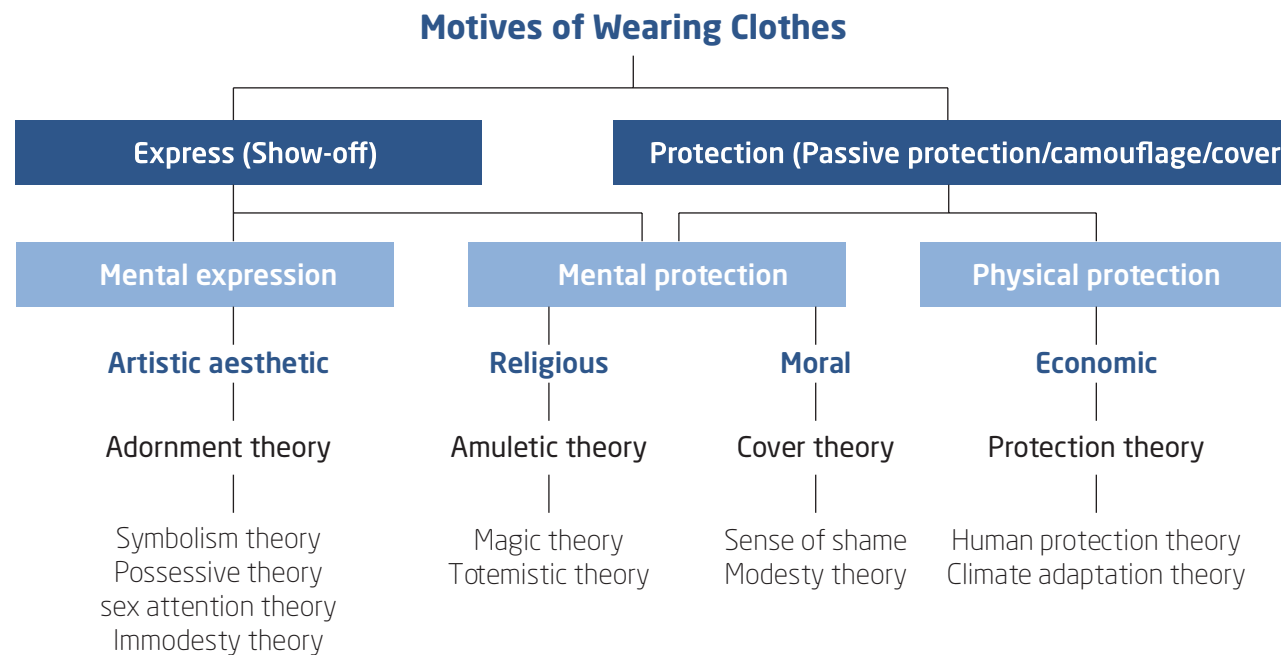


Figure 9: Li, D. Z., (2005). Motives for wearing clothes [Translated Graph]

**“No matter how much we want to believe that education and experience determine a patient’s satisfaction with care, we can’t ignore that our attire creates a first impression, and first impressions count”**

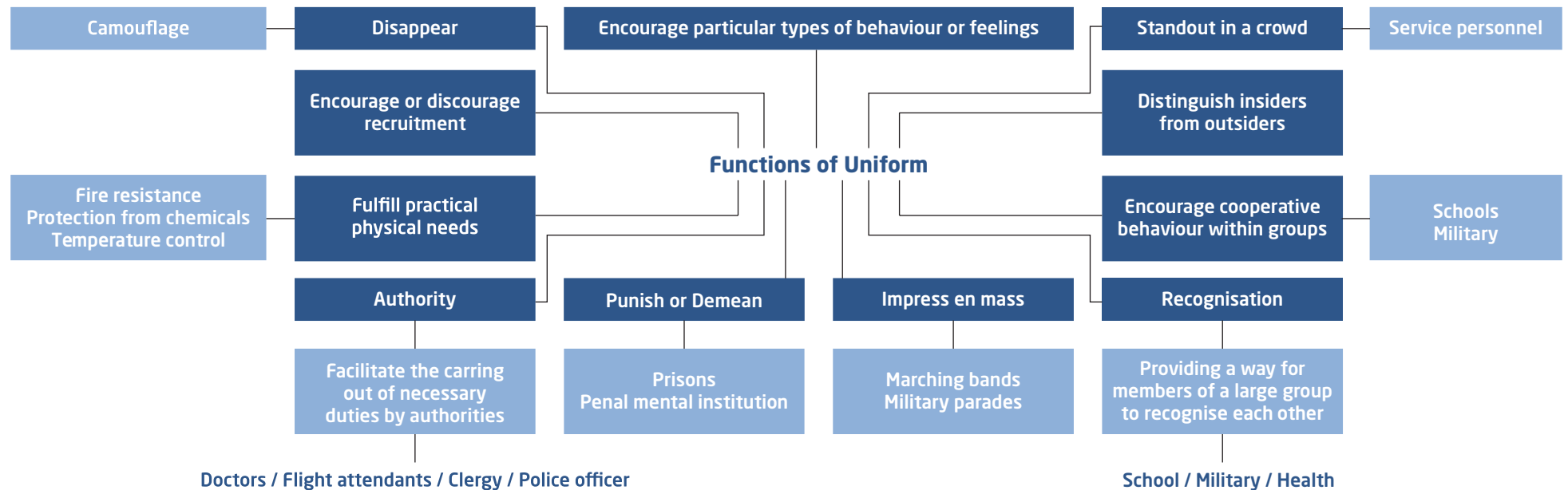
**(Spragley & Francis, 2006, p. 55).**

## | Purpose of a uniform

### Function

A uniform is capable of being designed to serve particular or multiple functions, many of which may be achieved together in a single design, depending on the situations and requirements of the organisation (Fig. 10). For example, standing out from a crowd may be important for service personnel (e.g. food court cleaners and retail assistants); military and school uniforms can encourage and enhance co-operative behavior, while industrial uniforms are designed for practical physical requirements, such as temperature control or protection from chemicals (Hertz, 2007).

Figure 10: Wang, L. (2016, November). Functions of uniform [Graph].



Function, communication and visual recognition are important purposes closely related to the Bluecoat<sup>6</sup> uniform design. During my research, I was curious to discover why the Air New Zealand cabin crew uniform was re-branded just four years after the controversial redesigned uniforms by the fashion label Zambesi in 2005 (Fig. 11) which required “[a] warm, natural and friendly personality with a strong sense of responsibility ... Flight Attendants must be able to deliver the service our customers value in a uniquely Pacific way” (Sayers, 2007, p. 3).

*Please see appendix 2 for related research (p. 146).*



Figure 11: Fashion Museum New Zealand (2014), Air New Zealand belted teal and grey uniform designed by Zambesi from 2005 to 2010.

<sup>6</sup>See page 36 for an explanation of who the Bluecoats are.

## | Communication and visual recognition

Fiska (as cited in Barnard, 2002) introduced the concept that there are two main schools of communication. These are described by Barnard (2002) as the 'process' and 'semiotic' schools. He suggested that the 'semiotic' school is more relevant in terms of communication in fashion and clothing. Bringing this communication theory into fashion, the 'process' school indicates that fashion or clothing can be used as a medium for the sender to 'say' something to the receiver. Clothing is selected by the wearer based on daily activities, the mood and the messages they would like the viewer to receive (Fig. 12).

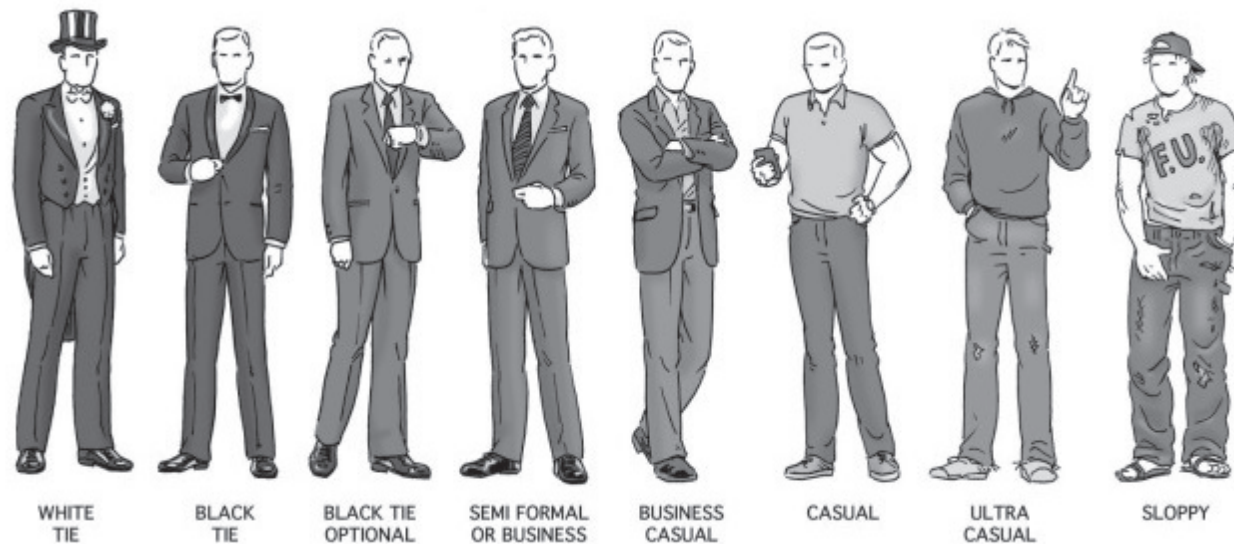


Figure 12: Centeno, A. (n.d). Visual language in clothing styles.

The 'semiotic' school makes an individual a community member through clothing and the sending and receiving of its messages (Barnard, 2002). It implies that the receiver is the more important role in this model. The nonverbal cues in clothing and the assumptions the receiver forms based on culture, background and personal experiences, help with the identity construction process. This is the reason that clothing is capable of communicating personal details such as origin, personal characteristics and taste, and is often used to do so. Clothes can also be used to demonstrate and express emotional messages to the viewer.

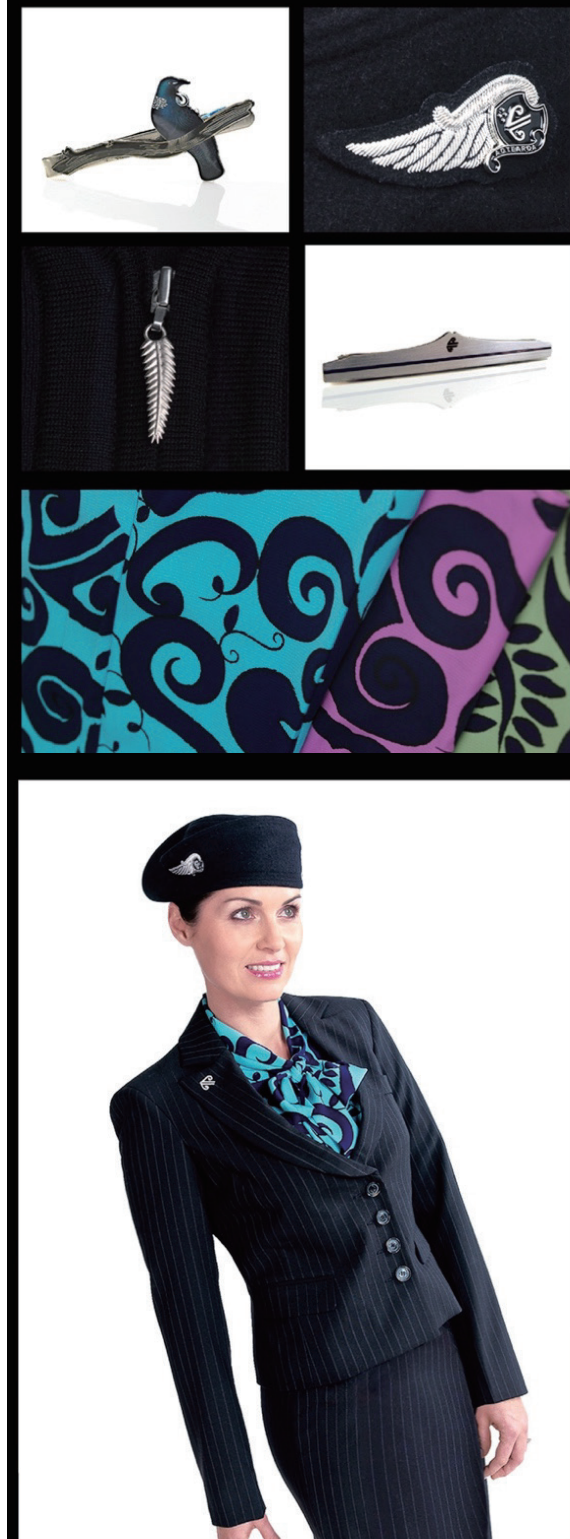
The types of visual recognition and the communication characteristics of clothing are further magnified by uniforms. These elements operate at a symbolic level and allow both the wearer and observer to establish interactions based on visual clues (Hertz, 2007). This visual information leads to expectations as to the wearer's behaviour and social status. Understanding the meaning of uniform is developed through visual transmission and cognitive categorisation. In a similar way, uniform mediates interactions between individuals and groups. It also carries a large amount of information about the wearer's organisation.

From an organisational point of view, a uniform is distinctive and unified clothing worn by members of the same organisation or for a specific type of work (Rafaeli, Dutton & Lewis, 1997). In a broader sense, this can be described as organisational dressing. A uniform brings a number of benefits to an organisation. It is a meaningful expressive symbol of a company's enterprise characteristics and professionalism. It helps in the establishment of the organisation's identity, it promotes the company, can give a welcoming impression to the customers and can differentiate between roles in a complex working environment. Firstly, the style, colour combinations, accessories and corporate logos of a uniform may enable the public to recognise where the wearer belongs (e.g. industry, occupation and role).

Secondly, as a primary visual communicator between organisations and the public, a uniform has been described as a company's business card (Bian, 2011). It contributes to the company's broader marketing and branding effort. For example, the unique textile print design on the Air New Zealand uniform and accessory pieces further express the role and emphasise company image to the public (Fig. 13). Thirdly, a unified style and matching colour reinforces a positive and reassuring impression to a customer. Traditionally, in a hospital setting, the white nurse's uniform gave an aura of professionalism to the wearer (Rafaeli & Pratt, 1993). Today's nurses' scrubs do not have that effect - nursing staff depend upon the hospital hierarchy for their authority. Finally, to staff members, the uniform provides a means of quick and accurate identification leading to efficient communication, supervision and collaboration, while those interacting with the organisation may more easily identify the staff member they are seeking.

To employees, dressing in a similar style, or uniform, can help create cohesion, and enthusiasm for work may be increased as a result (Rafaeli, Dutton & Lewis, 1997). A uniform can motivate employees to adhere to the company's expectations. Craik (2005) stated that uniform rules are a set of 'not' statements designed to limit unacceptable and unwelcome behaviour among employees. Considered from an organisational perspective, a uniform is not only a method to role-bind employee behaviour and gain discipline, but it also assists in strengthening a wearer's punctuality, responsibility and the sense of belonging (Woodard, 1990). Further, a uniform helps employees with self-identification. Szasz (as cited in Pearson et al, 2001, p. 148) states that 'I look like a nurse, therefore I am a nurse'. A uniform deepens the connection between role and wearer, which may help the wearer to be immersed in the job.

Figure 13: NZ Fashion Museum. (2011). Air New Zealand printed Koru uniform.



## | Use of uniform in a healthcare environment

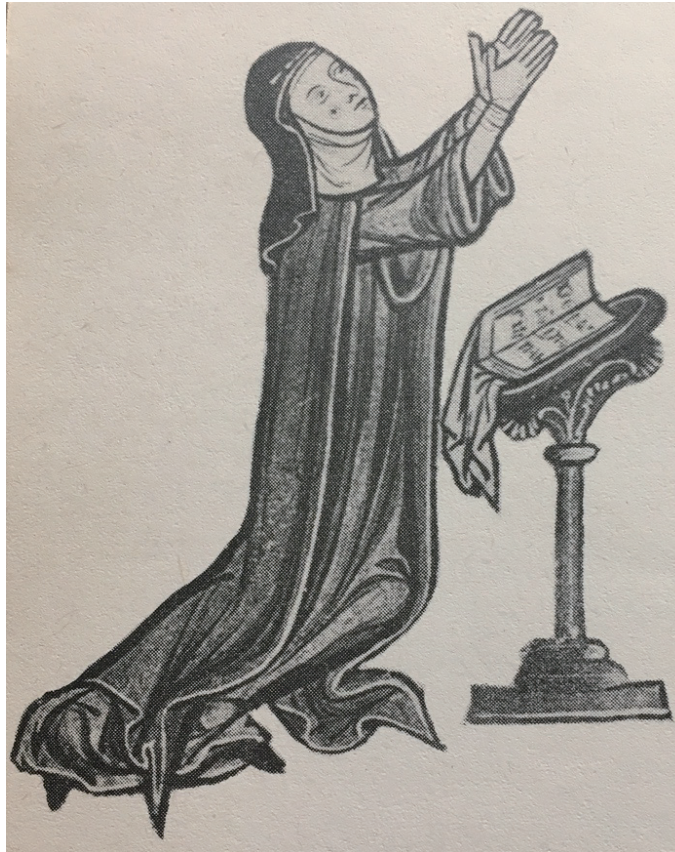
The plain habit (Fig. 14) worn by the Roman Catholic religious community can be traced back to the early centuries of the Christian era, and is therefore the first established and longest lasting uniform (Ewing, 1975). According to Spragley and Francis (2006), the earliest reference in modern literature of the nurse's uniform was to the Kaiserswerth Deaconess<sup>7</sup> Institute's Nurse Training School founded by Theodor and Friederike Fliedner in 1836 (Fig. 15). The Deaconesses were the first medical personnel who performed voluntary work.

*Please see appendix 3 for in-depth research of medical uniform development (p. 148).*

Figure 14: Ewing, E. (1975). Plain habits of nuns (left).

Figure 15: Nadine, F. (n.d). Early women members - order of St John (right).

<sup>7</sup>Deaconesses, the first parish workers and district nurses, were identified as the predecessors of the nuns who wore distinctive dress in the 6th century.



## | Hospital volunteers

Bluecoats, also called Blue Coats Ambassadors, are one group of the volunteers within the Auckland District Health Board (ADHB). A Bluecoat's main job responsibilities are closely associated with non-medical related tasks such as giving directions to visitors and answering general questions. Bluecoats are a volunteering organisation and are comprised mainly of elderly people, some of whom have been involved for as long as thirteen years. Hotchkiss (2007) is of the opinion that hospital volunteers are becoming increasingly important as a resource and that they are a positive influence in modern hospitals, to both patients and visitors. According to the 'Enquiries at Our Entrances' research<sup>8</sup> (Subramoney, 2015), there were 1261 total enquiries received by Bluecoats at Auckland City Hospital over the week 31 August to 4 September<sup>9</sup> - of which the most common were directions to wards, to the emergency department and enquiries from patients.

A 2016 study by Statistics New Zealand found that there were 97,000 non-profit organisations in New Zealand in 2004, and that the number increased to 114,110 in 2013, providing a total that year of 157 million volunteer hours. The largest group (43,220, or 44.5%) was in the areas of arts, culture, sport and recreation. In the health area, there were 2,210 non-profit institutions (2.3%). A further 7,400 (7.6%) came under 'education and research', and 11,280 (11.6%) were categorised as 'social services'. The number of people volunteering for non-profit institutions increased from 1 million to 1.2 million by 2016, and contributed six billion dollars to the economy (Statistics NZ, 2016). A study by Handy (2004) revealed that historically, hospital volunteers had provided

<sup>8</sup>Counting public interactions with Bluecoats at four entrances.

<sup>9</sup>Levels 4 and 1 were not staffed throughout the day, so the volumes reported will be lower than actual volumes at those entrances.

assistance to patients and ran gift shops. However, the focus has shifted and expanded to service, governance and fund-raising. Previously, volunteers were self-managed, but modern hospitals now often employ professional managers to supervise volunteer programs, which helps to avoid the risk of using unpaid volunteer non-professionals as 'managers' in public healthcare systems.

The rapid growth of the aged sector is leading to increasing demands on the healthcare service and funding (Department of Economic and Social Affairs Population Division, 2015). From a hospital management perspective, volunteers help to reduce expenses; they are an extra pair of hands to alleviate workload; they bring a positive influence to patient experiences, which beneficially influences the patients' quality of care (Handy, 2004). Volunteers also add a human touch to the technical aspect of care in the specialised and technologically advanced modern hospital (Hotchkiss, 2007).

<sup>8</sup>Counting public interactions with Bluecoats at four entrances.

<sup>9</sup>Levels 4 and 1 were not staffed throughout the day, so the volumes reported will be lower than actual volumes at those entrances.

Gidron<sup>10</sup> (as cited in Kenyarra & Zani, 2014) shows that volunteers may gain three rewards through their work: social, personal and indirectly economic (Fig. 16). Social rewards are through connection to the community and development of interpersonal relationships. 'Personal' provides a sense of belonging and self-fulfillment. 'Indirectly economic' suggests the opportunity to gain work experience and establish business connections. Research demonstrates that these rewards are age-related. Handy (2004) states that the opportunities to learn new skills, gain work experiences and become a more productive member of the community were ranked higher by younger generations, while mature volunteers benefited more from the social networking and interaction aspects of volunteering.

Since the egalitarian movement in businesses in the 1990s, numerous companies have implemented casual dress policies for both men and women (Adomaitis, & Johnson, 2005). However, the use of modern uniforms can still be observed in medium to large-scale enterprises, such as, hospitals, banks, hotels and the government sector. Although the hospital volunteers are working in a clinical environment, their job responsibilities resemble those of a customer service worker. Accordingly, I biased the research towards the service industries.

<sup>10</sup>Three hundred and seventeen volunteers were studied in four different health and mental institutions to draw out the answer to the question as to why people volunteer.

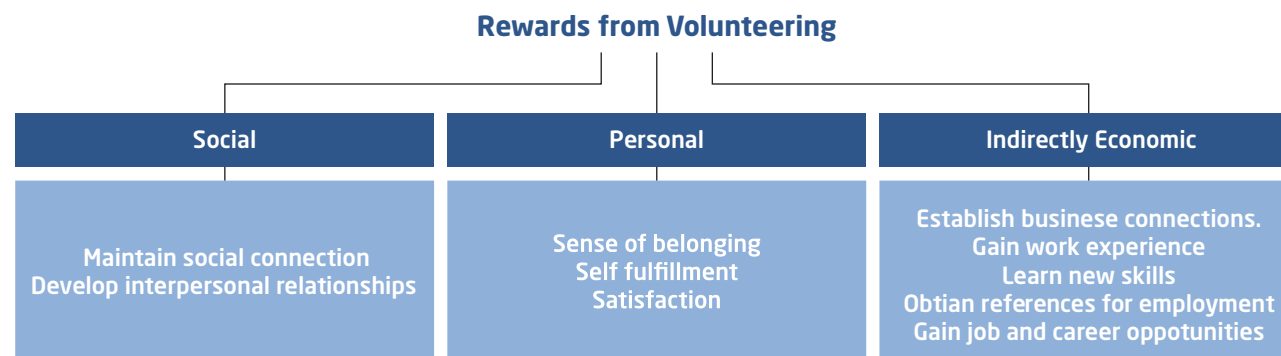


Figure 16: Wang, L. (2016, November). Rewards from volunteering [Graph].

An argument about casual and formal uniforms is a popular topic in modern organisations (Taylor, 2016). Adomaitis and Johnson (2005) interviewed a group of flight attendants to investigate reasons for the swift change of uniform styles from formal to informal and back to formal for their airline. In conclusion, they noted that most flight attendants expressed concern that casual uniforms reinforced vacation-like behavior on the part of staff, and greater insecurity amongst travelers and less confidence in customer relations. Wearing a formal uniform, the flight attendants believed they engaged in a higher level of personal grooming and reported that they felt more in control. In contrast, a question was raised regarding whether formal uniform reinforced class distinctions and work relationships in a negative way. An advantage of a casual uniform for modern corporations is to minimise or eliminate class distinction regardless of rank, corporate position, or salary (McPherson, 1997).

Casual T-shirts and polo shirts are the most common volunteers uniform styles, for short-term (although sometimes long term) sports events or music festivals (Fig. 17-24). These styles are popular due to four distinctive characteristics essential to a volunteer's uniform. They are often made in block colours, sometimes with a bold textile print design that strengthens visibility, helping volunteers to stand out in the crowd. Secondly, a T-shirt can be screen printed easily with bold-coloured slogans such as "Volunteer" or "Ask Me", which aid visual communication by clarifying an intended message. Thirdly, both the T-shirt and the polo shirts are comfortable, which helps deliver a relaxed, friendly image to the viewer. Finally, thanks to simple designs, they will more likely fit various silhouettes easily and cost less in comparison to other styles.

In conclusion, the volunteering service is an important resource in the hospital and their uniform is one of the significant elements to assist the volunteers to fulfill the role, be recognisable in the working environment and deliver a friendly and positive visual message to the viewer. 'Authority' is one of the main messages required for airline attendants, but 'friendly and approachable' may be more important for voluntary workers. For the Bluecoat uniform, design requirements (colour, style, fabric) and the fine line between casual and formal needed to be further defined in the practice section through research methods such as survey and role-play. The outcomes influenced guidelines for the design direction of this project.

*Figure 17: Trejo, L. (2015). Volunteers at Saddleback Memorial Medical Center.*

*Figure 18: Stalons, M. (2015). Volunteers at Huntsville Hospital.*

*Figure 19: Santiam Hospital. (n.d). Volunteers at Santiam Hospital.*

*Figure 20: Medical Mutual. (2016). Western & Southern Open Volunteers – Polo Style.*

*Figure 21: Cedars-Sinai. (n.d). Volunteers at Cedars-Sinai Hospital – lightweight shirt style.*

17



19



20



18



21





Figure 22: Queen Elizabeth Hospital Birmingham. (2016). Volunteers – singlet style.



Figure 23: Montreal Children's Hospital. (2016). New uniforms for Montreal Children's Hospital Volunteers – apron style.



Figure 24: Martin Health System. (n.d). Martin Health Auxiliary Volunteers – casual jacket style.



# Methodology

## | Human-Centred Design (HCD)

The approach to this research and practice was inductive and explorative<sup>11</sup>. The methodology approach applied was Human-Centred Design (HCD), which is inextricably bound with the physical and psychological needs of the user. It is a creative design process, which has a necessarily close relation to three main terms: the product/artifacts, the designer and the user (Krippendorff, 2006). To the product, it not only serves the purpose of being supportive to the communities of users but also requires a user-friendly approach to every individual member. To the designer, this methodology encourages team collaborations, including with users, and is capable of deriving inputs or designs from collaboration with the stakeholders. In relation to the users, HCD considers them as the primary innovation sources that provide personal experiences or allow observation during interaction with the existing product. These experiences or observations supported me to identify relevant insights for design ideation, and for developing innovation (Dell'Era & Landoni, 2014).

<sup>11</sup>In contrast, deductive (proving a theory) is a quantitative research method.

User participation, user-designer interaction and communication, stimulation of and empathy from the designer are the key processes related to HCD. The process has three key stages in this project, which are 'hear', 'ideate' and 'create' (Fig. 25). The 'hear' stage commenced with identification of a question or challenge. This was followed by determination and utilisation of research methods, which involved various combinations of primary stakeholders (hospital authorities), secondary stakeholders (observers: visitors, patients and other staff) and tertiary stakeholders (the wearers). The research methods used were literature review, observation, role-play and surveys<sup>12</sup> which all contributed to my understanding of the responses from stakeholders both to the current uniform and to the new uniform possibilities. These research methods facilitated the growth of my empathy for users of the Bluecoat uniform. They also revealed issues with the current uniform. During the 'hear' stage, information, feedback and experiences were collected and narrowed down to create insights, refine the design brief and develop the project framework.

The 'ideate' stage separated into two sections (Fig. 25). The first part was ideation based on assumptions, which indicated that I had started the creative design process relying on limited understanding and insights into the project. When I completed the 'hear' stage, the insights were interpreted as a set of opportunities such as unmet user needs or goals. These were then translated into abstract thinking in the second part of the 'ideation' stage, to identify themes and form design concepts. Design brainstorming took place in the form of sketching in both sections, to create as many ideas as possible to explore a potential solution. Addressing complex problems requires broad and deep expertise, necessitating collaborative and interdisciplinary work with users to evaluate the initial design

<sup>12</sup>Role-play, observation and prototyping are qualitative research methods. Qualitative methods focus on descriptive, open-ended information that is not expressed in statistical or mathematical form (Park & Park, 2016). For example, questions such as 'what', 'how' and 'why' are expected to be answered rather than 'how many' and 'how much', which should be resolved by using quantitative methods.

concepts and obtain valuable insights (Abrás, Krichmar & Preece, 2004). Consultation is often the final stage of ideation, occurring several times throughout the research, following each new design, to help narrow down ideas for prototyping<sup>13</sup>.

Prototyping, gathering and sharing feedback, evaluation and reflection are activities of the 'create' stage. Prototyping translated concepts from sketches to a trial garment form. The design methods used were story board<sup>14</sup> and sketching. Prototypes were then shared with stakeholders for feedback. Both negative and positive feedback was received, which helped me to evaluate and reflect on the current solution and determine the next step. This took me back to the beginning of the 'create' stage to re-develop or refine the designs until the final product fulfilled the users' needs (Abrás, Krichmar & Preece, 2004). HCD was the framework within which action research took place.

<sup>13</sup>Prototypes are a limited version of the final product which avoids spending unnecessary time and money on high fidelity design, which makes the whole design process efficient.

<sup>14</sup>Refer to design methods/story board.

<b>Hear</b>	<b>1. Identify research question or design challenge</b>
	<b>2. Design research</b> Employ various research methods such as observation, survey, role-play to gain feedback and empathy from user's of Bluecoat uniform.
	<b>3. Synthesis</b> Generate insights/refine design brief/develop project framework.
<b>Ideate</b>	<b>1. Ideation Part 1</b> Design based on limited understanding and insight of the project. Design brainstorming - sketching
	<b>2. Ideation Part 2</b> Insights interpretaion and translation to a set of concepts. Design brainstorming - sketching
	<b>3. Consultation</b> Show design concepts to key stakeholders and narrow down options for prototyping
<b>Create</b>	<b>1. Quick prototyping</b> Translate selected design to 3D form. Design methods involved here such as storyboard and sketching.
	<b>2. Gather &amp; share feedback</b> Share prototypes to stakeholders and gather feedback to share with the design team.
	<b>3. Evaluation and reflection on design</b> Evaluation on both negative and positive feedback to help the designer reflect on the solution.
	<b>4. Plan for next step</b> Successful or unsuccessful - This may take designer back to the beginning of creat stage for futher development on the design.



Figure 25: Wang, L. (2016, November). My HCD processes.



## | Action research

Action research is a practical research methodology, which encourages researchers to inquire into or investigate questions through systematic action to resolve specific problems (Stringer, 2014). Action research is employed extensively in different research fields such as healthcare and education<sup>15</sup>. There are three conditions described by Swann (2012, p. 55) which must generally be met in action research:

*“First, its subject matter normally is situated in a social practice that needs to be changed; second, it is a participatory activity where the researchers work in equitable collaboration; and third, the project proceeds through a spiral of cycles of planning, acting, observing, and reflecting in a systematic and documented study.”*

In action research a problem is usually identified initially and a project plan created, which aims to resolve the research question (Fig. 26). The strategic plan is then actioned to determine potential solutions. This is followed by observation and reflection of the action and its outcome. The whole action and research process is then re-assessed, which may direct towards the identification of a new question or questions and hence to the start of a new cycle of planning, acting, observing and reflecting.

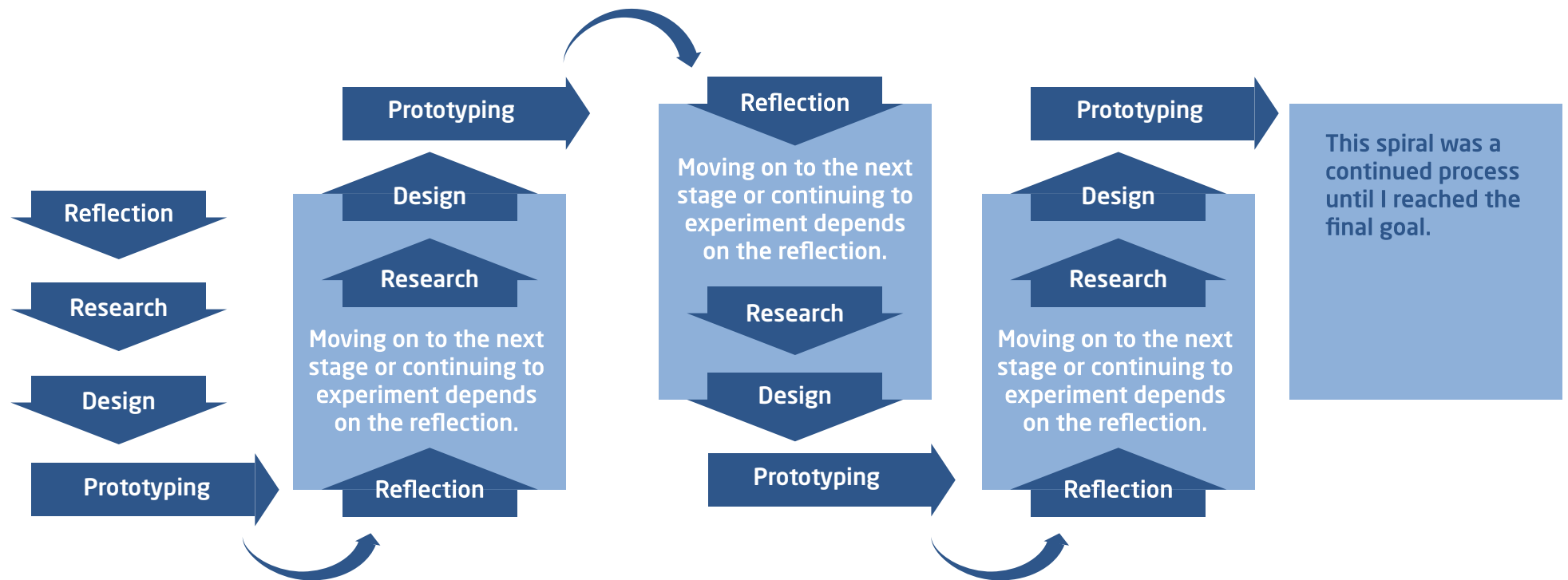
<sup>15</sup>In healthcare, it is known by various names such as participatory action research (PAR), community based participatory research (CBPR) and mutual inquiry. This method is used very differently in health and education from the way it is in design. CBPR aims to probe large-scale issues related to community health and political agency. In contrast, PAR with qualitative methods is more frequently adopted in school-based education, which is focused on small scale and is practitioner-centred.

Figure 26: Scholarship of Teaching and Learning, (n.d). Action research spiraling cycles.



In this project, this cyclical design process can be interpreted as research, design, prototyping and reflection (Fig. 27). The final design solution was achieved through several cycles of design and prototyping (amend, adapt, refine) and reflection (review). The research, design and reflection stages contributed to each other throughout this project. Employing this process to resolve research questions led to a constant injection of ideas, which enabled the continual enrichment of the developing outcome (Nita & Bowden, 1999).

Figure 27: Wang, L. (2016, November). My AR processes.



## | Research methods

### Literature review

As a research method, a literature review aims to give a comprehensive view of the main theme and subthemes of a chosen topic (Denney & Tewksbury, 2013). It was selected because the process helps a researcher obtain a thorough knowledge of the theme by evaluating and refining information, from the literature and from relevant resources, to a specific topic.

The subject 'uniform' was the starting point of the literature review. Brainstorming was applied initially to determine the relevant main and sub topics (Fig. 28). These key words were then used as truncated search terms on Internet search engines such as Google Scholar and AUT's library database. A preliminary selection was applied to topic-related professional journals and books by scanning titles and abstracts.

The first section of the literature review attempted to establish a broader understanding of uniform through categorising modern uniform variations, comprehending historical contexts and analysing functions and benefits of uniform from both organisation and employees' perspectives.

In the second section, the search topic was then narrowed to a particular field, the hospital uniform. As there was limited literature on the development of the volunteers' uniform, the history of nurses' uniforms was researched to help gain a better understanding of how uniform has been used in a healthcare context. Visual research was used extensively to show the evolution of the nurse's uniform through history, and to examine contemporary hospital volunteers' uniforms. This assisted in understanding the uniform as a visual form and allowed for more rapid capture of uniform styles and design details.

See appendix 3 for this body of research (p. 148).

As the research focus narrowed, a review of new literature was continually undertaken to support the design practice. Factors such as the psychology of colour and two-dimensional pattern cutting techniques were researched later in the design development stage.

Confidence	Origin	Colour code
Recognition	Discipline	Dress code
Communication, socialise	Identity	Weather, temperature
Role, occupation, character	Comfort	Authority
Hierarchy, status, rank	<b>Keywords Brainstorming</b>	Practicality
Regulation	Fabric	Conformity
Professionalism	Lab coat	High visibility
Nurse Uniform	Safety	Volunteer

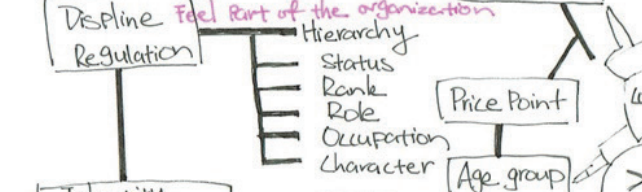
Figure 28: Wang, L. (2016, November). Key words brainstorming.

## Mind mapping

Mind mapping is a highly effective visual thinking tool, which allows the user to map out ideas visually and arrange many aspects of a topic or problem freely (Rosciano, 2015). It is a powerful graphic process. By using techniques such as words, common symbols, colour, images or sketches, commonly in the form of branches, it helps transfer monotonous ideas or complex nonlinear information into memorable and highly organised diagrams to ensure direct understanding (Martin & Hanington, 2012).

This method was selected to brainstorm ideas (Fig. 29) and determine relationships between related information. Mind mapping was also used as an innovative and logical means of note taking during the literature review and design development stages. Mind mapping was often utilised to expand ideas, identify questions and make (or break) connections between relevant (or irrelevant) ideas that has been identified. It was an efficient tool for summarising key characteristics, narrowing down research focus and prioritising and organising information. It was also an effective way to draw complex or multiple ideas directly from mind onto paper.

*Figure 29: Wang, L. (2015, June). Mind mapping - uniform.*

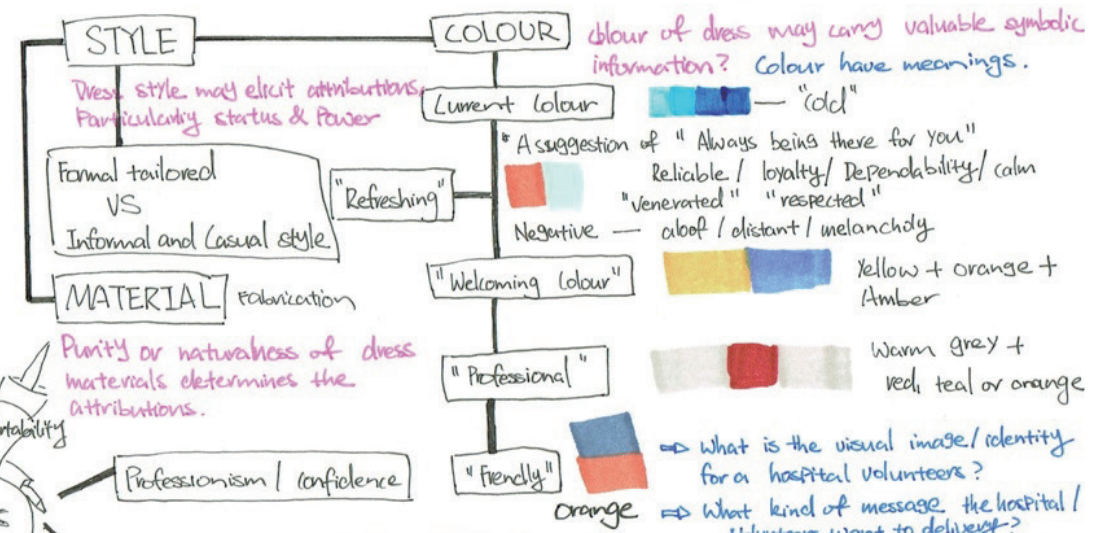


- What kind of message/ emotion this uniform will deliver?  
- High visibility

As uniform denote a distinction and a function to be performed, their origins must lie where this was first expressed.

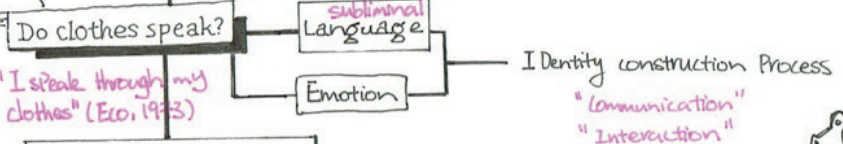
- # 1. Division between master & servant
- # 2. 1st early approach towards uniform  
- Neutral reddish brown attire (Middle Ages)
- # 3. 1st established uniform → Plain, severe habit → wear by monks & Nuns
- # 4. Rose Fysher → Florence Nightingale  
→ Elizabeth Fry (Nurse Uniform)

Do people wear uniform or uniform wear people?



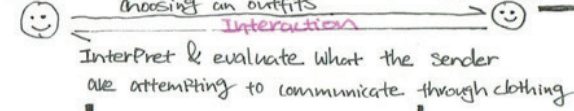
# UNIFORM

What is uniform? The clothing and artifacts the employees of an organization wear at work.



How clothes communicate?

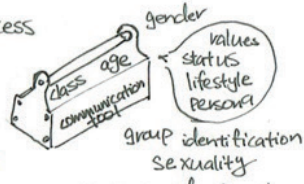
"A fundamental rule of communication is that an individual can never not communicate." (McCormack, 2007)



**Intentional = uniform**

The sender has the intention to create the nonverbal message to send to the receiver.

**Unintentional**



In the hospital environment, when background information is limited, such as in 1st impression clothing and appearance become the most influential element in forming judgement between the volunteers & patients with their families.

## Observation and Role-Play

Observation is a method for a researcher to better understand real-life situations and to uncover the reality of how people behave within a given context (Martin & Hanington, 2012). The observation methods used in this project were: natural (no interference with the volunteers by the designer during the observation period), and participatory (the designer actively joined in the activity being observed to gain a firsthand perspective) (McLeod, 2015). Observation was undertaken to establish connections and empathy with users such as visitors and volunteers who related to the Bluecoat uniform.

A ten-week guest volunteering experience was conducted at ACH in the early stages of the research to study the spontaneous behaviour of the Bluecoat

volunteers, how the current uniforms looked and functioned when volunteers were active at work and how the current uniform was viewed by observers (Fig. 30). Although the original arrangement with the volunteer coordinator was natural observation, and interaction with visitors was not allowed, this quickly developed into a participatory (role-play) observation thanks to the swift training provided by Bluecoats and the busyness at the Bluecoat help desk.



Figure 30: Wang, L. (2015, June). Bluecoat volunteers at Auckland City Hospital level one entrance.

Bluecoats run half-day shifts Monday to Friday. To become a hospital Bluecoat, every candidate is appointed to a particular group (shift) and is trained for at least two months. After negotiation with the volunteer coordinator<sup>16</sup>, it was decided that I could participate as a guest Bluecoat volunteer in shifts at the ACH for ten weeks to experience the working environment. Before the guest volunteering period began, a short article was created and published in the monthly volunteers' newsletter to introduce this project and myself officially to the Bluecoat volunteers (Fig. 31).

Ten guest volunteer shifts, at three entrances, at equal frequency (after an initial shift being introduced at all entrances) each four hours long, were completed during June and July 2015 to explore the following:

- who were the Bluecoats?
- what was their role in the hospital?
- what was the visual identity of the Bluecoat volunteers?

- what was the visual image that the Bluecoats wanted to portray to the public? What kind of messages did they want to deliver?
- how did Bluecoat volunteers interact with the public?
- establishing connections with the Bluecoats
- identifying potential candidates for a fitting model
- collecting feedback and user experiences of the current uniform from Bluecoat volunteers
- discovering the needs for the potential new uniform
- observing how the current uniform performed when worn by the volunteers during work
- developing research questions and refining the design brief

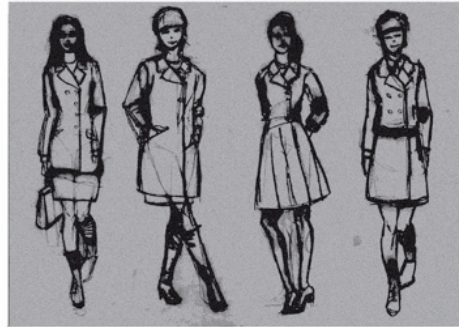
By positioning the designer in the role of a user, the aim was to gain empathy with the Bluecoats, gain detailed insights into these volunteers' job responsibilities, and define uniform issues. It was also a way to help the volunteers become aware of this project and have 'buy in' to the process. Note taking was the main technique

used for documentation. Useful information was noted down during the shifts and these were reviewed and analysed afterwards to ensure capture of useful insights to support the design-practice.

<sup>16</sup>Two options were outlined by the volunteer coordinator. The initial option was to really become a Bluecoat. Although this option would have provided the experience of what a real Bluecoat does in the hospital, it would have required the two-month training, and volunteering one shift per week for at least 18 months. This was not possible in the context of this research, nor my work commitments. Therefore, a second option, a ten-week guest-volunteering experience, was negotiated as a compromise to the situation. This option would permit visiting each volunteer group as a guest volunteer once during their shift. Observation and interviews with the Bluecoats about their experiences in the hospital would be allowed, but wearing the uniform and helping visitors would not. This option would potentially allow goals set in the plan to be achieved. It would also be fair for the Bluecoats as they would not have to spend time and effort with training.



## Blue Coat Uniform Project



My name is Leona and I am a fashion student from Auckland University of Technology. My current project is around the Blue Coat Uniform.



*My Storyboard*



## Project Abstract

Just as fashion mirrors the dynamics of cultures, economy and political changes of the society of its time, clothing reflects both the inward and outward characteristics and identity of a human being.

Although uniform is a separate category from the mainstream fashion, the communication and interaction network established through uniform is far more direct, definite and intense.

During my previous fashion study, I have always worked

in a more fashion-based context. The first time I came into close contact with uniform is after finishing my degree last year. I started working at a school uniform company after graduation and the idea of uniformity in fashion intrigues me, there is therefore I think this project is a great opportunity to investigate into the idea of uniformity.

Throughout this project I will be wanting to understand what is important to you (the blue-coats), as well as understand how the uniform is valued by visitors and staff.

There are series of questions I want to research through this project: What is the language of uniform? What is the visual image and identity of a hospital volunteer? On the fashion side, I want to explore different silhouettes and cutting ideas. How can uniform be both comfortable and aesthetically pleasing? How can one design fits various body shapes? Will fabrication and colour help deliver the "welcome" and "friendly" idea?

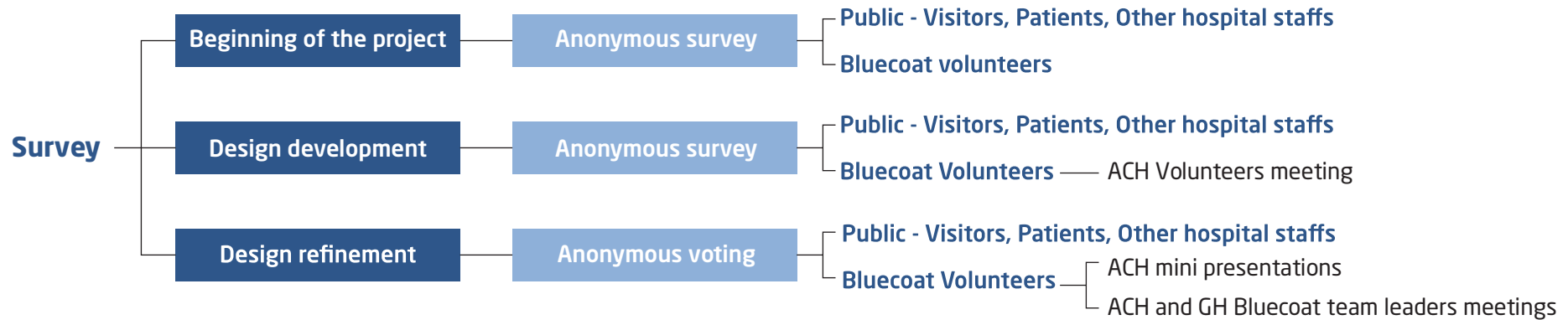
Figure 31: Wang, L. (2015, June). *Volunteers Newsletter*.

## Survey

“Surveys are a method used to collect self-reported information from people about their characteristics, thoughts, feelings, perceptions, behaviours, or attitudes” (Martin & Hanington, 2012, pg. 172). Design surveys assume that the users know what developments are needed to improve the product (Dell’Era & Landoni, 2014). This method used questionnaires and voting with the intention of inducing users to share their needs.

A feedback surveys were carried out at each of three key stages of the project. Each survey stage had two surveys deployed, one for the wearers and the other for the viewers (Fig. 32).

Figure 32: Wang, L. (2015, November). Survey plan.



## First survey

The first survey period was at ACH, after the observation methods were completed, to obtain a more detailed overview of the volunteers. This consisted of a Bluecoat Volunteers' Uniform Expert Survey (BVUES, for Bluecoat volunteers) and a public survey (for visitors and other hospital staff). Both surveys were revised and tested with a range of people for readability, ease of use and also to test the type of information that might be collected<sup>17</sup>. The surveys were used to further understand the users' un-met needs and their insights about the current and the potential new uniform. The BVUES (*see appendix 4, p.156*) was conducted between GH and ACH Bluecoats. The paper survey was made available at both volunteer tearooms for a four-week period from July to August 2015. An advertisement poster was used to help explain the project and recruit volunteer participants. A collection box was placed at ACH Volunteers' rest room to collect feedback and survey forms<sup>18</sup>.

The public survey was conducted in a face-to-face survey form with the help of semi-structured questions prepared beforehand (*see appendix 5, p. 158*). I asked the questions and listened to the replies, taking notes. A face-to-face survey was the best method to collect information from the public because it enabled close observation of the visitors' reactions to the questions. Questions could also be extended<sup>19</sup> easily with additional information collected during the conversation. This survey was conducted in ACH building 32 on level five mainly around the entrance, shop and café areas. Permission was gained through the ADHB for four survey sessions on Saturdays from 8th to

29th of August 2015, from 11am to 4pm. Through discussion with the volunteer coordinator and co-director from the Design for Health & Wellbeing Lab (DHW Lab), it was decided that I should wear the current Bluecoat uniform and carry a staff ID card during surveying, to meet safety and security concerns (relating both to myself and to visitors/patients). It was believed that if I were carrying a hospital ID card during the public survey, the visitors would feel safer and more willing to participate. Moreover, most visitors were not familiar with the current uniform so it was helpful to remind them of the current look by wearing it. It was also a part of the role-play experience to wear the uniform (although this approach was changed after the discovery that wearing the uniform may have influenced the public response). A participant information sheet (*see appendix 6, p. 159*) was carried during all the survey sessions and shown to participants before surveying, to gain verbal consent and avoid any misunderstandings.

Figure 33: Marketbeats. (n.d). Face to face interview.

<sup>17</sup>Initially, the first draft was divided into three sections, which were "colour", "style" and "wearability", 28 questions in total. Feedback gathered for this draft resulted the deletion of 9 questions and the utilisation of more multi-choice questions instead of open questions, which would be easier and faster for people to answer and for the designer to summarise afterwards. There were suggestions that indicated some of the questions were initially hard to answer. General questions, such as gender, age group and ethnic origin, were also added.

<sup>18</sup>There are only a small number of Bluecoats volunteering at GH and most of them also carry out shifts at ACH. Survey forms at GH were either submitted to ACH or collected by the volunteer coordinator.

<sup>19</sup>Some questions were extended, for example: "Do you like the current uniform (survey question)?" "Why?" (extension).



## Second survey

The second survey was carried out during the design development stage to gather feedback for prototype refinement and to further refine design direction. For the Bluecoats, the project was explained and prototypes were presented at the ACH volunteers' meeting. Feedback was collected during and after the meeting through verbal communication with some Bluecoats. Prototype garments were also left at the ACH volunteer rest room for a week, for volunteers to try them on or have a closer look. The public survey (*see appendix 7, p. 160*) was carried out after the ACH volunteers' meeting. It used the same face-to-face approach as the previous public survey and prototypes were shown on mannequins at ACH building 32 near the level five entrance.

## Third survey

The final survey was conducted in the form of voting, to assist with the selection of the final design and also to assemble final feedback for design adjustment. For the volunteers (*see appendix 8, p. 161*), design prototypes were shown at both ACH and GH volunteer team leader meetings first, and then mini design presentations were conducted with the Bluecoats at every shift at ACH for a week. These presentations were an effort to help the volunteers understand the new designs better and to lay aside non-project related considerations (such as the cost of the new uniform). Public voting was conducted using a face-to-face approach but it was done using digital representations of the uniforms (*see appendix 9, p. 163*). I carried an iPad with online voting forms and professional photographs of the current and new uniform designs and entered the vote, with the agreement of the interviewee.

## | Design methods

### Participatory design

Sanders expressed in 2006 that participatory design must try to involve future 'users' because they can enlarge what is possible throughout the process of designing (as cited in Dell'Era & Landoni, 2014). This design approach was selected to help ensure that the new uniform would be designed to meet the needs of the stakeholders. It aimed to involve all users in the design activities to assist design innovation actively. The wearer and the viewers participated in the initial exploration, problem definition, key design development and final design selection stages. The representatives of the organisation were invited during each design development stage (fittings and design meetings) to help evaluate proposed solutions and give feedback based on the organisational perspective.

### Storyboard

A storyboard fulfills the saying, 'a picture is worth a thousand words' and enables a design to be communicated clearly (WebdesignerDepot staff, 2008). A qualitative research method, it is often used to help designers start a project by gathering a compilation of inspirational photos or objects (Martin & Hanington, 2012). In this research, the focus started by identifying and seeking historical uniforms from hospitals, airlines and sports settings (Fig. 34), then shifted to images, colours, clothing, accessories and fabric samples that inspired me as a designer (Fig. 35). Storyboard proved an effective communication tool to exchange ideas with stakeholders. This method was used extensively in the early stage of the project to identify the main inspiration (which is drawn from two dimensional cutting techniques). The storyboard was constantly updated and edited as design progress occurred. This allowed me to overview the whole design process visually and remain focused on the main inspiration.

Lab coat and two-dimensional costumes were sourced at an early stage of design to offer inspiration and assist with pattern development. An experiment was conducted with the lab coat, which involved wearing it for a period-of-time to discover its good aspects as a uniform, since it is one of the most representative hospital uniforms with 'simple' and 'comfort' characteristics.



Figure 34: Wang, L. (2015, May). Early storyboard.



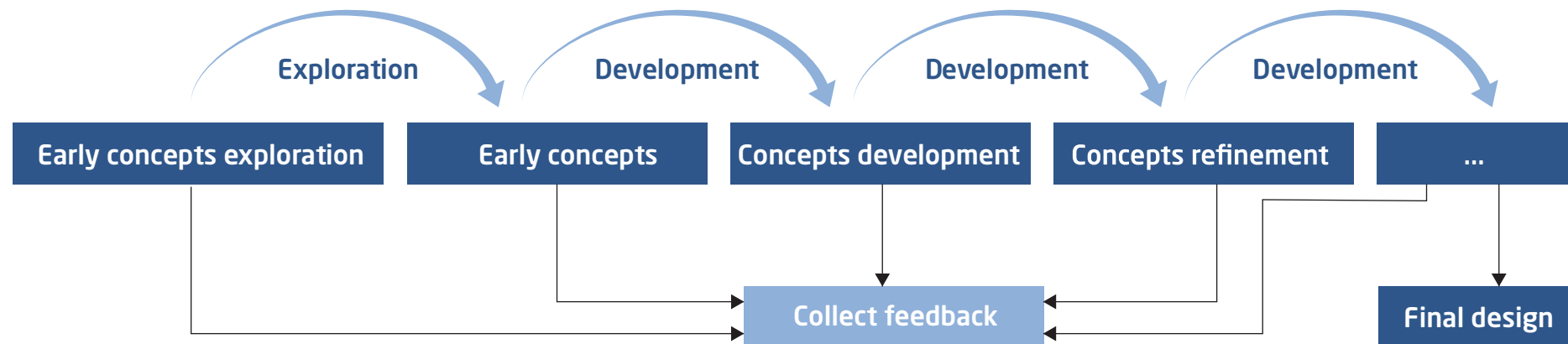
Figure 35: Wang, L. (2015, June). Updated storyboard.

## Sketching

Freehand sketching helps designers recognise and express many different imaginings. It supports the mind in revealing what was previously description (Helmi & Mohamed, 2016). Sketching as 'thinking on paper' is a beneficial way to start a project (Hodge, 2008). It was used in combination with the prototyping method. The final designs were achieved through a series of developmental processes (Fig. 36).

*Figure 36: Wang, L. (2016, November). Sketching – concept development process.*

### Keep development and refinement until final designs were achieved



Three aspects of sketching aided the design process of this project. Firstly, rough and fast design sketching (Fig. 37) was an effective instrument for rapid concept exploration, experiment and development (Helmi & Mohamed, 2016). Secondly, sketching was a beneficial technique to quickly draw on paper what I visualised, which greatly improved the communication process with stakeholders through visual transmission. Thirdly, it was used as a journaling activity to record design practice and pattern alteration details quickly. Every time I altered or drafted a new pattern, sketches and photographs were used to record the process.



Figure 37: Wang, L. (2015, August). Sketching – a page from early concept exploration.

## Prototyping

In this research, prototyping was used as a way to translate research and ideation into tangible models. This method is used in fashion design and often described as 'toiling' (from 'toile'). I have found that a toile process helps to efficiently and effectively explore design ideas and fit, especially in the early stage of the design process. Garment toiles were created using calico to test the initial concepts; each design development required numerous toiles before the correct fit and balance of design details were achieved to an acceptable standard. The highly resolved design was then made in the final fabric.

The design development process was initiated with concept sketches in response to research insights, and then blocks<sup>20</sup> were made to explore the designed silhouettes in a three-dimensional form. These 3D silhouettes (the prototypes) were made to fit a model<sup>21</sup> and were the foundation of subsequent refined designs. Once the blocks achieved the desired silhouette, patterns were then developed into design prototypes by adding details such as style lines, closures, collars or pockets. Feedback collected during each prototype fitting through the development stage was used to help refine the design direction.

<sup>20</sup>Almost every single piece of clothing that is not draped, is derived from a basic pattern block or 'sloper'. Blocks are often used in the fashion industry to speed up the process of making patterns and for accuracy of a pattern. They are usually developed on cardboard using the flat pattern-making system (two dimensions). Many designers and manufacturers have in-house models and use their measurements in the development of their own basic blocks.

<sup>21</sup>At first a Bluecoat then, when she was not available, one of my friends who was of similar measurements.

## Ethics

Ethics are commonly defined as the “norm for conduct that distinguish[es] between acceptable and unacceptable (David & Resnik, 2015).”

In order for this project to result in benefit and minimise any risk of harm, one of the obligatory tasks in the early stage was to gain ethical approval (low risk<sup>22</sup>) for the purpose of conducting anonymous research in a public space: the hospital. The objective was to ensure that I was aware of and adhered to accepted ethical research standards, which would assure that the research served the interests of individuals or groups as a whole (Nancy, n.d.).

In this project, the potential participants were the Bluecoat volunteers, visitors, patients and other hospital staff. To be pre-warned about the risks and benefits that this project could bring to them through participating were essential. To ensure that participants were aware of what would be done with the collected data and who would have access to it, participant involvement was explained and an information sheet was provided. This information sheet was used extensively during the survey and voting periods to gain verbal consent from the participants.

Formal ethical approval was sought and given for this research project to protect both the research participants and researcher (AUTC 15/214, approved 18 June 2015).

<sup>22</sup>This project is considered low risk because of where and who was involved in the research.

# Documentation of research & practice



This chapter is divided into three research cycles and ten research and design practice cycles. It aims to communicate the research process by presenting the tasks, the research findings, the design practice and the in-depth reflection and evaluation involved in each cycle.

## | Research cycle one

**Cycle one was the introduction to the practical section of this project. It included a consultation with the hospital volunteer coordinator and guest volunteering.**

### **The consultation**

The first consultation with the hospital volunteer coordinator was arranged for the purpose of defining what I could and could not do in the hospital in order for me to develop the methodology I would use.

### **Guest volunteering experiences**

After the completion of the ethics application, guest-volunteering sessions were carried out to obtain insights into the volunteering job. The Bluecoats' job responsibilities, opinions about the current uniform and any challenges in respect of a potential new uniform were ascertained.

There are three reception desks in ACH, near entrances located in Building 32 levels one, four and five. The primary working area for Bluecoats is behind the help desks unless they notice visitors who require further or special attention, such as being escorted to their destinations. Bluecoats are often the first people to have contact with visitors or patients; they represent part of the identity and culture of the hospital. Their attitude and look will influence 'visitors' first impressions of the hospital and also influence the ease with which the visitors find the locations they are seeking.

The Bluecoats' uniform is an unrestricted uniform<sup>23</sup>. The existing uniform consists of a vest, jacket and scarf or a tie (Fig. 38 to 40). Personal clothing, such as white shirt or blouse and black trousers or skirts and shoes are allowed to be worn underneath. Bluecoats wear the uniform once or twice per week during their four-hour shift. Bluecoats were allowed to maintain their own uniform but were not permitted to wash it themselves. All the uniforms had to be cleaned at least once a month and they were collected by a hospital-appointed dry-cleaning service. Many Bluecoats complained that they were often unable to get the same uniform back after dry cleaning since many uniforms were sent together and there is no identification on them.

This uniform has not been changed or updated, except for the scarf, since the establishment of the Bluecoat volunteer service (approximately thirteen years ago). The original design concept for the uniform was to achieve a 'mum' and 'family' look in order to be friendly and welcoming. Through observation, I discovered that the role of Bluecoats resembles that of customer service personnel or receptionists. Although many of them reported that a good deal of walking is involved in this job, I noticed that most of the volunteers preferred to describe a route to visitors instead of accompanying them to their destinations. From my perspective as a designer, this uniform should be welcoming and approachable but the cut and design of the current uniform gave a strong corporate and formal impression, which might have been a barrier to the communication between visitors and patients. This was tested with all of the users later in the survey section.

<sup>23</sup>See literature review section for definition of restricted and unrestricted uniforms.



Figure 38: Wang, L. (2015). Current female uniform - winter option.

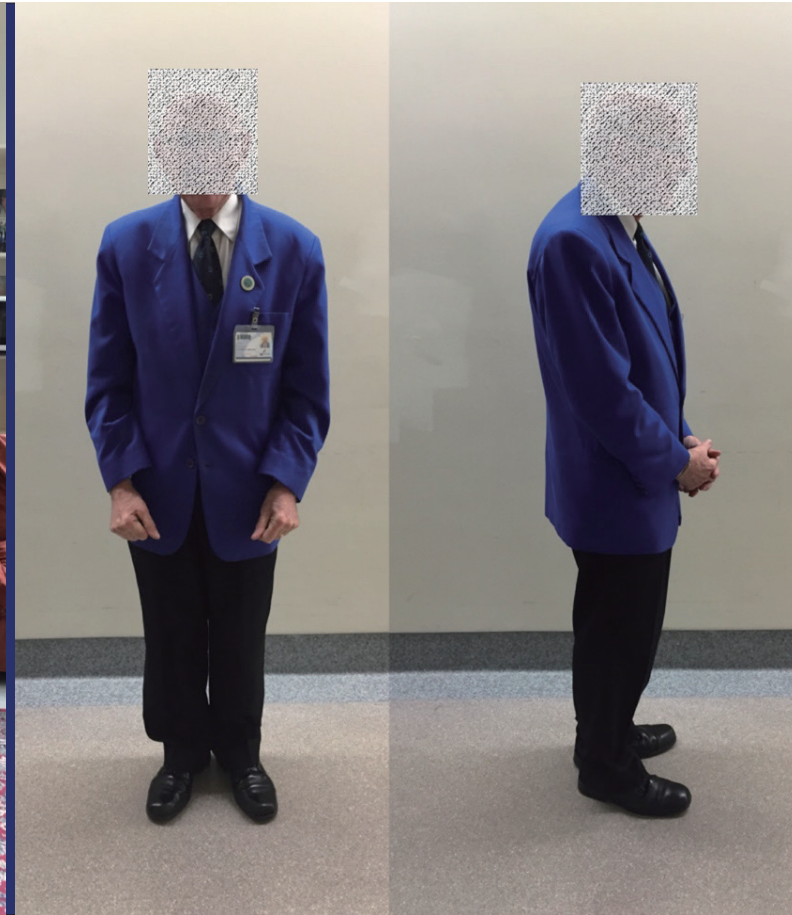


Figure 39: Wang, L. (2015). Current male uniform - winter option.

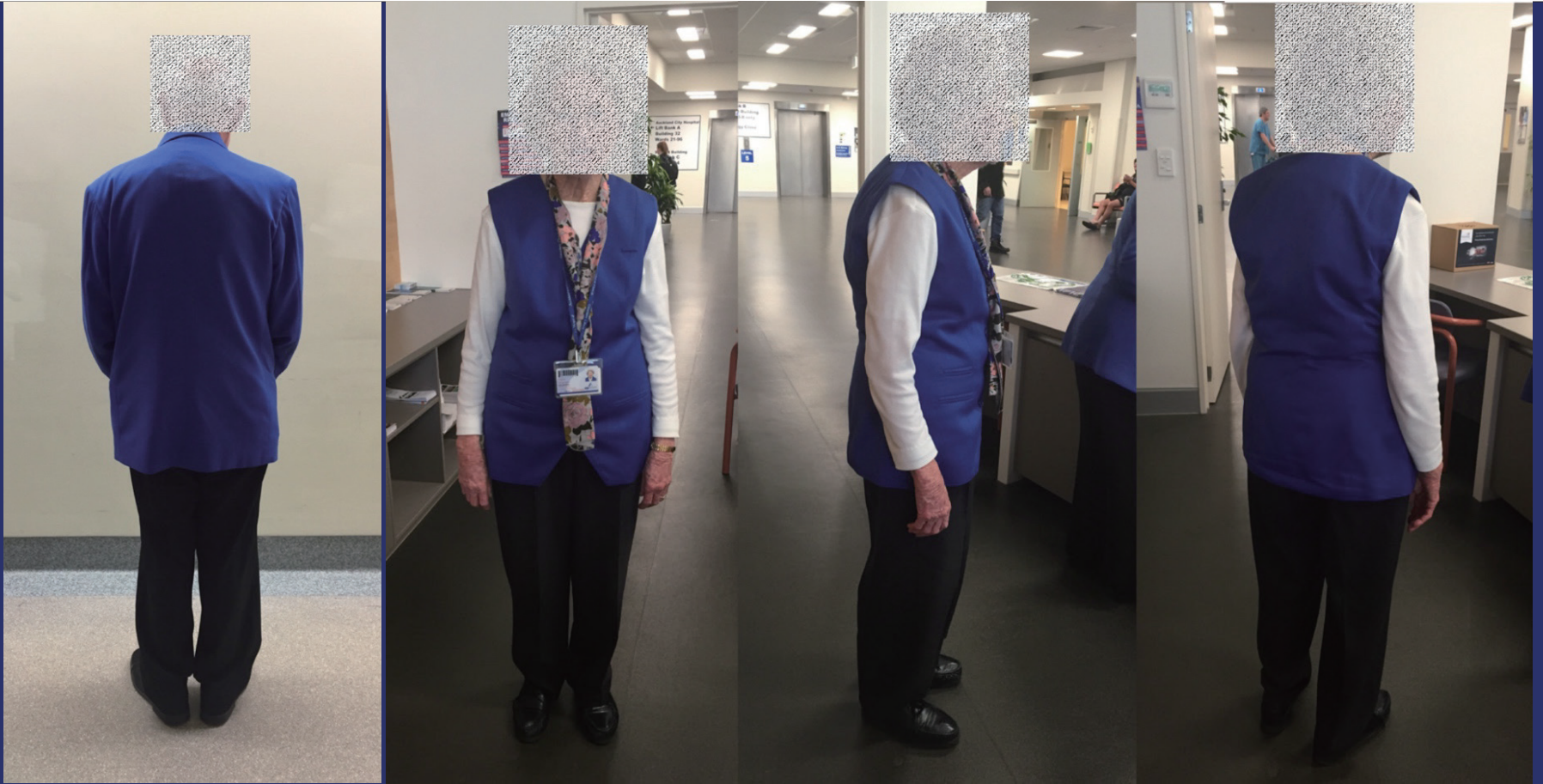


Figure 40: Wang, L. (2015). Current unisex summer uniform.

Three key issues with the current uniform were identified during conversations with Bluecoats and while observing their interactions with visitors (Fig. 4.1). Firstly, change was perceived as difficult. The majority of Bluecoats showed strong resistance when a uniform change was proposed (especially the older group). Comments such as *"If a new uniform comes in, I will stay in the old one"* and *"I will leave if the uniform gets changed"* (quotes from Bluecoats) were frequently received over the observation period. This led to a lack of genuine feedback from the wearers of the uniform at the beginning of the project. Comments from Bluecoats opposed to the idea of changing, as follows:

- age group: the volunteer co-ordinator suggested that because the average age of the Bluecoats is fifty-five, they are naturally 'afraid' of changing and do not respond to new ideas as fast as the younger generations.

- positive visitor feedback: *"Visitors always say how smart we look. We present ourselves well and I do not think we need to change anything...I am proud of my uniform"*. Currently the volunteers identify to such a degree with their uniform that they call themselves by the name of their uniform, "Bluecoats". Frequent compliments from the public caused them to believe strongly that the public favours the current uniform and the colour blue and that it represents their identity. However, this point was later proved inaccurate (in cycle two during the surveys).
- cost to replacement:
  - a) *"It is just a uniform...such a waste of money for the hospital to spend on unnecessary things"*. The majority of the Bluecoat volunteers were very concerned about the budget and very worried that the hospital would spend too much money on a new uniform, leading to a lack of resources for their

other benefits: *"The hospital already cut off our petrol vouchers; if we ask too much they will get rid of us"*.

b) *"It is such a waste to throw the airport uniform away"*. The Auckland Airport Bluecoats had just completed their uniform re-design project when I commenced this project. Because the old airport uniform was a similar style and colour to the current ACH Bluecoat uniform, these uniforms were passed to the hospital volunteers to use (recycling).

- failure to understand the role of a uniform: many Bluecoats think there is no major issue with the current uniform, so why change? *"Uniform is a uniform, you only wear it during work...If you like the job, then you do not really mind how the uniform looks. You will always love the uniform..."*.

Unclear identification was the second problem to emerge. There is no identification or logo on the current uniform. Although some Bluecoats mentioned that there were occasions when visitors did not recognise them as they patrolled the hospital, the majority believed the current style and colour was recognisable. Therefore, an experiment was conducted to explore whether the uniform had the effect that they thought it did. During this experiment, I wore a striking pink jacket and stood five to ten meters from the inquiry desk. Visitors approached to ask me questions and assumed I was a Bluecoat. This experiment started to make me think about the possibility that the Bluecoats may be over-confident about the public's ability to identify them from their uniform. This was explored further in the surveys.

A few Bluecoats reported that the current style was too corporate, stocky and inflexible. Volunteers, especially those who were younger, commented that only male members wore the vest because it was unpractical and old-fashioned. The younger generation suggested that a new design could be less complicated with fewer pieces.

The volunteer co-ordinator and co-directors at DHW design lab initiated the project<sup>24</sup> so I discussed with them the fact that the Bluecoats were very resistant to the idea of change (which continued throughout the research). In addition, two groups of Bluecoats wrote letters to the volunteer co-ordinator and requested that ADHB not change their uniform. This demonstrated how important it was, as a designer, to keep a positive attitude and how important it was to try to involve Bluecoats throughout the design process; to be transparent about new concepts and research data and to consider their feedback or suggestions carefully. To further investigate these insights gained through observation, I decided to carry out an anonymous survey with the Bluecoats (to gain useful feedback on the uniform) and the public (to test the feedback about the Bluecoats).

<sup>24</sup>It was initiated to update the uniform which they felt no longer reflected the desired image.

## Keypoints gained from the observation period

### Colour

#### Change to a new colour? (feedback from a small group)

Explore possibility of using light blue colour  
Colour needs to team with black

*"I do not like the current colour because it makes me feel I am an old women"*

*"I think yellow is the most welcoming colour but the Cancer Society volunteers already use this colour"*

*"I prefer mid to dark colour tones because the cuffs are very easy to get dirty"*

#### Stay in current colour? (Feedback from majority)

Strong resistance to change the current colour because they are "Bluecoat" volunteers  
Bluecoats strongly believe that visitors can recognise them from the current Colour

*"The current colour is great for mature people"*

### Design details

Inside pocket would be very handy

Need a place to clip ID

*"False pockets on current jacket is stupid"*

Buttons on current uniform comes off easily after each dry clean

*"I hate shoulder pad"*

### Fitting

#### Poor standard of jacket fitting

Most of the current jackets fits around shoulder but not for waist

### Scarf

Length is not right

Easy to get creased

All Bluecoats hate the current style

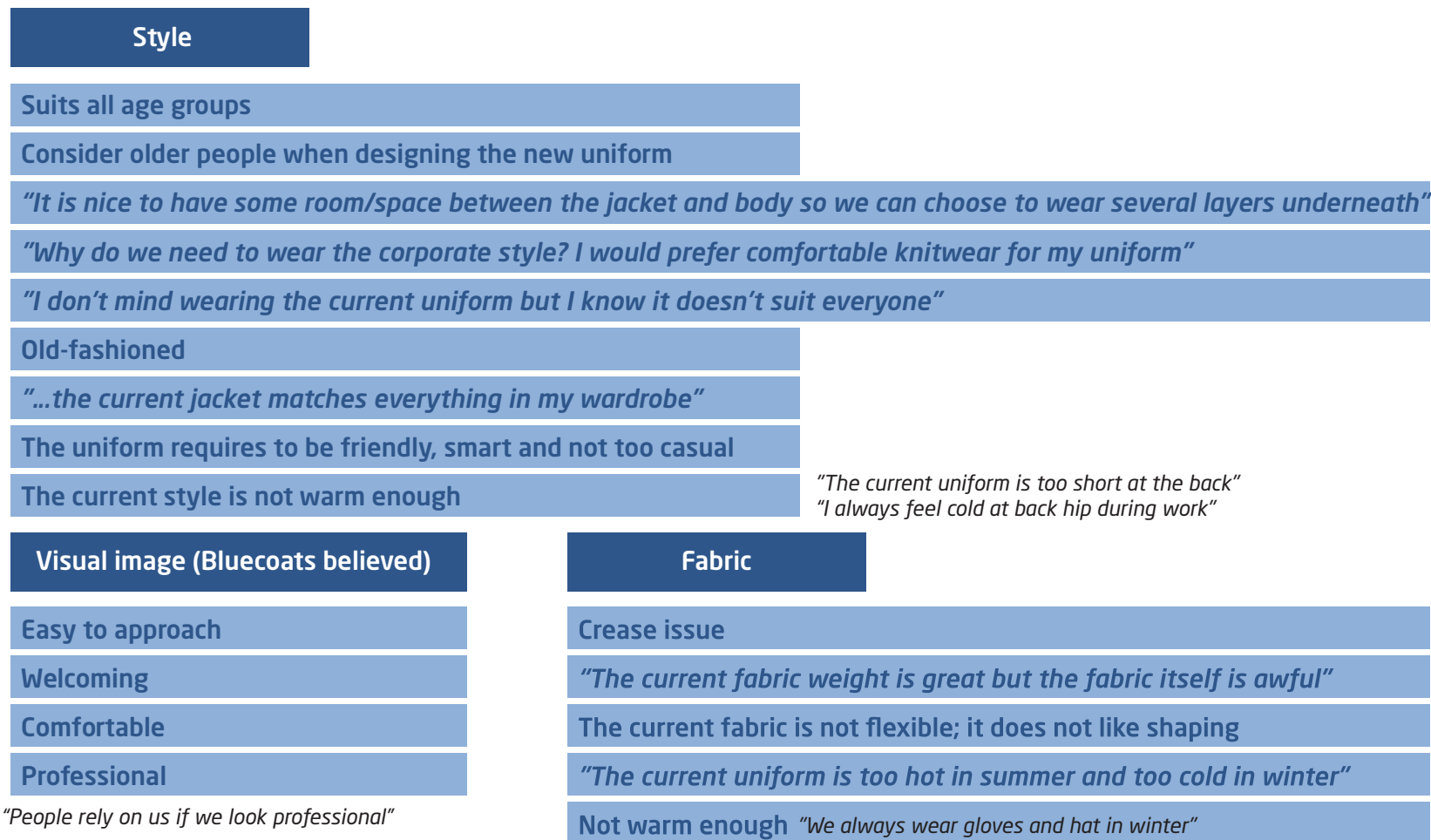
### Identification

#### No identification on current uniforms

Embroidery branding on jackets  
The current colour does not stand out at a distance  
No ADHB Logo

**(include feedback from the volunteers)**

Figure 41: Wang, L. (2015). Key points gained from the observation period.



## | Research cycle two

**The BVUES (Bluecoat volunteers' uniform expert survey) and the public survey were the main focus of cycle two.**

The purpose of the BVUES was to gain useful feedback on the uniform, while the public survey was to explore how visitors and staff perceived the uniform, including whether the colour and style were considered attractive.

Both survey results were summarised and in-depth reflection was applied to the data. These insights were shared with supervisors and relevant hospital staff.

*See appendix 10 for full documentation of surveys (p. 168).*

From the results of the public survey, it was confirmed that the Bluecoat volunteers were overly confident about the current uniform. Through sharing and discussing this data with relevant hospital staff and supervisors, I determined that the new design could be developed from four aspects: style, colour, fabric and identification. Style-wise, this new uniform needed to be less formal but still professional, to fit into the hospital environment. It needed to be modern and comfortable, to fit various body shapes and to respect all age groups. The messages delivered through this uniform should be 'welcoming' and 'approachable'. Further research and practice was required on two-dimensional cutting to ensure it was a suitable technique for this project. More colour options could be explored. New fabric options, such as, warmer and lighter uniform fabrics would need to be sourced for prototyping. Identification such as embroidery and screen-print logos could be considered for the new designs. Prior to starting any design practice, a design brief needed to be drafted to clarify the objectives of this study.

## | Research cycle three

Based on the insights generated from both surveys, the design brief objectives were reframed to include the significant information obtained.

### Amended design brief

- 1.Design for clear identification of Bluecoat volunteers in the hospital environment
- 2.Design for a less corporate, flexible style that delivers a friendly and welcoming image
- 3.Identify appropriate colour and fabric option (comfortable and practical for the job)
- 4.Establish a suitable sizing system
- 5.Explore new printed textile design for tie and scarf

### Preparation for design practice

At this stage of the research, I needed to put in to practice my design response to the insights I had gained. The first action taken was to revisit the two-dimensional cutting techniques that I was keen to employ for this project; this involved research of traditional Asian costumes and lab coat interactive experimentation.

See appendix 11 of documentation for both explorations (p. 180).

## | Research and design practice cycle four

### Concept design development

Sketching and storyboards were employed extensively during this action research (AR) cycle. Inspiration, colour and fabric storyboards were used to support the design ideation. The sketching method helped to generate variations of new uniform designs.

The initial approach to the storyboard was focused on background research of uniforms from different fields. Consequently, the first iterations of the design concepts lacked creative imagination and were constricted by tradition (Fig. 42 & 43) (*see appendix 12 part one, p. 186*). These concepts did not fit the eventual proposed design requirement as they were generated before the research had taken place (ideation part 1<sup>25</sup>). Originally, these concepts were undertaken to start the design process using my assumptions around uniforms; these original designs were too airline-like and the posture of the figures did not accurately portray the image of a Bluecoat. On reflection, I realised that through this design concept cycle I had entirely lost connection with the cutting methods I wanted to explore – this was a warning to me.

<sup>25</sup>Refer to figure 25 in methodology chapter.

Uniform → Characteristics

A. Details.

制服的外观解构不宜进行另类 and 怪异的变形，因此细节特色将成为现代制服款式的一大切入点。

Collar Flaplet Pocket Cuff

利用细节与流行元素统一起来。



B. Simple & Decent

- 是几群体中脱颖而出的。  
- 制服设计款式设计应尽量避免过于特殊和复杂，从而影响到穿着者在正式场合的面貌。  
- Police uniform  
Shirt / tie / waistband  
different colour  
Determine Rank/type.

Figure 42: Wang, L. (2015). First set of concepts page one.

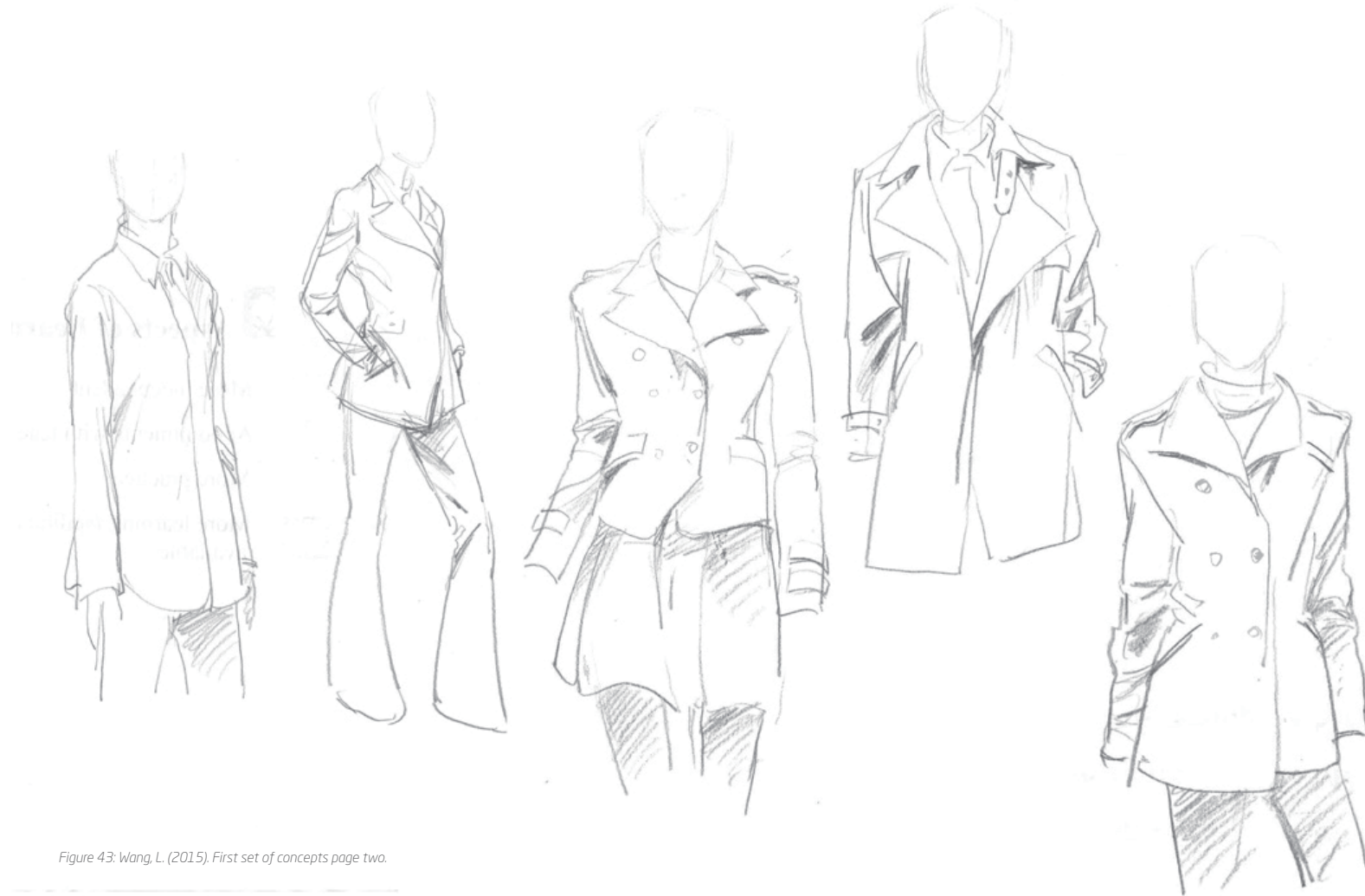


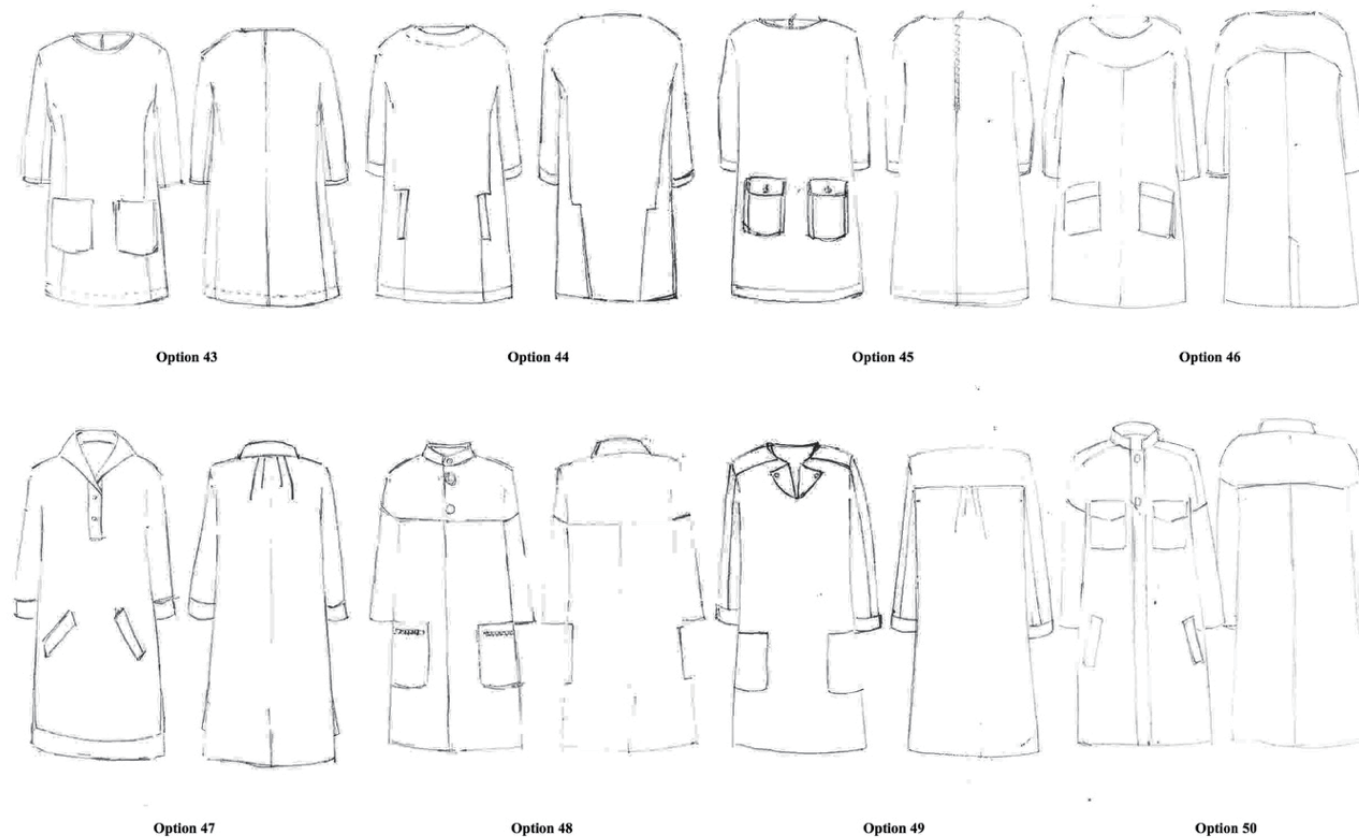
Figure 43: Wang, L. (2015). First set of concepts page two.

Based on the reflections on the initial concepts, I created a new series of designs (Fig. 44). Inspiration was drawn from aspects of a two-dimensional silhouette. These new designs were shown at a design meeting with hospital representatives for feedback. Three designs were chosen for further development based on feedback that *“the style is simple but different”, “convenient for alteration”, “smart-casual and friendly”* and *“the silhouette is flexible and allows room around the body which could potentially fit many body shapes”*. These three designs were the initial base of the later uniform designs.



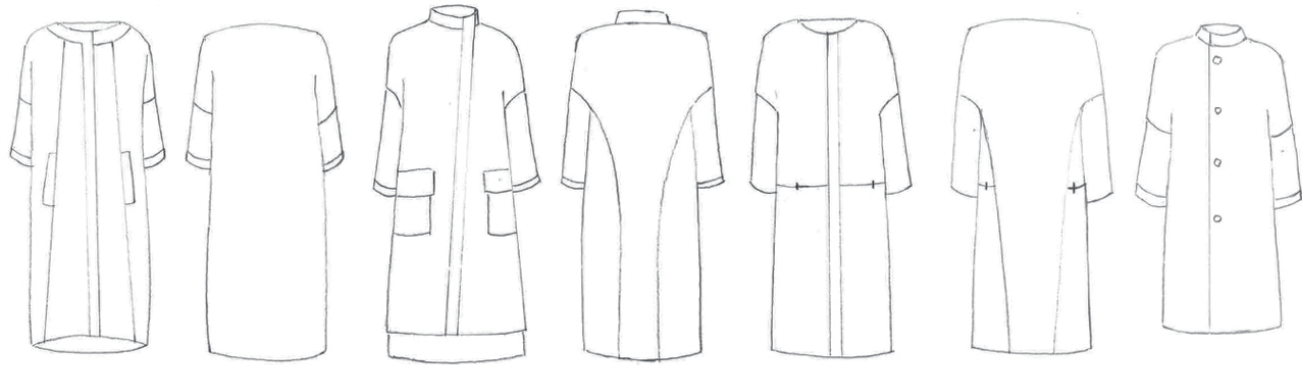
Figure 44: Wang, L. (2015). New design concepts.

However, it was also observed that the proportion and posture of the figures in the sketch still looked like fashion models and less like ordinary people. The design sketches were not communicating the design concepts clearly because the garments were tight fitting, which did not accurately express two-dimensional cutting elements. Therefore, a further drawing session was planned and working drawings<sup>26</sup> (Fig. 45) were made instead of figure drawings (see *appendix 12 part two, p. 188*). I then chose seven concept development sketches based on the design brief and feedback from the hospital representatives. These were used for prototyping to test out the ideas.



<sup>26</sup>Working drawing is much more detailed and is more suitable for rectangular voluminous designs.

Figure 45: Wang, L. (2015). Concept exploration - working drawings.

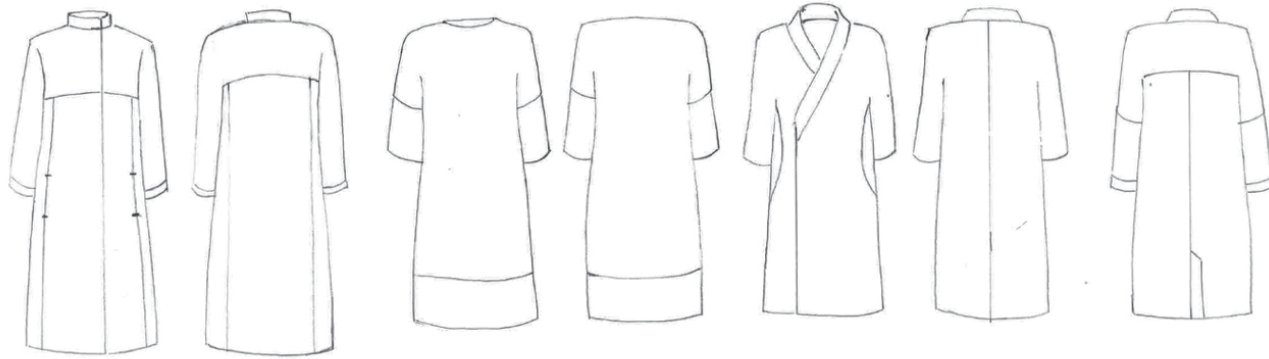


Option 51

Option 52

Option 53

Option 54



Option 55

Option 56

Option 57

## | Research and design practice cycle five

### Block development.

There were four blocks developed at the early stage of cycle five: two female and two unisex options (Fig. 46-49); two-dimensional cutting features, such as the kimono and Magyar sleeve were explored. A current Bluecoat volunteer was invited to be the regular fit model<sup>27</sup>. For the purpose of resolving the current complex size range issue, the new design was simplified to small, medium and large. The base size was determined to be 'small' based on the Bluecoat model's measurements. A series of prototypes were developed during this cycle and frequent fitting sessions were scheduled with hospital representatives. Constructive discussion and reflection for the next cycle of research and practice resulted from each fitting. This feedback was summarised and informed the plan of design and prototype alterations.

<sup>27</sup>The key clients for this uniform, in terms of the fitting, were the volunteers, so it was more focused on ordinary body shapes and heights.

Figure 46: Wang, L. (2015). Block one.

Figure 47: Wang, L. (2015). Block two.





A formal feedback fitting with the volunteer coordinator was scheduled at AUT after the completion of the four blocks (see appendix 13 for detailed documentation of development processes, p. 192).

Useful feedback was gained through this meeting, assisting with design decisions. The volunteer coordinator again expressed her interpretation that the primary design principle for the new uniform was to be simple but eye-catching. The uniform would also need to be wearable through all seasons. She commented that it was hard for her to see the design since they were all still in block stage but silhouettes of blocks one and two were preferred because they had more of a jacket or coat look. She suggested that the raglan sleeve made block three look 'very sporty and casual' and therefore might not be suitable for this project. Moreover, three fabric types were favorably identified as potential choices for the new uniform; they were wool (for warmth), poly-cotton (for comfort and practicality) and pure cotton (for maximum comfort); thus, further fabric sourcing would be required.



Figure 48: Wang, L. (2015). Block three.

Figure 49: Wang, L. (2015). Block four.

## | Research and design practice cycle six

This cycle utilised the blocks developed in cycle five to explore uniform silhouette concepts.

### Concept development

There were five garments developed during this stage (see appendix 14 for detailed documentation of process, p. 215). Many toiles were made and fittings arranged to achieve the ideal fit. A design meeting with hospital representatives was arranged at the end of this cycle to gain feedback for narrowing down design options and re-determining the design direction.

The first silhouette concept was developed from block one (Fig. 50) and silhouette two (Fig. 51) was a loose fitted tunic dress developed from block two.



Figure 50: Wang, L. (2016). Silhouette concept one.



Figure 51: Wang, L. (2016). Silhouette concept two.

The pleated tunic dress (silhouette three) was also developed from block two (Fig. 52). This design was trying to deliver a younger and more relaxed look.



Figure 52: Wang, L. (2016). Silhouette concept three.

Silhouette four was developed from block four (Fig. 53). The initial shape of this design was an oversized 'T' shape, which would contribute to extra comfort and flexibility. It was designed as a unisex uniform option.



Figure 53: Wang, L. (2016). Silhouette concept four

Silhouette five was developed as a unisex style from the raglan block (Fig. 54). It aimed to establish a softer look; the raglan silhouette rounded the shoulder line with no underarm fullness.

After finalising all of the basic silhouettes, a formal feedback meeting was organised. Five silhouettes were shown and four of them were chosen for further development (*see appendix 15 for detailed feedback, p. 229*).



Figure 54: Wang, L. (2016). Silhouette concept five.

## | Research and design practice cycle seven

Value identity design exploration was the first part of this cycle, followed by colour, concept, textile print and fabric developments. A design meeting with hospital representatives was arranged at the end of this cycle for feedback on the designs. Some of the prototypes produced for this feedback meeting were made from potential final fabrics, based on insights gained from the survey and the observation.

### ADHB value identity design

“Aim High”, “Together”, “Welcome” and “Respect” were recently launched (2015) as the new value identities associated with the ADHB (Fig. 55). “Welcome” has been identified as one of the key research values of this project so it was decided to meet with the DHW Lab designer who led the design development ([www.dhwlab.com/hh](http://www.dhwlab.com/hh)). The aim was to explore how the value identities could be incorporated into the design process. In this meeting, the DHW Lab designer showed the new value identity logos to me and explained how they were inspired by the idea of weaving different cultures, ideas and people together. Colour psychology had also been utilised in the design of the new value logo. Each value was paired with the colour that shares the same meaning (Fig. 56). This meeting brought more possibilities to this project; firstly, the “welcome” value and the colour communication idea could be adapted to this study. Secondly, the new identity logo could be developed to a surface printed textile or an accessory piece such as scarf or name badge.

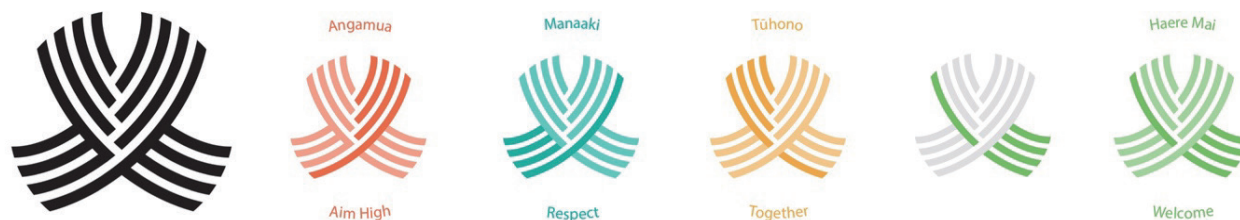


Figure 55: Jacob, E. (2015). ADHB Value Identity Logos.

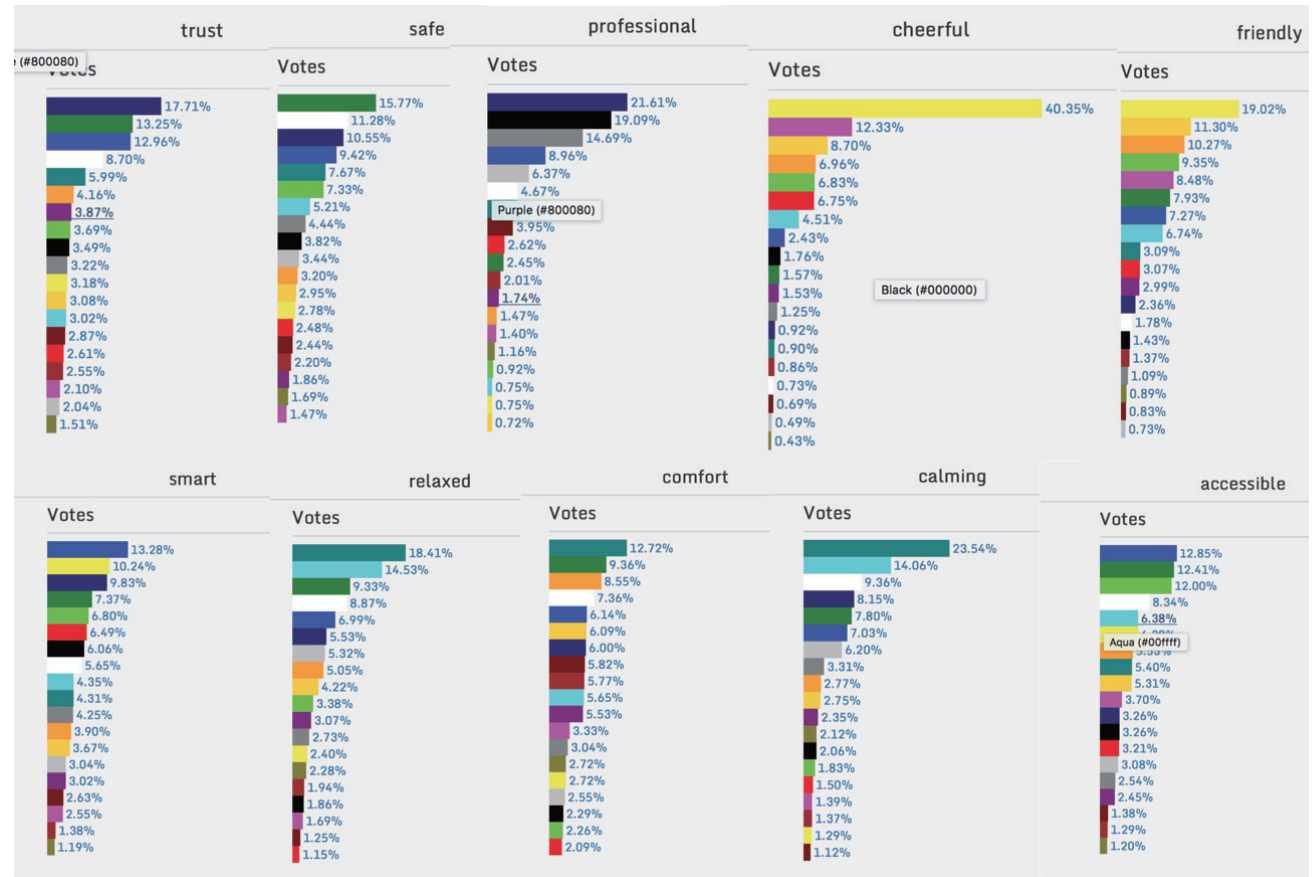


Figure 56: Jacob, E. (2015), ADHB Value Identity colour.

## Colour research

Research reveals that people make a subconscious judgment about a person, environment, or product within ninety seconds of initial viewing and that between 62% and 90% of the assessment is based on colour alone (Gopikrishna & Kumar, 2015). The idea of changing the uniform colour was raised after the public survey. Research was conducted to determine what colour might have potential.

Colour is one of the key elements associated with emotions and evokes certain feelings (Gray, 2014). It is also a strong element with which to build up identity and brand. Therefore, I started to work on the words that were mentioned frequently during the survey and their connection with colours<sup>28</sup>. The words selected were 'Friendly', 'Warm', 'Calming', 'Cheerful', 'Comfort', 'Professional', 'Relaxed', 'Smart', 'Safe' and 'Trust'. Yellow, blue, cyan, orange and green were identified to be the potential colours (Fig. 57 & 58).



<sup>28</sup>The designer of the new value identity logos introduced me to a website which associates meaning with colours. I selected the potential colours from the list of 'meanings' associated

Figure 57: Symbolism. (2016). Voting for meaning associated with colour.

However, after communication with the volunteer coordinator, she indicated that nearly all of the Bluecoats were strongly resistant to the idea of changing the blue colour. To avoid a politically complex situation, it was decided to keep the colour blue, but to explore lighter and warmer shades such as green and blue combination colours (aqua and turquoise) or sea colours. I think a lighter colour would potentially help visitors feel more relaxed and cheerful which could help to decrease unnecessary stress and nervousness when they visit the hospital. Research on colour psychology showed that blue is a very suitable colour for use in a hospital according to the points below (Eiseman, 2000) and (Eiseman, 2006):

- blue symbolises professionalism. It is the first choice for use in corporate branding and identifications because it is closely associated with the words 'dependability' and 'loyalty'.
- blue also conveys a suggestion of "always being there for you".
- blue indicates a remarkable dedication to the consumer.
- the human mind always views blue as 'tranquil' because this colour reminds people of a clear, cloudless sky or the sea. These reflect the emotions of 'calm', 'peaceful' and 'reliable'.
- the blue cloak of the Virgin Mary in paintings represents mercy.
- blue also expresses a sense of authority and justice. The ten commandments were carved on sapphire tablets which presents blue at the highest orders of justice and moral behaviour.

RED	hot passion Love rebellious powerful sex radical excited bold devil	   
ORANGE	warm fall summer retro mellow solar friendly rococo cottage inviting	  
YELLOW	solar happy cheerful summer fun energetic jubilant young sun friendly	  
GREEN	environmental money natural organic Profit earthy grow Dublin trust jealous	  
BLUE	liberal cold smart Progress music trust freedom royal medicine launch	  
PURPLE	royal mystical victorian decadent vanity romantic elegant stylish sensual eclectic	  
BROWN	rustic furniture fall earthy cottage library warm romantic colonial book	 
MULTI		   

Figure 58: Fadeyev, D. (2008). A guide to choosing colours for your brand.

A new colour story showing varieties of blue and sea colours was developed to identify potential alternatives to the volunteers. Aqua(mint) and a pale blue were selected as the most popular new colours for the new uniform (Fig. 59, black circled).



Figure 59: Wang, L. (2015). New colour story board.

## Concept development

In March 2016, a design meeting was planned at the DHW design lab. The reason for changing the location to the hospital was mainly because I was keen to make this project more transparent to all stakeholders who were involved. The aim of this meeting was to gain organisational feedback on design prototypes, colours and fabrics to help narrow down design options. During this process, I not only received useful opinions and suggestions from the organisation but also from the students and designers in the design lab.

Textile print concepts were presented. The new textile prints were developed by exploring various layout combinations of the new value identity plus colours and scale of the new identity logo (Fig. 60 & 61). Prints were scanned onto existing hospital uniforms, scarves and ties to give a better visualisation of the designs (Fig. 62). They were also tested on furniture pieces and as wall art to make the new uniform interact with the overall environment (Fig. 63). Feedback on prints was positive and it was agreed to run some A4 samples in different proportions, colours and fabric types. During discussion, I thought it would be helpful to also start exploring print placement ideas.

*See appendix 16 for extended documentation of colour research and fabric selections (p. 230).*

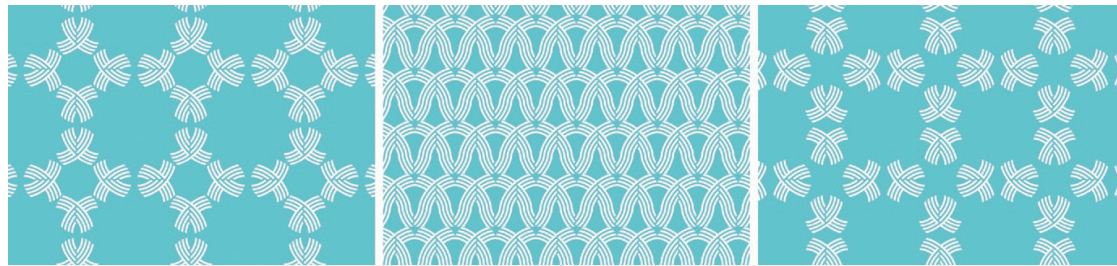


Figure 60: Wang, L. (2016). Textile print design - layout combinations exploration.



Figure 61: Wang, L. (2016). Textile print design - colour and scale exploration.



Figure 62: Wang, L. (2016). Textile print design - hospital uniform, tie and scarf.



Figure 63: Wang, L. (2016). Textile print design -furniture pieces and wall art.

Prior to this meeting, all of the female styles were developed further and design variations explored<sup>29</sup>. Seven styles were shown during the fittings, and four were selected to carry into the next design stage (Fig. 64). Models were required to swap prototypes around so different styles could be tried on different figures (Fig. 65 & 66). The styles selected for the next sampling stage were Emma, Emily, Louisa and kimono. The pleated style was eliminated because the back pleats were very unflattering on some figures. The 'Ava' style was similar to the Kimono, so it was decided to only keep one of them for the next sampling stage. After comparing these two designs on models, more people voted for the kimono. The majority of Bluecoats volunteers are in the over seventy-one age group, and the volunteer coordinator suggested strongly that the 'Isla' style would be hard for them to wear. Both short and longer versions of the 'Louisa' style were shown following comments from the last meeting the decision was made to keep the short length because it was more in proportion and Bluecoats also preferred to show their trousers or skirt underneath.

<sup>29</sup>The 'Emma' style was a development from the tunic dress silhouette option three from cycle seven (see appendix 17, p. 231). The 'Isla' and 'Emily' styles were design variations. The pleated style was developed from the pleated dress silhouette option four in the previous cycle and the 'Ava' style was a design variation (see appendix 18, p. 233). The Louisa and Kimono styles were developed from dolman sleeve silhouette option one.

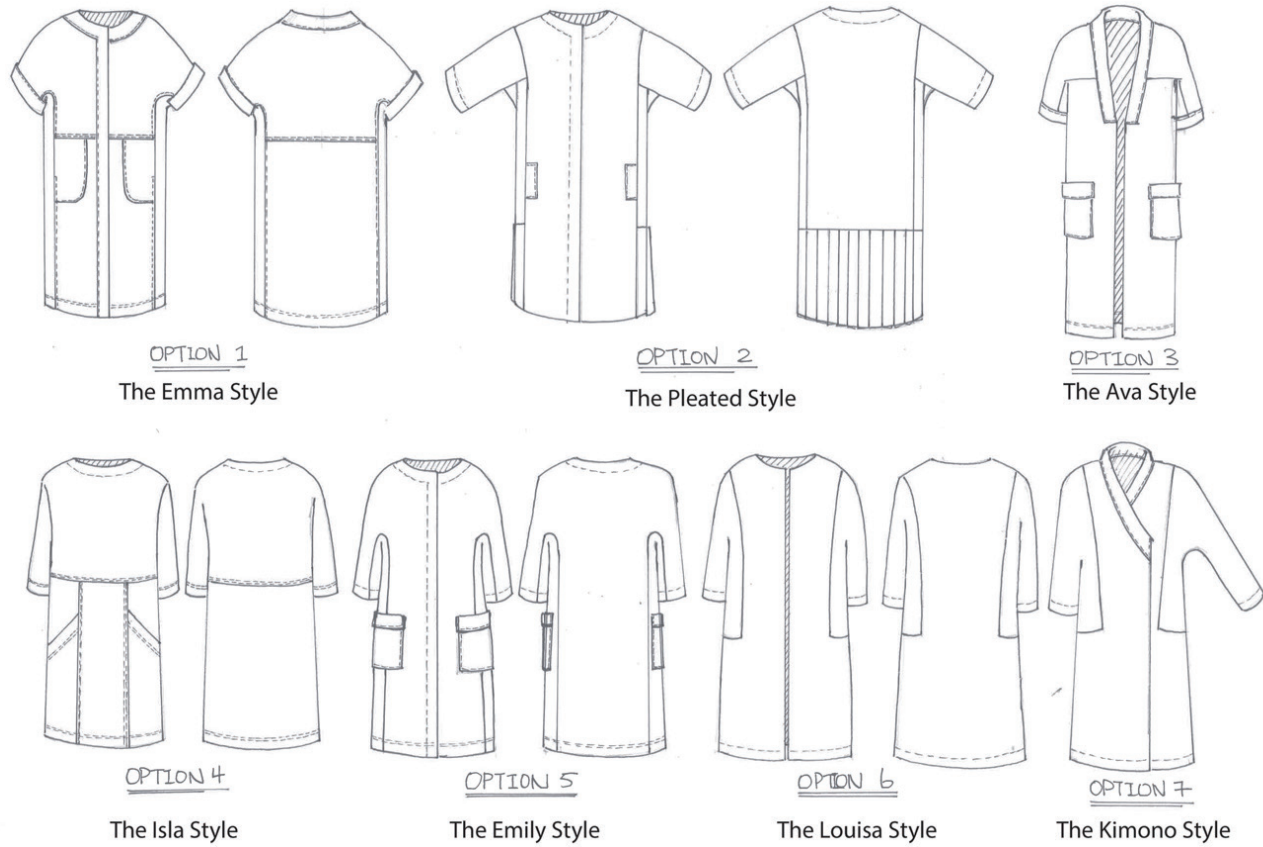


Figure 64: Wang, L. (2016). Concept sketches.



Figure 65: Wang, L. (2016). Fitting photo one. Auckland: property of the designer.



Figure 66: Wang, L. (2016). Fitting photo two.

## | Research and design practice cycle eight

The primary actions involved in this cycle were fabric sourcing trip, textile and concept development, and print placement.

### Fabric sourcing trip

Finding suitable fabrics was the priority for this period following feedback from both fittings. Therefore, a fabric trip was planned to visit wholesalers around Auckland (Fig. 67). Fabric sample cards were collected during the trip for future reference (*see appendix 19 for extended documentation of fabric sourcing, p. 235*).



Figure 67: Wang, L. (2016). Fabric sourcing trip at Hawes and Freer.

## Textile design development

Further to the cycle eight feedback, textile prints were tested on Silk Habotai, Cotton Percale and Merino Weave fabrics in blue/green/black combinations, blue, and teal (Fig. 68). Print scale was explored by reducing to 80% and 100% then enlarging to 150% (Fig. 69). Although these selected fabrics were all pre-treated for digital printing, the silk and cotton fabrics demonstrated a better ability to take the dye. These samples were left at the volunteers' office for a week and feedback suggested that the teal and the blue/green/black options were preferred.

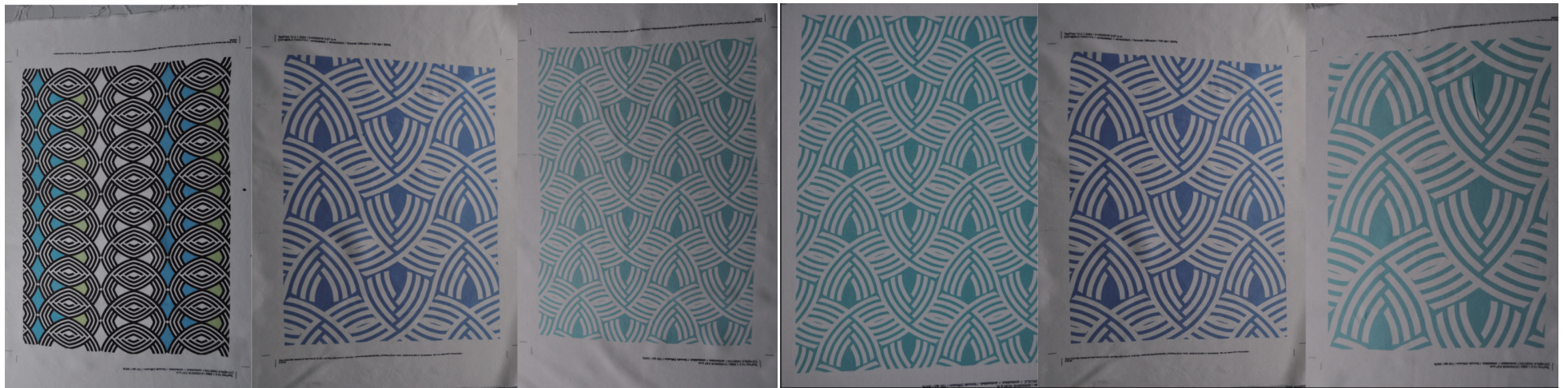


Figure 68: Wang, L. (2016). Textile print colour options.

Figure 69: Wang, L. (2016). Textile print in different proportions – left to right: 80%, 100% and 150%.

## Concept development

After completion of the four print tests, a feedback meeting was organised with the volunteer manager, coordinator and volunteer representative. Feedback gained through this session was divided into three aspects: colour, fabric and style.

*See appendix 19 for detailed documentation of feedback (p. 236).*

## Print placement

Print placement designs were explored through sketching (Fig. 70 & 71). They were then scanned onto fitting photos to quickly visualise the test ideas (Fig. 72-74). The inspiration of the placement designs was to focus on exploring different proportions (print size). Feedback from the volunteer panel was to avoid use of prints over a large area since they might become dated quickly. Therefore, options one, seven and eight were preferred.



Figure 70: Wang, L. (2016). Sketching – exploration of print placement design one.

Figure 71: Wang, L. (2016). Sketching – exploration of print placement design two.



Figure 72: Wang, L. (2016). Photoshop – exploration of print placement design one.



Figure 73: Photoshop – exploration of print placement design two.



Figure 74: Wang, L. (2016). Photoshop – exploration of print placement design three.

## | Research and design practice cycle nine

This cycle aimed to further develop the existing uniform styles and reduce colour and fabric options.

### Concept development

A series of design developments were first explored through sketching and three sketches were selected for prototyping (Fig. 75); next, a fitting was conducted to test the design alterations and to ensure that every design fitted the new model<sup>30</sup>. Both female and male uniform prototypes shown in this fitting session were made in calico since the colour palette for the new uniform was unresolved.

*See appendix 20 for detailed documentation (p. 238).*



<sup>30</sup>The Bluecoat model advised in May that she would not be available for fittings any more. Therefore, a replacement model with similar measurements (size small) was found.

Figure 75: Wang, L. (2016). Design development sketches.

A fabric and colour feedback meeting was scheduled with the hospital representatives on the 23rd of May 2016 to review colour options after a second fabric sourcing trip (*see appendix 20, p. 241*). My suggestion on the aqua (mint) colour was agreed and two potential final turquoise shades were also selected for final prototyping.

During this meeting, I received an invitation from the volunteer coordinator to show and gain feedback on the female uniform prototypes along with scarf print samples at the ACH volunteer meeting on the 20th of June, where all of the Bluecoat volunteers would be in attendance; I was also asked to deliver an update on the project, although the designs were not ready to be presented.

## | Research and design practice cycle ten

This cycle was an important feedback collation period of the ACH volunteers' meeting and a public survey. A new design direction and criteria was then formed based on my reflection on the feedback.

### ACH volunteers meeting

The aim of this meeting was not only to inform the volunteers about the design progress, but also to get them involved in the design process. To prepare for the meeting, designs and patterns for the 'Alex', 'Kimono', 'Sophia' and 'Emma' styles were refined, based on the reflections in cycle nine, and presentation prototypes were made in the selected final fabrics (*see appendix 21 for detailed documentation of development process, p. 242*).

While I was presenting the concepts, the Bluecoats again demonstrated their reluctance to embark on any sort of change (Fig 76). This led to generally negative feedback on the new concepts. In order to better understand the challenges, I approached and collected more detailed feedback with some volunteers individually, in more relaxed circumstances, after my presentation. I also decided to leave all prototypes at the volunteers' office for a week so the Bluecoats could try the new designs on and also have a closer look at the fabrics. Through discussion with the hospital representatives, it was agreed that a public survey would be helpful to assist with an understanding of the new designs.

*See Appendix 22 part one for detailed feedback on the new designs collected during the meeting (p. 247).*



Figure 76: Wang, L. (2016). ACH Volunteer Meeting.

## Prototype feedback survey

In response to the negative feedback received from the Bluecoat volunteers, it was decided to conduct a face-to-face survey to collect feedback on the new prototypes from the public; this was to see if they shared the negative views.

Survey questions, a participant information sheet and a poster were drafted based on the previous public survey. It was undertaken on the 1st July 2016. The survey venue agreed with the hospital was next to the Bluecoat volunteer desk on level five in ACH. The reason for choosing this location was to help the participants compare the current and new uniform designs more easily. Fifty-four people were invited to participate: thirty-five took part and nineteen declined. Twenty-nine females and six males participated. Three prototypes were shown on mannequins (Fig. 77) and there was also a poster (Fig. 78) and a sheet on the wall explaining that 'this is a student project reimagining the Bluecoat uniforms and seeking feedback on some new uniform design concepts'<sup>31</sup>.

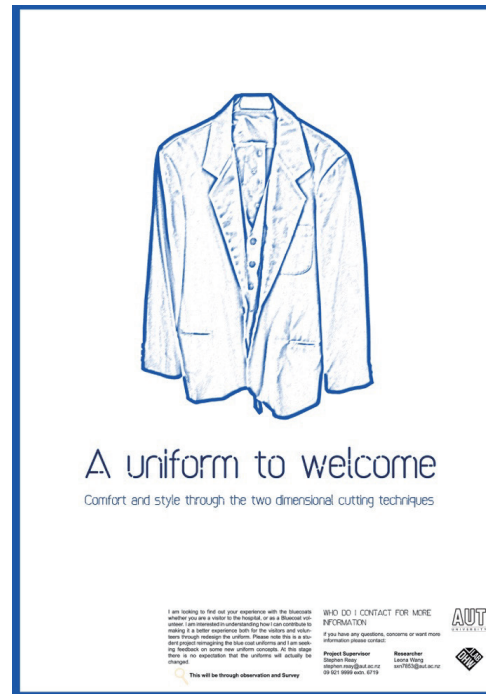


Figure 78: Wang, L. (2016). Public survey poster.



Figure 77: Wang, L. (2016). The public voting.

<sup>31</sup> The hospital required me to make clear to the public during the survey that there was no expectation that the uniform would actually be changed at this stage and that feedback collected was to inform the design direction.

The results of this anonymous public survey confirmed that the new fabric and colour were not ideal. Many participants described the fabric as being too clinical looking and said that it reminded them of the existing patient pajamas. The new colour was felt to be too similar to the current cleaner's uniform. Feedback strongly suggested that the Bluecoats' uniform should be distinctive and stand out among all the uniforms in the hospital.

*See Appendix 22 part two for detailed feedback on the new designs collected during the public voting (p. 248).*

Following feedback from both the volunteers and the public, refocusing of the project direction was required. Refined design criteria are summarised and listed below:

- the new design was required to be completely different from all other existing uniforms in the hospital in fabric, style and colour.
- the new fabric needed to be thicker, warmer and wrinkle-free (more polyester content).
- the colour option was constrained to blue.
- the textile print design must clearly communicate the value identity logo.
- to ensure that the uniform looked professional and that it would last for at least ten years, the main body of the uniform needed to stay plain and the value identity prints could be extensively used on accessory pieces.
- the new designs were required to be fully lined.

During this cycle, I think I was pushed to collect feedback on the prototypes when the designs were not ready to be displayed; I was still in the design exploration stage - the prototypes were not fully finalised and I think if I had had time to refine these prototypes, they would have been far better received by the Bluecoats and also the public.

## | Research and practice cycle eleven

The primary achievement of this cycle was to start the communication process with the uniform design expert (Fashion Uniform Ltd) (Fig. 79).

During the process, insights were obtained on hospital uniform design and how the Bluecoat uniform concepts could be further developed. New prototype development was also commenced with expert advice from Fashion Uniform in regards to colour, fabric, uniform design and the manufacturing processes. Moreover, re-development of the textile print design, to ensure the value identity logo could be clearly identified, was also a significant part of this cycle. *See appendix 23 for consideration of commercial manufacturing (p. 249).*



Figure 79: Wang, L. (2016). Fashion Uniform Ltd.

## Concept development

By reflecting on the new design criteria and considering expert advice from Fashion Uniform Ltd, the styles I chose to further develop were the 'Alex' (male option), the kimono (ranked the highest among the volunteers and public) and 'Sophia' (Fig. 80-82). The reason for selecting the 'Sophia' as an alternative option was because I thought this design suited the role of Bluecoat volunteers the best. It is easy to wear, smart-casual and more trans-seasonal than the Kimono. There were no major changes made to the designs because the feedback had focused mainly on fabric and colour. I also thought that the new fabric and colour would completely re-vamp the look of the new designs. Button closure, belt loop for ID badge and embroidery logo were added in order to show a fully finished look to the stakeholders. Several toiles were made by Fashion Uniform Ltd to test the fit of digital patterns before the final samples were produced.

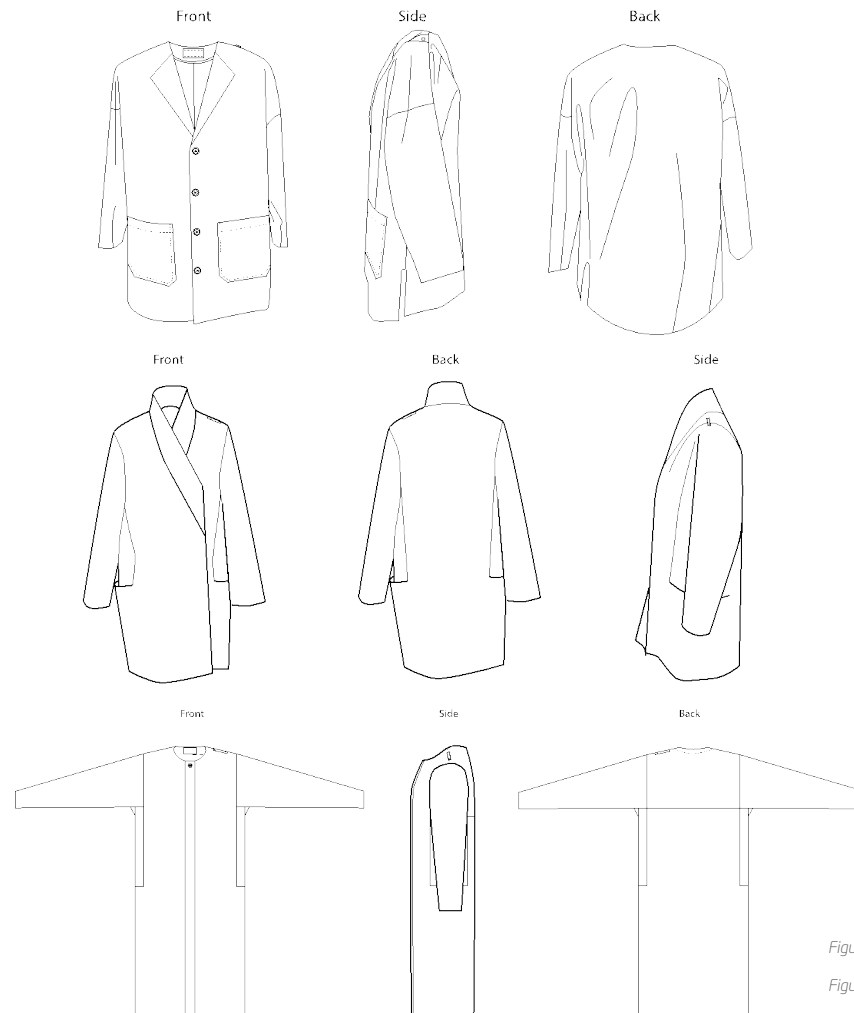


Figure 80: Wang, L. (2016). New design sketches – Alex style.

Figure 81: Wang, L. (2016). New design sketches – Kimono style.

Figure 82: Wang, L. (2016). New design sketches – Sophia style.

Two embroidery designs were developed for the volunteers to further clarify their identity in the hospital (Fig. 83 & 84). While I was working on this uniform, the hospital ID badge was re-designed. It changed from a clip at the right side to the left shoulder using a belt loop sewn at the shoulder seam. This new ID badge location influenced the embroidery location.

*See appendix 25 for full documentation of this section (p. 251).*

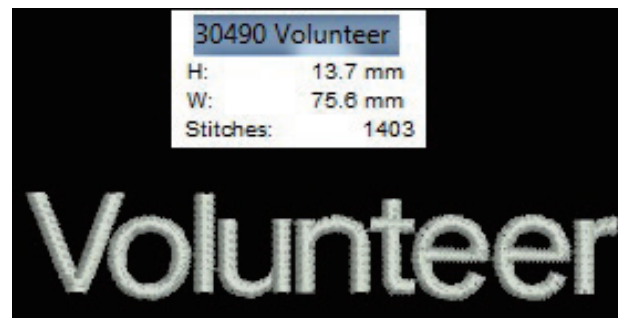


Figure 83: Wang, L. (2016). Embroidery design option one.



Figure 84: Wang, L. (2016). Embroidery design option two.

## | Research and design practice cycle twelve

Collecting votes and final suggestions on the new designs from both the Bluecoats and the public were the aim of this cycle; this data would assist in making final alterations and forming final decisions for the final practice outcome.

### Bluecoat volunteers voting

The new developed prototypes (Fig. 85) were firstly presented to the hospital representatives in response to suggestions and criticism received during ACH volunteers meeting and subsequent public survey. It was decided by the stakeholder group to display the new prototypes at the volunteers' office for a week to show how I had responded to the feedback. A Bluecoat meeting and public voting for final selection and feedback collection were planned during this period.



Sophia Style

Kimono Style

Alex Style

Figure 85: Wang, L. (2016). New uniform designs.

Because the Bluecoats had misunderstood this project<sup>32</sup>, I was concerned that if the mannequins and voting forms were left unattended at the volunteer office, the Bluecoats could easily influence each other and the results collected from the voting form might not be reliable. Therefore, a decision was made to engage the Bluecoats in the feedback process by first having a presentation on the project and then handing out the voting forms to collect feedback. There were a few constraints<sup>33</sup> encountered through this process. However, through negotiation, I finally secured an opportunity to present the new prototypes and explain the design process to the Bluecoat team leaders at ACH and GH separately and have mini-presentations for a week with the ACH Bluecoats (Fig. 86).

<sup>32</sup>For example, many Bluecoats do not believe this is a wise expenditure of ADHB money to change the uniform.

<sup>33</sup>Constraints: 1) It is not a current expectation of the volunteers to come in as a group - the Bluecoats do not have a current routine of getting together as a team. To get them together would require parking and petrol vouchers. 2) The shifts are three times daily so to catch Bluecoats individually would mean being stationed in their office three times a day for seven days. 3) The Bluecoats are stationed at two different hospitals. 4) Survey fatigue - the Bluecoats had been surveyed at work on a number of matters in 2016.

Figure 86: Wang, L. (2016). ACH Volunteer Leaders' meeting.



Illustrations (Fig. 85) and technical flat drawings (Fig. 80 to 82) for each concept were prepared for the presentations in an effort to clarify the designs through visual images to simplify and support the communication process. The uniform the Bluecoats were currently using was listed as one of the options on the voting form to ensure that participants were able to vote on all available options and to provide further data about the question of 'change'. *See appendix 26 for documentation of voting results (p. 254).*

The anonymous public voting took place at ACH over four days on Friday 25th, Saturday 26th and Sunday 27th November from 10am to 4pm and on Sunday 28th from 10am to 2pm. The voting form was designed digitally using Survey Monkey so I was able to use an iPad to collect votes. Photos (Fig. 87) were used during the voting to show the participants directly how the new design looked on people. *See appendix 27 for detailed account of public voting results (p. 256).*



Figure 87: Wang, L. (2016). New designs – from left to right: Sophia, Kimono and Alex styles.

Overall, although there were comments made regarding the length and style being clinical looking, the public was more supportive of the new designs and the 'change'. Combining the responses from both voting sessions, the royal poly-wool fabric is confirmed to be the final fabric for the new Bluecoat uniform. I also decided to apply final alterations to styles 'Sophia' and 'Alex'. Design changes would be made based on my interpretation of the feedback and importantly, my designer voice.

## | Research and design practice cycle thirteen

The last design cycle for this project concentrated on the refinement of three female and one male design, ready for final presentation of the new Bluecoat uniform. In response to the feedback received from the voting process, amendments and reconsiderations were undertaken.

*See appendix 28 for detailed documentation of this process (p. 258).*



Figure 88: Wang, L. (2017). Male design – new Alex style.

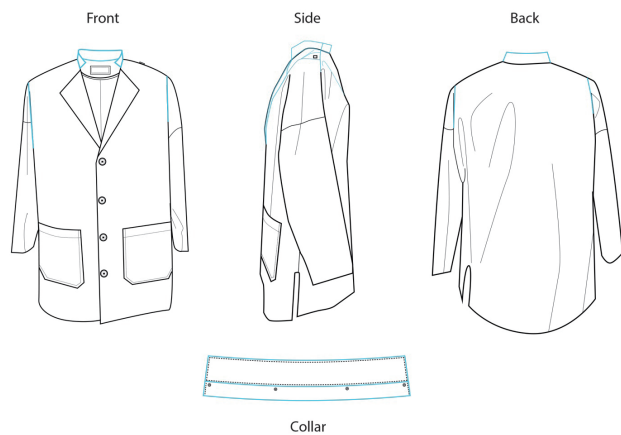


Figure 89: Wang, L. (2017). New Alex style development process (black: Alex style, blue: new Alex style).



Figure 90: Wang, L. (2017). First final female concepts – fitting process three.



Figure 91: Wang, L. (2017). Second final female concepts – fitting process four.

Figure 92: Wang, L. (2017). Third final female concepts – fitting process three.

## | Discussion

HCD, as a primary research and design approach used in combination with AR methodology throughout this project, provided many new learning opportunities for me to understand what users needed or wanted in a hospital volunteer's uniform; these approaches helped me determine design direction at every key stage throughout the development of the uniform. There are two main points, which I have learnt from HCD - user inputs and determination of the key stakeholders. User input is the essence of the ideation and development stages. Users in this project acted as co-designers when provided with insights about the current uniform, gave feedback on design prototypes and were given the opportunity to make design suggestions. As the primary designer, I had always to make selections and my own interpretations of this information or find a balance point rather than making a compromise to the designs. Otherwise, it would be easy to lose my voice as a designer by solely following the feedback from the users. Moreover, there were times when the

same user group provided different responses to the same question. For example, when I first surveyed the Bluecoats, the majority of them preferred a longer uniform for greater warmth; however, in the final voting, they requested a shorter uniform because they thought the short length would suit their heights better.

A project may involve multiple users and those users may indicate their needs or wants in different or even opposing ways. In this study, there were several contrasting views among the stakeholders. For example, the hospital (organisation) and the viewers (visitors) supported a change for the uniform, and the wearers (Bluecoats) did not. In this situation, it was important to identify who is the key stakeholder of the designed product, and the other users may be required to compromise their position. In this case, rather than the wearers, the viewers (visitors) of the uniform were the key users. When the Bluecoats showed strong resistance to any change and refused to provide useful insights, I

should have shifted the focus to the public and hospital visitors much earlier in the process.

There are two things that would be worth exploring to improve the design process if I encountered a similar project in the future. Firstly, I would reduce interactions with the resistant user group (the Bluecoats in this project). I think during the early to middle stages I made too many compromises in an attempt to please the Bluecoats by following their suggestions - however, with little progress for the project since they never changed their minds. They wanted to stay in the current uniform or to have a similar style. I held views that were opposite to those of the Bluecoats all the way through the project, and this sometimes reduced my motivation and caused me to lose my voice in the design practice. The volunteer coordinator also pointed out that I had asked the volunteers for feedback too many times and allowed them to think that they had 'the say' about the change of the uniform, which made things even more

difficult. Secondly, Fashion Uniform Ltd suggested that I could have established a design group, including representatives of the Bluecoats and the organisation, at the beginning of the project and have these people really engaged in the project and design practice. The design group could have given opinions on designs, colours and fabrics, but the rule would be that I would make the decision. In this way, working with a large group of people and trying to convince them to accept a design would be avoided.

This project was a new learning experience for me as a fashion designer and also provided many challenges to overcome. It took me some time to understand the HCD method of research fully and to become familiar with how to incorporate this new approach into my design process. The HCD approach forced me to merge into the user group and try to consider issues from their perspective before any design practice had taken place. Regular feedback meetings with the hospital

representatives and coordinating large-scale feedback with Bluecoats and the public pushed me to continually critique my design practice. During the process, one of the most significant learnings of this project, for me as the designer, was to always keep a positive attitude to the negative feedback from the user; this is because taking on board negative comments undermines one's motivation and adversely affects confidence and work output. It is also important to communicate to the organisation in the early stages if one of the primary user groups is refusing to accept the project, because that is not the designer's responsibility.

In conclusion, regarding the actual design output (the uniform), compromises were made to my initial desire to adopt purely two-dimensional cutting techniques, but introducing a mixed method approach offered the best of both worlds. I think the final design solution is successful as I provided multiple choices for the uniform to the stakeholders by considering and fulfilling the

users' needs for the Bluecoat uniform, while still being true to myself as a designer.



Figure 93: Wang, L. (2017). First final female style.





Figure 94: Wang, L. (2017). Second final female style.





Figure 95: Wang, L. (2017). Third final female style.





Figure 96: Wang, L. (2017). Fourth final female style.





Figure 97: Wang, L. (2017). Final Alex male style.



# Appendices

## | Table of Figures

**Figure 1:** Ancient Egypt Online. (n.d). *Ancient Egypt's social pyramid*. Retrieved January 15, 2017, from <http://www.ancient-egypt-online.com/ancient-egypt-social-structure.html>

**Figure 2:** Phoebe. (n.d). *Greek clothing - chlamys (left)*. Retrieved January 15, 2017, from <http://greekcommunity.weebly.com/clothing.html>

**Figure 3:** Bomgaars, J. (n.d). *Kofun period armor, Japan, from around 250 to 538 CE (right)*. Retrieved January 15, 2017, from <https://s-media-cache-ak0.pinimg.com/236x/f9/98/1f/f9981f9199baaf32f325dad7773a9675.jpg>

**Figure 4:** Haynes, R. (2016). *Medieval life*. Retrieved January 15, 2017, from <http://slideplayer.com/slide/9097503/>

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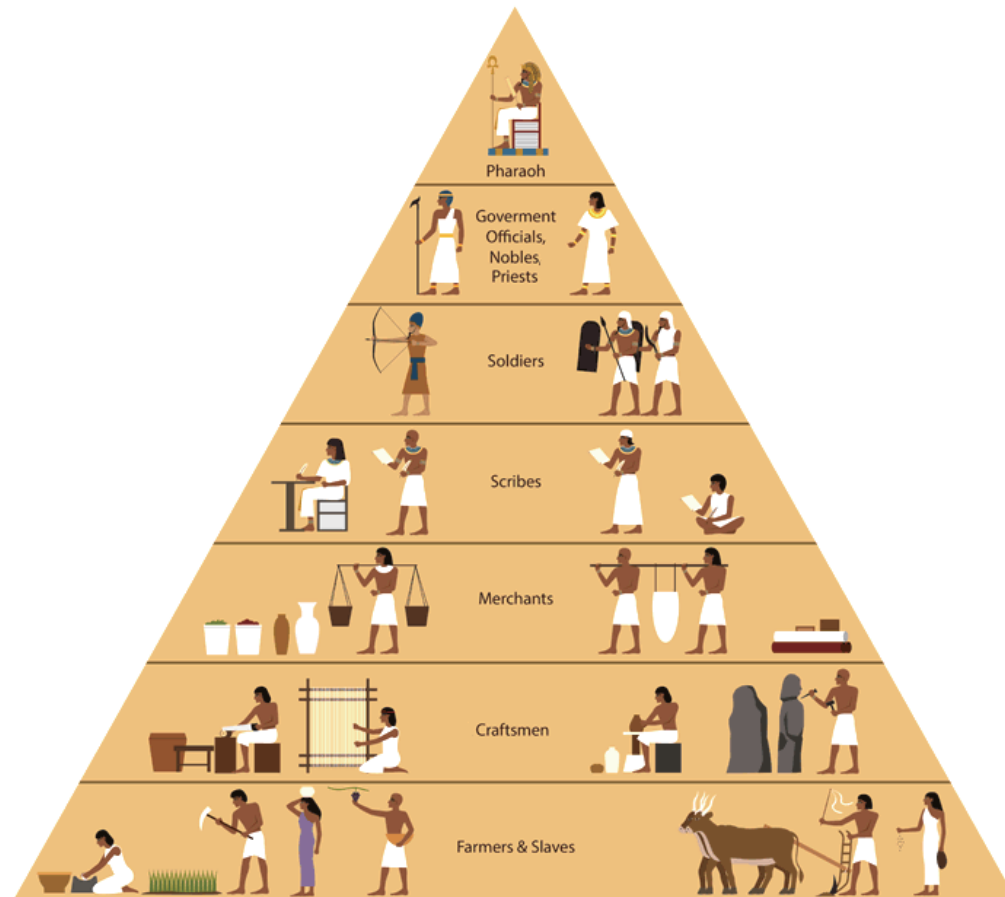
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## | Appendix 1 - The evolution of uniform

“The primitive man in the wolf pelt was not keeping dry; he was saying, ‘Look what I killed. Aren’t I the best?’” - Katharine Hamnett (as cited in Cabrera & Frederick, 2010, p. 175).

A variety of reasons for the wearing of clothes can be found, even back to the earliest origins of clothes. The motive for wearing clothes could be divided into four main categories. The first type, the Cover Theory, is based on the moral emotions and behaviour of a human being feeling the ‘sense of shame’. The Protection Theory is comprised of the Human Protection and the Climate Adaptation Theories. These provide protection to the human body, which is the driving force for clothing innovation. Non-valuable items (e.g. shell and feather) were often carried or used as decoration by primitive man. This can still be seen in a different pattern today as amulet or totem. These behaviours belong to the Amuletic Theory which is closely associated with mental protection and expression. Li (2005) suggests that the most acceptable theory to the general public is the Adornment Theory. Tattoo, body painting and body adornment were the forerunners of clothing, according to this view. He also expressed the idea that the invention of clothing reflects the human desire to communicate and ‘show-off’ authority, beauty and dominion.

The Adornment Theory can also account for the origin of uniform, but here hierarchy, status and authority are the significant factors. Rigid hierarchy was an essential part of ancient societies. In ancient Egypt<sup>1</sup>, clothes were regarded as a significant way to distinguish between the different classes (Fig. 1). Slaves and servants were distinguished by a lack of clothing rather than by any distinguishing livery (Lu & Sun, 2012). Similarly, in Greece<sup>2</sup> and Rome<sup>3</sup>, the lower the rank of individuals, the fewer clothes they wore, and these were of poorer quality in comparison with higher classes. Clothes not only act efficiently to communicate signals of power, wealth and authority but also as a signifier of denial of individual rights. Key words such as slavery, servitude, restriction and rules were closely associated with the idea of clothes and uniform in ancient times (Li, 2005).



<sup>1</sup> Ancient Egypt begins from the Early Dynastic Period (3100BC) and ended at the Achaemenid Egypt Period (332BC).

<sup>2</sup> Ancient Greece dated around 650BC to 146AD.

<sup>3</sup> Ancient Rome dated from 753BC to 476AD.

Figure 1: Ancient Egypt Online. (n.d). Ancient Egypt's social pyramid.

In past centuries, when draped, loose garments, with some slight alterations in styles, were mainstream, fashion and uniform was not obviously recognised in any social group (Ewing, 1975). There is some evidence indicating that the idea of a uniform did not start with the whole outfit but might have started with some particular items of clothing.

During the Ancient Greek period, from the 7th to the 1st century BC, a short cloak called Chlamys<sup>4</sup>, as shown in figure 2, was recognised as the initial concept of a uniform (Bian, 2011). It was designed with functionality in mind and specifically for soldiers and hunters. In ancient Japan, the emergence of warriors' uniform, the armour (Fig. 3), can be traced back to the Kofun period (Lu & Sun, 2012).



<sup>4</sup>The chlamys is usually just a rectangular piece of woolen material, measuring around 183 centimeters by 137 centimeters. This cloak can be worn by simply draping the garment over the left shoulder and securing both sides over the right shoulder. In this way, a large area of the upper body was covered and kept warm while the right arm was unconstrained to hold a horse's rein or a sword. Metal weights were often decorated and attached at the corner of the chlamys to allow the cape to drape elegantly. It could also be used as a blanket when traveling overnight.

Figure 2: Phoebe. (n.d). Greek clothing – chlamys (left).

Figure 3: Bomgaars, J. (n.d). Kofun period armor, Japan, from around 250 to 538 CE (right).

Following the Middle Ages<sup>5</sup>, one of the early approaches to uniform was the neutral reddish-brown gown<sup>6</sup> worn by the lower classes (Ewing, 1975). In contrast, the noble classes and military leaders wore highly decorated uniforms, while emperors wore crowns and special attire to signify their importance (Fig. 4). The sumptuary law, imposed during this time in Medieval and Renaissance Europe, was also a way to encourage, monitor and maintain social hierarchy. This law was strict as to details such as style, length and width of clothing; use of particular materials, colour and adornment (Cumming, 2004). This method of creating social distinction through clothing is also historically cross-cultural. In ancient China, a yellow robe with nine embroidered dragons<sup>7</sup> was to be worn only by the emperor. Another example in Japan is the kimono. Its colour, weave, pattern, the accoutrements, the size and stiffness of the obi (the band on the kimono) all express the social rank and the gentility of the wearer (Milhaupt, 2014). While these were ordinary clothing items, styled to show rank in society, from an outsider observer's point of view, they show many of the features of uniforms. In these cases, clothing was used, much as a uniform, deliberately to stress class distinction and the privileges of the nobility, to create an overt social ladder. Therefore, the notion of this clothing, as for a uniform, was for an outward and visible sign of the role and status of an individual.

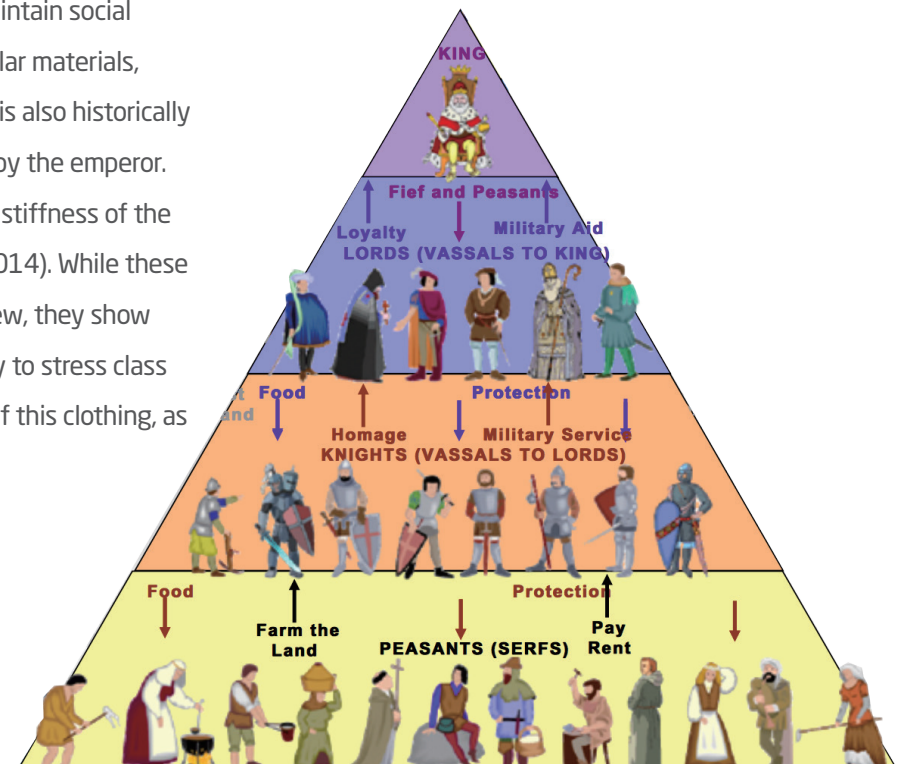
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<sup>5</sup>The Middle Ages dated approximately from 476 to 1453AD.

<sup>6</sup>This gown is also frequently referred to as the main outfit of the poor and later also appeared in the context of servants' outfits.

<sup>7</sup>The number of embroidered dragons varied with different dynasties; however nine is the most common number.

Figure 4: Haynes, R. (2016). Medieval life.



## | Appendix 2 - purpose of a uniform - function

One of the significant features of the 2005 Air New Zealand uniform is the Maori-inspired embroidery design, which was a collaboration with the well-known Maori artist Derek Lardelli. The uniform utilised teal, greenstone and schist as the colour palette, which is softer than the former Air NZ favorite shades (Fig. 5). Signature pieces for female members were a muted teal merino wrap, a hat and a paua-design scarf. Male members wore mist or stone-coloured long sleeve under shirt with a koru-inspired jacket and belt. At that time, the 2005 design was described by Air NZ chief executive Rob Fyfe as an outstanding “elegant, contemporary yet quintessentially New Zealand uniform collection that encapsulates our heritage, our country’s natural beauty and the warmth and integrity of our people” (as cited in Pepperell, 2009). However, two years after the release of the new uniform, the airline changed the colour back to the darker shade because the lighter colour resembled an old (worn out) and washed-out look on some staff members. Style-wise, staff complained “the uniform creased easily, was difficult to keep clean and unflattering for larger females” and “[t]here were accounts of men having to get their trousers altered for a better fit” (Pepperell, 2009). Criticism and negative responses from the public and media accelerated the pressure for a new uniform.

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Figure 5: NZHerald.co.nz. (2010, January). Air New Zealand uniforms over the years.

## | Appendix 3 - use of uniform in a healthcare environment

The deaconesses uniform was followed by a servant's uniform<sup>8</sup> (Fig. 6 & 7), in the early Victorian era<sup>9</sup>, which was worn by nurses whose occupation was considered promiscuous, slovenly, and dishonest<sup>10</sup> (Spragley, & Francis, 2006). Florence Nightingale (Fig. 8) soon overturned this perception by sanitising the hospital and reforming the nursing uniform, which was later used during in a military campaign (Jacinta, 2012). She had a significant effect on the development of the nurse's uniform and on the practices of modern nursing (Jacinta, 2012). This uniform was respected and afforded protection to the nurses from the disorderly Scutari army's<sup>11</sup> unwanted attentions by reflecting the reformed role of nursing (Ewing, 1975). Conditions in the hospitals during the Crimean campaign were appalling, and deaths caused by infections were more frequent than deaths through injury (McDonald, 2014). Florence Nightingale came from a wealthy background and was highly educated in healthcare, and she managed to bring enormous changes to the patient care system by proposing the theory of five vital elements<sup>12</sup> for an optimal healthcare environment (Nightingale, 1859). This led to a dramatic reduction in the mortality rate of Scutari soldiers. Consequently, wide admiration was earned both for Nightingale herself, and for the role of nurses, from the soldiers. Nurses' identity was reinforced by their uniform (Jacinta, 2012).

<sup>8</sup>It is a full black, or printed gown with a white gathered or banded cap and apron.

<sup>9</sup>The Victorian era indicates the time of Queen Victoria's reign from 1837 to 1901, in British history.

<sup>10</sup>Nurses in the early Victorian era were portrayed as a "sordid", "coarse", "ignorant" and "brutal" elderly women tipping at the brandy bottle and fulfilling community service obligations for breaking the law. Patients had little or no confidence in them for even the simplest medical duties because of their notorious reputation for immoral behaviour (Jacinta, 2012).

<sup>11</sup>The Scutari army was the British army based at Scutari during the Crimean war.

<sup>12</sup>Pure air, pure water, efficient drainage, cleanliness and light. Nurses' uniforms and nursing equipment fall under 'cleanliness'.



Figure 6: AngelS. (n.d). Dress for maids in service lady's maid (left).

Figure 7: AngelS. (n.d). Dress for maids in service nursemaid (middle).

Figure 8: Pacific Rim Digital Library Alliance. (n.d). Florence Nightingale, the lady of the lamp (right).



Figure 9: *Workwear Essentials*. (2014). Nurse in 1800 (left).



Figure 10: *Workwear Essentials*. (2014). Nurse in 1850 (right).

In Britain, the nurse's uniform started to look distinctly different from servants' uniforms in the 1900s (Fig. 11 & 12). Nursing became a respectable and highly demanding career with schooling systems, and had uniforms which were "lady-like" gowns with white aprons and caps (Ewing, 1975). From this time on, this uniform became synonymous with the nursing profession (Pearson, Baker, Walsh & Fitzgerald, 2001). The use of a hat and band also became an important component of the uniform to distinguish nurses and display their rank.



Figure 11: Library of Congress. (1909). *Angel of mercy* - nurse in 1900s.

Figure 12: Library of Congress. (between ca. 1914 and ca.1915). *French Red Cross nurses* - nurse in 1910s

Figure 13: Library of Congress. (between ca. 1922). *Nurses* - nurse in 1920s.

Figure 14: Library of Congress. (1931). *Nurses* - nurse in 1930s.

Figure 15: Library of Congress. (1942). *Nurse training* - nurse in 1940s.



Figure 16: Dowling, K. (2010). Western nursing students from the 1950s.

Figure 17: Workwear Essentials. (2014). Male nurse in 1960s.

Figure 18: Pace University. (2011). Nurse in 1960s.

Figure 19: Homestead. (n.d). Nurse in 1970s.

While early changes to the nurse's uniform maintained a sense of authority and professionalism, more recent changes have emphasised functionality (Spragley & Francis, 2006). The desire for functionality emerged as early as Florence Nightingale's time. "The dress of women is daily more and more unfitting them for any 'mission' or usefulness at all. It is equally unfitted for all poetic and all domestic purpose..." (Florence Nightingale cited in Ewing, 1975 p. 44). The First World War (1914-1918) brought an opportunity to make functionality the first priority in nurses' uniform design, to meet the profession's requirements of providing efficient and quick care. Hygiene became significant after the discovery of the 'no germ theory' in 1861 (Adlington, 2015). These factors helped initiate the prototypes of the contemporary sterilised surgical attire<sup>13</sup> (Fig. 20 & 21), or 'scrubs' and the laboratory coat, which remain iconic items in the modern medical world (Kintu, 2014).

<sup>13</sup>The modern surgical uniform emerged late in the 20th century

Figure 20: Buczynski, B. (n.d). Nurse in 1980s.

Figure 21: Workwear Essentials. (2014). Examples of western modern hospital uniform.



Ritchie (2015) states that hospital uniforms in the 21st century are designed to be more casual and less defined in terms of dressing regulations and standards. The clothing style and the recognised nurse image has been updated dramatically from the starched apron, hat, veils and medals of the past, to simple 'scrubs' and gym shoes. The wearing of the doctor's coat and the use of white as a symbolic colour has largely disappeared worldwide (Ritchie, 2015). Modern uniform design has greater concern for emphasising particular roles, conditions and the environment. For example, scrubs are designed to be simple, with minimal places for dirt to accumulate; durable, and economical to replace if damaged or stained irreparably (Neve, n.d.). Colour choice is also more flexible. Unlike traditional uniforms, scrubs are similar to pajamas. They are made of breathable fabric and are deliberately loose-fitting to support an easy range of movement while achieving maximum comfort. The invention of scrubs led to the colour-coding system for the purpose of easy identification (Fig. 22). This was necessary because most hospital staff wore scrubs and it was important to know quickly what each group's job was. Moreover, modern nurses' uniforms are more relevant to the viewer. For example, nurses dealing with children's healthcare may wear warm and colourful shades or prints (Fig. 23 & 24) to create a friendlier and more welcoming atmosphere (Roohafza et al, 2009).

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Figure 23: Shriners Hospitals for Children, (2015). Nurse uniform.



Figure 22: Burton, E. (n.d). Example of nurse uniform colour coding



Figure 24: NY Metro Parents. (2013). Children's health care provider - PM pediatrics uniform.

# Appendix 4 - Bluecoat Volunteers' Uniform Expert survey form

## Bluecoat Volunteers Uniform Expert Survey

### General Questions

Please provide a little information about yourself by selecting the most relevant category:

**1. Are you?**

- Female  
 Male

**2. What age group are you in?**

- 18 to 20     31 to 40     51 to 60  
 21 to 30     41 to 50     61 to 70  
 71+

**3. Which ethnic group(s) do you belong to?**

- NZ European     Niuean  
 Maori     Chinese  
 Samoan     Indian  
 Cook Island Maori     European  
 Tongan     Other

**3.1 Which volunteer group(s) do you belong to? (For example Monday morning/ Thursday afternoon and so on).**

### Uniform Questions

**1. How long have you been volunteering?**

**2. Why do you volunteer?**

**3. Do you like your uniform?**

Strongly Dislike                      Neutral                      Strongly Like

**4. What do you like about the uniform? Is there anything you don't like? (What don't you like about the uniform? Is there anything you do like?)**

**5. Do you think the current uniform welcoming?**

Strongly Disagree                      Neutral                      Strongly Agree

**6. What does wearing the bluecoats' uniform mean to you?**

**7. What sized uniform do you wear currently? Does it fit you well? If it's not, what size do you normally wear?**

**8. What do you think about the fabric of the current uniform?**

**9. Do you think the current uniform is easy to spot in the hospital?**

Strongly Disagree                      Neutral                      Strongly Agree

**10. How comfortable is the current uniform?**

**11. What comments has visitors made to you about your uniform?**

**12. If there is a new uniform, what do you think it should be like?**

**13. How open are you to change or wearing a new uniform?**

Strongly Disagree                      Neutral                      Strongly Agree

**14. What changes would you like in the new uniform?**

**15. What kind of emotion/message do you want this uniform deliver to the visitor? (For example, warm, welcoming, authority and so on)**

**16. Would you like to be involved in the design of a new uniform?**

- Yes  
 No

If Yes, Please write your name here:

---

17. Which colour do you think is the most welcoming?

18. Would you prefer a new uniform to be in a pattern/print fabric or a plain one?

Pattern/Print fabric

Plain fabric

Other (please specify)

19. Further comments (if you have any further comments about the current uniform or ideas for a future uniform)

[Go back to page 58.](#)

Figure 25: Wang, L. (2015). Bluecoat volunteers' uniform expert survey page one.

Figure 26: Wang, L. (2015). Bluecoat volunteers' uniform expert survey page two.

Figure 27: Wang, L. (2015). Bluecoat volunteers' uniform expert survey page three.

# Appendix 5 - public survey

## Bluecoat Volunteers Uniform Anonymous Survey

### General Questions

Please provide a little information about yourself by selecting the most relevant category:

**1. Are you?**

- Female
- Male

**2. What age group are you in?**

- 18 to 20
- 21 to 30
- 31 to 40
- 41 to 50
- 51 to 60
- 61 to 70
- 71+

**3. Which ethnic group(s) do you belong to?**

- NZ European
- Maori
- Samoan
- Cook Island Maori
- Tongan
- Niuean
- Chinese
- Indian
- European
- Other

**4. Are you a?**

- Patient
- Hospital staff
- visitor
- Other (please specify)

### Current uniform

**5. Do you know who the Bluecoats are?**

- Yes
- No
- Other (please specify)

**6. Have you seen people wearing bluecoats?**

- Yes (Go to question 7)
- No (Go to question 8)
- Other (please specify)

**7. Do you think the Bluecoats are easy to spot in the hospital?**

- Strongly disagree      Neutral      Strongly agree
- 

**8. What is your first impression?**

**9. What do you like about the uniform?**

**10. What don't you like about the uniform?**

**11. Which colour do you think is most welcoming? Why? (Colour selection)**

**12. Does the current uniform welcome?**

- Yes
- No
- Why? (please specify)

### 13. What emotion/message does the uniform give to you? (For example relaxed, confident and so forth)

### New uniform

**14. Do you think a uniform can make you feel safe? How?**

**15. The uniform could be changed! What do you think?**

- Strongly disagree      Neutral      Strongly agree
- 

**16. Do you think the Bluecoat uniform should be casual or formal?**

- Casual
- Formal
- Why? (please specify)

**17. What should a new uniform should be like?**

**18. Do you think the uniform should have a pattern?**

- Yes
- No
- Why? (please specify)

**19. What kind of emotion/message do you want to receive when you see the uniform? (For example welcoming, professional, authority and so on)**

**20. Does the uniform adequately represent the work the volunteers do?**

- Yes
- No

**21. Do you have any other comments, questions, or concerns?**

Go back to page 58.

Figure 28: Wang, L. (2015). Public survey page one.

Figure 29: Wang, L. (2015). Public survey page two.

## | Appendix 6 - Participant information sheet

# Participant Information Sheet



### Date Information Sheet Produced:

18 June 2015

### Project Title

15/214 A uniform to welcome – comfort and style through the two-dimensional cutting techniques

### An Invitation

Hello, my name is Leona Wang. I am currently a Master student studying Art and Design at Auckland University of Technology (AUT). I would like to ask for your help with my research, which aims to find out your experience with the bluecoats if you are a visitor to the hospital, or as a Bluecoat volunteer. I would also like to find out what you think about the bluecoat uniform and how it could be improved.

### What is the purpose of this research?

I am interested in understanding what it's like to be a bluecoat and how I can contribute to making it a better experience both for the visitors and the volunteers through redesigning the uniform. The purpose of this research is to find out what the needs of the bluecoat uniform are and to produce a design that will help to provide for these needs.

With your help, the outcome of the research will be a prototype of my design, which may be a uniform collection. I will also be publishing the results of the research in my master thesis.

### How was I identified and why am I being invited to participate in this research?

You have been approached because I am looking for people who can talk to me about their experiences with the bluecoat volunteers, or as a bluecoat volunteer, and about their uniform. You have been chosen because you have experiences that you might be willing and able to talk to me about.

### What will happen in this research?

If you would like to participate then I will ask you some simple questions about your experience of the bluecoats. I will ask you what your thoughts are on the uniform as well as anything you have found good or bad during your experience. The aim of the questions is for me to understand your experience and perspective, there are no wrong answers and I am grateful for any thoughts you would like to share with me. I may take some notes from your response but I will not take down any information that might be used to identify you. I am happy to receive any questions about my research. My contact details are below.

### What are the discomforts and risks?

We don't expect there to be much discomfort or risk in this research; however, you may feel uncomfortable sharing your opinions with me.

### How will these discomforts and risks be alleviated?

If you are uncomfortable with any question you may choose not to answer and will not be required to give any reasons. You can also choose to end your participation at any point, no questions asked. If your discomfort can be eased my more information, please feel free to ask me any questions you may have.

### What are the benefits?

I benefit from this research by using the results to complete my qualification. I also get to practice my skills and gain experience running a project like this.

In return I hope that you will benefit from the opportunity to share your thoughts and experiences in a safe environment and have them listened to. You will also have the chance to contribute towards the improvement of Starship Outpatients'. I hope that this will benefit you in any future interactions you have with the department.

### How will my privacy be protected?

You will be anonymous to me as the researcher as I will not be asking for any identifying information about you such as your name. You will not be identifiable to anyone reading the written outcomes of the research.

### What are the costs of participating in this research?

There is no cost to you for participating in this research except for a time contribution of approximately ten to 15 minutes.

### What opportunity do I have to consider this invitation?

You will have 15 minutes to consider this invitation to participate in my research. The decision is up to you, and if you do not wish to participate you will not be approached again. If you need further information please don't hesitate to ask me any questions, I'm more than happy to answer them.

### How do I agree to participate in this research?

If you have considered this invitation and would like to participate in my research feel free to approach me and let me know. You can also approach me if you have any further questions about the research.

### Will I receive feedback on the results of this research?

You will not receive feedback on the results of this research, as your contact information will not be collected in order to protect your privacy and maintain your anonymity.

### What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Stephen Reay*, [stephen.reay@aut.ac.nz](mailto:stephen.reay@aut.ac.nz), 09 021 9999 ext 6719.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEAC, *Kate O'Connor*, [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz), 921 9999 ext 6038.

### Whom do I contact for further information about this research?

#### Researcher Contact Details:

Leona Wang, [sxn7853@aut.ac.nz](mailto:sxn7853@aut.ac.nz)

#### Project Supervisor Contact Details:

Stephen Reay, [Stephen.reay@aut.ac.nz](mailto:Stephen.reay@aut.ac.nz), 09 021 9999 ext 6719.

Approved by the Auckland University of Technology Ethics Committee on **type the date final ethics approval was granted**, AUTEAC Reference number **type the reference number**.

[Go back to page 59.](#)

*Figure 30: Wang, L. (2015). Public survey participant information sheet page one.*

*Figure 31: Wang, L. (2015). Public survey participant information sheet page two.*

## | Appendix 7 - Bluecoat uniform feedback sheet (public)

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**1. What are your first impression of the new designs?**

**2. What do you like about the new designs?**

**3. What don't you like about the new designs?**

**4. What further development you would like to see of the potential new uniform?**

**5. What do you think about the new colour and fabric?**

**6. Does the potential new uniform look welcoming and cheerful to you?**

**7. Which potential new uniform concept do you like the most?**

Style 1

Style 2

Style 3

Why:

**8. How does the design represent the values of the Bluecoats and what might help the uniform do this more effectively?**

**9. Do you like the new pattern/prints design? Why?**

**10. Do you prefer to have the pattern/prints as an accessories piece or as part of the uniform?**

**11. Do you have any other comments, questions, or concerns?**


Go back to page 60.


## Appendix 8 - Bluecoat uniform voting sheet

**AUCKLAND CITY HOSPITAL**  
*Te Toka Tūmahi*

**BLUECOAT  
VOLUNTEER  
UNIFORM**

**VOTING  
FORM**





Please provide a little information about yourself by selecting the most relevant category:  
Circle or tick your answer

**> Are you?**

Female      Male

**> What age group are you in?**

18 to 20	21 to 30	31 to 40
41 to 50	51 to 60	61 to 70
	71+	

### About the Project

This is a student project to re-design the Auckland City Hospital Bluecoats uniform through human centered approach to enhance hospital volunteers' experience of their uniform and the experience of visitors, patients and staff. The aim of this project is to generate designs that meet user needs and also explore how uniform may enhance the visitor' feeling of welcome and safety.

**> Which ethnic group(s) do you belong to?**

NZ European	Cook Island Maori	Chinese
Maori	Tongan	Indian
Samoan	Niuean	European

Other Please specify:

**Uniform Design Questions**

**> Which style do you prefer? And Why?**

**FEMALE STYLES**

Kimono Jacket      Round neck Jacket      Current Jacket

Why?

**MALE STYLES**

Male New Jacket      Current Jacket

Why?

**> Do you think the new uniform is easy to spot in the hospital? Please rate from 1(Strongly disagree) - 5 (Strongly agree).**

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 32: Wang, L. (2016). Bluecoat volunteer uniform voting form page one.

Figure 33: Wang, L. (2016). Bluecoat volunteer uniform voting form page two

**>** Do you think the new uniform is professional?  
Please rate from 1 (Strongly disagree) - 5 (Strongly agree).

1                  2                  3                  4                  5

**>** Does the new uniform/colour welcome? Please rate from 1 (Strongly disagree) - 5 (Strongly agree).

1                  2                  3                  4                  5

**>** What do you think about the new fabric? Please rate from 1 (Strongly disagree) - 5 (Strongly agree).

1                  2                  3                  4                  5

**>** Which fabric option do you prefer?

Poly-wool                                  Polyester

**>** Which colour do you prefer?

Royal                                  Sky  
(Female Prototypes)                  (Male Prototype)

**>** Which lining colour option do you prefer?

Same as body fabric                  Contrast lime colour  
(Please refer to Female Prototypes)                  (Please refer to Male Prototype)

**>** Which scarf/tie design do you prefer?  
(Please refer to posters. Please only choose one preferred design option and then select the colour)

Scarf/tie design 1  
Green                  Pink                  Blue                  Mint

Scarf/tie design 2  
Green                  Pink                  Blue                  Mint

Scarf/tie design 3 [Gradient]  
Green/Blue                  Orange/Green                  Orange/Mint                  Pink/Blue

**>** Further Comments  
(If you have any further comments about the new designs, please write them here)

Go back to page 60.

Figure 34: Wang, L. (2016). Bluecoat volunteer uniform voting form page three.

Figure 35: Wang, L. (2016). Bluecoat volunteer uniform voting form page four.

## Appendix 9 - Bluecoat uniform public voting form

Web link: <https://www.surveymonkey.com/r/KJ5X572>

General Questions

1. Are you male or female?

Male

Female

2. What age group are you in?

18 to 24

25 to 34

35 to 44

45 to 54

55 to 64

65 to 74

75 or older

3. Which ethnic group(s) do you belong to?

NZ European

European

Chinese

Maori

Tongan

Indian

Samoan

Niuean

Cook Island Maori

Other (please specify)

1

4. Are you?

Hospital staff

Visitors

Patients

Other (please specify)

2

Figure 36: Wang, L. (2016). Bluecoat volunteer uniform public voting form page one.

Figure 37: Wang, L. (2016). Bluecoat volunteer uniform public voting form page two.

### 5. Which female style do you prefer? And why?

- Current Jacket
- Round neck Jacket
- Kimono Style Jacket

Why?



### 6. Which male jacket style do you prefer? And why?

- Current jacket
- New design

Why?

#### Male Jacket Options



Figure 38: Wang, L. (2016). Bluecoat volunteer uniform public voting form page three.

Figure 39: Wang, L. (2016). Bluecoat volunteer uniform public voting form page four.

7. Which colour option do you prefer?

- Royal
- Sky Blue

Why? (please specify)

8. Do you think the selected styles are easy to spot in the hospital?

Strongly disagree                      Neutral                      Strongly agree

Why? (please specify)

9. Do you think the selected styles deliver a professional image in the hospital?

Strongly disagree                      Neutral                      Strongly agree

Why? (please specify)

10. Do you think the selected styles welcome?

Strongly disagree                      Neutral                      Strongly agree

Why? (please specify)

11. Which Scarf/tie design do you prefer? And why?

- Design 1
- Design 2
- Design 3

Why? (please specify)



Figure 40: Wang, L. (2016), Bluecoat volunteer uniform public voting form page five.

Figure 41: Wang, L. (2016), Bluecoat volunteer uniform public voting form page six.

12. Which scarf/tie colour option in Design One do you prefer?

- Green
- Pink
- Blue
- Mint



13. Which scarf/tie colour option in Design Two do you prefer?

- Green
- Pink
- Blue
- Mint



Figure 42: Wang, L. (2016). Bluecoat volunteer uniform public voting form page seven.

Figure 43: Wang, L. (2016). Bluecoat volunteer uniform public voting form page eight.

14. Which scarf/tie colour option in Design Three do you prefer?

- Gradient Green/Blue
- Gradient Orange/Green
- Gradient Orange/Mint
- Gradient Pink/Blue



15. Do you have any other comments, questions, or concerns?

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Figure 44: Wang, L. (2016). Bluecoat volunteer uniform public voting form page nine.

Figure 45: Wang, L. (2016). Bluecoat volunteer uniform public voting form page ten.

## | Appendix 10 - documentation of surveys

### Bluecoat volunteers' uniform expert survey

This survey was used to gain more detailed feedback from both ACH and GH Bluecoat volunteers regarding their perceptions of the existing uniform, the potential development opportunities for it, and the image they would like to portray to the public.

### General information

Nine GH and thirty-one ACH Bluecoats participated in the BVUES. They were thirty-two female and eight male members. This represented forty-nine percent of the total Bluecoat volunteers at both GH and ACH. The forty Bluecoats were differentiated into five age groups, more than half belonging to the over seventy-one age group.

### Bluecoat perception of the current uniform

In summary, both positive reviews and resistance to a possible new uniform were expressed through this survey (Fig. 46). Comments such as *"I like everything about this uniform. It is smart and admired by many visitors/patients..."* and *"[it] is a colour that suits most people. After all these years, we have been known as helpers to the public"* (statements from Bluecoats) were frequently mentioned in the survey. Because of compliments from visitors, Bluecoats believed strongly that the public was in favour of the current blue colour, and that the current style enabled the public to recognise them easily. The design feature of the current uniform the volunteers liked the most was the colour. They believed the royal blue colour was distinctive, strong and suited a variety of skin colours. 'Welcoming', 'comfortable' and 'warm' ranked as the most significant characteristics of the volunteer's uniform, according to the volunteers.

The current uniform was depicted by the Bluecoats as professional, standing out, identifiable and suiting various body shapes. Sixty-eight percent of Bluecoats believed it delivered a welcoming image, enhanced customer service confidence, the overall user-experience, and created a more professional working environment. Ninety-two percent thought the uniform was easy to spot in the hospital. More than seventy percent of Bluecoats suggested that the current uniform was good enough as a uniform and suited multiple figures. Bluecoats believed that the uniform made them a part of the ADHB team and they expressed their pride in being hospital ambassadors to provide assistance to the visitors and patients.

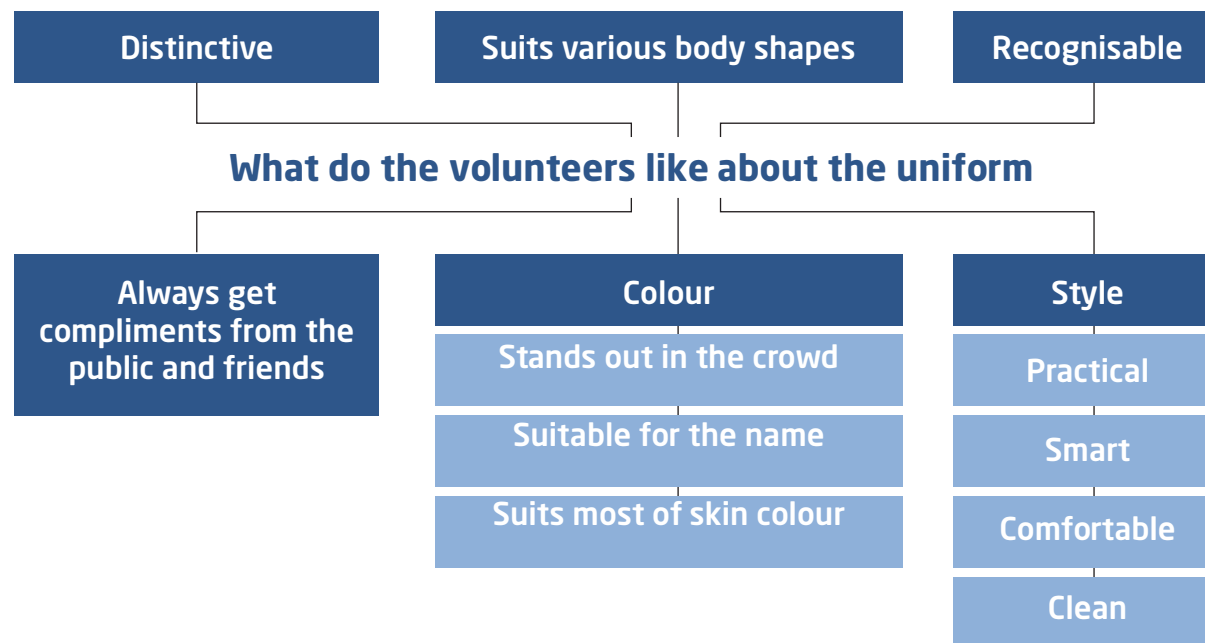


Figure 46: Wang, L. (2015). What do the volunteers like about the uniform?

## Potential development opportunities

In contrast, some Bluecoats suggested the current uniform was old-fashioned and the fit was of a poor standard. Negative feedback was focused mainly on three aspects: warmth, sizing and fabric (Fig. 47). Since the hospital entrance doors open continually next to the level four Bluecoat desk, more than half of the volunteers mentioned the need to have a warmer coat in winter, for when desks are in very cold areas. Nearly all of the volunteers reported *"it is the time for a change for the scarf and the men's tie"* because the synthetic scarf was hot and uncomfortable, while the tie needed a new style.

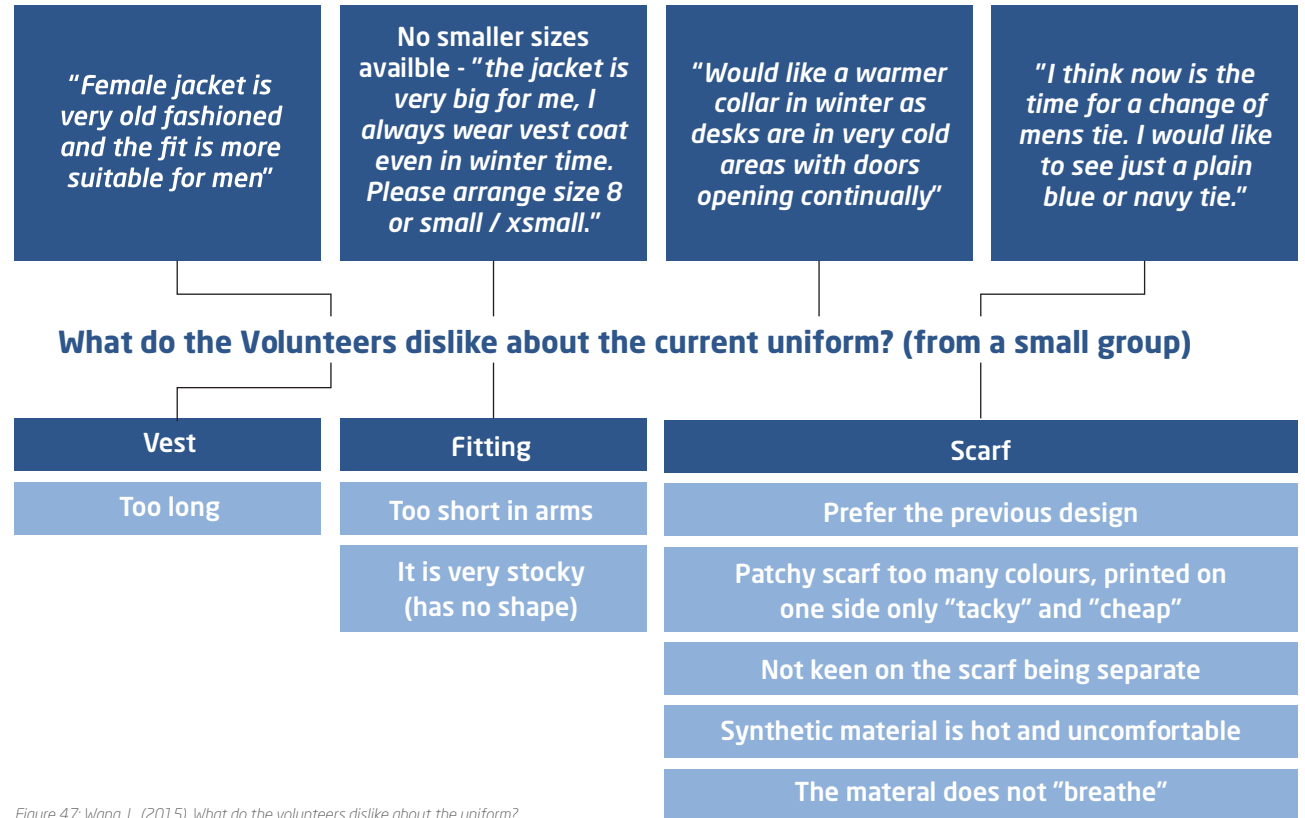


Figure 47: Wang, L. (2015). What do the volunteers dislike about the uniform?

There were seven sizes in the female uniform (sizes 10 to 22) of which size 14 was the most often required. When selecting the jacket, Bluecoats believed the priority was to fit around the shoulders, so the uniform often did not fit other areas such as bust and waist. In the survey, the volunteers suggested having a simpler size range<sup>14</sup> with more uniforms in each size<sup>15</sup>. They also reported their dislike of shoulder pads which created an illusion of a broad, muscular look. A semi-fitted shape and slim looking silhouette was identified as the most desired. Nearly all of the Bluecoats suggested that the most important feature for this new design would be for it to suit all age groups and that it must pay respect to the elderly.

In my opinion, polyester is durable, has strong crease resistance but is less comfortable to wear compared with natural fabrics. As the fabric used for the existing jacket was a hundred percent polyester, and as the Bluecoats reported in the survey, it was un-breathable and so was too hot during summer. From the insights drawn from the surveys, and reflections on my observations, I felt that when I selected my fabric, temperature would not be a problem in winter because the Bluecoats could always wear extra layers under the jacket. The survey indicated that the current thirteen-year-old fabric was showing significant wear and thus had become unpresentable, while the polyester itself was uncomfortable. The survey also revealed that the weight of the fabric should be trans-seasonal, suitable for both summer and winter, and that lightweight and natural fabrics would be preferred but crease resistance was a top priority.

<sup>14</sup>Small, medium and large.

<sup>15</sup>There was a lack of uniforms in some sizes as they had worn out and had not been replaced.

## Public image

*"If we are not working we need to do something worthwhile for the community. If we have the time, we love to help people"* (statement from a Bluecoat).

At the beginning of this project, a key consideration was what motivated people to volunteer, in order to better understand the public image and culture Bluecoats would like to portray through the uniform. The culture of the Bluecoat volunteers and reasons that encourage this commitment are listed below. These suggest a very positive group of people, with eager willingness to help, who gained satisfaction from the job. From a designer's perspective, I think the message of this uniform should be 'warm', exuberant, optimistic, helpful and approachable.

- Giving back to the community - *"I have always worked in PR or with people. I hope to give back to the hospital staff the time and effort which I once*

*received when I was a patient"* (statement from a Bluecoat).

- Gaining great satisfaction - *"I am proud to wear the Bluecoat uniform because being able to help visitors on their arrival at hospital gives me huge satisfaction that I have achieved on my shift"* (statement from a Bluecoat).
- Being useful in their later years - *"...to do something I consider useful during my retirement years"* (statement from a Bluecoat).
- Creating a sense of belonging among volunteers and feeling proud to be a part of the ADHB team.
- Connecting socially and interacting with colleagues and the public - satisfaction and enjoyment gained from caring for each other and connecting socially with colleagues.

In conclusion, the survey results suggested the emergence of three redesign themes:

- reformat the sizing from a numbered range to small, medium and large. The advantages would be reduced cost and greater convenience for the Bluecoat choosing their size.
- update the style and fabric to give the uniform a modern look.
- re-vamp the scarf and tie designs.

## Anonymous public survey

This survey was used to understand what the public thought about the current uniform.

The public survey research methods were reviewed during the process because the data collected on the first day were not as expected. Initially, I was advised to wear the Bluecoat uniform for reasons of safety<sup>16</sup>. However, wearing the uniform appeared to influence the way participants responded to the questions. Numerous compliments were received during the session when the uniform was worn. In order to verify whether the uniform was influencing visitor responses, I conducted additional survey sessions in plain clothing. This revealed that visitors had been hesitating to share their true views on the uniform when the uniform was being worn during the communication, because they regarded me as part of the Bluecoat group<sup>17</sup>. Consequently, the remainder of the survey was undertaken wearing plain clothes.

The data collected while wearing the uniform was discarded as it was compromised, but a reflection was conducted to show that it did correspond with the comments the Bluecoats themselves receive from the public - that they looked nice (sixty-four percent of participants believed that the current uniform portrayed a welcoming image). The outcome of the survey undertaken wearing the current uniform showed six-eight percent of participants thought the current Bluecoat uniform stood out in the hospital. Only twenty percent of participants showed a dislike or a strong dislike of the current uniform. The majority of the participants (sixty percent) chose 'neutral' when asked how they felt if the uniform was to be changed. Overall, the feedback received from the public about changing the uniform was indifferent when the current uniform was worn during the survey, and most of the participants thought "[i]t doesn't matter to me if the uniform gets

*changed as long as there is an announcement to the public..."* (statement from survey respondent).

In contrast, when I was wearing plain clothing, sixty-two percent of participants gave the response that they did not know who a Bluecoat volunteer was nor what their role in the hospital was. Moreover, forty-three percent indicated that they had never seen anyone wearing the Bluecoat uniform in the hospital. Only one third (33.3%) of participants reported that the current uniform portrayed a welcoming image. Fifty-seven percent of participants surveyed supported, and thirty-one percent strongly supported, a change of uniform.

<sup>16</sup>Refer to methodology, research methods, survey section.

<sup>17</sup>A group of uniformed hospital staff commented to me that it was difficult to comment on the uniform because I 'was' a Bluecoat.

## General information

Three survey sessions were undertaken wearing plain clothes (15th to 29th August 2015).

A hundred and one people were invited to participate in the survey and 42 agreed: 11 hospital staff, 29 visitors and 2 patients. Equal numbers of hospital staff and visitors were asked to participate during the three sessions.

## Public perception of the current uniform

Overall, the participants expressed that *"...there is a lot of room to improve the current uniform."* Comments were made in respect of four main issues: identification, style, colour and fabric (Fig. 48 & 49).

*Figure 48: Wang, L. (2015). Public first impression of the current uniform.*

### First Impression of the Current Uniform

Like		
Style	Accessory	identification
<ul style="list-style-type: none"><li>/ <b>Stands out</b></li><li>/ <b>Smart</b></li><li>/ <b>Professional</b></li><li>/ <b>Tidy</b> - <i>"This uniform looks tidy compare to all other uniform in the hospital"</i></li><li>/ <b>Appropriate</b></li><li>/ <b>Neat</b></li><li>/ <b>Suitable for most figure types</b></li></ul>	<ul style="list-style-type: none"><li>/ <b>Scarf</b> - <i>"I like the colour of the current scarf. It adds some colours to the whole outfit"</i></li></ul>	<ul style="list-style-type: none"><li>/ <b>Bold and easy to identify</b> - <i>"They look professional and they know a lot around the hospital"</i></li><li>/ <b>Distinctive, different from other hospital uniform</b></li><li>/ <b>Recognisable</b></li></ul>

## Dislike

### Style

- / *"The uniform looks 20 years old and it also gives the feeling that the Bluecoats don't feel comfortable to wear the uniform"*
- / *"An older person will wear it"*
- / *"Too business looking and not comfortable to wear"*
- / *Oversized*
- / *"Both the style and the fabric of the current uniform looks old. It is time for change/an update"*
- / *"Jacket looks too warm to wear in the hospital"*
- / *"Unapproachable - the whole look is very serious and colour is cold"*
- / *"They don't look like volunteers. The style is too formal and corporate, too lawyer like at this moment. They look like they are about to go to do an operation. The uniform needs to be look more like what customer service people would wear"*
- / *"The style needs to be more refined. A hospital volunteer's uniform don't need to look too formal like what people wear in the bank. It needs to look more stylish and fit to their body shape"*
- / *"It doesn't suit everyone"*
- / *"I think the volunteers should have priority in design of the uniform rather than patients and other staff. The uniform needs to be comfortable for them to wear"*
- / *"The current uniform looks too formal and serious"*

### Colour

- / *Colour is cold and chilly in winter*
- / *Dull*
- / *Old*
- / *Dirty*

### Identification

- / *"The uniform looks too common, nothing really interesting. A lot of people wear blue in the hospital. Sometimes it can be really confusing"*
- / *"The uniform don't have any sign of logo showing they are volunteers. I won't approach them for help unless I know who they are"*
- / *"I really not sure who they are. I know they are part of hospital but I don't know they are volunteers when I first saw them"*
- / *"I don't think they are volunteers when first saw them. In my opinion, volunteer's uniform is always very casual"*
- / *"I have no idea the Bluecoat are volunteers who can help us with directions, I can't tell anything from their uniform"*
- / *"I have been in the hospital a lot so I know who I should go to but for the people who come here the first time, I doubt they will be able to figure out who to ask for help"*
- / *"The uniform should clearly show Bluecoats are the information people and the "go to person"*
- / *"It is a plain jacket, people do not know who they are"*

### Fabric

- / *"The fabric of the jacket seems old and washed-out. I think this uniform needs to be more presentable"*



Figure 49: Wang, L. (2015). Public expectation of the current uniform.

## Identification

*"I did not know who they are or what they do in the hospital before this conversation. When volunteers wear this uniform, they should be proud of it and their job but if most of the visitors do not know who they are this uniform will be meaningless"* (response from a visitor)

In the survey, nearly all the participants believed the role of uniform in a hospital was important because it represented identification, reliability, safety and trustfulness. They expressed that *"I never ask someone in the hospital without a uniform. I don't trust ID and I need to see the uniform"* and *"when you see a uniform, you know that this person is trained and qualified to help you."* However, the survey indicated that the identification aspect of the current uniform did not match the public's expectations and these concerns were widely expressed. Comments such as *"there is no logo or any sign to signal their role"* and *"the new uniform should have some kind of lettering clearly showing who the Bluecoats are..."* were constantly brought up in the survey. Hospital staff also agreed: *"I am a hospital staff member so I know about the Bluecoats but what would happen if I were an outsider. I think identification is a really important aspect to take into consideration for the design of the new uniform"*.

*Go back to page 76.*

## The style

The survey suggested that the overall fitting was oversized and unflattering. It was viewed as old-fashioned and corporate-looking. The formality created a barrier to communication and also an 'unapproachable' atmosphere. Participants commented that *"...They look like they are about to do an operation. The uniform needs to look more friendly"* and *"I am already stressed enough when I come to the hospital. I don't want to see people looking even more serious - lawyer-like. The volunteers should look more casual so I will also feel that it is easier to talk to them"*. The survey also revealed that the current uniform and its colour were seen as 'cold' and serious, which caused uneasiness and hesitation to approach.

## The colour and fabric

Negative comments about the current colour of the Bluecoat uniform were focused on the fabric being old, dull, dirty and easily lost among other hospital uniforms. Suggestions were made to use bright, 'warmer' colours or colour combinations. Participants suggested colour was a powerful way to delivering emotional messages to the viewers. For example, red makes people feel alarmed. Blue or navy are hospital-like colours which express messages such as calm and peacefulness. Other emotional messages which almost all participants suggested that a uniform and its colour can communicate are reliability and trustfulness. These helps to calm them down emotionally and make them feel safer in an unfamiliar environment. However, by eliminating the colours already used in the hospital and considering different skin tones, blue was still the highest ranked colour, followed by yellow and orange. When participants were informed that there was the possibility of having a unique textile print design on the fabric, this was generally not welcomed. Nearly half of the participants thought the uniform should stay plain because textile prints create restrictions as to the clothes worn underneath, and it would also make the uniform become unfashionable more quickly. The rest of the participants thought a pattern or print would better symbolise the volunteers, but they agreed with the negative points (above). The most important messages the public would like to receive from the uniforms were identified as 'welcoming', 'professional', 'friendly', 'helpful' and 'approachable'.

## | Appendix 11 - documentation of cutting exploration and traditional costume research

### Cutting exploration

The fundamental philosophy of the two-dimensional cutting technique is to utilise two-dimensional thinking as inspiration and to treat the body as a flat surface. Two-dimensional clothing is normally straight-cut out of flat-folded cloth (Fig. 50). The side seam runs all the way from the sleeve to the bottom hem. Because of the extensive use of embellishments, such as embroidery, on two-dimensional costumes, the designs were required to have fewer seam lines.

The kimono style is one of the most obvious examples of two-dimensional cutting. It is a large rectangular piece of fabric with a neck hole. The shoulder is always at a right angle to the center front. The straight grain runs up and down the body and cross grain runs across the shoulder. It is usually oversized and swings around the body. Design variations are often created by using tucks, pleats and gathers based on the basic shape (The Cutting Class, n.d.).



Figure 50: The Cutting Class. (n.d.). Example of a two-dimensional cut clothing - Michaele Vollbracht Angel Fish Dress.

Compared to three dimensional clothes, two dimensional designs can be laid flat and easily folded up, which would enable the Bluecoats to transport the uniform more easily. Two dimensional designs are set away from the body to achieve extra comfort and movement. This feature greatly helps with the need for one garment to fit various body shapes. As shown on figures 51 and 52, the difference between two-dimensional and three-dimensional cutting is that three-dimensional cutting clearly defines the 'body' and 'sleeve' areas.

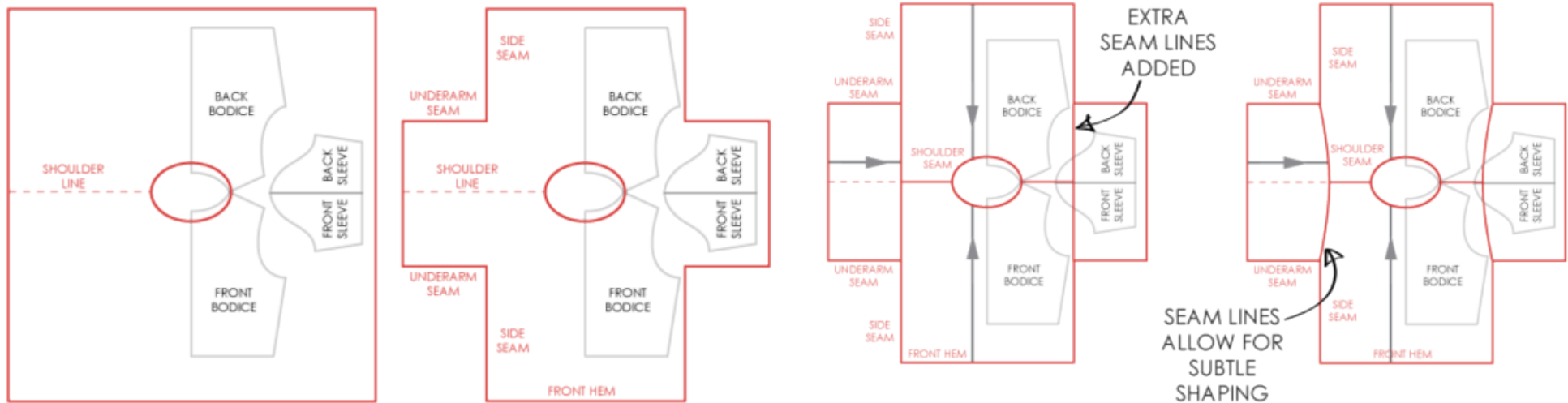


Figure 51: The Cutting Class. (n.d.). Simplified patterns for squared shoulder shapes 1.

Figure 52: The Cutting Class. (n.d.). Simplified patterns for squared shoulder shapes 2.

## Traditional costumes research

To better understand the principles of the two dimensional cutting techniques, two traditional costumes were sourced from The Asia Gallery<sup>18</sup> (Fig. 53). The silhouette of the design on the left is very similar to a lab coat. It has drop shoulders, side splits and embroidered pockets but with no closure. The second costume shown on the right side is fully lined. There is extra fullness around the armhole and underarm areas. The front is shorter than the back and side splits are opened from the waist. The front piece kicks towards the front and the sleeve is very fitted. The positions of the embroidery create an illusion of separated body and sleeves but the whole garment is a complete "T" shape without sleeve and shoulder seams.



<sup>18</sup>67 Maurice Rd, Penrose, Auckland.

Figure 53: Wang, L. (2015). Traditional costumes - from left to right: costume one and costume two.

Visual research on two-dimensional cutting was also compiled to draw inspiration for design practice (Fig. 54). The costumes and visual research showed that two-dimensional clothes have a less defined and therefore softer sleeve and shoulder line. Following this visual research, I believed this cutting technique would achieve the design brief of dressing the Bluecoat in a less formal but still professional and functional attire.



Figure 54: Wang, L. (2015). Story board of two-dimensional cut clothes.

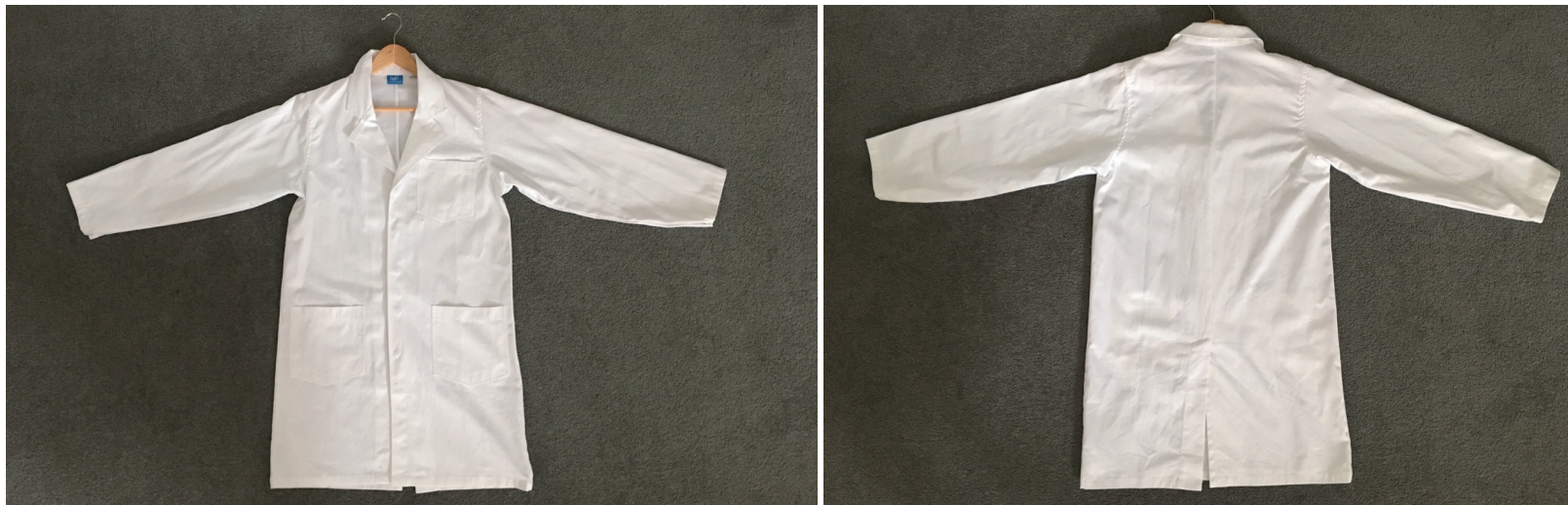
## Lab coat

The lab coat, as an iconic healthcare uniform, shares a similar design concept and silhouette to two-dimensional clothing. Therefore, I decided to conduct an experiment using the lab coat.

The lab coat in figures 55 and 56 was sourced from the University Bookshop at AUT. This lab coat was made of hundred percent cotton fabric; hence it was breathable and comfortable to the skin. When on a body, this lab coat has plenty of room to move around especially at sleeve and middle to lower body. It has a boxy silhouette with reverse collar and snap-fastener closure at center front. There are two roomy front pockets and one chest pocket. There is also elastic and a snap-fastener on the sleeves to assist the wearer to adjust the cuff length. A back vent designed to allow extra movement is positioned at hip and thigh areas when walking and sitting.

Figure 55: Wang, L. (2015). Lab coat front view.

Figure 56: Wang, L. (2015). Lab coat back view.



I wore this lab coat for a day to experience how it felt to work in this uniform. Reflection of my insights from wearing the lab coat:

- 1) the lab coat is thin and super-light which does not feel like wearing an extra layer.
- 2) there is no restriction of movement.
- 3) it is a simple design without unnecessary design features.
- 4) it is easy to wear.
- 5) it suits various body shapes due to the loose and oversized silhouette.
- 6) it is a great protection for the wearer's personal clothing.
- 7) it is less expensive to manufacture than a formal tailored business uniform (such as the current Bluecoat uniform).

In conclusion, the research on the cutting technique, traditional costumes and lab coat helped validate my decision to employ the two-dimensional cutting techniques in the concept initiation and block development process. The boxy silhouette of the lab coat and the traditional two-dimensional costumes was used as the main inspiration driving cycles four and five.

[Go back to page 77.](#)

## | Appendix 12 part one - concept exploration: first set of concepts

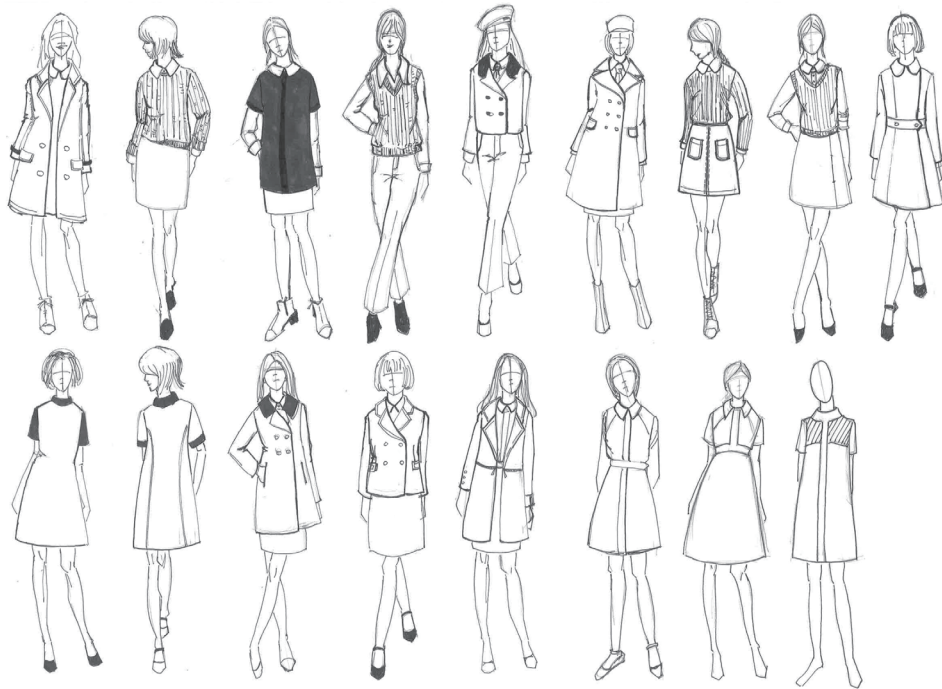


Figure 57: First set of concepts page three.



Figure 58: First set of concepts page four.

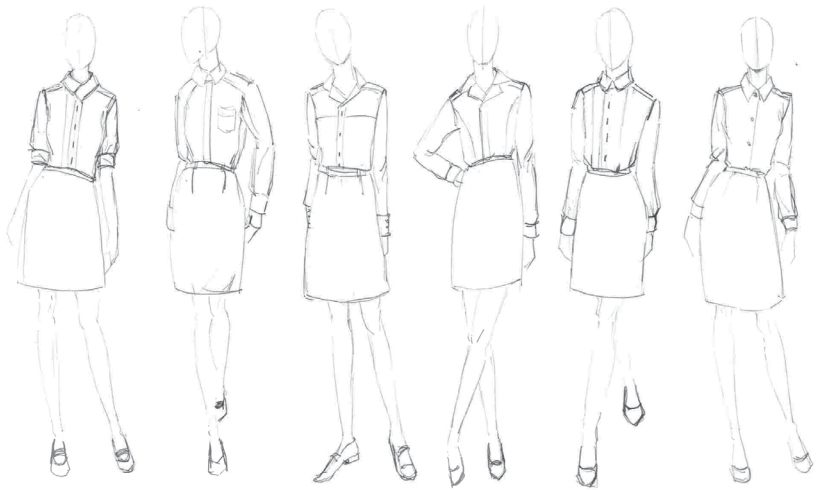


Figure 59: First set of concepts page five.

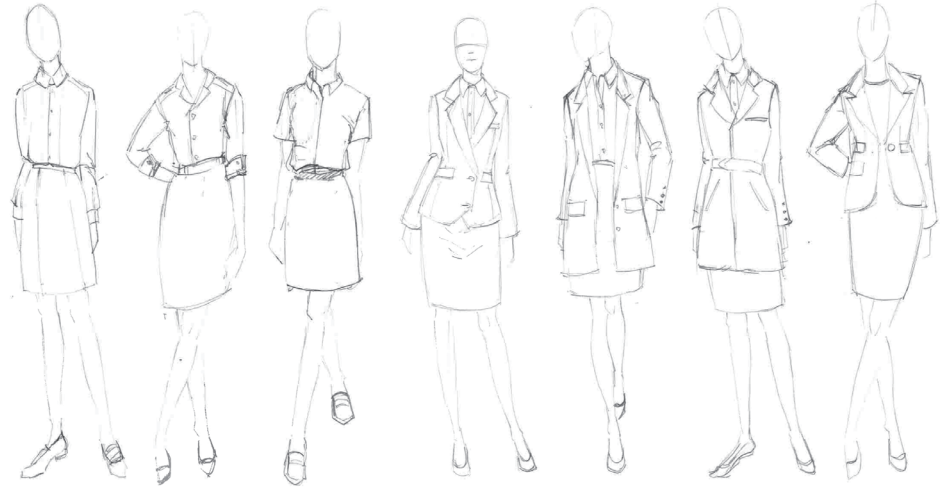


Figure 60: First set of concepts page six.

**Go back to page 78.**

## | Appendix 12 part two - concept exploration: working drawings

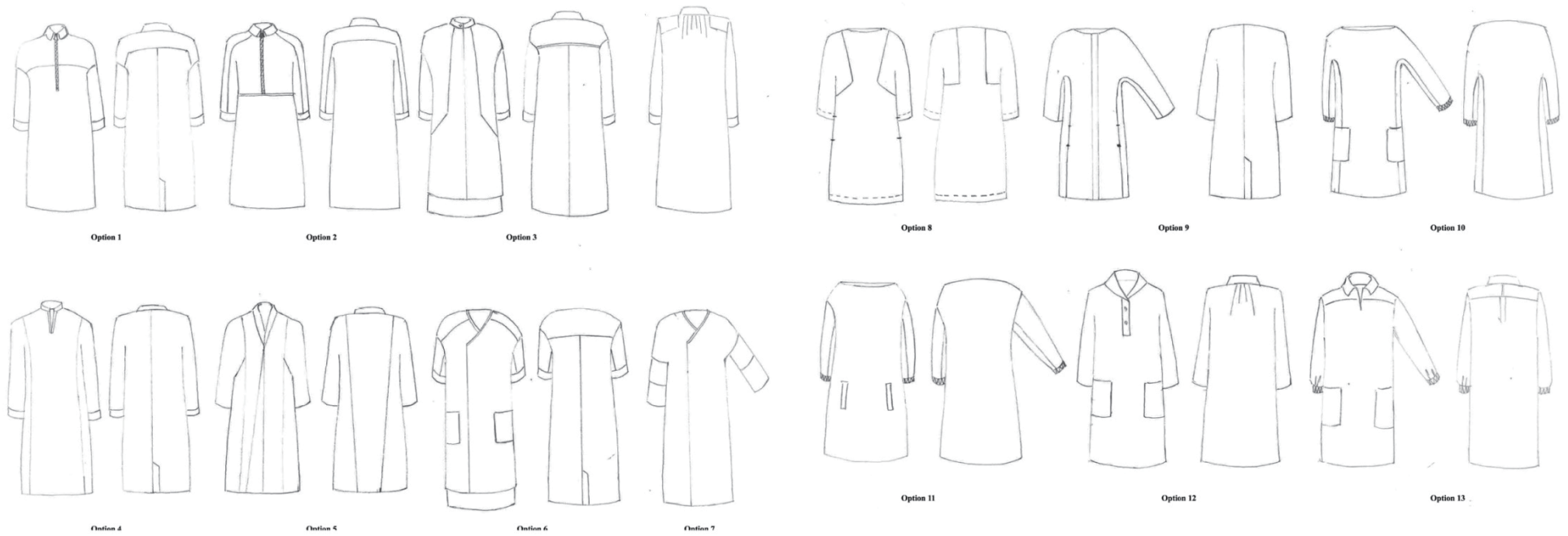


Figure 61: Wang, L. (2015). Concept exploration – working drawings page one.



Option 14

Option 15

Option 16

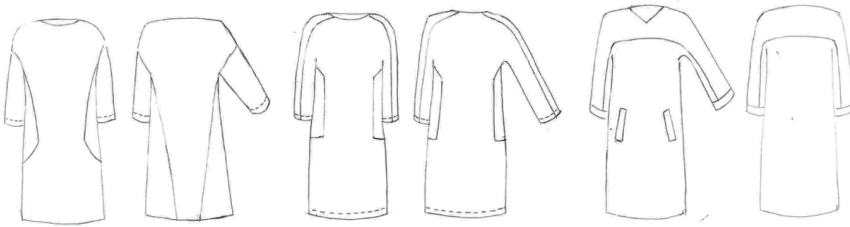


Option 20

Option 21

Option 22

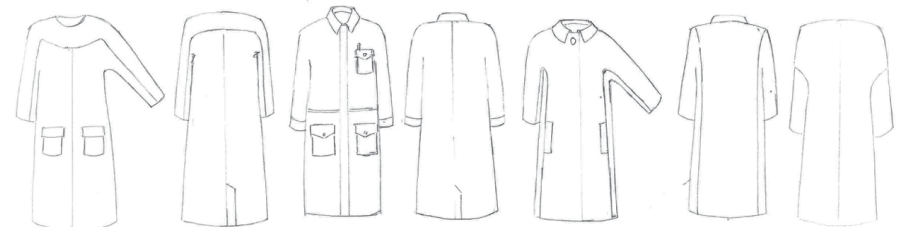
Option 23



Option 17

Option 18

Option 19



Option 24

Option 25

Option 26

Figure 62: Wang, L. (2015). Concept exploration – working drawings page two.

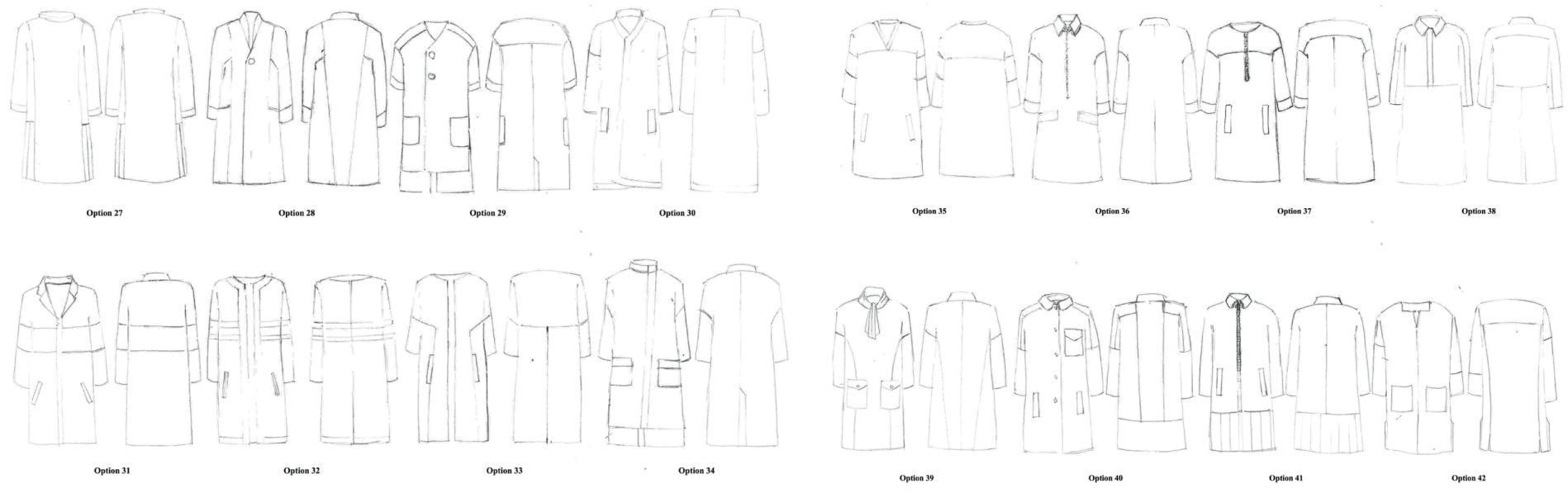


Figure 63: Wang, L. (2015). Concept exploration - working drawings page three.

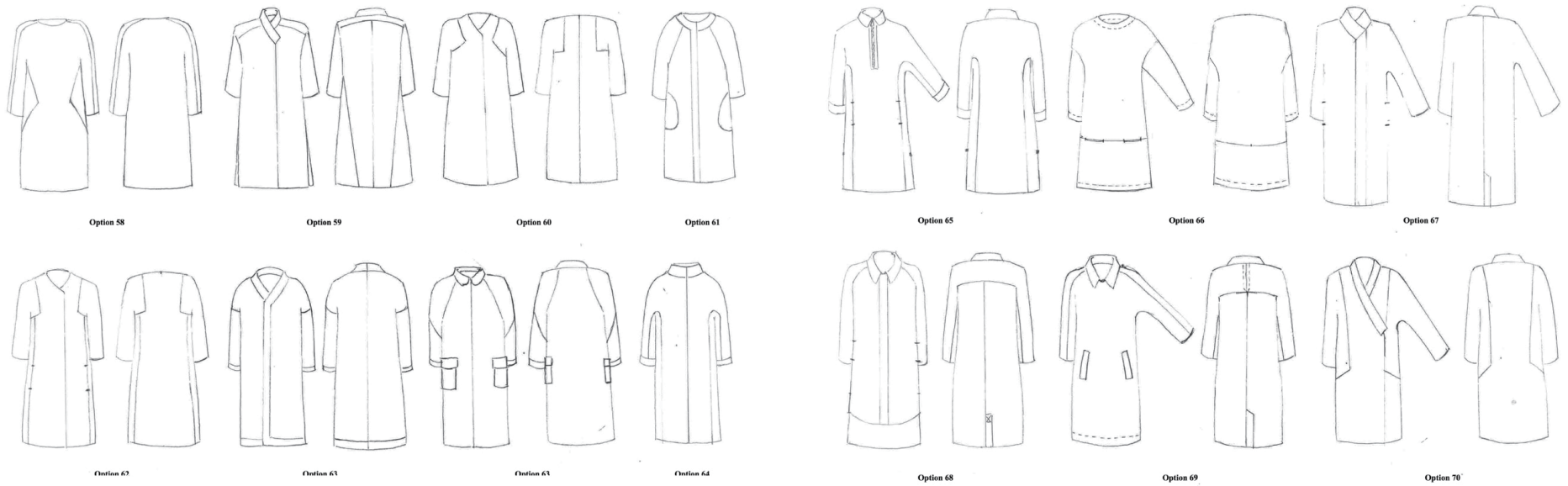


Figure 64: Wang, L. (2015). Concept exploration - working drawings page four.

Go back to page 82.

## | Appendix 13 - block development

### Block one style description

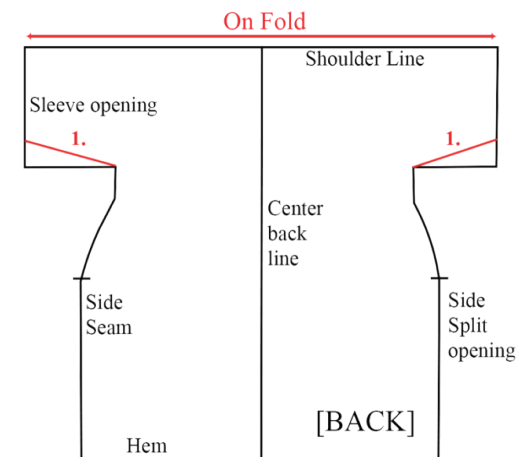
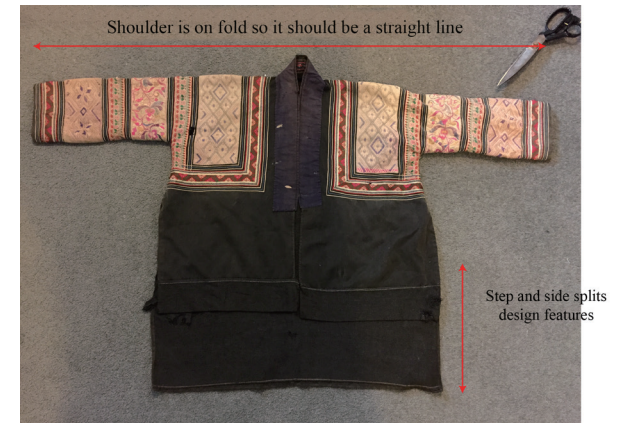
Block one was developed from costume two. The aim for this prototype was to explore two-dimensional cutting from a pattern-making perspective and also to attempt to change this style into a basic block for a jacket design. Three fitting and alteration stages were involved. The silhouette was started with a simple kimono 'T' shape, and then dolman sleeves were developed. The design idea for this block was a light to medium weight long jacket which would resemble the functionality of a lab coat but be more modern and stand out more.

### Detailed block one development process [Toile one]

Design block one was entirely traced from costume two with slight changes at shoulder, sleeves and body length. A problem was found when I tried to develop the costume to paper patterns. The shoulder line was not straight but it was on the fold (Fig. 65). Therefore, I decided to take the extra fabric from the underarm. Since this pattern would be used as a jacket or coat block, I also lengthened the front and back body (alteration shown in red pen on pattern diagrams) (Fig. 66 & 67). When fitting toile one on the model, extensive excess fabric formed around the armhole and underarm areas. Shoulder and upper arm areas were very tight and restricted (Fig. 68).

Figure 65: Wang, L. (2015). Costume two.

Figure 66: Wang, L. (2015). Block one toile one - pattern diagram A.



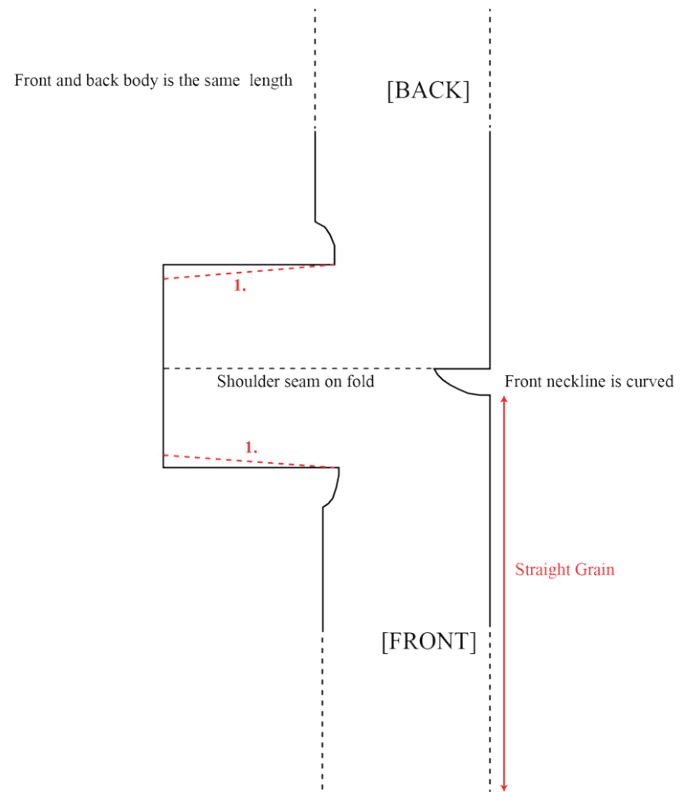


Figure 67: Wang, L. (2015). Block one toile one – pattern diagram B.



Figure 68: Wang, L. (2015). Block one toile one – fitting photos: front, side, back views.

## Detailed block one development process

### [Toile Two]

Toile two (Fig. 69) was developed to resolve the fitting issues discovered on the previous toile. I decided to fully close the side seams to better understand the current silhouette. After slashing open the upper arm areas to release the tension, the restriction at the shoulders was resolved (Fig. 70). However, there was no obvious improvement in the fullness created around the armholes.

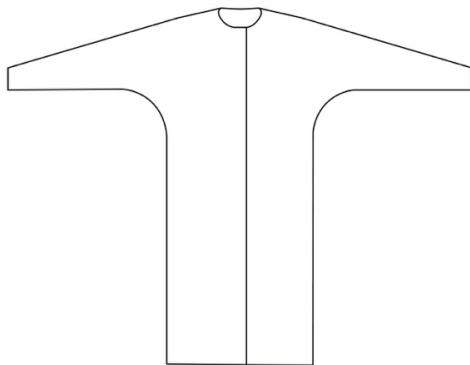


Figure 69: Wang, L. (2015). Block one toile two - working drawing.

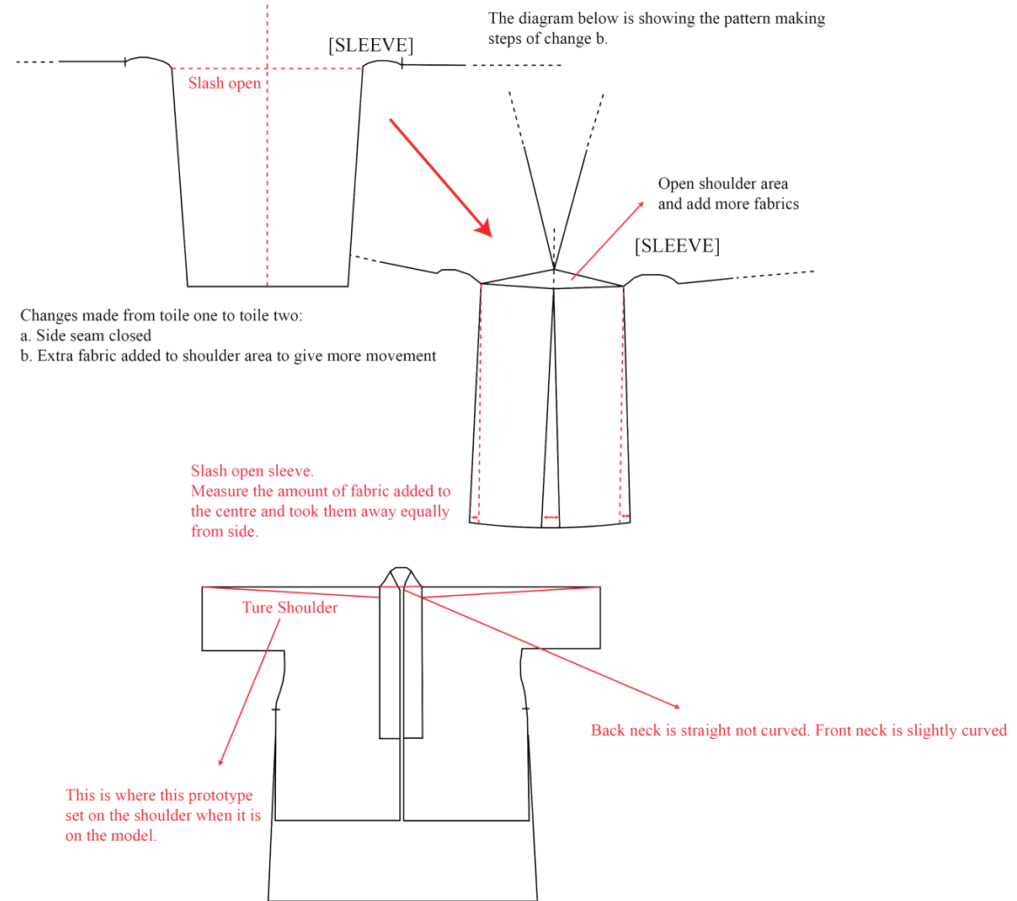


Figure 70: Wang, L. (2015). Block one toile two - pattern diagram.

Issues that I identified in this toile are shown in figure 71 and circled in red. Firstly, the toile was not sitting correctly on the model, which made the side seam kick towards the front. Secondly, the sleeves were twisted because the back sleeve and armhole were shorter than the front, and these would normally be the other way around. Finally, the bottom shaping was tapered in from the hip, which created a 'bee' shape.



Figure 71: Wang, L. (2015). Block one toile two – fitting photos: front, side, back views.

## Detailed block one development process [Toile three]

Reflection on toile two indicated that the cause of the side seam kicking forward and the twisted sleeve was due to the incorrect position of the shoulder line. This third prototype (Fig. 72) was an experiment to solve the shoulder line issue by shifting the sleeve to a newly identified shoulder line. The all in one kimono sleeve was separated into sleeve and body because the all-in-one sleeve restricted the fabric options<sup>19</sup> (Fig. 73). The underarm curves were reshaped to give more movement. The side splits feature was also designed to provide more flexibility at the hem area.

<sup>19</sup>It could not fit any fabric that was less than 160cm wide.

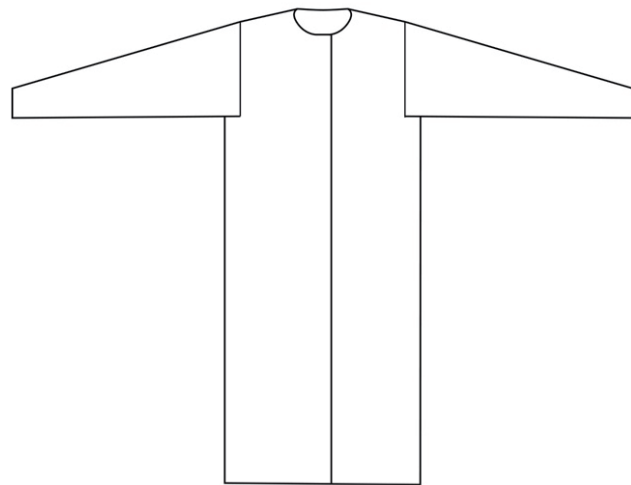


Figure 72: Wang, L. (2015). Block one toile three – working drawing.

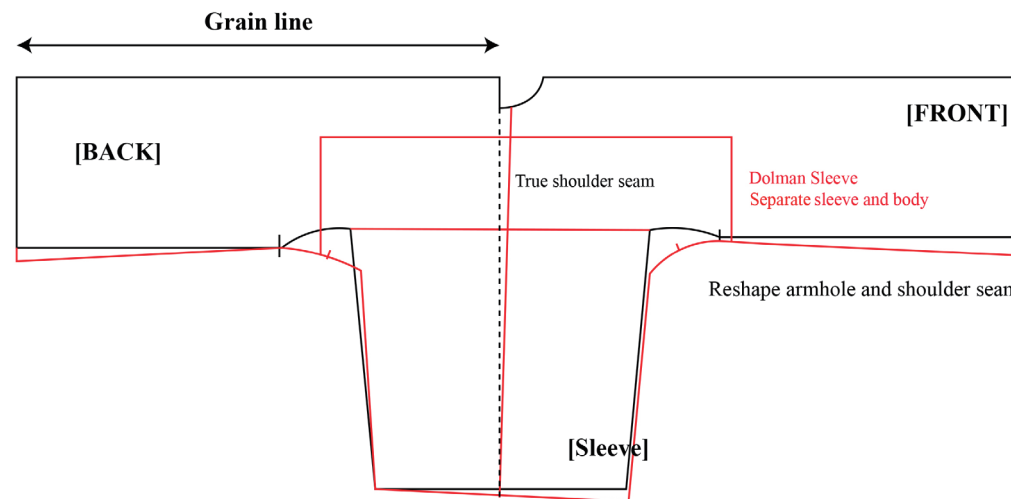


Figure 73: Wang, L. (2015). Block one toile three – pattern diagram.

Although there was an obvious improvement to the armhole fitting, this issue was not fully resolved. Moreover, this prototype was not yet fully balanced<sup>20</sup> and the side seam was still slightly kicking to the front. To resolve these issues, I planned to look specifically into the two-dimensional sleeve and armhole next. During the fitting, a design idea emerged which was to develop the sleeve panels into a pocket design (Fig. 74).

<sup>20</sup>The front and back were still not at the same level.

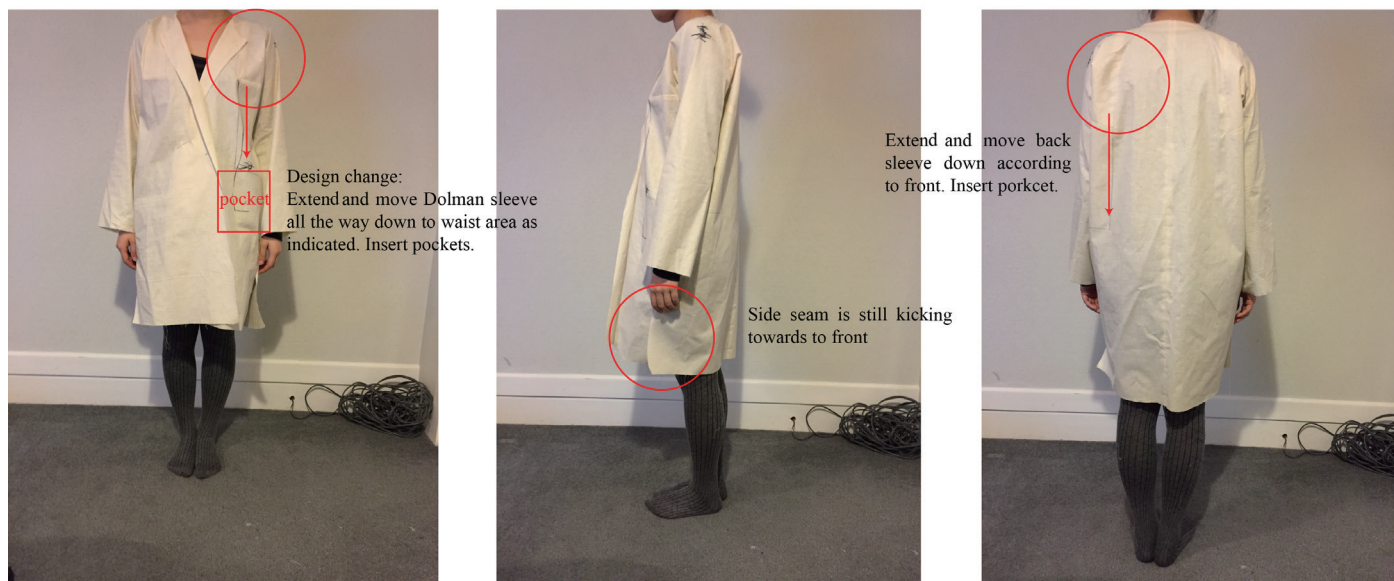


Figure 74: Wang, L. (2015). Block one toile three -- fitting photos: front, side, back views.

## Block two style description

The initial inspiration for block two came from the kimono but it was given a curved shoulder slope and separate underarm panels. The natural all-in-one sleeve and the fact that the overall shape is not as fitted as a tailored jacket, helps with the concept of fitting different body shapes. This style was designed to have maximum flexibility around arm and sleeve areas but with minimum underarm fullness. This style can also be laid flat and folded easily. As in block one, three fitting and alteration stages were involved with this block to achieve the fit with the Bluecoat model.

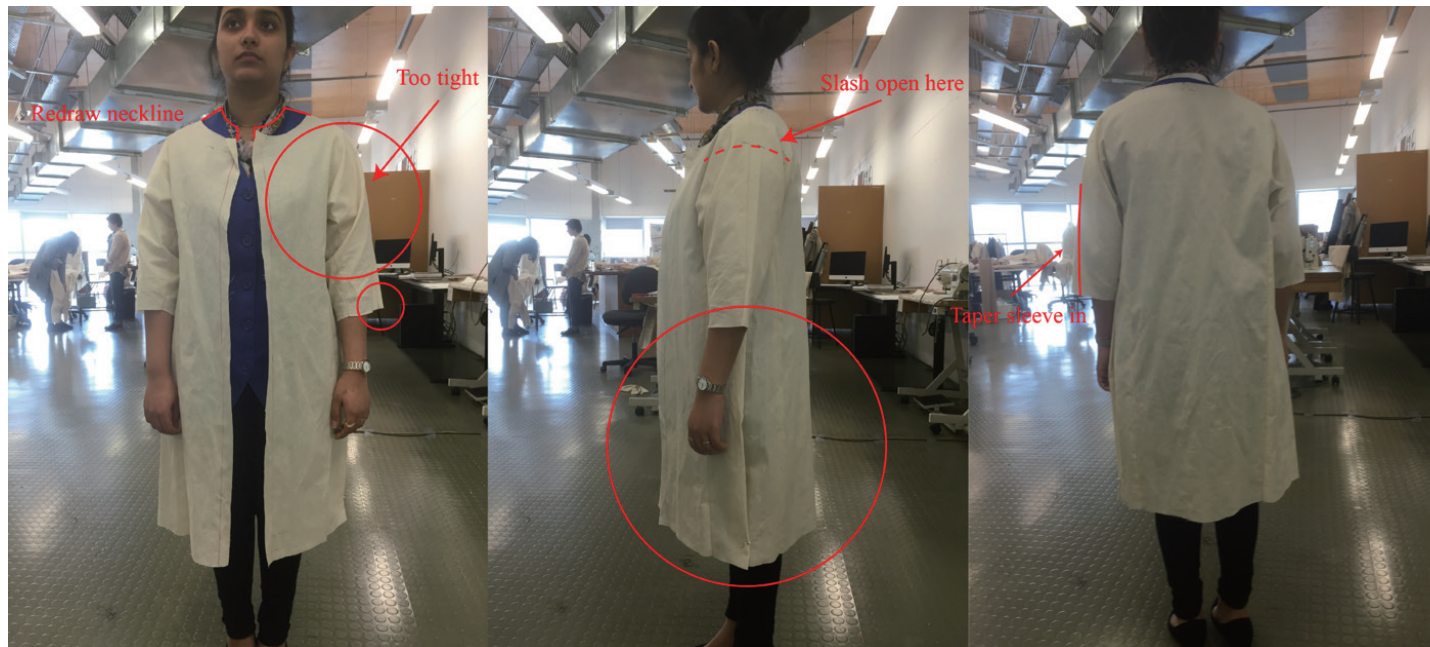


Figure 75: Wang, L. (2015). Block two toile one-fitting photos: front, side, back views.

## Detailed block two development process

[Toile one]

After the development of block one, I decided to explore more silhouettes so the hospital could have multiple alternatives to help inform the new designs. The inspiration for this block was drawn from an existing two-dimensionally cut dress. A few issues were discovered after the fitting, which are circled in red in figure 75 and alteration steps shown in figure 76. Firstly, the overall size of this block was too small on the model. The waist, bust and hip measurements had to be rechecked. Secondly, the neckline was set too far away from the neck. It would need to be redrawn as indicated on figure 77. Thirdly, the upper arm areas were too tight which restricted the model's movement. The tight areas needed to be slashed open to allow more room. Finally, it was decided to take 10cm away from the underarm side panel because the bottom part flared out too much. The shoulder and sleeve seams were also reshaped to taper sleeves in.

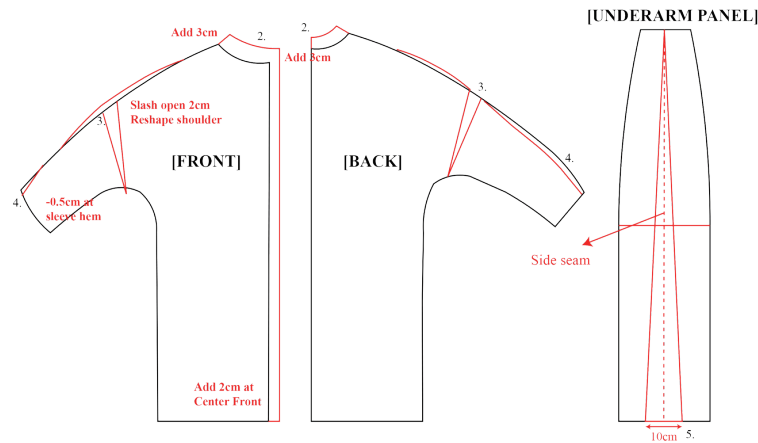


Figure 76: Wang, L. (2015). Block two toile one – pattern diagram.

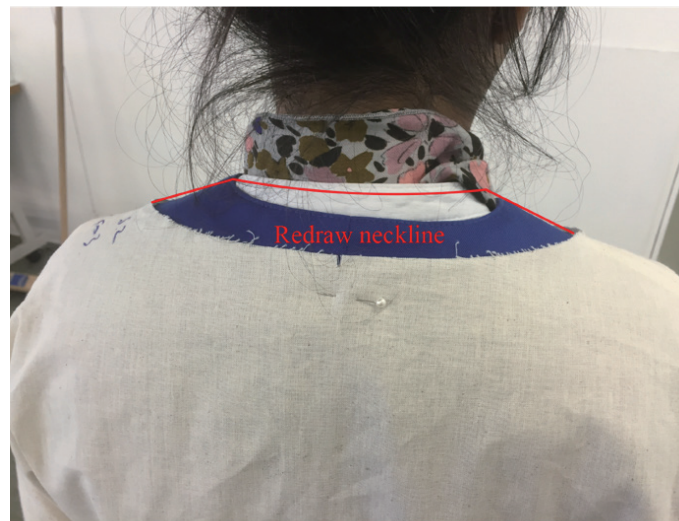


Figure 77: Wang, L. (2015). Block two toile one – detailed neck view

## Detailed block two development process [Toiles two and three]

A series of pattern alterations were made to toile one after the first fitting. Research was also conducted on different neckline and collar designs and finishing ideas on two-dimensional clothes (Fig. 78). Considering the age range of the Bluecoats, I decided to focus on simple opening designs such as a round neck, which would be easy to put on and take off.

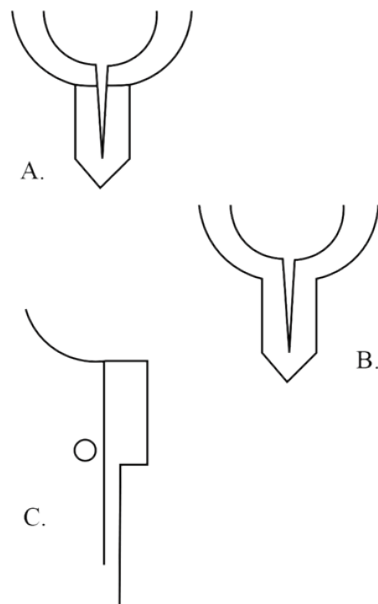


Figure 78: Wang, L. (2015). Block two – possible neckline/collar finishing ideas.

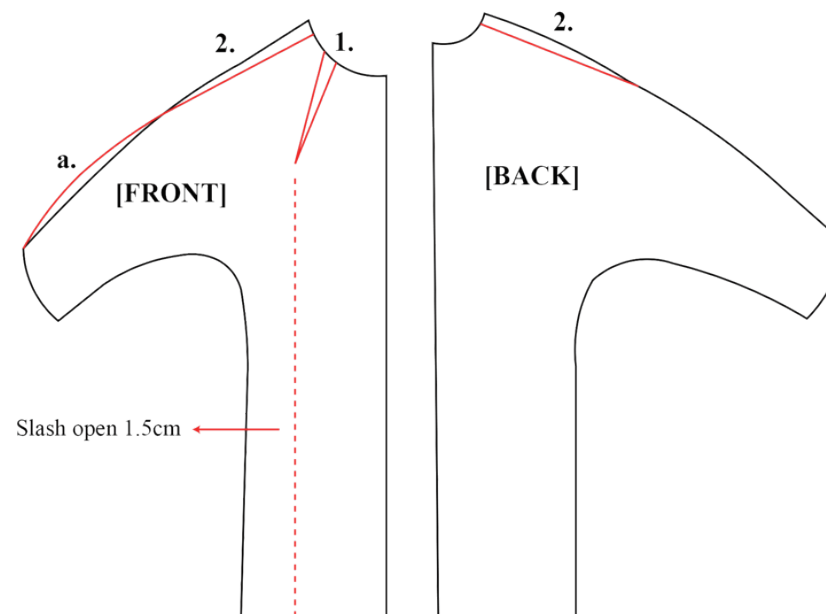


Figure 79: Wang, L. (2015). Block two toile two – pattern diagram.

This block was graded one size up and the neckline was also re-shaped. However, the centre front (C.F) line was not straight around the bust area, which indicated the addition of more fabric was required. The collar circumference was also too large, so I decided to take a dart away from the front neckline and transfer that amount of fabric to the front panels as shown on figure 79. The shoulder and sleeve were slightly altered as indicated to achieve a better shape. The hem line was not straight which is shown on figure 80. It was decided to slash open from the bust area to drop the front panel down to level up with the back. Figure 81 shows the finalised silhouette for block two, which is ready for design details to be added.



Figure 80: Wang, L. (2015). Block two toile two - fitting photos: front, side, back views

Figure 81: Wang, L. (2015). Block two toile three - fitting photos: front, side, back views.

## **Block three style description**

Block three was given a raglan sleeve design. Although raglan sleeves do not follow the two-dimensional cutting rules, they are often utilised on outerwear and active sportswear. Compared to the kimono sleeve, the raglan is also a great choice for comfort, flexibility and less fullness around the armhole area. Block three was developed as a unisex style. Compared to blocks one and two, this style had a more of a modern and sporty look. Since this style was designed from scratch, more fittings and alterations were involved to understand the principles of a raglan design.

## Detailed block three development process [Toile one]

This raglan block was developed from an existing size 10 basic bodice block. Figure 82 shows the instructions followed to draft up the first toile. The first fitting revealed a few fitting issues (Fig. 83). Firstly, the model could not close this block at the front thus there was not enough fabric around the body. Secondly, to make the front and back hemline even, the bust line was slashed open and dropped 2cm down at the CF. Finally, it was easy to see from the back-view photo that the sleeves created a strange shape at the red circled area. Patterns were reshaped to smooth out the sleeve and shoulder lines.



## Detailed block three development process

[Toile two]

There are a few key improvements from toile one to toile two (Fig. 84). Firstly, the shoulder and sleeve lines were redesigned to achieve a better shoulder shaping. Secondly, extra front and back sleeve panels were added to give more shaping to the sleeves. Thirdly, the body length was extended and the sleeves were shortened by ten centimetres for aesthetic reasons. Finally, front and back body were slashed open to add more space. However, when the model lifted her arm up slightly, the block opened considerably at CF (Fig. 85). Since this block was prepared for a jacket or coat design, the pattern needed to be larger. Further development was also required on the sleeves. The sleeve shape was still baggy at the elbow area. The front raglan sleeve seam was drafted too high as indicated on the front view photo. The sleeve shape needed to be reshaped as shown on the side view photo to make the sleeve follow the shape of the arm which would improve the comfort of the sleeve.

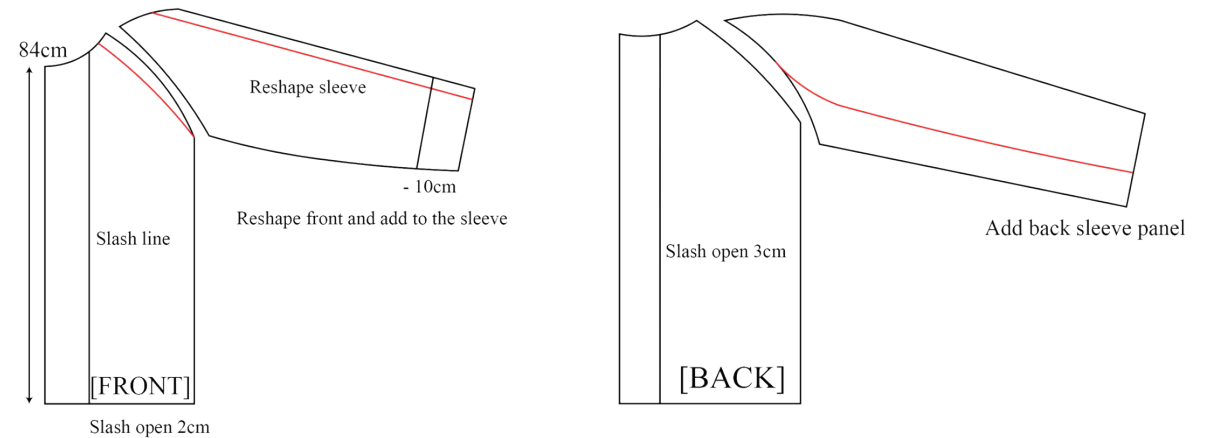


Figure 84: Wang, L. (2015). Block three toile two – pattern diagram.

Figure 85: Wang, L. (2015). Block three toile two – fitting photos: front, side, back views.

## Detailed block three development process [Toile three]

On figure 86, it is obvious that the prototype needed to be graded one size up to fit the Bluecoat model. The underarm areas were extremely tight and restricted when she tried to move her arms. In order to achieve the right fit, extra fabric was added at CF, side seams and underarm areas as shown on figure 87. It was very noticeable that the front hem was not level with the back hem from the side view photo. Therefore, the bust line needed to be slashed open to drop down the front hem.

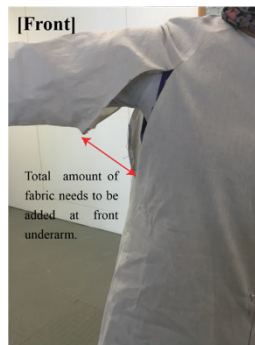


Figure 86: Wang, L. (2015). Block three toile three - fitting photos: front, side, back views.

Figure 87: Wang, L. (2015). Block three toile three - detailed fitting photos.

## Detailed block three development process [Toiles four and five]

The diagram below (Fig. 88) shows the pattern alteration steps from toile 3 to toile 4. The overall fit was greatly improved and the style proportion also looked correct on the Bluecoat model (Fig. 89). However, a few alterations were still required to finalise this block. Firstly, a strange shape was created at the shoulder and sleeve area (Fig. 90). This effect was caused by the neckline being too tight. It disappeared immediately once the sleeve seams were opened. Therefore, the extra amount of fabric shown on the photo needed to be added to the neckline. Secondly, the back sleeve was very voluminous so the excess was transferred to the middle sleeve. Thirdly, the middle sleeve was slashed open at the upper arm area to give more flexibility to the arm. Finally, although the front hem was already altered from the previous prototype, the length added to the CF was still not enough.

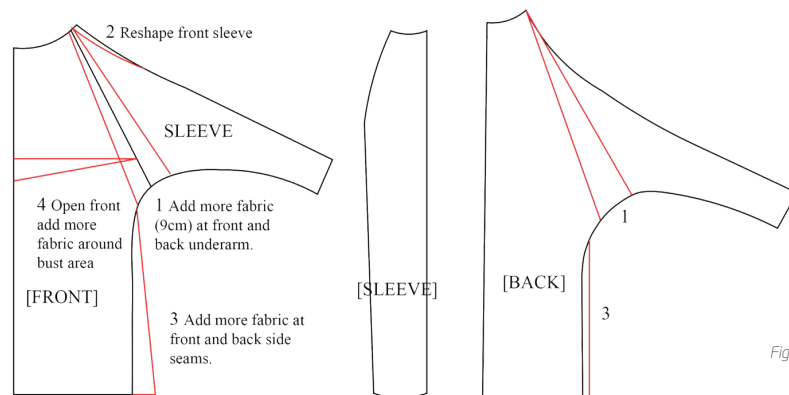


Figure 88: Wang, L. (2015). Block three toile four - pattern diagram.

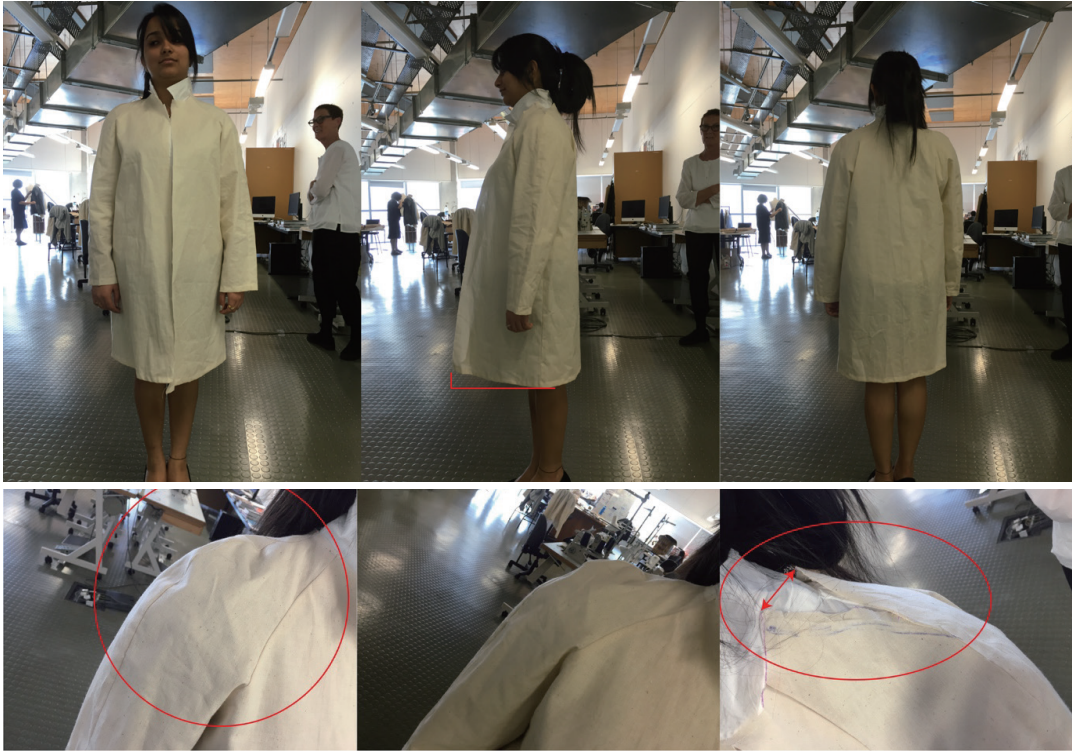


Figure 89: Wang, L. (2015). Block three toile four - fitting photos: front, side, back views.

Figure 90: Block three toile four - detailed fitting photos.

Figure 91 and 92 shows the fully re-solved raglan block and the alteration process.



Figure 91: Wang, L. (2015). Block three toile five - fitting photos: front, side, back views.

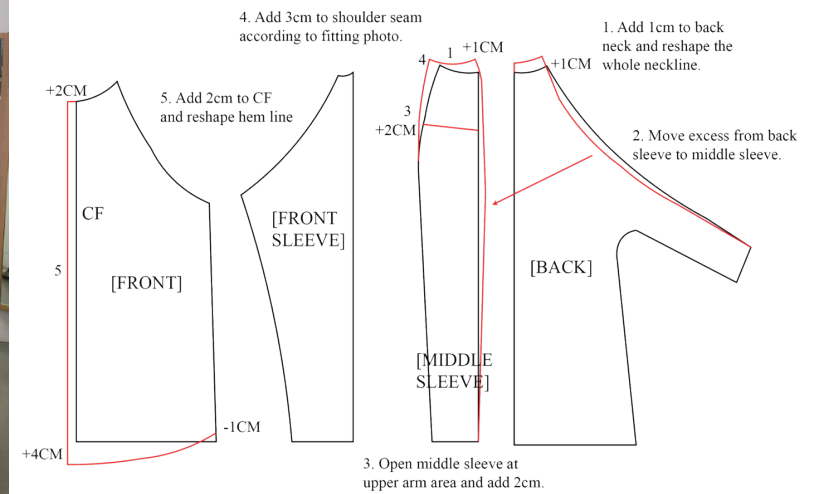


Figure 92: Wang, L. (2015). Block three toile five - pattern diagram.

## Block four style description

Block four was inspired by costume one and also designed for a unisex style. Following the theory of the other two-dimensional cutting blocks, the overall shape of this style is still an oversized "T". This style was designed as a shorter block option for an over-garment or jacket. Alterations were required at armhole, neckline and front bust before it could be used as a block for the design development stage.

## Two-dimensional sleeve experiments

Due to the fitting issue frequently raised around the sleeve and armhole areas (Fig. 93) during block development, I decided to carry out experiments on a basic kimono sleeve to try to find a solution to improve this problem.



Figure 93: Wang, L. (2015). Sleeve issues.

There are three different kinds of sleeves closely associated with two-dimensional cutting: dolman, magyar and kimono. The dolman sleeve has a dropped underarm, with the underarm seam curving from the waist to the wrist. The sleeve, which tapers at the wrist, does not have a large wrist opening. The magyar sleeve is a variation of the dolman. It can be very short, so the opening can be much larger. It is more of a 'T' shape compared to the dolman sleeve but still has the curved underarm shape. Unlike dolman and magyar sleeves, the kimono sleeve does not have the gentle curve from waist to wrist. It is a real 'T' shape, with a vertical seam from the waist to the underarm, which then turns and creates a horizontal seam from the underarm to the wrist. It often does have a large wrist opening, and a gusset is frequently utilised at the underarm for extra comfort and movement.

Three sleeve experiments were conducted to explore how the distance between the garment underarm

and the actual underarm of the body would affect the degree of arm movement available to the wearer. A few key insights related to arm-movement and sleeve fullness were discovered. All of the experiments determined that arm movement was decided by the fullness in the sleeve and across the whole body. It can be adjusted by changing the shoulder slope. When the sleeve shape was cut square from the shoulder, it provided more arm movement and sleeves were able to lift straight up to shoulder level (Fig. 94). This also meant a lot of fabric draped in the underarm area. In contrast, when the pattern shaped from the shoulder point and the shoulder slope reduced to less than ninety degrees, the sleeve could only be lifted to a certain point before the rest of the garment began to move (Fig. 95).

In the second experiment, I discovered that it is the nature of two-dimensional cutting to cause a generous amount of the fabric's fullness to collapse into folds at the underarm area when the arm is lowered (Fig. 96).

Therefore, a two-dimensionally cut sleeve can never be like a three-dimensional fitted sleeve. There will always be fullness or extra fabric around the armholes to help with arm mobility but the fullness can be minimised by adding seams or panels. This experiment also indicated that every seam line in two-dimensional cutting provided an opportunity to change the direction of the grain line and shape the silhouette. Through the third experiment, it was identified that the arm movement was also affected when the underarm point is cut away from or closer to the body (Fig. 97).

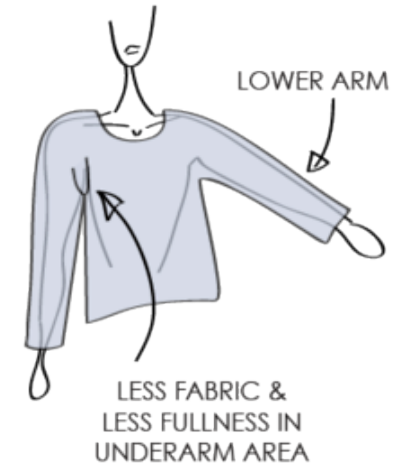
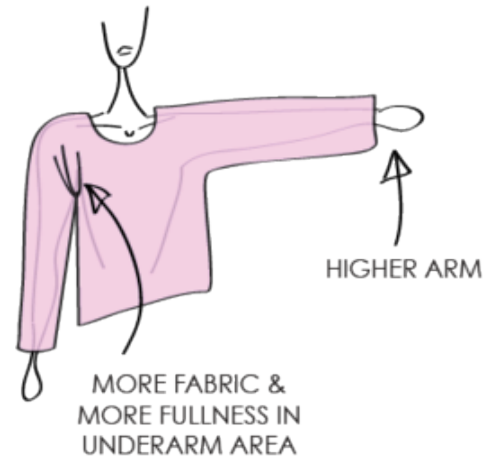
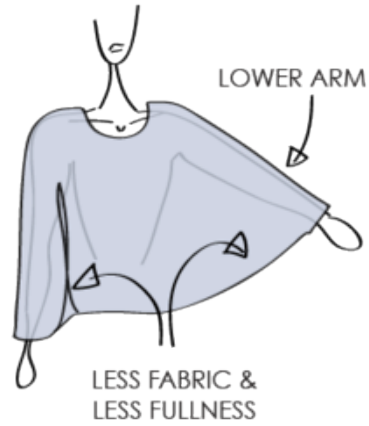
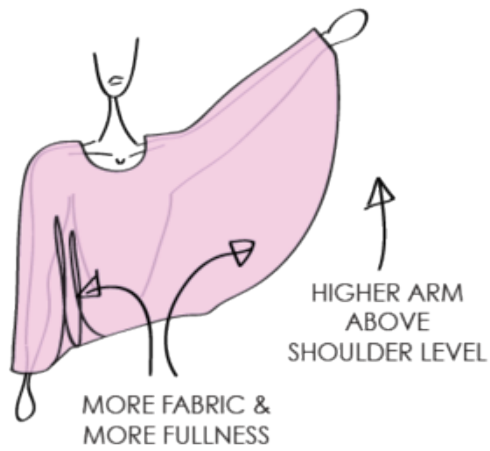


Figure 94: Wang, L. (2015). Sleeve finding diagram one.

Figure 95: Wang, L. (2015). Sleeve finding diagram two.

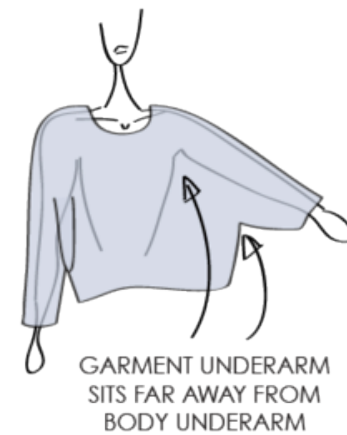
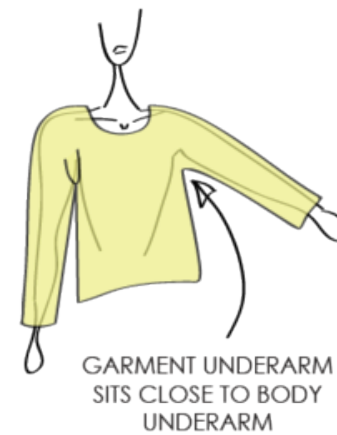
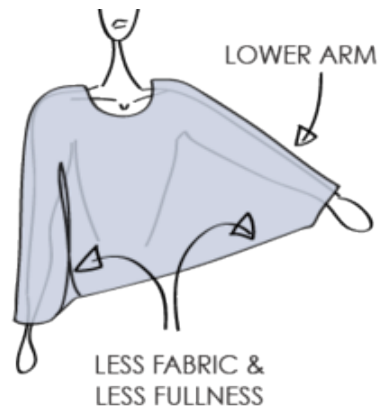
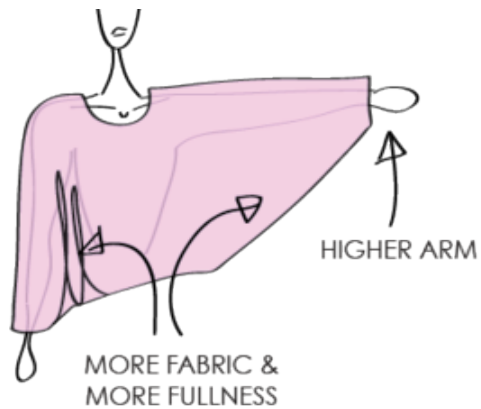


Figure 96: Wang, L. (2015). Sleeve finding diagram three.

Figure 97: Wang, L. (2015). Sleeve finding diagram four.

## Detailed documentation of sleeve experiment

### First two-dimensional sleeve experiment

The base pattern for experiment one is traced from an existing kimono block. In this experiment, the pattern was altered so it did not create a 'T' shape and the shoulder slope was reduced to be less than 90 degrees (Fig. 98). This method reduced the fullness around the armhole area but it greatly restricted the flexibility. The model was unable to lift her arm up to be in line with the shoulders (Fig. 99).

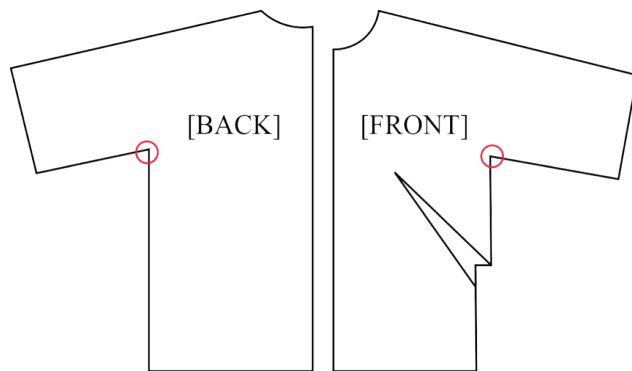


Figure 98: Wang, L. (2015). Sleeve experiment one – pattern diagram.



Figure 99: Wang, L. (2015). Sleeve experiment one – fitting photos: front, side, back views.

## Second two-dimensional sleeve experiment

Extra movement was made possible for the second prototype by slashing open from the neckline to the underarm (Fig. 100). The aim of this prototype was to enhance the sleeve flexibility and comfort without adding too much fabric at the underarm. Sharp underarm points were also smoothed when reshaping the side and underarm seam. It is obvious from the pictures that the model's arm was able to lift higher than when wearing prototype one (Fig. 101). This experiment indicated that there would always be extra fabric around armholes to allow for arm flexibility in two-dimensional cutting. The technique of cutting into the underarm area to separate and shape the side seam and under arm seam is an effective way to control the fabric around the armhole.

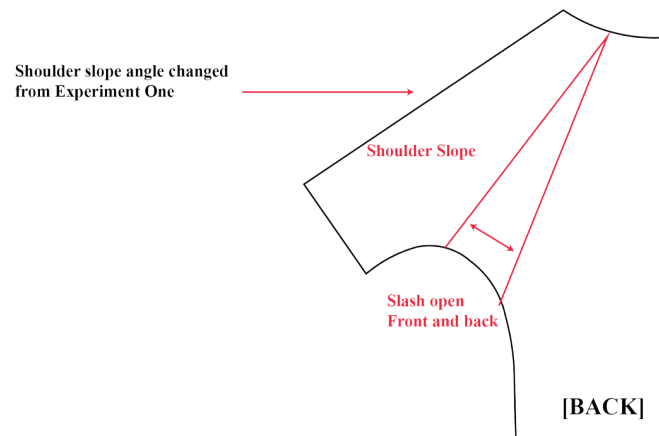


Figure 100: Wang, L. (2015). Sleeve experiment two – pattern diagram.



Figure 101: Wang, L. (2015). Sleeve experiment two – fitting photos: front, side, back views.

### Third two-dimensional sleeve experiment

In experiment three, the underarm curve was reshaped and the toile 1 shoulder slope was applied. I laid toiles 1 and 2 on top of each other to see the sleeve slope angle and how much fabric has been added from toile 1 to 2 (Fig. 102). This experiment resulted in more fabric around the armholes and the underarm points were also made to sit away from the body (Fig. 103).

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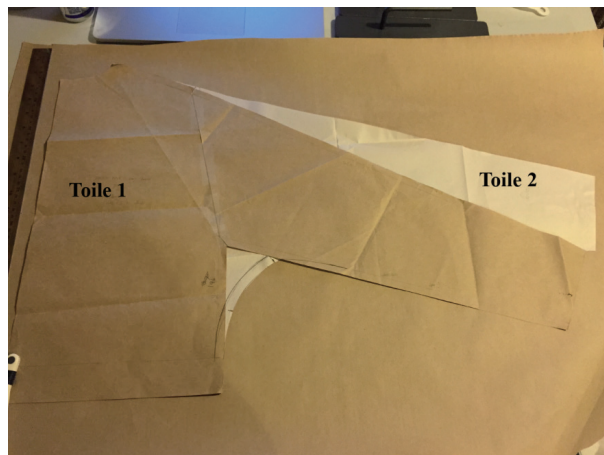


Figure 102: Wang, L. (2015). Sleeve experiment three - patterns.



Figure 103: Wang, L. (2015). Sleeve experiment three - fitting photos: front, side, back views.

## | Appendix 14 - cycle six - detailed documentation of process

### Silhouette one

During the development process, a few prototypes were made and five fittings were scheduled to improve the fit of silhouette one. The major design changes were to eliminate unnecessary seams or panels and develop the dolman sleeve panels into a side pocket feature. This inspiration came from the two-dimensional cutting storyboard where one of the most significant aspirations was to reduce the number of separate pattern pieces. It is important to consider the overall visual appeal of the garment in two-dimensional clothing so that seams do not detract from the heavy embellishments such as embroidery, bead-work or appliqué which often adorns these costumes.

## Detailed silhouette one development process [Toile one]

This concept was developed from block one. The major development was to drop the sleeve seam down to the waist area to make it into a pocket feature. However, a lot of excess fabric was found all the way around the waist area after the change. Pinning out all the extra fabric on the model indicated that the sleeves, side and back would require further alteration. Moreover, the bottom shape was tapered in, so I opened the side seam during fitting (Fig. 104). The side view photos clearly show how much additional fabric would be required to make the shape hang straight. This prototype was the first experiment for concept one so I extended the sleeve seams only to test the pocket position. The pattern diagram displays the detailed alteration steps required for this prototype (Fig. 105).

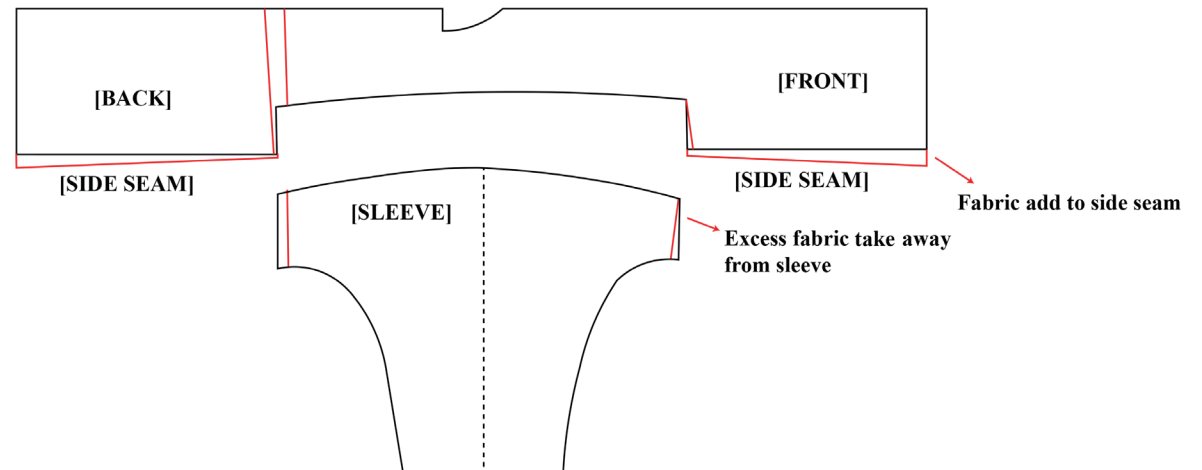


Figure 104: Wang, L. (2016). Silhouette concept one toile one - fitting photos: front, side, back views.

Figure 105: Wang, L. (2016). Silhouette concept one toile one - pattern diagram.

## Detailed silhouette one development process [Toile two]

The fit was greatly improved after correcting all of the issues identified from the last supervision (Fig. 106). Pocket extensions and bags were also successfully added. A design decision was made to merge the front and back from side to eliminate the side seams (Fig. 107).

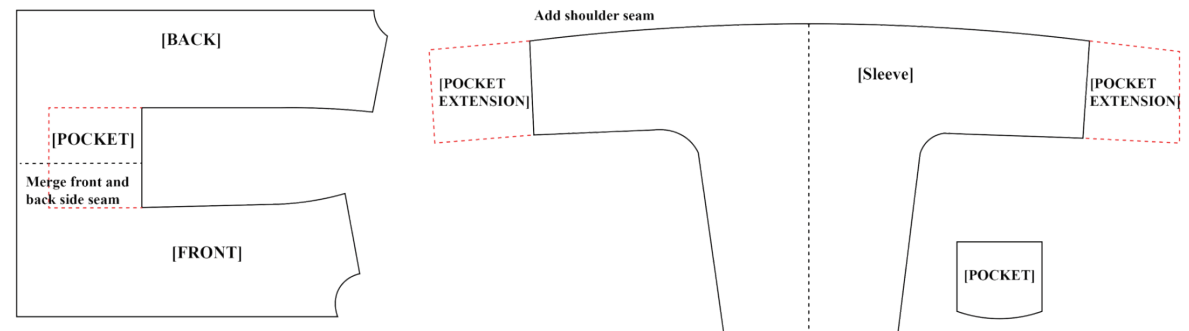
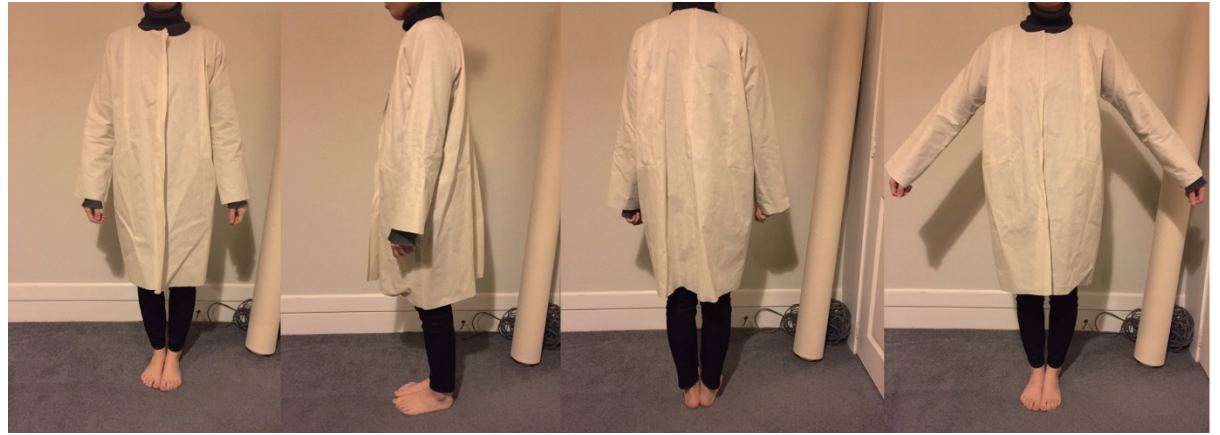


Figure 106: Wang, L. (2016). Silhouette concept one toile two – fitting photos: front, side, back views.

Figure 107: Wang, L. (2016). Silhouette concept one toile two – pattern diagram.

## **Detailed silhouette one development process** [Toile three]

A size small prototype was developed to fit the Bluecoat model in this third fitting. A few issues were discovered and indicated on the fitting photos (Fig. 108 & 109). Firstly, the pockets were designed too far towards the back. It was not a natural position to reach for the pockets, as the model discovered. The pockets were also a little too small, so I decided to shift part of the front side section to the front sleeve to enlarge the pockets. Next, lots of extra fabric was showing around the armhole. The sleeves seemed to be falling off the shoulder due to the incorrect shaping of the sleeve head and shoulder. Both shoulder, neck and sleeve needed to be reshaped. Thirdly, the bust line needed to be slashed open and dropped down again to make the front level with the back hem. Finally, the sleeve was a bell shape, narrow at the top and wider towards the sleeve hem. I thought that it was not very suitable for the Bluecoats' work because the sleeve formed multiple folds when the hands were by the side. Therefore, the sleeve needed to be narrowed at the hem in the next prototype. The detailed alteration process is shown on figure 110.



Figure 108: Wang, L. (2016). Silhouette concept one toile three – fitting photos: front, side, back views.



Figure 109: Wang, L. (2016). Silhouette concept one toile three – detailed fitting photos.

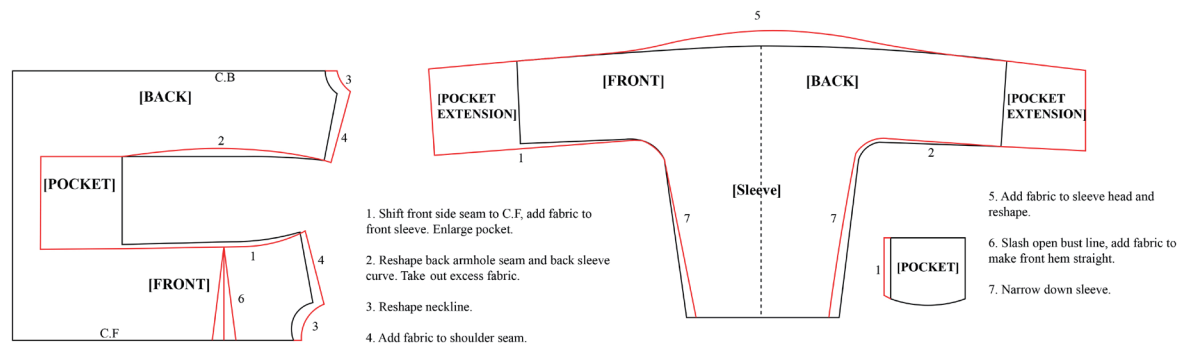


Figure 110: Wang, L. (2016). Silhouette concept one toile three – pattern diagram.

## Detailed silhouette one development process [Toile four]

This fourth prototype had already achieved the overall fit, shape and proportion (Fig. 111 & 112). The next stage would be adding details, finalising the inside finishing, and then toiling with a potential final colour and fabric. The Bluecoat model made a useful observation during this fitting. She mentioned that Bluecoats like to wear the current jacket open and that they always wear skirt or trousers underneath. It would be ideal if this new uniform could be middle length so they can show-off their other garments. Following this comment, the prototype was pinned in search of the right length and the final decision was to shorten the body length by 20cm (Fig. 113).

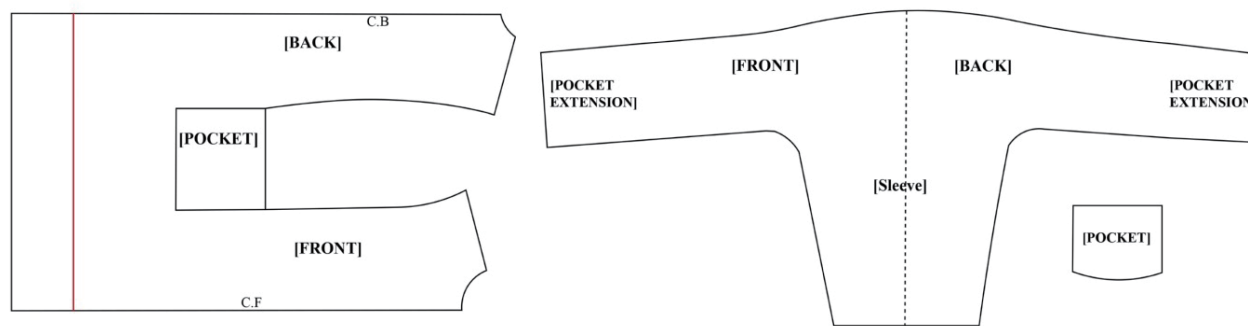


Figure 111: Wang, L. (2016). Silhouette concept one toile four – pattern diagram.



Figure 112: Wang, L. (2016). Silhouette concept one toile four (long) - fitting photos: front, side, back views.

Figure 113: Wang, L. (2016). Silhouette concept one toile four (short) - fitting photos: front, side, back views.

## Detailed silhouette one development process [Toile five]

This was the shortened and finalised concept one prototype (Fig. 114). It would be used as one of the potential design styles to show at the stage one design meeting.



Figure 114: Wang, L. (2016). Silhouette concept one toile five - fitting photos: front, side, back views.

## **Silhouette two**

Silhouette two was short-sleeved with turn-over cuff. This dress had front and back style lines across the waist area, and two generous front side pockets with back zip closure. The idea of this design was to create a simple and trans-seasonal piece that the volunteers could easily wear with their own clothes underneath. It was similar to the apron idea researched earlier, but considering the age group of most Bluecoats, it was decided to make this concept look more like an actual garment.

## Detailed silhouette two development process [Toile one]

Concept two was developed from block two (Fig. 115). A few alterations were required and are indicated in the diagrams (Fig. 116). After adding all of the design features onto the block, this new prototype seemed to be small on the model (Fig. 117). Therefore, the most important alteration required for this toile was to grade the pattern one size up. Secondly, this tunic dress was designed to have a zip closure at the back and no front opening. I noticed it was difficult even for the model when she tried to get into this tunic dress and realised that a dress might not be very suitable for this project; it would be better to have a larger neck opening. Finally, it was decided to move the pockets to the waist seam for aesthetic reasons.

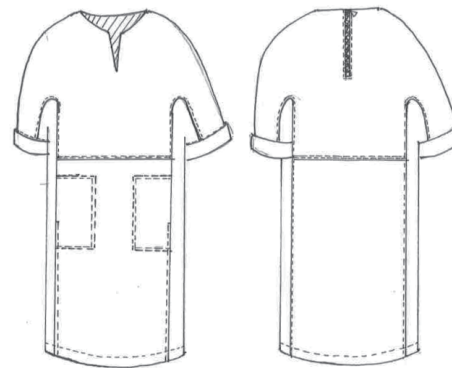


Figure 115: Wang, L. (2016). Silhouette concept two toile one - working drawing.

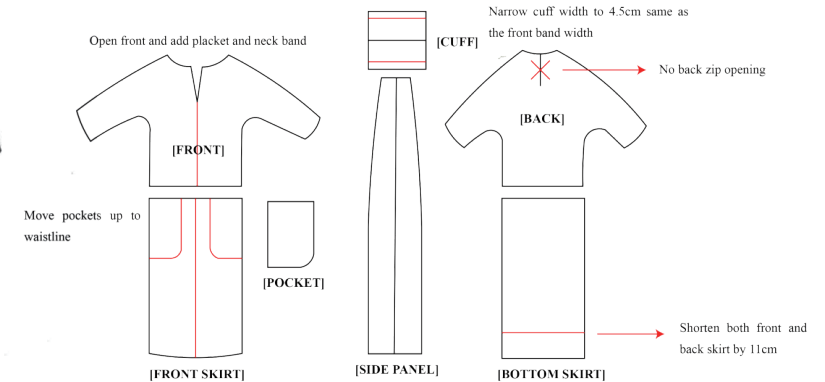


Figure 116: Wang, L. (2016). Silhouette concept two toile one - pattern diagram.



Figure 117: Wang, L. (2016). Silhouette concept two toile one - fitting photos: front, side, back views.

## Silhouette three

This style was developed based on block four. Compared to all of the other new shapes, this was the closest style to the current Bluecoat uniform. Three design variations were developed after finalising the initial silhouette. These variations were made to experiment with different collar, neck line, style line, side splits and pocket designs.

### Detailed silhouette three development process [Toile one]

This prototype was fitted on the Bluecoat model and she commented that it was very comfortable and flexible to wear (Fig. 118). A print design option was brought up in this fitting and there was the possibility of using printed facings on the collar for the men's uniform. This prototype was just a basic shape at this stage but all fitting issues were resolved. Collar, pocket and all other design features would be added in the next prototype.



Figure 118: Wang, L. (2016). Silhouette concept three toile two - fitting photos: front, side, back views.

## [Design variation one]

After resolving all of the issues mentioned in the last fitting, I tried a mandarin collar and added pockets to this prototype (Fig. 119). However, the mandarin collar made the style look old and traditional. Therefore, I decided to explore more design variations. A few fitting issues were also identified (Fig. 120 & 121). Firstly, the neckline needed to be dropped down as indicated to help the collar sit correctly on the neck. Secondly, the front panel had not allowed for the bust shaping so the side seam had kicked to the front. Therefore, I decided to slash open around the bust area and add more fabric lengthwise to keep the front and back balanced. Thirdly, an extra 1cm also needed to be added to the side seam to help both sides fall straight. Finally, the front neck at the side was opened to allow for more room there. The whole neckline would need to be reshaped after all of these alterations.



Figure 119: Wang, L. (2016). Silhouette concept three design variation one – fitting photos: front, side, back views.



Figure 120: Wang, L. (2016). Silhouette concept three design variation one – detailed fitting photos A.

Figure 121: Wang, L. (2016). Silhouette concept three Design variation one – detailed fitting photos B.

## [Design variations two and three]

I developed another two design variations from block four. Both of them were made in a black navy poly-cotton uniform fabric sourced from my workplace. The first design was simple and semi-formal (Fig. 122 & 123). It has a reverse collar with two handy pockets at sides. For the second design (Fig. 124 & 125), a style line was inserted just a little above the bust line. I created this style line with the intention of inserting a small pocket at the left hand side where the volunteers could clip their ID. Side splits were also added to achieve more movement around the hip area. I also used single welt pockets to enhance the corporate or formal feel of this design. Since these two prototypes were developed from the same block, some common fitting issues were found (Fig. 126). Firstly, the neckline required reshaping. Secondly, there were a few draglines on the sleeve. To resolve this problem, more fabric had to be added to the side armhole to release the sleeve.

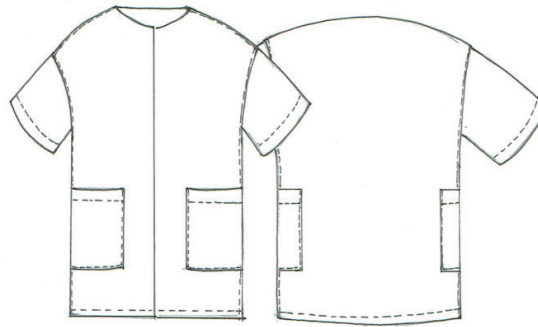


Figure 122: Wang, L. (2016). Silhouette concept three design variation two – working drawing.

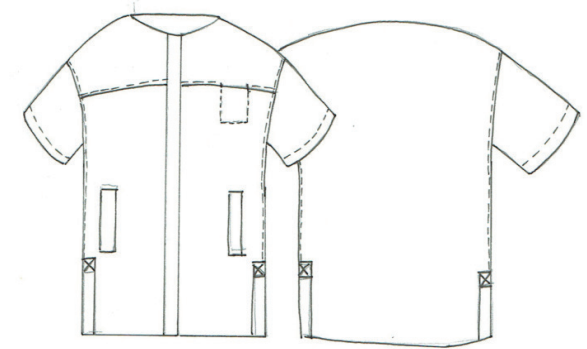


Figure 124: Wang, L. (2016). Silhouette concept three design variation three – working drawing.



Figure 123: Wang, L. (2016). Silhouette concept three design variation two – fitting photos: front, side, back views.



Figure 125: Wang, L. (2016). Silhouette concept three design variation three - fitting photos: front, side, back views.



Figure 126: Wang, L. (2016). Silhouette concept three design variation two and three - detailed fitting photos.

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## | Appendix 15 - cycle six - detailed feedback

The first silhouette was most preferred by the volunteer coordinator. The pocket and sleeve design features were commented upon as simple but creative. However, the volunteer coordinator said that she would like to see a slightly longer version. For the second concept, all of those present suggested that a dress was not suitable for this project and that it would be better to turn this dress into a tunic jacket<sup>21</sup>. Similarly to the second design, the closure and the proportion of the third design needed be reconsidered. For example, the length was too long, which made the style look old-fashioned. The volunteer coordinator emphasised that a dress was not an appropriate approach to the Bluecoat uniform design because of the age group involved. The fourth concept was identified as more suitable for a male uniform. Therefore, alterations in the proportion were required to make it fit a male body shape. The last raglan shape was removed from the development list because of comments such as *“unflattering”* and *“too sporty and casual-looking for the Bluecoats”*.

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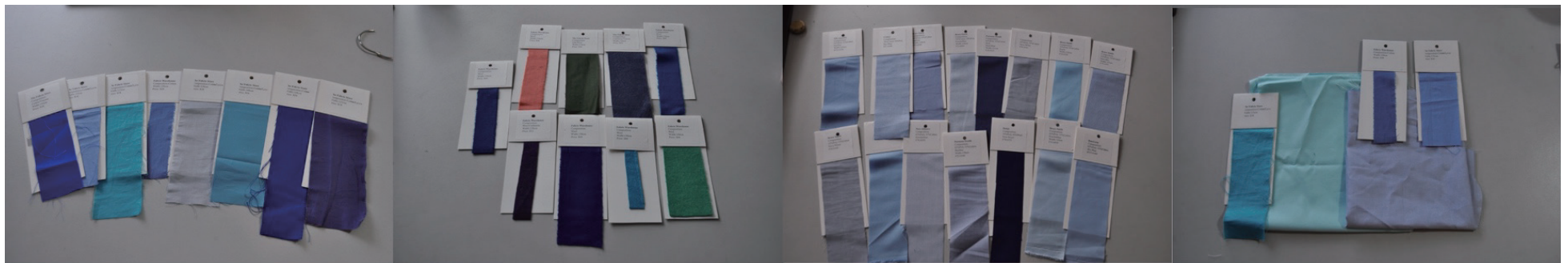
<sup>21</sup> After reflecting on the feedback, I redeveloped this style in the next cycle by opening up the front and designing a 4.5cm band which went all the way around neck and front opening. The length was shortened by 11cm to adjust the proportion. The cuffs were also too wide and were changed to match the front band width.

## | Appendix 16 - cycle seven - extended documentation of colour research and fabric selections

Fabric samples in pure cotton, poly-cotton and wool were sourced and shown (Fig. 127). Wool fabrics were eliminated because they could not be digitally or screen printed unless the wool was pretreated, which greatly restricted the fabric choice. Wool is also more expensive and can be more easily damaged if care instructions are not followed correctly. The question then was whether to use poly-cotton or pure cotton. Poly-cotton fabric is commonly used in uniform design. The polyester part contributes to crease resistance, durability and easy care. The cotton content helps to enhance the overall comfort of the fabric. However, poly-cotton fabric can have a strong resistance to dye and digital printing. In contrast, pure cotton provides ease of dye and printing compatibility. Cotton fabric can also be recycled more easily than poly-cotton. It is more comfortable to wear but less durable and more easily creased. By discussing the issue with the hospital representatives and considering that the Bluecoats only wear the uniform once or twice per week (about 4 to 8 hours), and that the uniform is professionally drycleaned by the hospital, the final preference was to use pure cotton for this project. Four colours were picked from the pure cotton range for sampling. At this point, the concern was that the turquoise might be too bright, so further sourcing would be required to find a lighter shade. For the purpose of this project, it was also highlighted that it was important to source fabrics through wholesalers. This would help to simplify the production process once this project is confirmed.

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Figure 127: Wang, L. (2016). Fabric samples – wool, poly-cotton and pure cotton.



## | Appendix 17 - development process of the Emma style

### Emma style development - [Toile two]

I redeveloped concept two following feedback from the previous fitting. The back closure was closed and a 4.5cm band from hem to around the neckline was added.

Adjustments were made to the length of the garment by shortening it 11cm. It was a good decision to move the pockets up to the waist seam so that the top pocket opening could be secured at the waist seam. The whole design looked much neater both from the outside and the inside (Fig. 128 & 129).

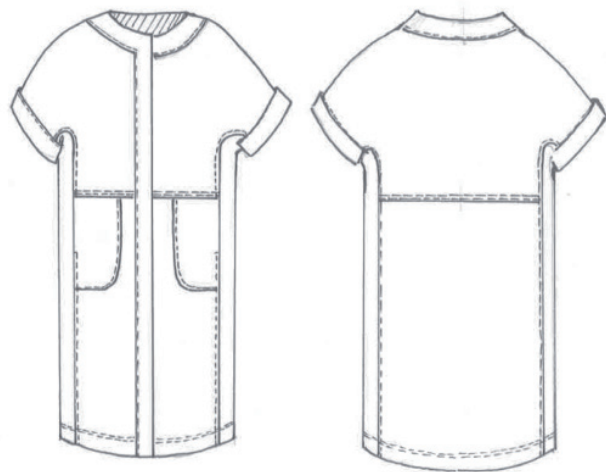


Figure 128: Wang, L. (2016). The Emma style toile two - working drawing.

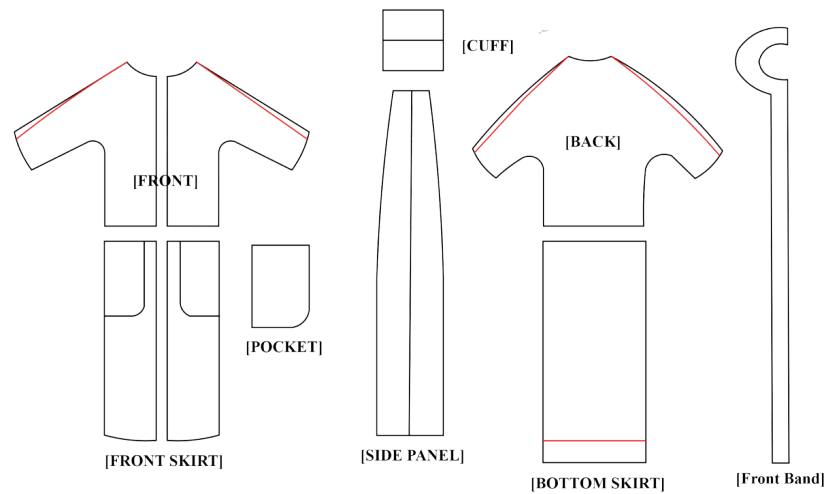


Figure 129: Wang, L. (2016). The Emma style toile two - pattern diagram.

The larger size looked more proportional on the Bluecoat model, who enjoyed wearing this style (Fig. 130). She felt more comfortable and had more room around the body and less restriction to her arm movement. I also slightly reshaped the sleeve to make it narrower at the hem. Side splits were added to give additional movement at the bottom hip area. I designed a back step (back longer than front at sides). However, after discussion with the supervisor we decided that this back step design was not practical and was inappropriate as a hospital uniform design feature. Because this design was not yet finalised, most of the seams had not been flat felled but I did twin needle stitching to achieve the effect and also to save time.

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Figure 130: Wang, L. (2016). The Emma style toile two - fitting photos: front, side, back views.

## | Appendix 18 - development process of the pleated style

### The pleated style development - [Toile one]

This concept was developed from block two and is a design variation of concept two (Fig. 131). It was an experiment to add extra comfort to the armhole and sleeve by employing a gusset feature. The pleated bottom skirt and shirt collar designs were intended to target the younger age group of the Bluecoats. During the fitting (Fig. 132), I identified it would be better if the front opening could be extended to the bottom hem. A simple round neck design or a mandarin collar would also help to make this design less corporate-looking (Fig. 133).

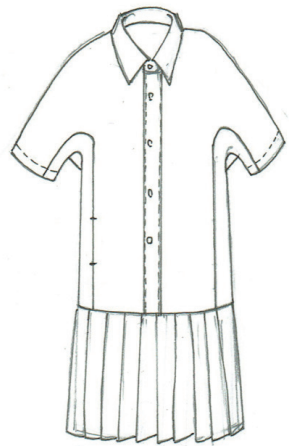


Figure 131: Wang, L. (2016). The pleated style toile one - working drawing.



Figure 132: Wang, L. (2016). The pleated style toile one - fitting photos: front, side, back views.



Figure 133: Wang, L. (2016). The pleated style toile one - collar.

## Design concept four development - [Toile two]

The overall fit and silhouette was achieved with this style (Fig. 134 & 135). The shirt collar had been changed to a simple round neck design. The pleated section was moved to the side and the centre front opening extended to the bottom hem. Pockets and pocket flaps were also added to test their position. When designing this style, I was worried that it would not be suitable for the main age group of the volunteers. However, after communication with the supervisor, it was decided that it would be worthwhile to place a different style into the new uniform range so the volunteers would have a wider range of designs to choose from.

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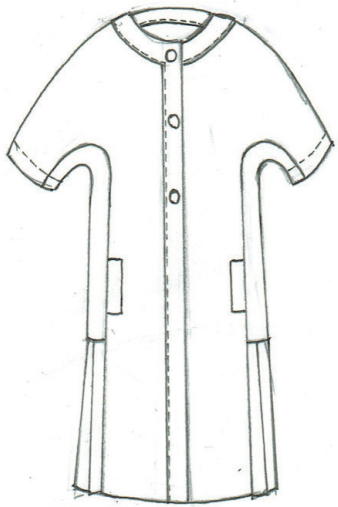


Figure 134: Wang, L. (2016). The pleated style toile two - working drawing.



Figure 135: Wang, L. (2016). The pleated style toile two- fitting photos: front, side, back views.

## | Appendix 19 - detailed documentation of cycle eight

### Fabric sourcing trip

Hawes and Freer (H & F) was the first supplier visited. According to previous experience, this supplier specialises in workwear. In this trip, I explored the pure cotton and poly-cotton collections there. By considering the budget and colour availability, a pure cotton collection was eliminated<sup>22</sup>. A variety of aqua and pale blue colours were found in their poly-cotton collection<sup>23</sup>. However, the aqua colours were all in light-weight fabrics and they were too thin for the designs which might not be able to hold their shape. The polyester content might also cause problems with digital or screen printing so fabric testing would be needed. The benefits of using H & F fabric was that the colours showed in their sample books were available as stock colours which would only take about ten days to order for sampling with no minimum order quantity required.

A heavy pure cotton aqua drill was found at Frost

Fabric and it was very close to the colour selected on the storyboard. The supplier also commented that this fabric was perfect for dyeing or screen printing. Extensive colour ranges of poly-cotton and pure cotton were also available at John Rainger and O'Neil Fabric. Charles Parsons and Wall Fabric specialise in fashion fabrics and so only stocked white pure cotton fabric.

After the fabric sourcing trip, from a designer's perspective, I started to think that the aqua colour was not an appropriate colour option for this project. On the story board, the aqua colour looked fresh, striking and connected to the sea colour concept, which was why the volunteers liked this colour. They also believed that, while aqua was a different colour, it was still in the blue range. However, when I saw the actual aqua fabric sample, I thought it was a completely different colour from what was expected and that it would be difficult

for the volunteers to keep the colour connection with the name "Bluecoats". Moreover, this colour would not suit some skin tones and it could not be matched easily with other existing clothes. In order to help the stakeholders visualise the colour on the body, I decided to make the four previously-selected prototype designs in the following fabrics: sourced aqua (pure cotton drill), plus the storyboard pale blue (poly-cotton: one light and one heavy weight) and, an alternative option, turquoise (poly-cotton).

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<sup>22</sup>The pure cotton ranges at H & F are sourced from China and Spain. The Spanish collection is for luxury apparel and the price was out of budget for this project. Therefore, I went straight to the China collection but limited stock colours were available unless H & F could dye to the desired colour. However, they made it clear that their factory would only be able to dye the fabric to match a specific colour if the order were over 300 metres.

<sup>23</sup>The composition of H & F poly-cotton collection is 60% cotton mixed with 40% Polyester. They are mainly in light to medium weight.

## Concept development

The colours of the Louisa (Fig. 136), kimono (Fig. 137) and Emma (Fig. 138) styles were thought to be too dull and cold. The aqua (mint) colour used for the Emily (Fig. 139) style was preferred as it established a brighter and livelier look than the others. However, the volunteer coordinator pointed out that the colour of the 'Emily' style was very similar to the current hospital cleaner's uniform. This led to a discussion as to whether or not to use the aqua (mint) colour. Since the other colours were not satisfactory, another round of fabric sourcing was required to find more shades of aqua (mint), turquoise and blue. Secondly, it was agreed that the mid weight poly-cotton fabric used for the kimono style was the most suitable option for the new uniform.



Figure 136: Wang, L. (2016). The Louisa style - fitting photos: front, side, back views.

Figure 137: Wang, L. (2016). The kimono style - fitting photos: front, side, back views.

Style-wise, the 'Louisa' style was considered to be too masculine looking and the volunteer panel was concerned that this style would require the shoulder area to fit well on the wearer. The volunteer panel favoured the kimono style; they commented that this design was different from common uniforms and looked 'smart-casual'. They suggested that compared with the current serious and formal-looking uniform, it was a great design to help break the boundary between the visitors and the Bluecoats. The volunteer panel was fond of the sleeve design of the 'Emily' style. However, as a designer, the 'Emma' style was my favourite piece but the hospital panel commented that this style was too uniform-like and the sleeve was too short for winter. Summarising all of the feedback above, the decision was made to continue developing the kimono and 'Emma' styles.

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Figure 138: Wang, L. (2016). The Emily style - fitting photos: front, side, back views.

Figure 139: Wang, L. (2016). The Emma style - fitting photos: front, side, back views.

## | Appendix 20 - full documentation of cycle nine

### Concept development

I decided to re-develop the Alex style as a male uniform option<sup>24</sup>. A design decision was made to add a side splits feature to allow for more movement around the restricted hip area. The sleeve of the Emma style (Fig. 140) was re-designed with adaptations from the Emily style in cycle seven. Minor alterations would be required at sleeve, front and panel seams to achieve the fit.



Figure 140: Wang, L. (2016). The Emma style - fitting photos: front, side, back views.

<sup>24</sup>The delay in male uniform prototyping was due to my lack of experience in menswear design. The plan was to focus on the female uniform first and then use it as inspiration for male uniform.

A major issue regarding the grain line was discovered on the kimono style. The whole garment had not been cut on the straight grain which would have been the cause of the drag lines created at the shoulder to armhole areas (Fig 141). The design of the neck band being shorter than the front neckline (A) and the round front opening shape (B) were not successful from a design point of view (Fig 141). These features created unnecessary difficulty during construction, and the finishing of the neckband at the front looked untidy and bulky. Therefore, I decided to extend the neckband to be in line with the front edge.



Figure 141: Wang, L. (2016). The Kimono style - fitting photos: front, side, back views.

The Sophia style was a newly-developed design variation of the pleated style in cycle eight (Fig. 142). The reason I decided to re-develop the pleated style was due to the neat silhouette and the increased comfort a gusset design would provide to the arms.

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Figure 142: The Sophia style - fitting photos: front, side, back views.

## Second fabric-sourcing trip

The second fabric-sourcing trip was conducted during this cycle (Fig. 143). The aim of this was to find more variations of the aqua (mint), blue and turquoise colours in the desired weight. It was at this point that I decided to suggest to the hospital panel that they focus on the turquoise colour because the aqua (mint) was not a good option for the new uniform. As previously mentioned, it was not suitable for many skin tones and the volunteers could have a negative reaction to the colour because they would no longer be the “Bluecoats”.

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Figure 143: Wang, L. (2016). Fabric samples collected in the second sourcing trip.

## | Appendix 21 - documentation of cycle ten

Each pattern piece was examined manually using the 'walking pattern method' to ensure that each curve or line aligned with each other (Fig. 144).

Pattern alterations were applied based on the previous fitting. Side splits design ideas for the Alex style were explored. Compared to options one and two, option three is a slightly more formal, suitable and cohesive method of construction for the overall design of the Alex style (Fig. 145). The detailed pattern alteration process is shown in figure 146.



Figure 144: Pattern refinement.



Figure 145: Wang, L. (2016). Side splits design variations.

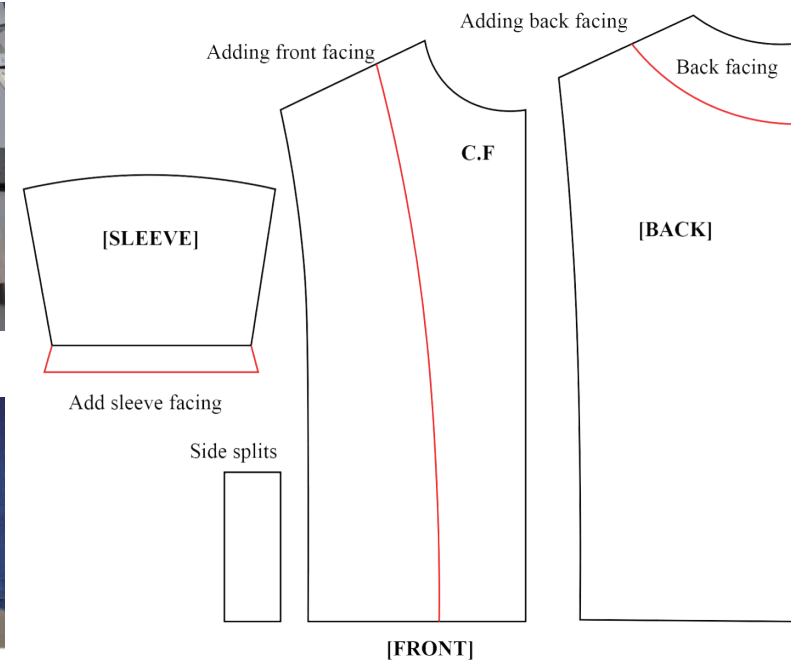


Figure 146: Wang, L. (2016). Detailed pattern alteration diagram for Alex style.

Through checking the kimono-style pattern, it was confirmed that the straight grain was off the centre. Several adjustments were applied to shift the straight grain to be parallel to the C.F. Through experiments, I identified that the fold created at neck to underarms was caused because the angle of the shoulder slope was incorrect. As shown on figure 147, the perpendicular distance between the neck point to the shoulder tip needed to be at least 3 to 4cm and the original pattern was only 1.5 cm.

Detailed pattern alteration notes and the pattern manipulation process for the Emma style are shown on below figures 148 & 149.

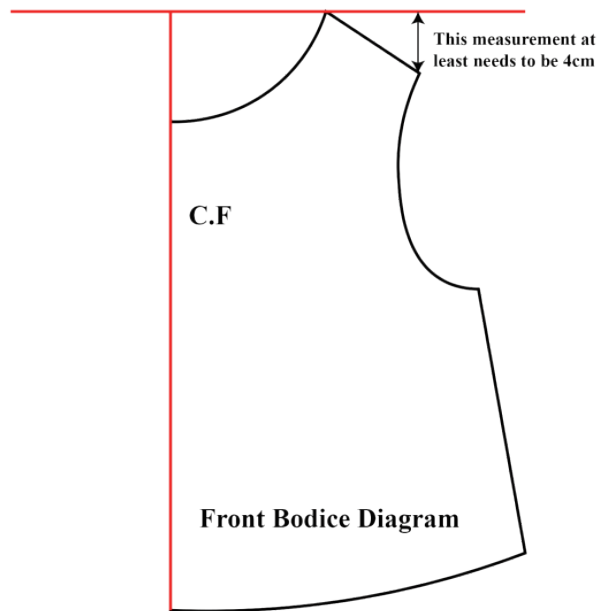


Figure 147: Wang, L. (2016). Angle of the shoulder slope.

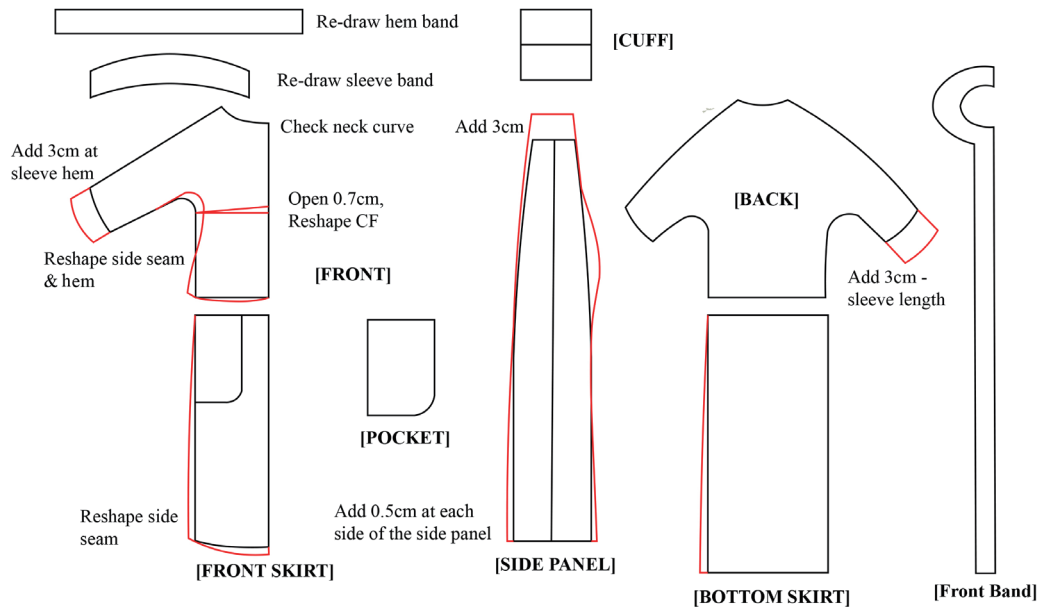


Figure 148: Wang, L. (2016). Detailed pattern alteration diagram for Emma style.

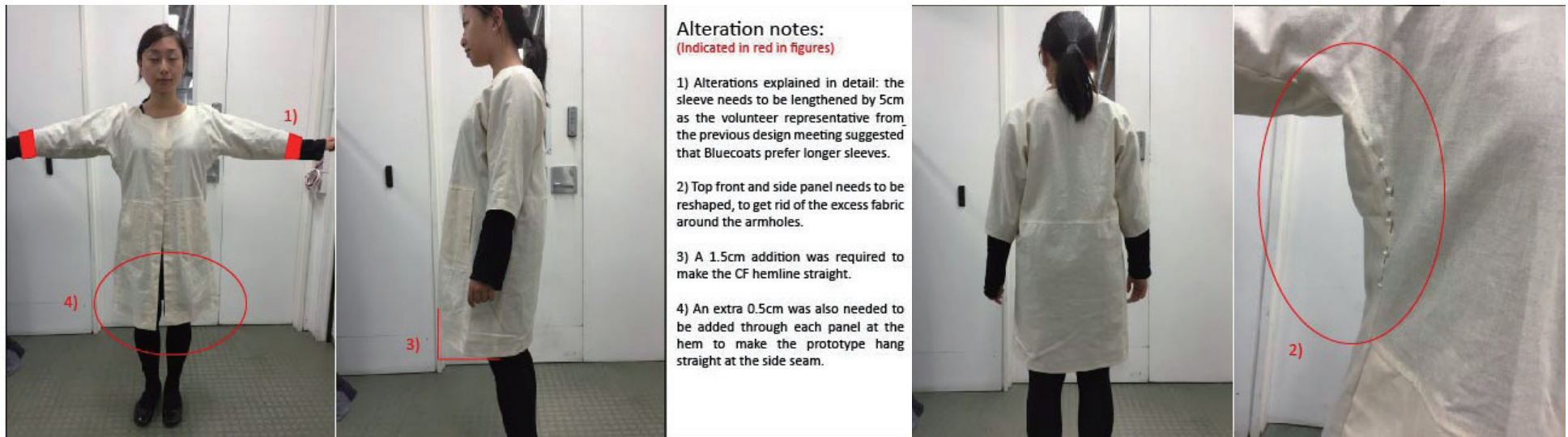


Figure 149: Wang, L. (2016). Fitting photos and alteration notes for the Emma style.

Detailed pattern alteration notes for the Sophia style are shown below in figure 150.

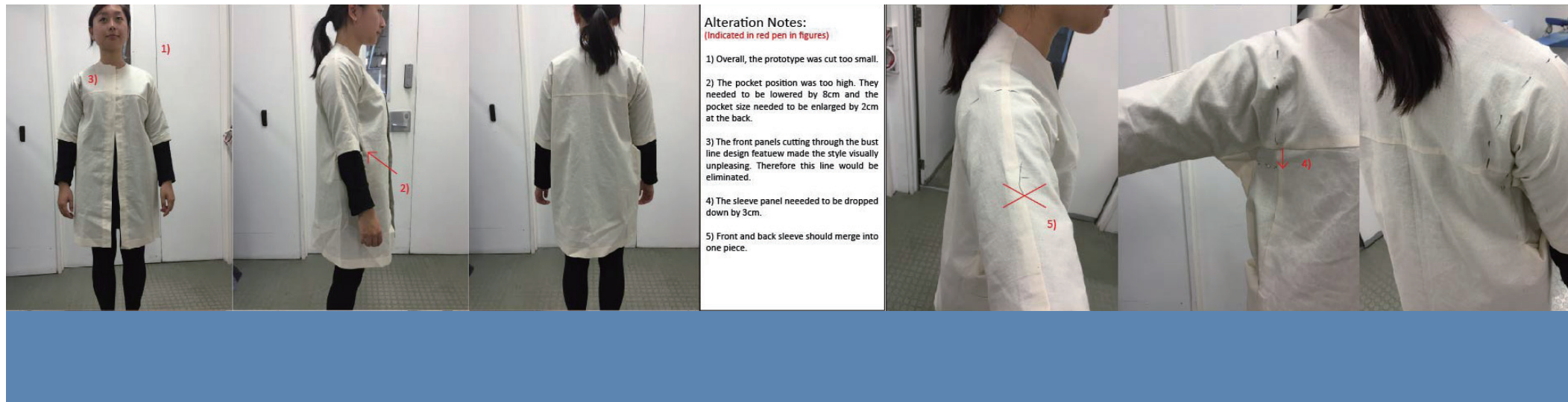


Figure 150: Wang, L. (2016). Fitting photos and alteration notes for Sophia style.

Four uniform styles were shown during this ACH volunteers meeting (Fig. 151). The Emma style (option one and three) was tested with digitally printed fabric. The Kimono style was presented with a screen-printed value logo on the back (Fig. 152). Two digitally printed scarf designs, one in tone-in blue (in silk fabric) and the other in a green, black and blue combination (in cotton fabric) were also made to show the volunteers (Fig. 153).

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Figure 151: Wang, L. (2016). Four designs presented at the ACH Volunteer Meeting.



Figure 152: Wang, L. (2016). Screen-printed Value Identity logo samples.

Figure 153: Wang, L. (2016). Digitally printed silk and cotton scarf samples.

## | Appendix 22 part one - detailed feedback on the new designs collected during the ACH meeting.

The feedback can be summarised in the following points:

- of the current models, the kimono style was the most preferred overall (but not the colour or material).
- while a small number of Bluecoats did like the bright blue colour, most of them showed resistance to any of the new colours. Some of them thought that the bright blue option resembled the hospital cleaners' uniform.
- almost all of the Bluecoats disliked the new fabric. It was referred to as 'night gown fabric' and perceived to be more suitable for a dress or apron and not a smart jacket. They also commented that the new fabrics were too thin and too cold for winter. Bluecoats generally expressed that *"If the new designs had been in similar material to their current jacket, they would have been far better received"*.
- the Bluecoats strongly disliked the fact that there was no lining in the new designs which meant *'informal and cheap'* to them.
- most of the Bluecoats were not keen to wear a jacket with printed designs.
- many female members described themselves as 'mature' women, and suggested that the round neck (Emma style) was not comfortable for them to wear. They expressed the view that a formal collar similar to their current uniform would be preferred and they also felt that the formal collar would look better.
- some Bluecoats suggested that a short jacket would suit them better because of their lack of height.
- the textile design for the scarf was commented on as being too complicated and that it looked more like a 'chain', which reduced the clarity and ability to recognise the value identity logo.
- female members liked the silk scarf material, but most would prefer having a longer length.

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## | Appendix 22 part two - detailed feedback on the new designs collected during the public voting.

The light and bold digital print design was described as bringing 'brightness' and 'happiness' to the hospital. The cross-cultural reference in the print design was thought to be 'creative' and 'interesting' by many participants. At least half of the participants agreed that the print design helped the uniform look unique, but they were also concerned that it might go out of date very fast. Some participants described the printed Emma style as too casual, old-fashioned and unflattering mainly because of the prints used on the upper body. They suggested that the new uniforms would look more professional if the print design was only used on accessory pieces.

Several respondents suggested once again that the current jacket looked 'classic' and that therefore it was a waste of money to make new uniforms. However, positive feedback was received for the kimono style from most of the participants. They commented that the kimono style looked comfortable to wear and that it would fit various body shapes. The cut and the pocket design were described as modern and forward thinking.

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## | Appendix 23 - consideration of commercial manufacturing

Fashion Uniform Ltd is one of the New Zealand healthcare and corporate wardrobe suppliers and they are currently re-designing other uniforms such as the nurses' at the ACH. To better understand the commercial reality of uniform design and manufacture, an expert meeting was scheduled with the general manager from Fashion Uniform Ltd to gather insights into potential manufacturing processes, uniform design considerations and cost estimates for the new designs. The initial meeting was followed by a site visit trip to the Fashion Uniform Ltd factory. During this visit, the opportunity to further develop the prototypes in collaboration with them was brought up.

Fashion Uniform Ltd had specific expertise that helped the research, in particular in the areas of colour, fabric selection, pattern digitising and grading. Firstly, a quick company tour was provided to gain general understanding of local production and sample-making processes. Next, I delivered an up-to-date overview of my project to staff at Fashion Uniform Ltd. This included showing the prototypes used for the ACH volunteers' meeting, and I summarised insights and design criteria from the previous cycle. Thirdly, current jacket models at Fashion Uniform Ltd and fabric sample books (poly-cotton and poly-wool) including local and overseas suppliers were shown for selection to use for this project. I decided to prototype the finalised concepts and digitise the patterns using Fashion Uniform Ltd as the manufacturer to help simplify the sampling and manufacturing processes. This process allowed me to be involved throughout any digital pattern alterations and re-making processes to ensure the prototype was the same. Prototypes could be completed within three to four weeks after submission of the finalised concepts. Fourthly, logo embroidery and an individual fitting service could be provided. Finally, indicative costing for manufacturing was also supplied by Fashion Uniform Ltd (*see appendix 24, p. 250*).

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## | Appendix 24 - The quotations

Style:	Poly wool royal blue fabric:	Poly twill bright blue fabric: (100% Polyester Uniform Fabric)
Kimono Ladies' Jacket	\$239.00	\$172.70
Round Neck Ladies' Jacket	\$189.90	\$151.00
Lapel Men's Jacket	\$239.00	\$172.70

\* All prices are including custom coloured lining with flat piping lining trim detail.  
 \*\* All prices are including ADHB logo embroidery. If the word 'Volunteer' is also required - please allow \$4.00 for this to be added.  
 \*\*\* The polyester wool fabric is much more expensive than the polyester suiting fabric. Also, the colour options are very limited. The polyester twill fabric is available in many colours - including the swatch you have selected in the bright blue shade.

Style:	100% Poly-chiffon	100% Silk
Scarf	\$45.00	\$45.00

\* Minimum order quantity is 100pcs

Style:	100% Silk (AU)	100% Silk (China)
Tie	\$50.00	\$38.00

\* Minimum order quantity is 100pcs

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## | Appendix 25 - full documentation of cycle eleven

### Embroidery development

The first option had only the word 'Volunteer' embroidered and the second had the ADHB logo and the word 'Volunteer' underneath. I selected option two because it was more recognisable. The ADHB logo also indicated that the volunteer was part of the organisation, which had been identified previously as one of the important reasons people wanted to be a Bluecoat. Option two was planned to be embroidered on the right chest (when wearing). This allowed it to be visible on the opposite side from the ID badge.

## Colour and fabric selection

The new colour selection was made through studying the ADHB colour palette and the availability of manufacturing stock fabric colours<sup>25</sup> (both provided by Fashion Uniform Ltd), and the current ACH uniform colours. Since the base colour blue was irrevocable for the Bluecoats, sky blue, royal and navy (common stock colours for most suppliers) were the options from which to select. The aqua colour shown on figure 154 was used already for the hospital cleaner's uniform (A). Fashion Uniform Ltd also confirmed that the new nurses' uniforms were to be changed to navy, blue and grey (B). Therefore, I decided to try the royal for the two female prototypes and sky blue for the male prototype (Fig. 155). The new royal colour (poly-wool) was in a slightly lighter shade to the current Bluecoat uniform and similar to the new Bluecoat uniform at the airport. The sky blue (100% polyester) is 'warmer' and brighter which could help to establish a happier and more welcoming image. Both the poly-wool and polyester fabrics were specialised for uniform design use. They were selected by considering the feedback on the previously used poly-cotton and cotton drill fabrics as being too thin and 'patient-uniform-like'. These new fabrics would provide better warmth, crease-resistance ability and would also express a more professional image, being expected uniform fabrics. Opportunities to incorporate other value identity colours such as rose and olive were explored. These could potentially be used in details such as lining, piping, scarf and embroidery. I therefore decided to test olive lining and grey piping with the Alex style (sky blue).



Figure 154: Wang, L. (2016). Colour exploration.

Figure 155: Wang, L. (2016). Fabric samples explored at Fashion Uniform Ltd.

<sup>25</sup>The 300 metres minimum order quantity mentioned previously with H & F also applies with Fashion Uniform Ltd, which greatly restricted the colour choice.

## Textile design development

The value identity-inspired textile print design was further developed, based on the feedback received from the ACH meeting and the public voting. During the process, additional print layout combinations were explored to reinforce the clarity of the logo and to reduce the 'chain' look (Fig. 156-158).

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Figure 156: Wang, L. (2016). New textile print design option one.

Figure 157: Wang, L. (2016). New textile print design option two

Figure 158: Wang, L. (2016). New textile print design option three.

## | Appendix 26 - documentation of Bluecoat voting result

Voting results indicated that 40 out of 82 Bluecoats participated. Half of the volunteers surveyed (52%) preferred to keep the current female style. The current male style was preferred by 40% of the participants while the rest voted for 'unsure'. Although I made several compromises to the designs based on the feedback from the Bluecoats and delivered presentations to explain the design processes, the majority of them still delivered strong negative responses to the new designs and showed the desire to have *"the current jackets remade in the material that you are using for the new uniforms"*. Comments were received from Bluecoats such as *"[w]e don't need to change. Waste of money - something desperately needed by the hospital - dreadful, funeral"* and *"[t]he whole exercise is quite unnecessary..."*. The survey demonstrated that the volunteers intended to judge the new design based on personal experiences such as *"...prefer current male jacket based on 38 years wearing suit, tie and business shirt"*. There was only a small group of volunteers who thought *"[i]t is time for change"*.

Colour-wise, 45% of the volunteers preferred the new royal blue and 40% were "unsure" about their preferred colour option. Moreover, most Bluecoats preferred the matching lining colour for the new female designs. For fabric selection, 42% selected the new poly-wool fabric, while 55% were unsure about fabric choice, and only 3% selected the polyester fabric. For the print design, there was not a preferred option, with 20% voting for option one, 13% preferring option two, only 10% selecting option three and the 57% 'unsure' (Fig. 156 to 158). However, nearly all of the Bluecoats thought that use of a scarf would be a more appropriate way to incorporate the (values) print, and they preferred a plain jacket.

Bluecoats made many comments about the collar, length, shoulder and the fit of the new designs. For example, *"[n]ot convinced either of the other necklines work... feel they are too loose, big and long. Shoulder not*

*defined enough which would make them fit better - Shorter shoulders with shoulder pads*" (quote from a Bluecoat). It was commonly expressed that the Sophia style was unacceptable because there was a theory held by the volunteers that a "[j]acket looks unprofessional without a collar". The length was still a concern for many Bluecoats. They referred to the length of the new designs as a 'dressing gown' or coat length which is too long, especially for shorter people. The volunteers also expressed that they preferred more defined and structured shoulders (with shoulder pads) and sleeves similar to the current uniform. Because the fabric change and lining reduced the trans-seasonal ability of the new design, many Bluecoats raised a new concern for summer uniform.

Through summarising the feedback received from the volunteer voting, I was confused by the feedback on the jacket length, as in previous feedback sessions and the Expert Survey, many Bluecoats complained that the current jacket was too short and that they felt cold around the back-waist area during winter. This point demonstrated that one of the challenges of working with a user group like this is that they tend to change their minds a lot. Moreover, regarding the question of the summer option, my initial concept was to make one trans-seasonal design because it would be more convenient and cost-effective. This was the reason I used the mid-weight poly-cotton fabrics previously and most of the original prototypes were slightly oversized with three quarter sleeves and not lined. These features could ensure that the wearer felt comfortable in summer and also that they could add extra layers for warmth easily under the design according to their preference in winter. However, this notion was strongly opposed by the Bluecoats due to their mind-set that the Bluecoat uniform must be a jacket. Moreover, they also believed that a jacket must be lined and that the sleeve is required to cover the wrist area.

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## | Appendix 27 - detailed account of public voting results

Two hundred and forty-five people in total were invited to participate in the survey. Of these, 96 agreed to participate, 54.3% of whom were NZ European. Sixty-nine percent of the total were female. The largest group of respondents were in the age group 25 to 34 years. Just over half (63.5%) of participants were visitors to the hospital, while a third (27.1%) were hospital staff and the rest (9.4%) were patients.

The voting results indicated that 33% of participants selected the kimono style, 37% chose the Sophia style and 30% preferred the current Bluecoat uniform. Although the percentages seemed even, distinguishing between the new styles and the current style, 70% of the participants selected the new styles. For the male options, 51% of participants selected the new design and 49% preferred the current uniform. In regards to colour and fabric, 79% of the participants preferred the darker royal poly-wool fabric. For print designs, 56% of participants voted for option one, and of these 70% preferred the blue option (Fig. 156). They thought a tone-in blue coloured scarf or tie would be a better match to the designs.

Positive reviews on the new styles were received from the public such as *"[i]t's great the hospital is looking into the volunteers' uniform. The current style looks too old"* and *"[i]t's a great idea to change the uniform. The new design with lighter sky blue colour definitely looks more approachable and inviting"*. One of the important factors was that 70% of the participants chose the new designs because they felt these two delivered a more relaxed and casual look. Compared to the current uniform, many participants commented that the cut used on the new designs was more modern. The majority of the participants suggested that the four colour options of the accessories should

all be made available to the volunteers because different colours suit different people and skin tones. Positive responses were also generally received regarding the embroidery. Many participants expressed that *“I like the logo on the new designs. There are so many colours used in the hospital, a jacket can’t really tell [you] who they are”*.

On the other hand, there were participants who preferred the current style for four main reasons. Firstly, they preferred a more fitted shape and shorter length. These participants mentioned that although they did not like the style of the current uniform, it was the only shorter option available. Secondly, the decision to use the sky colour fabric for the Alex style also caused a loss of votes. Although I explained to the participants that they should only judge on the style not the colour when making a selection on the male options, it was difficult for them to visualise how the new design would look in the darker royal fabric. Thirdly, a few participants also brought up a concern that the new style was too clinical looking. Comments were received such as *“[t]he new styles look very clinical; hospital volunteers should look totally different”* and *“[a]lthough the current style looks awful, I chose the current male jacket just because it looks totally different from a hospital uniform”*. Finally, there was a small number of hospital staff who questioned that *“I am really used to the current uniform. What is wrong with them? They just need a badge or embroidery”*.

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## | Appendix 28 - detailed documentation of cycle thirteen

The first and second female concepts ('Zoe' and 'Ella' styles) were further developed from the 'Sophia' style (Fig. 159 to 162). Based on the suggestions from the Bluecoats, a formal collar similar to that on the current uniform was designed on the Zoe style. A mandarin collar with zip opening was used on the 'Ella' style to provide an alternative option. The third concept, the new kimono style, also had a formal collar added (Fig. 163 & 164). For all three concepts, the front and back body was re-shaped to give a semi-fitted silhouette, the jacket length was shortened and the armhole and sleeve were adjusted to deliver a more defined look around the shoulder area.

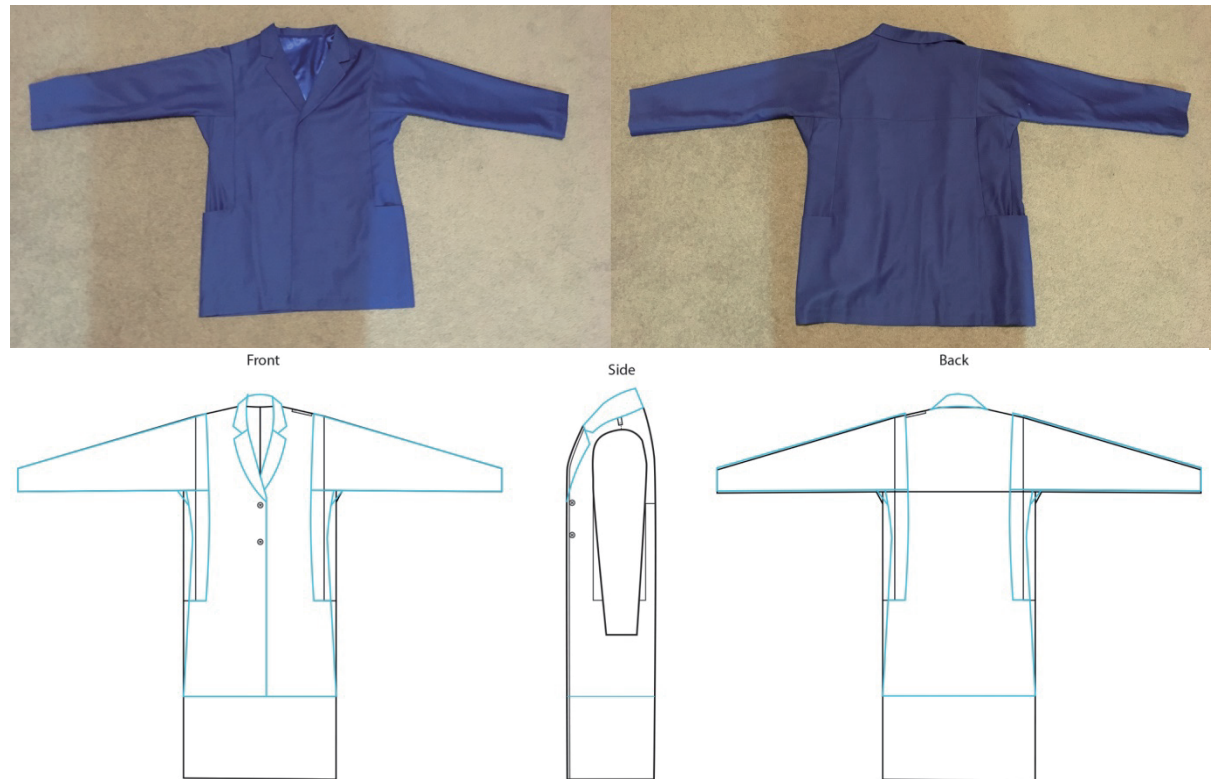


Figure 159: Wang, L. (2016). Female design - Zoe style.

Figure 160: Wang, L. (2017). Zoe style development process (black: Sophia style, blue: Zoe style).



Front

Back

Front

Back

Side

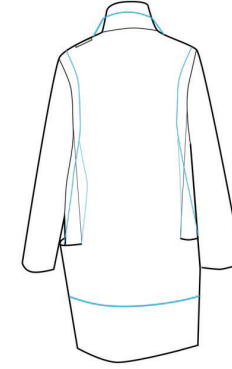
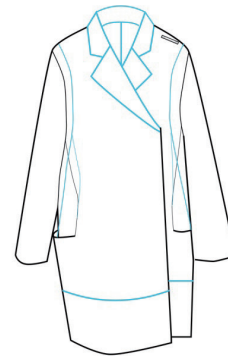
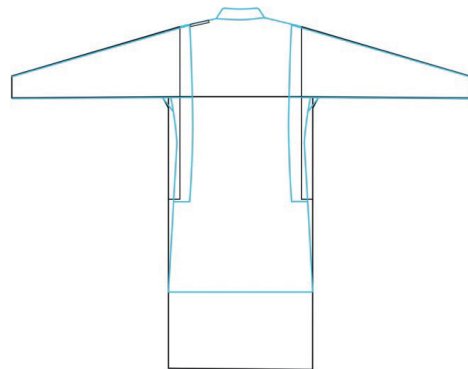
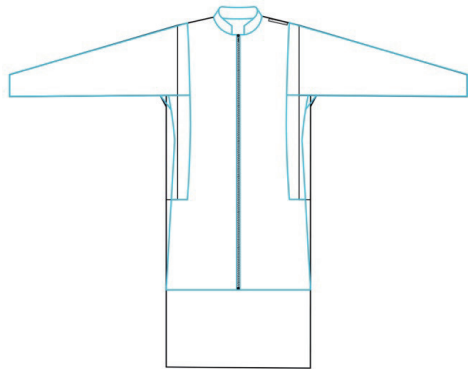


Figure 161: Wang, L. (2016). Female design - Ella style.

Figure 162: Wang, L. (2017). Ella style development process (black: Sophia style, blue: Ella style).

Figure 163: Wang, L. (2017). Female design - new Kimono style.

Figure 164: Wang, L. (2017). New Kimono style development process (black: Kimono style, blue: new Kimono style).

The male option, the new 'Alex' style, was designed to have a reverse and detachable mandarin collar to provide more choice to the wearer (Fig. 165). The shoulder points were also raised to give a more formal look. All four pieces were fully lined and made in a poly-wool fabric which is similar to the final fabric sourced from Fashion Uniform Ltd. Compared to the current female jacket, the three new designs were developed from different concepts and also from the two-dimensional silhouettes but after the modification, the new designs looked identical to the current jacket worn by the Bluecoats. I decided to eliminate these new female designs because I felt that my voice as a designer was not evident and the process of work that had been undertaken was invisible. I re-started the design process using the Kimono style as the base silhouette in the second part of the cycle thirteen.

During the second section, three new female styles were designed. The design inspiration during this process was to ensure that these new designs were comfortable to wear, easy to work in, suitable to the hospital environment, and portrayed a professional and friendly image. These new female designs needed to express who I am as a designer but also try to fulfil the stakeholders' requirements; therefore, the three newly-developed options aimed to deliver multiple choices of semi-fitted and loose-fitted silhouettes. The new designs combined two-dimensional and body contour cutting methods to achieve a style that carried authority without appearing too formal, with extra comfort for the Bluecoats to wear. One of the important reason that led me to use a combination of cutting techniques was because there had been comments that the kimono style was maybe too ethnically biased.



Figure 165: Wang, L. (2017). Detachable mandarin collar- new Alex style.

The finalised female concept one (Fig. 166-168) utilised the combination of two-dimensional and three-dimensional cutting principles, with a focus on body contour cutting, to ensure that the design would deliver a slightly formal and fitted shape but was still comfortable and flexible to wear. It had a stand-up collar but this collar could also be folded back as a reverse collar to fulfil the requirements from the Bluecoat to have a formal jacket collar. Two-piece sleeves were designed to create more room and reduce restriction at the elbow area. Design details such as inside pockets and back vent were added to ensure that the Bluecoat could work conveniently in this uniform.



Figure 166: Wang, L. (2017). First final female concepts – fitting process one.



Figure 167: Wang, L. (2017). First final female concepts – fitting process two.



Figure 168: Wang, L. (2017). First final female concepts – fitting process four.

The finalised female concept two also used both cutting techniques with a concentration on two-dimensional cutting (Fig. 169-171). This style was inspired by the raglan sleeve design, therefore delivered a softer shoulder line and created a more relaxed and casual look. The third final concept used only the two-dimensional "T" silhouette without shoulder seams (Fig. 172 to 173). It has a convertible collar to add formality to the design and has a soft shoulder and sleeve line; it has a looser fitting through the body compared with the other two designs.



Figure 169: Wang, L. (2017). Second final female concepts – fitting process one.



Figure 170: Wang, L. (2017). Second final female concepts – fitting process two.



Figure 171: Wang, L. (2017). Second final female concepts – fitting process three.



Figure 172: Wang, L. (2017). Third final female concepts – fitting process one.

Figure 173: Wang, L. (2017). Third final female concepts – fitting process two.

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