ASIAN SIZING
DEVELOPING AN EFFECTIVE SIZING SYSTEM FOR GLOBAL APPAREL COMPANIES
BY SANDRA BAST
Asian Sizing

Developing an effective sizing system for global apparel companies

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I certify that the work presented here is to the best of my knowledge and belief, original and the result of my own investigations, except for acknowledged sources. The thesis has not been submitted, either in part or whole, for a degree at this or any other University. The views expressed in this paper are those of the author and not necessarily those of the Amsterdam University of Applied Science (HvA).

Leipzig May 29, 2012

Sandra Bast
Frequently used vocabulary

Note: The following terms are defined by the author. These indicate how the terminology is used in the report. The definitions may not reflect the view of others.

**Anthropometry**: The scientific study of the measurements and proportions of the human body

**Alvanon**: Size research expert and mannequin producer, which is involved in all recent anthropologic studies of populations worldwide using 3D scanners

**Down-sizing**: Selling the same garments under a smaller size label in a different region

**Fit**: Is the way in which garments fit on the human body

**Global**: *relating to the whole world, worldwide*

**International**: Agreed on or used by all or many nations, depending on the market and the term definition of brands and retailers, international can cover the multiple countries of Europe, and/or solely America and/or solely Asia, if countries worldwide are meant the term ‘global’ is used in the text

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**Standard**: 1) a level of quality, 2) a measure or model used to make comparisons, 3) a publication on national or international level that provides rules, guidelines or characteristics for activities or their results, for common and repeated use. Institutional standards are created by bringing together all interested parties including manufacturers, users, consumers and regulators of a particular material, product, process or service. Everyone benefits from standardisation through increased product safety and quality as well as lower transaction costs and prices.³

**EN standard**: A European Standard (EN) that has been adopted by one of the three recognized European Standardisation Organisations (ESOs): CEN, CENELEC or ETSI. (e.g. EN 13402 is a standard for labeling clothing sizes, measurements and size intervals), it is measured in centimeters

**DIN standard**: standards published by the German standardization institute (Deutsches Institute für Normung)

**GB/T**: stands for “Chinese national standard/recommended” issued by the Standardization Administration of China (SAC) and the Chinese National Committee of the International Organization of Standardisation (ISO), (e.g. GB/T 1335.1-2008 Standard sizing systems for garments –Men)

**ISO**: International Organization of Standardization

**Size standard**: 1) A measure that defines a size
2) A size specification method,
A size standard can be defined by national or international standardization institutes and/or by a brand

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**Size:**

general term that is used to define body-, garment-, and label-size

1) the overall measurement or extent of something (body or garment)

2) the series of standard measurements in which clothes, shoes, and other goods are made

3) the number (i.e. 38), letter (i.e. M) or code (175/96A) that labels garments by size

**Body-Size:**

physical body measurements and proportions, classified by different criteria such as height, length, width and girth measurements, proportion, weight, statue, body shape; usually full measurements

**Garment- Size:**

1) The garment dimensions, usually half measurements, measured flat

**Label-Size:**

is the size designation communicated in garments, different systems are used to define label-sizes (ad-hoc size system, labeling by body dimensions or garment measurements), label-size systems are classified by national standadisation institutes however their use is voluntary, brands can choose the system that communicates size, however most nations dictate that the size-label needs to be attached to the garment and should be easily viewed

**Ad-hoc size**: Label-size system that provides a number, letter or code with no obvious relationship to any measurement (Example Size 12, XL), the brand defines the measurements that classify the ad-hoc size

**Single-size:**

ad-hoc size usually defined by numbers, for example 38, 12, 90; used for garments that fit a small body-size range

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Double-size: ad-hoc size, usually defined by letters, for example S, M, L; used for garments that fit a large body-size range, usually two single sizes (e.g. size M classifies the range of 38-40), sometimes used for unisex garments\(^5\), label-size system also known as international sizes, however the definition of ‘international’ is based on the market, some brands distinguish between Asian sizes and Europeans or American sizes, (for example the Adidas label-size indicates ‘Asian XL’)

Sizing: is part of brand strategy, is an element of product development;

verb (sizes, sizing, sized) 1) to group something according to size, 2) is the process to define a sizing system, noun (sizing) is the definition of size standards also known as sizing system (e.g. ‘How high were the investments to develop the new sizing?’)

Sizing system: is the sum of the size standards that are defined by a standardisation institute or a brand, these size standards define the range of body measurements of a populations (classified as the target group), the size speciation standards and the size communication in labels

Asian sizing: 1) is the sum of the size standards that are defined of specific Asian nations, this report compares measurements and sizing systems of selected Asian countries (China, Korea, Thailand, Japan)

2) Is the sizing system that brands could define for specific Asian nations or the whole Asian region

\(^5\) Intersport for example classifies men and women collections with the single-size system, and unisex collections with the double-size system
**Size specification:** often abbreviated as ‘size spec’, a size specification system defines the garment measurements needed to develop a style in different sizes, it defines the size range, grading rules (known as size interval) and the label-size, it is based on the body measurements which a brand defines as a standard

**Size interval:** Other meanings are intersize interval or size step; it defines the value between sizes with which garment measurements increase or decrease to define the next size (also knows as garment grading)

**Size range:** Defines the number of garment sizes that are produced

**Size ratio:** Defines the number of garments produced per size

**Size roll:** Overall term for defining size range and size ratio

**Unisex:** designed to be suitable for both sexes, female and male gender

**Sell-through:** percentage of units sold during a period
Preface
In August 2011, I came to Intersport in China to take part of the Asian Sizing project during my internship. The goal of my work was to develop basic block patterns that would serve as the foundation to develop apparel for the Asian market. With my background in tailoring and international fashion management studies, I thought to be prepared to fulfill this task. Soon I realized that I had to acquire comprehensive knowledge in the field of sizing and that I had to overcome challenges, which I had considered being less difficult and time consuming. Experience is key to develop products, seldomly though it is recorded in books. I was highly motivated to drive the development of the Asian basic block patterns, unfortunately though I was not able to provide the desired patterns in the available time. Nevertheless this unfinished work motivated me to continue my research, to summarize my previous findings and to make an attempt in defining the answers to the remaining questions in my thesis.

One of the reasons that slowed down my progress during the work placement was that research was missing and knowledge levels on sizing differed between people. For example detailed data to classify the target group population by body measurements was not available for Asia. Terminology was misused and misinterpreted and led to many situations where people talked at cross purposes. Measurements were interchanged in discussions. The methods of developing a new sizing system were partly unknown and the sequence of steps to develop a new sizing system could not be agreed between people. These findings helped me realize that my thesis needs to serve people as a glossary that defines sizing terms and methods. It should serve as a reference for everyone to understand the complexity of sizing. The report should enable people to communicate on the same level, to distribute tasks in a team and to make better strategic decisions for the brand.

A number of problems were based on the limitation to access knowledge channels in China such as university books, the internet and costly research studies from the industry. Some data on anthropometry in Asia is not open to the public or not available yet, some reports were not useful to me since they were not written in English. Unfortunately I did not have the extra
money to buy reports, so I made use of diverse sources such as e-books and my contacts at Intersport to gain access to information. Mainly I had to refer to existing research in my thesis because collecting quantitative research on body measurements that represents Asian populations is impossible to carry out alone. Regardless the difficulties, I believe I gathered sufficient information to answer my thesis question and to fulfil its aim.

The knowledge I acquired during my internship offered me the opportunity to define my thesis topic. The chance to deepen my knowledge in product development and quality in the past nine months helped me to define the goals for my future career, which I consider being the most significant result of my internship and thesis research. Besides this personal gain, I hope that my thesis will be of advantage to all of those, who want to familiarize themselves with the topic of sizing.

I would like to thank my Intersport colleagues in the Swiss, Shenzhen and Hong Kong offices, which made this report possible. It was a great opportunity to work with all of you in China. In addition I want to thank Boscji Piatza for his creative ideas and dedication to design the cover page for this report. It represents the topic on Asian sizing perfectly in a modern context! Thank you also to all friends and relatives, who supported me during my studies.

Leipzig May 29, 2012  Sandra Bast
Executive Summary

The economic boom in emerging Asian markets has motivated many global apparel brands and retailers in the recent years to position themselves there. The main question is, if global brands need to adjust product sizing in order to satisfy the needs of the Asian consumers. This contemporary problem is analysed to allow the development of an effective sizing system for Asia. The thesis enables managers and students to understand the process of developing a sizing system. Different influences of sizing are discussed to raise awareness of the variables that determine sizing.

The thesis shows how brands and size consultancy companies evaluate the need for Asian sizing. Than it compares the Chinese and German size standard to determine the similarities and differences between primary and secondary body measurements of the populations. The body shape and proportions classified by both standards are highlighted. The different systems of labeling size are discussed later. Competitor analysis and a consumer survey give additional examples to evaluate if an Asian sizing system is needed.

The medium size Chinese is compared to the German shorter and slimmer. The Chinese have a similar upper body length, but shorter arm lengths. Chinese have shorter legs and a significantly shorter waist-hip distance. Their body shape is similar to the Germans classified. These results reason that garment sizing should be adjusted to the Asian body. Different approaches are defined to label garments for the Asian market. A system based on body measurements is recommended.

Overall it is the decision of the brand to define a specific sizing system for Asia. The different levels of developing a good sizing system summarises the report to allow the reader making sizing decisions based on the brand strategy.
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INTRODUCTION
Global apparel brands and retailers have defined expansion strategies in the recent years to position themselves in the Asian market. Sue Jenkyn Jones says in her book on fashion design that “brands usually build up their reputation and loyal following over many years of satisfying consumer expectations of consistency, and by advertising their unique qualities.” Brands and retailer with a European background, which want to introduce themselves into the Asian market, do not have such a reputation. Their market analysis is of vital importance to ensure that investments are returned and profits are made. The thesis is based on market research to enable brands making the best sizing decisions in order to grow profitable. The main question is, if global brands need to adjust product sizing in order to satisfy the needs of the Asian consumers.

**Thesis question:**
How can European based brands develop an effective sizing system for Asia?

Various different opinions circulate on the need for developing a specific Asian size system. The aim of the research was to show prove, to verify if sizing needs to be adjusted or not. In addition the report should improve the communication on sizing between people of different knowledge backgrounds. It should enable everyone to define the factors that influence sizing. The thesis enables design and management students to understand the requirements on product development for the mass market. Managers get an introduction to the consequences that market expansion has on the product level. This thesis is a useful tool for students and professionals, because it analyses recent size surveys of Chinese and German population and it summarizes the opportunities for developing an effective sizing system for Asia.

The thesis is structured into six chapters. The first chapter defines the terminology of sizing. It outlines the process of defining a sizing system and highlights the benefits for a company that has defined a good sizing system. The second chapter is based on opinions using interviews to show that people have different understandings of the necessity of developing a sizing system for Asia. Different influences of sizing are addressed and different approaches are named. The
The third chapter is a brief summary of the resources, which brands can acquire to gain more information on Asian sizing. The advantages and disadvantages of all resources are compared and a rating on the best resources concludes this part. The decision was made to base the comparisons of the body dimensions and size-labeling methods on national size standards. The nations China and Germany were selected to represent an Asian and European country. The fifth chapter deals with different methods of labeling size. The problems with the ad-hoc size system are discussed and competitor analysis shows examples of the sizing system that global brand use at the current time to sell garments in China. The chapter concludes with recommending a size-label system for Asia. At the end of the thesis are the results of all specific chapters drawn together in order to suggest a model that allows rating the adaptation of a sizing system. This model visualizes that developing an effective sizing system for Asia is necessary in order to secure consumer satisfaction and profit.

Guides in the report
Three visual highlights allow accessing the most important data in the research paper very easily.

- **Assumption**
  - highlights possible solutions for sizing, but assumptions are not verified yet
  - further research is needed to conclude the opportunities or consequences of changing or keeping the existing sizing systems

- **Review**
  - verifies the assumptions with prove

- **Attention**
  - highlights and summarizes the most important points of the chapter
  - shows recommendations
Limitations
Most examples focus on China since data was easier available from this Asian country due to a previous internship in Hong Kong and Shenzhen. The report was aimed to compare the sizing of various different Asian countries, but due to the lack of data or language differences, fewer examples can be shown.

It is impossible to carry out sizing research on body dimensions in a population alone since time, money, manpower and possible technology is needed to conduct such comprehensive surveys successfully to represent a population. For this reason existing size surveys were used to compare measurements. Due to the reason that size surveys are conducted based on different methods, time frames and research aims, the accuracy of comparisons cannot be guaranteed.

The accuracy of the data used for body measurement comparisons cannot be guaranteed. The national size standards to not determine the average body size in a population, which is why a choice was made by the author. In general it is difficult to classify the human body into sizes, for the reason that every person has an individual body. However sizing systems have developed control variables to group people of similar size.

The report lacks depth, for the reason that only general conclusions on the need for developing an effective sizing system are made. Brands are recommended to use sizing consultancy companies in order to match a sizing system to the specific requirements of the brands. These companies have the ability to filter sizes based on different variables. The report was not able to show these opportunities. Sizing is based on many different influences such as fit perception and fashion trends, which are not analysed in detail by the report. Further research is needed to develop garment fits that fulfill the expectations of the target consumer.

The opinion of individuals are subjective, they may not reflect the views of the reader. The consumer survey only represented a very small group of people, which is why additional research into Asian consumer markets are needed to verify the reports conclusions.
1. DEFINITIONS

1.1. Terminology

Before it is possible to analyze the necessity for Asian sizing, the terminology of the topic must be defined.

The term ‘size’ and ‘sizing’ has various meanings depending on the context and the user that can lead to miscommunication. Numerous universal and textile dictionaries limit the terminology to the application of compounds (known as size) on a material such as paper or cloth to alter their characteristics. The sizing process in fabric production however is not described in this report.

The Oxford Dictionary defines size as “the overall measurement or extent of something” and secondly as “the series of standard measurements in which clothes, shoes, and other goods are made.” The first definition of size can be applied to body and garment dimensions, whereas the second definition is applicable to the size classification of products. Besides the fabric agent, the term ‘size’ is used in three different contexts, when determining body measurements, garment measurements and the size definition in labels. Although the methods of measuring body size can vary, the systems that have been developed by the textile industry to control where and how measures are taken are mainly concise between nations. Similar to defining body size, brands usually publish an internal how-to-measure guideline to control how garment dimensions are expressed and measured. For these reasons, the meaning of body- and garment size, that define measurements is comprehensible for everybody. Size labeling on the other hand depends on various size standards, which brands can determine independently. The meaning of the communicated size label can therefore vary between

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brands. The general size term can be confusing and misleading, which is why it is important for companies to ensure that size is clearly defined to ensure consistent communication internally and towards the consumer.

When using the term size in conversations or email correspondence, a possibility is to define size within its context. For example, these specific size terms could be used:

- **Body-Size**: physical body measurements and proportions, classified by different criteria such as height, length, width and girth measurements, proportion, weight, stature, body shape, usually full measurements.
- **Garment-Size**: defines garment dimension(s), usually half measurements, garment measured flat with a measuring tape.
- **Label-Size**: size graduation of garments communicated in size labels.

The detailed measurements, criteria, and methods that define body-, garment- and label-size are further analyzed in the following chapters defining Asian sizing.

Sizing cannot be reduced to the action of “[grouping] something according to size”\(^9\), since it is derived from the term ‘size’ which already identifies different scopes. Sizing is further used as an overall term that Miller states (2011) as the process of defining size standards which an apparel company develops for its market\(^10\), it is therefore part of brand strategy. These size standards are the criteria on which brands define the body measurements of the target group, the size specification system, and the size designation (size label). The brand defines a body size

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\(^8\) Further explained in chapter 4


standard that represents the intended target consumer. In respect to the type of garment under consideration, the number and kind of defined body measurements allow to develop the garment fit. The standard criteria that defines the size specification system allows to develop a style for the defined body size standard. It allows to fit a style to various different body sizes (the up or down graduation of the body size standard known as size interval) in the same way. In addition the specification system determines the range of garment sizes (size range) that is produced to fit the target group in a population. At last the size designation system has the purpose to allow the consumer to identify the garment that is designed for a body size. The following figure shows an overview of the criteria that defines a sizing system.
1.2. Sizing – The Process
Sizing is a strategic management process. Robbins\textsuperscript{11} (2009) process model shows the different stages of planning, implementation and evaluation.

These steps can be followed to develop a successful sizing system. The report is not based on a specific brand example. It therefore shows different examples how brands identify their sizing strategy. The report outlines the benefits and pitfalls of sizing. It shows examples of how brands can acquire sizing knowledge in order to formulate strategies. A competitor analysis based on size labeling shows how brands implement sizing at the moment in Asia. The report evaluates opinions and observations to judge whether it is necessary to develop an Asian sizing system. In addition an example of German and Chinese anthropometric data is analyzed to determine the differences between the populations and to further verify if an Asian sizing system needs to be developed. At the end of the report, a model describes the different stages of implementing a sizing system.

1.3. Sizing – The Benefits
The influences that sizing has on business success are summarized from the book publishers Susan Ashdown, size researcher Elfriede Kirchdörfer and the sizing company Alvanon in the following list of benefits that good sizing can realize:

Sizing can lead to:
- market share increase
- sustainable competitive advantage
- turnover and sell-through increase
- reduction of markdowns due to fit or sizing
- reduction of returns due to fit (no matter which sales channel in-store or mail delivery)
- enhanced customer satisfaction, brand loyalty, recommendations

The goal of any commercial business is summarized by Robbins (2009) who states that “every business wants to earn a profit.” Financial figures determine the success or failure of a company best. Managers have to estimate if the expenditure of developing a new Asian sizing system promises higher profits than keeping the existing sizing system.

Andrew Crawford, director of 3D fashion technology company Sizemic, emphasizes that brands and retailers have to balance the benefits of developing a new sizing system. If one of the three requirements time, money and resources cannot be fulfilled, it does not matter whether a company has realized the need for an Asian sizing system, if it cannot be developed nor put into action.

Unfortunately it was not possible to acquire figures on profit or consumer feedback that would allow assessing the implementation of an Asian sizing system in terms of comparing ‘before and after’ results. Detailed financial information is kept under brand confidentiality. Further research is needed to show the influences of sizing on profit and consumer satisfaction. This
example however highlights the opportunity to control business success based on the sizing criteria. Alexander Welbers, commercial director of Intersport Asia Pacific, says “our shops give us the best feedback” if sizing is correct or needs to be adapted to the market needs. Later in the report some examples are shows to make brands aware of the opportunities how data resources can be acquired in order to develop an Asian sizing strategy.

- Sizing is linked to the profit of the brand. Business success can be measured.
- Sizing is the tool to develop products that are consumer orientated
- Costs need to be in reasonable relation to the benefits

2. OPINIONS
In order to evaluate whether global brands need to develop a specific sizing system for the Asian market, different measures were defined. Literature reviews and several interviews with brand managers and sizing consultancy companies were analyzed to gain an overview of how the textile industry evaluates the necessity of developing an Asian sizing system. Subsequent a consumer questionnaire analyzes to what size label systems the Chinese and Europeans are used to. If further shows how effective the current sizing of international brands is viewed by the consumer. Although opinions are a very subjective, the research is valuable in a way that it shows the different views and influences of developing a sizing system.

2.1. Opinions of the Industry – Interviews with Intersport
The Intersport international office in Switzerland and the Hong Kong office were asked to evaluate the necessity of Asian sizing. Interviews offered a time consuming but easy method to show the opinions of managers who make brand strategic decisions, who develop products and secure product quality on a daily business.

**Brand Introduction:** Intersport is a group of numerous national organizations which sell products based on licensee agreements. Intersport is the world number one multi-brand sport retailer which has numerous private labels of sport apparel in the fitness and outdoor sector. Interviews were conducted of people who influence different stages in the product
development process of these private labels. At the moment Intersport has stores in Korea, but the group plans to open stores in China and Lebanon next year. CEO Franz Julen negotiates with licensee partners in Singapore, Malaysia and India to achieve a future growth of 500 shops in Asia with a turnover of USD 1 billion in the next ten years. Intersport has continuously adjusted the garment fits in the last seasons as well as adopting a new size label that states the addition information “Asian size”.

At first the expansion manager Alexander Welbers from Intersport Asia Pacific, was interviewed to give his opinion about the need for developing an Asian sizing system. Welbers does not exclude that an Asian sizing system needs to be developed. He is “sure that [Intersport] cannot implement [the] home strategy 1:1 in Asia” and adaptations to local need will result. Welbers emphasizes that product alterations of sport apparel “towards well-being rather than lifestyle” will be the future, but he does not mention which adaptations will need to be made concerning product sizing. Overall he states that the “strategy adaptation will be defined by time” depending on the demand of the consumers.

Gally Chan, Hong Kong category manager at Intersport Asia Pacific has a similar opinion on adapting products based on consumer feedback. He acknowledges differences in Asian body size and proportions compared to Europeans. Chan notices that people of different Asian countries have different body characteristics as well as people in different regions of the same country. He forecasts that even though Intersport would develop an average Asian sizing system, buyers will still continue to adapt products to specific market needs like they do with the international range in Europe. He highlights the difference of fashion tastes as another reason why special-mark-ups (product adaptations for color, material, size etc. based on the core design) are produced for different markets. Chan states an example of his sales experiences that shows that product expectations vary between people and nations. He states that the Korean consumers “preferred over-long sleeve lengths” above fits that he perceived as being correct. Therefore it is necessary to understand the consumer fit preferences as much as their body size.

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12 Appendix: Interview Gally Chan
Beate Schindel, head of quality assurance at Intersport International Cooperation, is sure that a specific Asian sizing will be necessary to secure product quality. She says that “it will not be enough to just shorten arm or leg lengths for Asian consumers since the style details also need to be adapted to the different body proportions.” Similar to Chan, Schindel points out that the aim to define an ‘international size’ is a “hassle...for a market like Europe or Asia” since people vary between nations. She underlines the necessity of an Asian sizing system for the reason that “the possible damage to the brand in case of wrong sizing is a high risk”\(^\text{13}\) when selling the same products in new markets. The effort to develop a sizing system is “often underestimated,” Schindel stresses that investments for data acquisition and quality control are needed to face the new challenges in the Asian market.

Overall these interviews show an example of a brand that has realized the need for developing a sizing system apart from Europe. However the company strategy of offering an international collection range to its consumers bring along the difficulty to satisfy specific market needs. For this reason national organizations (consumer) of Intersport most often adjust the styles to specific market needs.

<table>
<thead>
<tr>
<th>Brand Opinion</th>
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<tbody>
<tr>
<td>• overall agreement that Asian sizing is necessary</td>
</tr>
<tr>
<td>• the markets needs are different depending on the consumer (body size, fashion taste, fit perception) and region, therefore developing an 'International size' is difficult</td>
</tr>
</tbody>
</table>

2.2. Opinions of the Industry – Interviews with sizing consultancies

The views of sizing experts of consultancy organizations can give additional information to evaluate the necessity of Asian sizing.

**Sizemic\(^\text{14}\):** Is a British fashion technology company that specializes in products and services based on 3D body scanning data. Similar to Alvanon they offer fit mannequins and advise on developing sizing systems e.g. size patterns.

\(^\text{13}\) Appendix, Interview Beate Schindel
Andrew Crawford, director of Sizemic, points out that sizing “is not really standardized locally or internationally” saying that it is more determined “by the population for which clothing is aimed at rather than an official set of measurements.” He outlines that the need for an Asian sizing system depends also on the product nature. If the size range is larger, for example for casual clothing and knits that are more forgiving in fit, the existing sizing can in some cases be used.

**Alvanon:** Global sizing consultancy/fashion technology company that specializes in products and services based on 3D body scanning data. The services are segmented by sub-companies called Alvainsight (sizing consultancy) and AlvaForm (standard or brand specific fit mannequins).

Ed Gribbin, president of Alvainsight stresses that it is not possible to have “a global fit” nor to have “one ‘Asia fit’” for the reasons that populations have radically different bodies comparing different ethnic groups as well as people of different Asian regions. He points out that market coverage can vary depending on the region. Gribbin alarms that if transferring the European sizing system to Asia, the market that would fit the product drops from about 30-40% to only 10%. Even though the population is bigger in Asia, the brand risks losing market share. The need for sizing adoption also depends on the region in Asia. He states that most brands can cover the Japanese population to 85% with a sizing that is only based on four sizes, but this method would not be as successful in China, where it would only “accommodate 25% of the population”. Similar to Beate Schindel, Gribbin says that “making it shorter doesn’t put all of the other style details in the right position on the body.” He explains with an average height difference of 10cm between European and Asian countries, adjusting the design on some length measurements will not achieve the desired result since “lapels, buttonholes, princess seams, darts, pocketing, etc. aren’t in the same place.”

The opinions of size experts show that brands need to be able to define their products and target market. Overall developing a sizing system to specific market needs is highly recommended. The level of adaptation to the specific Asian markets however needs to be assessed based on various different criteria (product nature, body size of the population).
2.3. Opinions of the Consumer
Both the brand managers and the sizing experts of consultancy organizations emphasized that sizing is based on the consumer. Before the body measurements of a potential Chinese consumer are further analyzed, research was aimed at answering the question how satisfied the consumers are with the current sizing of the products they can buy in Asia. A consumer survey on sizing could analyze different aspects of the system. The consumer could be asked about his/her satisfaction of garment fit. However this research was not carried out for the reason that a general study would not allow to judge in which way brands should define a sizing system. For this reason brands should conduct research specifically based on their product range and target consumer. Several control values need to be defined in order to reach a useful conclusion. Since the aim of this report is to give general advice to brands, a specific example was not chosen. However the attempt to define fit is made in order to give brands an idea about the criteria, which they can select in order to research consumer satisfaction based on product fit.

2.3.1. Fit Definition and Fit Perception
When asking the sizing expert Elfriede Kirchdörfer, who works for almost thirty years in size research and pattern construction “How would you define fit?” her answer is not expected. She says “a definition does not exist.”\(^\text{15}\) Fit is a very subjective judgment she says, it is determined by many different components such as the use of the clothing, the function or the wear comfort. Kirchdörfer further explains that the perception of fit also depends on the wearers preferences. Some people like to wear clothing tighter than others.

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\(^\text{15}\) Appendix, Interview with Elfriede Kirchdoerfer, Hohenstein Institute
The category manager Gally Chan has made similar experiences and observations. He states that selling garments to Koreans has been challenging during his former career at The North Face and the previous work at Intersport. He mentions that some people became used to buy oversized clothes from foreign brands import over the years. The ‘wrong’ US or European sizing made people believe that what professionals defined as ‘too long’ was the exact way Korean buyers liked their garments. In addition he notices that different generations wear the same garment in different ways depending on their fashion taste. He notices that elderly Korean men rather prefer wearing pants in their natural waist line compared to younger men. This example highlights again how important it is to know the target consumer and their personal fashion taste and fit preferences.

Dictionaries have made the attempt to define fit as a characteristic for garments to be of proper size and shape. Others definitions state that clothing that fits, “meets the required purpose, it fulfills a standard”. These definitions are in some way correct although ‘proper size’ and ‘quality standard’ can be identified differently between brand and consumer. For this

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reason the definition of fit should rather state that it is a garment quality that satisfies or fails the expectation of the consumer. This leads to the answer why consumer research is important. It is a part of feedback control that allows to prove how the people in the target market evaluate product quality and how potential consumers are satisfied by the existing garment fit. Depending on these results strategic decisions on adapting the sizing system can be made.

2.3.2. Consumer understanding of Size Labeling
In order to find out how useful Asian people find size labels in selecting garments, a survey was conducted. Additional interviews gave an insight into the recognition and use of international and local size system. The aim of the survey was to find out how consumers evaluate the usefulness of the size labeling that is used in current garments of global brands. The result should assist brands in making decisions on size labeling.

The collected survey data is a snapshot of the views from consumers in Hong Kong and Shenzhen in China. The European group was added as a control with participants from Germany, Switzerland and the Netherlands. Fortyeight answers were received in total (40 females, 8 males; 29 from China, 19 from Europe). The sample size for the urban population in China would have to be 600 to represent 607 million people. Unfortunately results are not sufficient to represent the region. This study requires more research. However the diagrams

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18 Based on figures from 2008. Wikipedia claims that urban population was 691 million in the end of 2011, but a source could not be found.
allow evaluating the balance between answers. The survey gives an idea how effective brands communicate size in Asia.

One of the first questions asked was “What is your size?” The actual size was not of importance, but the size system and the standard that was mentioned allowed predicting the awareness of a size in the consumer mind.

The letter size system is more recognized than the numeric system among Chinese. 86.2% of the Chinese mentioned exclusively a letter size (S, M, L), which predicts that 73%-99% of the urban Chinese population would give the same answer. Only 3 people named a different size system. One woman from Hong Kong answered with a European size and two people from Shenzhen named a size that related to body height. None of the Chinese people named a size that is defined in a national Asian size standard.

The survey continued asking people, if they understand what the size label represent.

- Chinese consumers are very much used to the 'international' system of labeling garments
- it needs to be further assessed whether the sizing system needs to be adapted to local market regulations

The survey continued asking people, if they understand what the size label represent.
The green section on the diagram show that almost half of the people claim to know what information the size label communicates and other blue section represent people who do not know what it means. However it needs to be acknowledged that Chinese people based their answer on the letter size system. Interviews showed that they answered yes for the reason that they knew that S stands for small, M for medium and so on. On the contrary European answers were based on the numeric system that was not possible to be explained in such easy manner. The evaluation of this data is therefore difficult. It is assumed that approximately 80% or more of the total people do not know how the label size is linked to body measurements or garment measurements. The last question on the appreciation of size labels showed that the majority of people finds size labeling useful. However they rely on trying on garments.

People were asked to complete the sentence: "The information in the size label is for me

a. very important: the size always fits me
b. relevant: I select by size label, but I rely on trying on the garments
c. not important: I try on what I like and shop what fits me best
This diagram shows clearly that consumers value the size information that labels can provide. No matter what the size label represents, if people are used to the system it guides them in selecting garments. People however rather rely on trying on clothes than making a purchase decisions solely based on the size label. For developing an Asian sizing system, this means that brands need to know how consumers select garments, which size label system they can relate too and how they evaluate fit.

### 2.4. Conclusion Chapter 2

<table>
<thead>
<tr>
<th>Not necessary</th>
<th>Necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>• depends on product nature</td>
<td>• Body differences</td>
</tr>
<tr>
<td>• people buy novelties, products with good Brand image</td>
<td>• Consumer satisfaction, loyalty, profits</td>
</tr>
<tr>
<td>• % of people will fit products everywhere</td>
<td>• Competitive advantage</td>
</tr>
<tr>
<td></td>
<td>• National size standards cannot be followed, adaptation to brand</td>
</tr>
</tbody>
</table>
Based on the interviews and consumer research, it can be said that the overall evaluation of developing an Asian sizing system is positive. Managers of brands and sizing consultancy companies have acknowledge that an Asian sizing system is needed because Asian people have compared to Europeans different body measurements. The consumer research has shown in addition that people value size labels, but they rather rely on fitting the garment before making a purchase. This shows an opportunity for adapting the size-label system to allow consumers a better understanding of fit and size.

Although some people acknowledge that an existing sizing system can in some cases be transferred to Asia, it can be agreed that if global brand enter the Asian market the existing sizing system needs to be reassessed. Brands vary in their target market and brand strategy, which is why it is not possible to give case specific reasons for changing or not changing the sizing system. In the following report, different levels of implementing an Asian sizing system are analyzed that also refer to brand specific cases. The model at the end of the report summarizes the stages of entering the Asian market by adapting the sizing system.

A quote of Wernher von Braun concludes this section with a general advice to all brands and retailers:

“Research is what I'm doing when I don't know what I'm doing.”
3. Data Acquisition

This section is a brief comparison of the different resources that brands can use in order to develop a sizing system for Asia. The comments are based on the personal experience of the author which was acquired during a period of nine months on developing an Asian sizing system for Intersport. Gathering all references to prove these statements, was not possible due to time limitations during writing the report.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| **Asian National Size Standards** | - Only available for some Asian countries  
- English translations are not always available  
- Control of data accuracy is limited  
- Research methods are not always described, explanation of Asian size experts can be needed  
- Difficult to compare with each other, sizing systems are different, measurement units are different  
- Data cannot be filtered on specific criteria |
| - Low costs (ca. EUR 100)  
- Moderate accessible  
- Classifies the national average population  
- No data exchange | |

| **International Size Standards** | - Only available for Europe  
- Based on average European body measurements  
- Requesting further information is only possible via testing institutes or sizing service companies |
| - Low costs (ca. EUR 90-150)  
- Easy accessible  
- Continuous updates  
- Detailed description of data and methods  
- Concise result based on different interest groups  
- Defined guideline to develop sizing system  
- No data exchange  
- Many Asian countries base national size standard on ISO standards | |

| **Counseling Services** | - High costs depends on service package (consumer based adult fit mannequin costs approx. EUR 2000-3000)  
- Rely on expertise of external company  
- Data exchange > agreement of confidentiality is necessary |
| - Higher accuracy level  
- data filter to brand specific needs  
- market coverage can be determined  
- time efficient, data comparison is done by company: brand is guided in making decisions  
- service package is extensive: brand specific data collection in combination | |
Further insights can be looked up in the Appendix.

The data sources that are available to gain information on body measurements and sizing systems are ranked in the order of a traffic light showing red to the least valuable data source and green to the most valuable data source. The quality experts are not represented in the rating overview, since they do not represent a real data resource.

<table>
<thead>
<tr>
<th>Competitor Research</th>
<th>Quality Experts/Garment Technicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Inexpensive</td>
<td>- Exchange of experience/sizing methods</td>
</tr>
<tr>
<td>- Good market overview</td>
<td>- Networking, gathering information of other experts</td>
</tr>
<tr>
<td>- Online analysis is comfortable</td>
<td>- High involvement in control of the system, recommendations to sizing adjustments can be made fast</td>
</tr>
<tr>
<td></td>
<td>- Experts from the country speak the language, national size standards that are not available in English can be translated</td>
</tr>
<tr>
<td></td>
<td>- Only allows to analyze garment dimensions</td>
</tr>
<tr>
<td></td>
<td>- Developing a body size standard backwards from the garment dimensions is difficult</td>
</tr>
<tr>
<td></td>
<td>- Mistakes might be copied</td>
</tr>
<tr>
<td></td>
<td>- Samples are not always easy to access (high travel costs)</td>
</tr>
<tr>
<td></td>
<td>- No solution to the problem alone, since managers need to determine the brand strategy</td>
</tr>
<tr>
<td></td>
<td>- Few people with experience in Asian sizing, difficult to find/hire</td>
</tr>
</tbody>
</table>
Overall ranking of data sources

**Competitor Research**
- good to gain insight into the market, especially into label-sizes
- Useful but not recommended if used solely
- it is more difficult to go backwards in the sizing process and determine body size of target group based on garment measurements since fashion style influences the fit
- mistakes of other brands might be copied
- selected competitors might not represent size standards of own brand
- time intensive

**Hiring Garment Technicians**
- guidelines need to be defined by brand and not a single person, subjective
- experienced experts in the Asian sizing are difficult to find
- good source to exchange experiences with sizing systems to develop new standards
- valuable resource to control the implementation of a sizing system

**Size Standards**
- Relevant good reference
- size information is based on average body measurements and not specified to the brands target group/products
- how size covers the market cannot be determined

**Counseling service**
- cost intensive but data analyses can be matched to brand specific target group/needs
- company has insight in Asian market
- market coverage can be determined
4. DATA ANALYSIS – Body Measurements
The interviews have highlighted that developing a sizing system for the total Asian region is difficult due to extreme body differences. The intention of the report was to prove these statements, showing the differences in body measurements of various Asian and European sizing systems. However data of different Asian countries was not sufficiently available. Nevertheless the acquired data allowed showing examples that outline the key differences of body measurements between Chinese and German people. China was chosen because most brands forecast the highest market potential in this Asian country and Germany was chosen because it is one of the biggest markets in Europe.
This chapter highlights how the Chinese and German national standard has defined body measurements of the population. Width and length measurements as well as body proportions are compared and examples of the consequences for garment size are visualized. The comparisons of the standards give an insight into size range and size intervals which determine the size specification system that is necessary to realize garment production. The chapter points out assumptions, which questions what would happen if sizing would not be changed. Prove (highlighted in the review box), shows if the assumptions were correct or wrong. The results allow drawing conclusions on the consequences of keeping the existing European sizing.

The European based ‘international’ size standard is referenced for defining body measurements as well as methods to determine the system of size labeling.
4.1. Introduction of National size standards

It is relatively easy to access the information on body measurements published in national size standards. Therefore these resources were chosen. The German size standard published for each gender three different size charts based on short, normal and long size groups. The normal German size chart is most represented in the following comparisons. The Chinese size standard on the other hand published for each gender four size charts based on different width proportions. The shape ‘A’ size chart is chosen in the following comparisons since it is most used in size labeling by brands and according to SGS it represents the most common sizes.

The German and Chinese national size standards do not indicate which size defines the average body size of the population. In other words the size charts do not show what proportion of the population has a specific size. This data can only be accessed through sizing consultancy companies like HumanResources (Germany) or Alvanon (global). Since these resources were not available, the medium sizes of the ‘normal’ size charts with equal amount of sizes to the left and right were determined as highlighted in the box.

<table>
<thead>
<tr>
<th>Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>German Women</td>
</tr>
<tr>
<td>German Men</td>
</tr>
</tbody>
</table>

The medium of the ten sizes in the German size chart is highlighted in the table. Size 40 is selected for women and size 50 selected for men to compare the belonging body measurements of these sizes with the Chinese standard. These sizes represent the standard that Intersport has defined as the average European size.¹⁹

The Chinese size standard is based on body height. Medium sizes were selected in the same way like the German sizes. Of eight sizes were selected size 160 for women and size 170 for men.

<table>
<thead>
<tr>
<th>Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese Women</td>
</tr>
<tr>
<td>Chinese Man</td>
</tr>
</tbody>
</table>

¹⁹ The body measurements may vary in detail. Depending on the collection and the brand, the medium size for German women is also often defined as size 38.
The Chinese size standard is set up in a matrix compared to the list method of the German size standard. The size range of measurements within one size (based on height) is shown as represented in the table.

For example, men with a height measurement of 170cm and a chest of 88cm (medium of total chest measurements) are classified by the waist measurements of 72cm and 74cm.

The Chinese size standard only communicates body height, bust/chest and waist measurement, whereas the most recent German size standard shows 44 different measurements. For this reason additional body size information of the medium Chinese body size determined by Alvanon was used to compare also the inside leg length measurement and the hip measurement.

For the reason that size standards are difficult to compare due to different methods of classifying size, the accuracy of the research cannot be guaranteed. Choosing the medium size in the available size charts, does not mean that this size also represents the average body measurement in the population. It is assumed that the size chart is developed according to the most represented body sizes in a population. The following research can be used by any brand for general references but it is not recommended to solely define a size system on these results.

To evaluate how a sizing system can be defined for Asia, similar or identical Chinese body measurements are highlighted yellow in the German size charts for better orientation and easy size designation.

4.2. Selection of Body Measurements

Body measurements are the length and width (girth) measurements of a person. The body measurements in this report are defined in the centimeter unit, like it is practiced in Germany and China. The dimensions represent the full body measurement.
In order to know how the terms and methods of measuring the body are defined in the German size standard, the European standard EN 13402 size designation of clothes - Part 1 (2001) was used. The German standardization institute references this ‘international’ standard.

In contrary the Chinese size standard gives no definition on the terms and methods of measuring the body. It is assumed that the terms and methods are used in the same manner. The following sections reflect the term definition of the European standard.

In order to select the body measurements for the size comparison, part two of the European size standard was used. It defines the primary and secondary body measurements that are recommended to use for labeling garments. An example is shown in the following table.

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Primary Measurement</th>
<th>Secondary Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knits: T-shirt, cardigans, sweaters</td>
<td>Bust/Chest</td>
<td>Height</td>
</tr>
<tr>
<td>Trousers</td>
<td>Waist</td>
<td>Height, Inside leg length, Hip girth</td>
</tr>
<tr>
<td>Shirts</td>
<td>Neck</td>
<td>Height, Arm length</td>
</tr>
<tr>
<td>Blouses</td>
<td>Bust</td>
<td>Height</td>
</tr>
</tbody>
</table>

The body size comparison starts with the body height, to show the general differences between the European and Asian population. The specific size comparison of Chinese and German body height is used as well as an example of height differences between Chinese regions to show whether a different sizing system needs to be developed for China. The chapter continues with the analysis of width measurements between both nations. The measurements of the bust (women)/chest (men), waist and hip (low hip measurement) are chosen as referenced in figure 2.

After that body proportions are further analyzed to verify if a different sizing system needs to be developed. The upper body is analyzed on calculating the bust-waist ratio as well as explaining how the Chinese size standard defines different body shapes. The research continues with the analysis of the lower body comparing the nations by the waist-hip length (also known as crotch length) and the inside leg length. Numerous different measurements could added to
show more detailed the similarities and differences of body measurements and proportions between the nations, however this selection was made to give a good overview of the most important measurements.
4.2.1. Height Measurement
The height is the vertical distance between the crown of the head and the soles of the feet. It is measured with the subject standing erect without shoes and with the feet together.\textsuperscript{20}

With referencing to the Wikipedia entry of human average body heights\textsuperscript{21} around the world, the following diagrams of Asian and European nations was produced.

(Light color is women, dark color is men)

Although the data is limited in accuracy because it cannot be compared on the same criteria, since it is based on different age groups, different regions (urban, rural or both) and different sizing methods, the visualization allows general conclusions. Women are on average shorter than man in all compared nations and the average Asian person is shorter compared to the European person.

Similar to Ed Gribbin, who stated that the average difference between Asian and European nations is 10cm, the specific example based on the national size standard shows that the height difference between Chinese and German women is 8cm and between men 10cm.

\textbf{Average Height}
\begin{tabular}{|l|c|c|}
\hline
& Chinese Women & 160 & Chinese Man & 170 \\
German Women & 168 & German Man & 180 \\
\hline
\end{tabular}

\textsuperscript{20} EN 13402 size designation of clothes - Part 1 (2001)
If concluding the need for developing a sizing system for Asia only on these results, the measurements suggest that companies that sell garments based on the German ‘short’ size chart (defined height for women 160cm and for men 170-179cm) could consider selling these sizes to China without changing the sizing system. However additional measurements that define a garment need to be compared to verify this assumption.

4.2.2. Height Measurement based on Region

Height measurements of average Chinese women by region (South: Shenzhen, Hong Kong, Guangzhou, East: Shanghai, Hangzhou, Wuhan, North: Harbin, Beijing)

As forecasted by the interviewees the above diagram shows an example of the variation of body height in different regions. The example of Chinese average body height of women visualizes that women in the north are taller compared to women in the south and women from eastern China are the shortest with an average height of 160cm.
The German national standard defines ‘short’ sizes for women by the height of 160cm. The average Chinese woman is east China has the same body height, but women in other regions are taller. Therefore selling ‘short’ sizes (if not classified by other dimensions) would only be applicable to the East region.

4.2.3. Bust/Chest Measurement
The bust/chest measurement is the maximum horizontal girth measured during normal breathing with the subject standing erect and the tape-measure passed horizontally over the shoulder blades (scapulae), under the armpits (axillae), and across the chest or bust prominence. The term bust is used for women and the term chest is used for men. The bust/chest measurement is the primary measurement for tops.

<table>
<thead>
<tr>
<th>Average Bust/Chest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese Women</td>
</tr>
<tr>
<td>Chinese Man</td>
</tr>
<tr>
<td>German Women</td>
</tr>
<tr>
<td>German Man</td>
</tr>
</tbody>
</table>

The comparison of the medium sizes of the national size standard shows, that the Chinese women and men have a slimmer bust/chest than their German counterparts.

The Chinese bust measurement (86cm) is represented in the size range of the German size 36-38. For Chinese men the chest measurement 88cm is represented by the German size 44.

EN 13402 size designation of clothes - Part 1 (2001)
This sizing shows that Chinese men and women have on average a slimmer bust/chest measurement compared to the Germans. Based on these body measurements, it could be assumed that tops in smaller German sizes could be sold as medium sizes in China, depending on the size classification. This procedure is also known under the name down-sizing.

**Assumption**

- Tops in German small size ranges can be sold in China as medium size

**4.2.4. Arm length**

The Arm length is the distance, measured using the tape-measure, from the armscye/shoulder line intersection (acromion), over the elbow, to the far end of the prominent wrist bone (ulna), with the subject's right fist clenched and placed on the hip, and with the arm bent at 90.

The arm length measurement comparison between Chinese and Germans analyzes whether tops in small size ranges can be sold in China. Measurements are controlled by same bust measurement. Since the Chinese size standard does not communicate arm length, the medium Alvanon size of the average Chinese scan data was use. The medium chest for men is defined with 94cm (size 46-48) and for women with 84cm (size 36).

<table>
<thead>
<tr>
<th></th>
<th>Chinese Women</th>
<th>Chinese Man</th>
<th>German Women</th>
<th>German Man</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Arm Length</td>
<td>57.75</td>
<td>60.75</td>
<td>59.6</td>
<td>63.75</td>
</tr>
</tbody>
</table>

The difference in arm length is 1.85cm for women and 3cm for men.
Unless the garment allows adjusting the arm length, for example Velcro adjustments on outdoor jacket sleeves, the sleeve lengths of garments that are based on the German sizing system will be too long for the average Chinese person. The image below shows how a top (upper body garment) would fit the other nation. Person one represents the medium sized Chinese person, wearing a garment based on the German sizing system. Since the German sizing is bigger in bust, waist and hip girth the garment would fit loose. Even though these measurements are adjusted, for example by dressing in a smaller size, the sleeve length would still be too long. Person two shows a European person wearing a garment based on the medium sized Chinese. In contrast to person 1, the garment fits tighter and sleeve lengths are too short. Depending on the garment type the difference in sleeve length might not matter as much. For example basic knits like T-shirts with short sleeves will have a similar pleasing appearance. For formal jackets or long-sleeved shirts however the choice of using the same sizing system might not satisfy the consumer.

Figure 5 Person 1 Chinese, Person 3 European wearing garments in the other nations sizing length

- Chinese people have shorter arm lengths compared to Germans

Review

- transferring the sizing system of Europe to Asia will not show the same results and vice versa, developing separate sizing systems is recommended
- for basic knits, down-sizing could be an option
4.2.5. Waist Measurement

The waist defines the natural waistline between the top of the hip bones (iliac crests) and the lower ribs. It is measured with the person breathing normally and standing erect with the abdomen relaxed. The waist measurement is according to the European size standard the primary measurement for both genders for trousers.

<table>
<thead>
<tr>
<th></th>
<th>Chinese Women</th>
<th>Chinese Man</th>
<th>German Women</th>
<th>German Man</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Waist</td>
<td>70</td>
<td>74</td>
<td>76</td>
<td>88</td>
</tr>
</tbody>
</table>

Again a similar pattern is shown in the data. Chinese people are smaller than their German counterpart.

<table>
<thead>
<tr>
<th>German Women Size Label</th>
<th>36</th>
<th>38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waist</td>
<td>69</td>
<td>72</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>German Men Size Label</th>
<th>44</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waist</td>
<td>74</td>
</tr>
</tbody>
</table>

Similar to the Bust/Chest comparison of women, the above excerpts of the German size chart shows that the Chinese women’s bust measurement 70cm is represented also in the size range of 36-38. The waist measurement of 74cm for Chinese men is classified again by the German size 44.

- Chinese people are on average slimmer in the waist compared to Germans

4.2.6. Bust-Waist Difference

After having shown the differences in bust/chest and waist measurements between German and Chinese people the relation to these two measurements is made by defining body shape. The following passage should highlight the importance of determining body shape for developing a sizing system.

---

23 EN 13402 size designation of clothes - Part 1 (2001)
4.2.6.1. Why is it important to determine the body shape of the target consumer?
Fashion can conceal or accentuate the human body. The garment dimensions determine the outline or the shape of clothing known as the silhouette\(^{24}\). Besides the design, defining the body measurements and the thereby arising body shape and proportions of the target consumer is equally important for brands. Knowing the similarities and differences in body measurements of European and Asian target markets allows brands to evaluate how the designed garment silhouette will appeal on the body. This knowledge can enable brands to define a sizing system and design garments with respect to their consumer’s body. Global brands might define coordinated sizing systems for different markets that allow them to easily transfer a style to different body measurements while ensuring the same look of the garment on the body.

4.2.6.2. What body shapes exist?
The relationship of a banana, a pear and an apple is rather fruit than body shape. Nevertheless these and many other vegetables, geometrical shapes and objects are associations for human body form. Other figure classifications like ‘bean’, ‘carrot’, ‘spoon’, ‘ruler’, ‘cone’, ‘oval’ or ‘diamond’ might come into mind. Magazines and fashion blogs use these figure types to direct women and men to achieve the ideal figure with dieting and exercise but mainly to advise how to dress figure-flattering.

Numerous body shape classifications exist. Figure 6 shows a selection of body shapes that classify both men and women. Exceptions are the last two shapes on the right, where the hourglass defines the female body, and the trapezium references the male body\(^{25}\).

---


Figure 6 Body Shapes classified by geometric shapes and objects

For example Figure 7 shows three women with the same body height and bust girth, they all have different body shapes (rectangle, triangle and oval shape). According to the international size standard, which states that garments should be labeled by the primary measurement, in this case the bust girth for dresses, they would all select the same dress size. The fitting result however is unalike because all three women have different bust-waist ratios and bust-hip ratios.

The dress fits well on the first rectangular-shaped women, securing comfort by garment ease. The shoulders point of the triangle-shaped women would be covered by the straps and the dress would fit tight around her hips, whereas the dress would hang on women three allowing the material to flow around her body. This example shows how different the appearance of the same dress can be on different body shapes. It highlights the necessity for a company to determine the average body shape in a sizing system. This definition with allow the company to evaluate which consumers will fit or not fit into their garments.
4.2.6.3. **Bust-Waist Difference – National Size Standard**
Ashdown states (2007) “to optimize the number of size and shape groups in a body sizing system, the intervals between the different sizes have to be determined with respect to the relation of the bodies.” Size standards allow analyzing the intervals of the body sizes. The bust-waist difference indicates the ratio between both widths. Although the German size standard shows a change in the relation of the key measurements, the intervals between small and large sizes comparing the bust-waist difference varies maximal with three centimeters in the women’s size chart and five centimeters in the men’s size chart. The German size standard only defines one body shape.

The Chinese size standard on the contrary groups the population in four different body shapes. These are called Y, A, B and C. The Hong Kong test institute SGS explained that the relation of the bust/chest measurement to the waist measurement is indicated by the letter group. The Y group is the thinnest body shape with a difference between the chest and waist measurement of 17-22cm for men and 19-24cm for women, whereas group C is the most straight body shape.

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27 See Appendix B

28 Appendix, Email correspondence with SGS
with the difference of 2-6cm for men and 4-8cm for women. Shape A is most referenced in Chinese size labels and Intersport garment technologists agreed that the shape A is most represented in the population. These assumptions however do not show proof whether this is the case. It is recommended to research the bust-waist ratio of the target group more thoroughly.

<table>
<thead>
<tr>
<th>Shape</th>
<th>Bust-Waist Difference Women</th>
<th>Bust-Waist Difference Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>19-24</td>
<td>17-22</td>
</tr>
<tr>
<td>A</td>
<td>14-18</td>
<td>12-16</td>
</tr>
<tr>
<td>B</td>
<td>9-13</td>
<td>7-11</td>
</tr>
<tr>
<td>C</td>
<td>4-8</td>
<td>2-6</td>
</tr>
</tbody>
</table>

The difference between the bust-waist width ratio in the German women’s size chart is between 13-16cm, for men it is 9-13cm. The table shows that the German difference in bust-waist measurements is very similar for women to the Chinese classification of shape A. The medium bust-waist ratio in Chinese women is 16cm because the shape is defined in the same proportion for each size in the size range. The German rectangular body shape for women is only 1.5cm slimmer in proportion (average 14.5cm based on total size range). The medium bust-waist ratio for Chinese men defined by the total size range is 14cm, whereas it is 10.6cm in average German men because of the different shape definition within the size range. This comparison highlights that proportion of the German male is more similar to the Chinese shape B definition than to shape A.

Figure 6 visualizes the different body shapes classified by China. Referencing a body shape study that compared the populations of the United States of America with Great Britain in 2005, Ms Wang from Alvanon said that “societies mirror each other because of similar eating habits and lifestyles.”29 This statement can also be applied to the comparison of Chinese and German body shapes. It is not clear whether the growing economy in China has resulted in a change of body shape, but the cultural influences should be acknowledged. Body shape can be easier manipulated by eating habits and lifestyle than gene related body proportions. Martin Rupp,  

director of clothing technique at the Hohenstein Institute summarizes the difference saying “the Germans have a straight silhouette.” 30 This can be applied to the average Chinese population as well.

Figure 8 Example of Body Shape classified by GB/T size standard men

- Men and women in Europe and Asia have both rectangular body shapes
- for women the chinese body shape A has similar bust-waist ratio than German size standard
- for men the bust-waist ratio shows that Chinese shape B is more similar to the body proportion of German man
- it is possible to design styles for both markets based on the same body shape considering that Chinese are slimmer than Germans
- further research on the target group is need

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4.2.7. Hip Measurement
The hip girth is horizontal measured round the buttocks at the level of maximum circumference. The average hip measurement cannot be represented for the Chinese national standard, since it is not mentioned, however the medium size determined from the Alvanon average scan data of China was used to make a comparison.

<table>
<thead>
<tr>
<th>Average Hip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese Women</td>
</tr>
<tr>
<td>German Women</td>
</tr>
</tbody>
</table>

The average hip girth comparison shows again that the Chinese are slimmer than the Germans. The Chinese medium size hip measurements are represented in the German body size range 34-36 for women and size 46 for men.

<table>
<thead>
<tr>
<th>German Women Size Label</th>
<th>34 36</th>
<th>German Men Size Label</th>
<th>46</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hip</td>
<td>89 93</td>
<td>Hip</td>
<td>96</td>
</tr>
</tbody>
</table>

These measurements lead to the following assumption.

- medium sized Chinese would fit bottoms in a different size group
- Chinese women would have to select size range 34-36 to fit pants/skirts
- Chinese men would need to select size 46 for bottoms instead of size 44 for tops

In order to prove if the assumption is true or wrong the inside leg length measurement as well as the waist-hip difference need to be compared for similarities.
4.2.8. Inside leg length

The inside leg length is the distance between the crotch and the soles of the feet, measured in a straight vertical line with the subject erect, feet slightly apart, and the weight of the body equally distributed on both legs. The inside leg length is a secondary measurement for trousers. It determines the lower body proportions.

The image to the left visualizes an example of people that have different height, but same body proportions. The proportions in national size standards usually grade in the similar way as shown in the previous chapter on bust-waist ratios.

The height can be defined as the control variable when analyzing size standards of different nations that classify size groups by different methods.

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Figure 9: Same body proportions of people with different heights

Figure 10: Inside Leg Length as Indicator of Body Proportion

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31 EN 13402 size designation of clothes - Part 1 (2001)
Figure 10 shows that the inside leg measurement is an indicator that determines body proportion in length. Comparing person 1 and 2 shows that people of different height can have the same leg length. The comparison of person 2 and 3 on the other hand shows that people can have the same height, but different inside leg lengths. In order to compare the Chinese body proportions with the German ones, height is chosen as the control variable.

<table>
<thead>
<tr>
<th></th>
<th>Height</th>
<th>Inside leg length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese Women</td>
<td>163</td>
<td>74.5</td>
</tr>
<tr>
<td>German Women</td>
<td>160</td>
<td>73.2</td>
</tr>
<tr>
<td>Chinese Man</td>
<td>174</td>
<td>77</td>
</tr>
<tr>
<td>German Man</td>
<td>174</td>
<td>79</td>
</tr>
</tbody>
</table>

For the reason that the Chinese size standard does not include the inside leg length measurement, data was used from the medium size determined from Alvanon by body scans in China. Unfortunately due to lack of data it was not possible to control the body height comparing women. Therefore a conclusion is not made. For men on the other hand, it was possible to control the height. The German size 25 classifies in the ‘short’ size chart men with a height of 174cm. This size was compared with the medium size of Chinese men. The difference is 2cm between both nations, showing that Chinese men have shorter inside leg lengths compared to German men. Since body height was a controlled measurement, the results show that body proportions of Chinese men are different compared to German men. It is assumed that a comparison of women would have shown similar results.

- Chinese have shorter legs compared to Germans

4.2.9. Waist-Hip Distance
The fit of trousers is not only based on the waist, hip or inside-leg length, it is also determined by the waist-hip distance. It is a length measurement that will allow evaluating if the sizing system for bottoms needs to be adapted to Asia.

<table>
<thead>
<tr>
<th></th>
<th>Average Waist-Hip Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese Women</td>
<td>20</td>
</tr>
<tr>
<td>German Women</td>
<td>33</td>
</tr>
<tr>
<td>Chinese Man</td>
<td>40</td>
</tr>
<tr>
<td>German Man</td>
<td>20</td>
</tr>
</tbody>
</table>
Figure 9 shows an exaggeration of the differences in body measurements between Chinese and German people. Person 1 defines the Chinese person and person 2 the German. The Bust-Waist length A is the same, for the reason that the difference is less than one centimeter comparing the size standards. This gives no reason for great sizing adaptations in the length dimension.

The lower body proportion on the other hand has a significantly large difference. The Chinese waist-hip length (b) is 13cm shorter for women and 20cm shorter for men compared to the German body.

Figure 12 People of with same bust-waist length but with different waist-hip length

Proportion

- Chinese have similar upper body proportion compared to Germans
- Chinese have a significant shorter waist-hip length compared to Germans
- Chinese have a significat shorter lower body compared to Germans

This finding reasons that bottom garments that are based on the German size system can by no means be transferred to China. As shown in the example below, the waist measurement could be matched to the Chinese size. However the pants would still not fit because pants legs would be too long for the short inside seam length of the Chinese body and the pants would fit higher in the waist because of the shorter waist-hip distance as shown below.

Figure 13 Fit of trousers on Chinese and Germans with same waist measurement
4.3. Conclusion to Body Measurements & Body Shape
The simplified picture in figure 11 summarizes the findings of the previous sections on body measurements and proportions. Chinese and German body shapes are classified by the rectangle shape. The Chinese body and the German body 1 represent the actual comparison whereas the German body 2 shows the differences in body proportions, if the Chinese and German would have the same body height.

The Chinese body is compared to the German body shorter in length and slimmer in width measurements. The first groups to the left shows that the Chinese have compared to the Germans shorter legs (length proportion C). The waist-hip distance (B) is significantly shorter in

![Figure 14 Simplified differences between Chinese and German body size standard](image)

Review
- bottoms in German sizing cannot be sold in China

Consequence
- the German (European) sizing system must be adjusted in order to sell garments that fit well in the Chinese (Asian) market
Chinese people than in Germans. Group two in the middle aligns both nations on the top instead of the bottom to show that the upper body proportion, the bust-waist distance (A), is the almost the same. On average the Chinese have a 1cm short upper body than the German people. Group three to the right shows the difference in body proportions if Chinese and German people would have the same height. The body proportions of the 2. German are extremely exaggerated. Since the Chinese medium sized person has a significant shorter lower body (B-C), the upper body (A) would be longer compared to the German body.

In conclusion to the body shape classification of both size standards, the Chinese men have a slightly slimmer bust-waist width difference compared to German man. The women on the other hand share the same shape in similar bust-waist proportion.

Some similarities can be found between German and Chinese body measurements. It might be possible to down-size tops since the upper body length is similar between both nations and the bust and waist girth are slimmer in Chinese people. However Chinese arm lengths are on average shorter than German arm lengths, which makes it difficult to use this system for all garment types.
Size 50 was determined as the medium size in the German size range, the Chinese medium sized man however is represented by size 44. In a similar method the German women’s size 40 was determined as mediums size, but the Chinese medium sized woman is represented in the German size range of 36-38. This means down-sizing as represented in the example table below might be an option if garment fit (especially sleeve length) is forgiving. For example if the size range is determined for Germany by size 36-44 (women’s size range), a similar percentage of the population might be covered if sizes 34-42 are sold in China.

<table>
<thead>
<tr>
<th>German</th>
<th>32</th>
<th>34</th>
<th>36</th>
<th>38</th>
<th>40</th>
<th>42</th>
<th>44</th>
<th>46</th>
<th>48</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>32</td>
<td>34</td>
<td>36</td>
<td>38</td>
<td>40</td>
<td>42</td>
<td>44</td>
<td>46</td>
<td>48</td>
<td>50</td>
</tr>
</tbody>
</table>

It is however not possible to sell bottoms (trousers, skirts) with unchanged sizing in China, since the waist-hip length distance is almost half the size by Chinese body proportions compared to Germans. The consequence of these findings is that the large differences between Chinese and German bodies do not allow transferring the existing European sizing system to China. It is recommended to define a total new sizing system for China.

As mentioned before the analysed data must be viewed critically. The professional journal ‘Textil-Wirtschaft’ has published an article in 2009 about the average German body measurements, which refered to different average body measurements than these selected in the report. It is therefore recommended to acquire professional assistance from sizing consultancy companies, who can guide making sizing decisions for the new market.
4.3.1. Risks of keeping the existing European sizing system
A brand that based their existing sizing system on German body measurements while attempting to expand to the Chinese market is a good example for many other brands that have their roots in Europe and plan to emerge into the Asian market. This example shows that brands which continue to use the existing sizing system when selling garments in the new Asian market risk losing market share, competitive advantage, turnover, profit and consumer loyalty because...

- Garments are too wide
- Garments are too long
- Garment proportions are wrong
- Garment details are not on the right position

5. SIZE LABELING
The following chapter is an introduction into different methods of size labeling. The purpose of a size label is defined and the problems of current size labeling are listed. The national regulations on size labeling are explained for Asia based on examples of China and Korea. Examples of different brands show which size-label system they use. The idea of a unified size system is discussed by using additional findings of the consumer survey that was partly already represented in chapter two. The chapter concludes with determining the advantages and disadvantages choosing specific size-label systems. Brands can use this overview to determine which size-label system fits best to their sizing strategy.

5.1. The function of a size label
Ashdown (2001) states that the purpose of a size label is to allow the consumer identifying the garment that is designed for a body size.  

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5.2. The methods
There are three approaches in labeling garments:³³

**Body dimensions:** the label states the key body measurements for which the product was designed (Example: children’s sizes classified by height)

**Product dimensions:** the label states the characteristic measurements of the product (Example: jeans size with waistband and inner-leg length measurements)

**Ad-hoc sizes:** the label states a size or letter code that is not directly related to any measurement. (For example size 0 or size XL)

5.3. The Problems
Label-size systems vary per country because national standards became established or because the proportion of people classified by a specific size in the size specification chart varies between populations and brands respect these variations by defining different size ranges. The label-systems can represent different information as listed in previous section on methods. Size labels come in different measurement units (centimeter or inch), numbers (38, 90, 12) and letters (XL, A). They refer to different measurements or have no meaning at all.

5.3.1. Ad-hoc size
The most common way of labeling clothing is in ad-hoc sizes. Depending on country, brand and product category, consumers find either a numeric size system or the letter size system in garments as later shown in label examples. Piller (2010, p.778) states that ad-hoc size labels are regardless of actual body or garment measurements, which is why they lead to confusion rather than to information.³⁴ Consumers and brands should be aware of the limitations to evaluate the usefulness of the size label.


The number of problems that result by using the ad-hoc size system can be summarized as the following:

- **Insufficient information** is displayed in size label, information on additional body size or garment dimensions is missing
- **Online communication** of ad-hoc sizes does not provide that consumers can predict best-fitting size for mail-order purchases if additional size communication is not given, returns based on fit and sizing might be the case
- **Additional costs** due to country specific size labels (translation, development of conversion tables and additional size labels)
- **False size labeling** resulting from change in body dimensions of the target consumer over time, or from “vanity” labeling, or brand history

5.3.2. International trade
Garments that are sold in international markets often have a list of size translations in the label as shown in the examples of figure 16. The Intersport garment label communicates similar to Esprit 5 different sizes for the European and American market. The size-label of a women’s shirt with the size 38 in Germany is translated into 40 in France, 44 in Italy, 12 in the UK and S in the US. Figure 16 shows that the same garment dimensions are communicated in various different size-label systems.

<table>
<thead>
<tr>
<th>INTERSPORT</th>
<th>ESPRIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>UK</td>
</tr>
<tr>
<td>38</td>
<td>12</td>
</tr>
<tr>
<td>D</td>
<td>UK</td>
</tr>
<tr>
<td>36</td>
<td>10</td>
</tr>
</tbody>
</table>

Although this example shows the great effort a brand needs to take to communicate size in different countries, this method creates no problem for the consumer provided he/she can refer to one of the systems. This is however not always the case, especially not if garments are labeled by European sizing systems and sold in Asia.

Another problem occurs if garments are traded in different countries, but the size label only indicates one size similar to figure 17. Incase the size label does not represent the national
system, consumers might be confused. For example a garment that is labeled in size 40 based on the Italian sizing system, might be assumed to represent also the German size 40. A garment labeled by size XL based on US sizing, will not represent the same fit as a garment labeled XL based on the Chinese sizing system. The consumer will than be irritated to find out that the garment does not fit in his/her accustomed manner.

5.3.2.1. The Problem with size conversion tables
Consumers, who do not find the size-label of foreign products useful to select a garment might turn to size conversion tables to gather information. These are published online on different international sizing systems. It is however difficult to find size conversion tables that represent Asian countries beyond Korea, China and Japan. The following table shows an example of a size conversion table published by Korea4expats.com\(^{35}\)

The table is a good example to underline the problems of such conversion tables. Sizes that are classified might not be correct. For example Korean sizes for women are not classified by size 44, 55, or 66. The Korean sizing standard in contrast classifies sizes by chest and waist depending on the product type. Typical Korean sizes for women’s tops are sizes 80, 85, 90 and for bottoms size 64, 68, 72 so on. \(^{36}\) Similar to the Korean sizes are Chinese sizes incorrect

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\(^{36}\) KSK0052 Sizing systems for female adult’s garments (2009)
classified. Although the table highlights the height in the size ranges, a normal consumer might not know how to interpret these numbers. In addition an indication for 84-86 for example is not given. One might therefore not know whether this size represents tops or bottoms, bust or waist measurements.

<table>
<thead>
<tr>
<th>Female Clothing Size Conversion Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korean</td>
</tr>
<tr>
<td>44 55 66 77 88</td>
</tr>
<tr>
<td>Japan</td>
</tr>
<tr>
<td>5 7 9 11 13 15 17 19</td>
</tr>
<tr>
<td>SS,XS</td>
</tr>
<tr>
<td>S M L LL XL XXL 3L 4L 5L</td>
</tr>
<tr>
<td>36 38 40 42</td>
</tr>
<tr>
<td>International</td>
</tr>
<tr>
<td>XS S M L XL XXL</td>
</tr>
<tr>
<td>US</td>
</tr>
<tr>
<td>0-2 4-6 8-10 12 14 16-18</td>
</tr>
<tr>
<td>UK</td>
</tr>
<tr>
<td>4 6-8 10-12 14 16 18-20 22</td>
</tr>
<tr>
<td>Europe</td>
</tr>
<tr>
<td>32 34-36 38-40 42 44 46-48 50</td>
</tr>
<tr>
<td>China</td>
</tr>
<tr>
<td>160-165 165-170 167-172 168-173 170-176</td>
</tr>
<tr>
<td>84-86 88-90 92-96 98-102</td>
</tr>
</tbody>
</table>

The letter code indication by Japan and ‘International’ also need to be viewed critically. Elfriede Kirchdörfer assumes that the letter code system was first established in the USA, prove was unfortunately not found. Kirchdörfer explains the the letter code usually represent a size range of two single sizes. For example depending on the brand the size M could stand for the size range 38-40 in German women’s sizes. The table shows only few size ranges, which means that this system is not applicable to some bigger US, UK and Europe sizes. Numerous other examples could be analysed, but this short paragraph should only outline that size conversion tables need to be critically assessed.

5.4. Labeling Regulations
Mandatory standards for labeling garments exist in Europe and Asia. However the regulations are based on fiber content, care information and label positioning. Standards to communicate size are voluntary for most countries. Many global brands play save and mention the national
size standard to minimize confusion among consumers. It is however not guaranteed that the size standard is useful to the consumer, which is why market research should be conducted to find out how the target group perceives the size designation and fits.

An exception to voluntary standards is the Chinese label standard GB 5296.4. It regulates that size information needs to be communicated in the sew-in label. The label instructions state that “product sizes or size specifications” need to be included. This statement however leaves room for interpretation. It is not specified which information needs to be mentioned on the garment label. Examples from Nike and Adidas in Korea show that the local size system is used in combination of an additional remark for body height, chest and waist measurement, the last two depend on the product category (tops or bottoms).

5.5. Competitor analysis
The purpose of the store check was to gain an overview of the size systems that are used in Asia. The size label information of product samples from Hong Kong, Shenzhen, Shanghai and Seoul was collected. An online store check gave an additional overview of the use of size systems for different collections.

Global brands:
Marks & Spencer: only UK size
H&M, Zara: size conversion of European numeric size to Chinese numeric size
Adidas, TNF, Decathlon: size conversion of Letter to Chinese size/Korean size
Columbia, Nike: Letter

37 SGS Leaflet on GB5296.4-1998 Instructions and Labeling
Asian brands:
Earth, Music & ecology: no/free size (one size fits all)
Uniqlo: Letter size
Mizuno: Ladies S-2XL, Men M-3XL and S-4XL
Phenix (Dongxiang group): XS-XXL
X-Nix: XS-XXL
Li-Ning: Ladies (2) XS-2XL, Men (X) S-3XL
K-Bird: Chinese size system with letter size combination (Tops: height/chest/shape; Bottoms: height/waist/shape, example 2XL 175/96A)

A large variety of size systems are used by global and local brands. This overview of global brands from Europe (Sweden, UK, Spain, France and Germany), the USA, and Asian brands (Japan and China) already shows an example of the diversity of size communication in labels found in the Asian market. Some products with the indication “F” for free size (Earth, Music & ecology from Japan) communicate “one size fits all”, whereas other brands only show a European numeric size (Marks & Spencer, UK). Some brands make use of a size conversion, either from the letter size to the Chinese numeric size (Adidas, TNF, Decathlon), or from the European numeric size to the Chinese numeric size (H&M, Zara). Since country boundaries are open to trade, products are imported from the European and the US market. Due to the reason that Europe cannot find consensus in defining a unified size system, the chaos of different systems is imported to Asia as well.

5.5.1. Down-sizing
One example of down-sizing was recognized in size labels of the brand Jack Wolfskin. Similar to the approach of Intersport or Esprit in Europe, Jack Wolfskin has identified the size conversion for different markets in one size label. Since the labels identifies both European and Asian sizes, the conclusion can be made that Jack Wolfskin has not developed a specific sizing system for Asia. Products based on the same European sizing are sold in Asia.
5.6. The unified size system

Although it is up the brand, how size is communicated in the garments, for the reason that the national Chinese and Korean size standard uses the method of communicating body dimensions, the question was raised whether this system shows advantages compared to the European sizing standard.

The European Union and the Swiss national standardization institutes and textile and consumer organizations work since 1986\textsuperscript{38} on a unified size standard to bring consensus to size labeling. The idea of picturing body dimensions is not new. The first standard that provided body measurements was BS1445: 1995 which was based on a survey of American girls in 1941.

Different versions of the European standard CEN/TC 248/WG 10 on textile size designation for adults have been published, but the final version has been postponed for years. Size expert E. Kirchdörfer mentioned that the standard is revised about every two years and that it is difficult to find consensus of all interest groups. In contrast to the description of a five digit code from 2005, Kirchdoerfer says the new code will most probably be a nine digit alphanumeric code with a pictogram that will indicate a size range of primary and secondary body measurements similar to the EN 13402 standard. The pictogram will illustrate the size range of the body height, chest, waist and hip girth in centimeter. In the case of a particular garment, further indications are provided by added letters that inform about the figure type.

\textsuperscript{38} Ginetex Switzerland. Size. [online] Available at: http://www.sartex.ch/en/textilkennzeichnung/groesse/ [Accessed on 5 April 2012]
Similarities between the unified international and other Asian size designations can be noticed. The Chinese size standard already recommends the indication of the height, chest or hip circumference and the shape. The pictogram of the unified size system shows the advantage of allowing the consumer to relate the body size ranges to the specific measurement positions on the body. In order to judge if a system based on body measurements is regarded being more useful than ad-hoc size systems, consumers were asked if they know their body measurements.

5.6.1. Consumer Survey – Body Measurements
The majority of people (81%) in China and in the control group knew their body height, whereas the minority of 8% of the people knew their personal chest, waist and hip measurement.

Based on these findings, the communication of a height measurement for garments might be an option for brands to assist the consumer in selecting garments. For the reason that the key width measurements were not known to the consumer, brands might not experience a disadvantage of continuing using the existing ad-hoc size method.

Since the majority of people specified their size in a letter size system (shown in chapter 2) the indication of a ‘international’ letter size might be an option if the product types correspond. Defining a different sizing system for China is recommended to address the different body measurements. Therefore the Chinese size-label standard could either be adopted or the letter
size with the additional ‘Asian’ indication could be used to clarify that the sizing system is based on Asian body measurements.

Although the Chinese consumer might not yet recognize the new system, in the future the unified size designation might be more successful compared to the ad-hoc letter size system.

5.6.2. Implementing new size-labels
Brands could develop an opportunity for consumers to learn about garment fit. A service in stores or online, that guides people to find out what sizes matches their body measurements would be an option. Brands could educate the consumer by adding the pictogram to the garment to enable understanding the label information. The communication of body shape and proportion could also be useful. Levi’s has for example turned this opportunity into a marketing campaign called “ID curve”, which assists consumers in selecting the product that corresponds to the consumers body shape.

Options to enhance consumer satisfaction:

- Show consumers how to determine body dimensions
- Inform about the garment dimensions
- Inform about the fit (loose, regular, slim, baggy, etc.)
- Inform about the size range for which the garment is designed for
- Assist consumers in selecting the right products
5.7. Conclusion Size Labels
Mandatory sizing standards state that size needs to be communicated in garments. However brands have the freedom to decide which label-system they use. Research has shown that different methods of size labeling exist and are present in garments that are sold in China at current moment. Some Asian size standards, such as the Korean and Chinese, recommends size labeling on body dimensions, whereas the European sizing system is based on ad-hoc sizes which do not refer to any specific measurement. Using the ad-hoc size-labeling system evokes numerous different problems if garment sizing is not adjusted and size conversion tables must be developed to communicate size in Asia. Compared to the Chinese size-label system, the unified size system communicates size in a similar way. The unified size system however has the advantage to communicate body size ranges as well as allowing to relate these measurements to the body measurement position compared to the Chinese system. Although the consumer survey has shown that Chinese people do not know the girth measurements of their body, the Chinese or unified size system shows a good potential of better size communication compared to the most common way of using ad-hoc sizes. Overall it is the responsibility of the brand to communicate garment size in a way that allows consumers to identifying the garment that is designed for a body size. Further research is needed to show to which size labeling systems the Asian consumer can relate.

**Recommendation**
- using the unified size system is a better size-label method for the reason that it communicates more information
6. SIZING LEVELS

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Change in garment size/proportions for tops and bottoms</td>
</tr>
<tr>
<td>4</td>
<td>Change in garment size/proportions for bottoms</td>
</tr>
<tr>
<td>3</td>
<td>Change in garment length, keeping width dimensions</td>
</tr>
<tr>
<td>2</td>
<td>Change in size-labeling</td>
</tr>
<tr>
<td>1</td>
<td>‘down-sizing’ keep existing sizing system, selling smaller sizes</td>
</tr>
<tr>
<td>0</td>
<td>no change</td>
</tr>
</tbody>
</table>

As a result of the total research, five levels of adapting an existing sizing system to the needs of a new market are defined. The arrow determines the direction from no change (bad) to optimum change (super). The color flow from red to green visualizes the grading similar to an up-side-down traffic light. Green therefore suggests that sizing is ‘good to go’, whereas red alarms the observer to ‘stop’ and reconsider the sizing system.

Level zero is the worst case scenario. The brand or retailer sells the same products without changing the size designation in the label nor the garment fit. Companies cannot expect to satisfy consumer needs in the same way they might do in Europe. Level one is the least adaptation to the Asian market without adapting garment fit, smaller European sizes as classified as Asian in the size labels. Although the change in size-labeling toward Asian needs is adapted in level two, the stage is still orange highlighting that due to the difference in body measurements and proportions it is not enough to choose a better size communication for the reason that still a rather large percentage of the Asian consumers will not fit into the garments.

To achieve level three, the products need to be adjusted in length and in size-label to the Asian needs. Level four only focuses on adapting bottoms to different size and proportions. Since the waist-hip difference in Chinese people is significantly smaller (half of the length) compared to the German body, adapting bottom fits has a higher priority compared to adapting tops. Another reason is that bust/chest-waist proportions are similar in length distance. The upper body shape is also similar between both nations. Level five is the optimum adaptation of the sizing system for tops and bottoms to the Asian consumer needs.
CONCLUSION

Global apparel brands and retailer increasingly expand into the Asian market. These companies need to analyse the market in order to justify whether their products need to be adjusted or can be sold without any adaptations in the new market. The thesis report analysed whether global brands need to adjust product sizing in order to satisfy the needs of the Asian market. The main question that guided the structure of the report was how European based brands can develop an effective sizing system for Asia.

At first the definition of size and sizing showed different meanings of the terms exists. For this reason size was defined with the addition body-, garment-, or label- to easily identify the meaning of the term not only by the context. It is recommended that companies ensure that definitions of size and sizing terms are used consistently in the same manner and consensus is agreed within a company. Sizing is defined as a part of brand strategy. It is the process of defining size standards which an apparel company develops for its market. These standards are based on body measurements of the target group that further define the size specification system, as well as the standard that defines how size is communicated in the size label. Later the benefits of good sizing where outline. These are market share increase, sustainable competitive advantage, and turnover and sell-through increase, reduction of markdowns due to fit or sizing and enhanced customer satisfaction and brand loyalty.

The second chapter compared the opinions of different market insiders on the necessity for developing an Asian sizing system using interviews and articles. Although people highlighted that sizing depends on the product type, the region and numerous other influences such as style or material, as well as fit is perceived differently by people, the necessity of developing a sizing system for Asia differently than the European system was agreed.

The third chapter pointed out different resources to acquire knowledge on Asian sizing. The rating of the resources showed that accessing data through size consultancy companies like Alvanon promises to be most accurate. The company can filter size data on various criteria, which allows developing a sizing system that is the most effective for the target group of a specific brand.
Since the report did not analyze data based on a specific brand, national size standards were used to compare body measurements of Chinese and German populations in the forth chapter. The medium size Chinese is compared to the German shorter and slimmer. The Chinese have a similar upper body length, but shorter arm lengths. Chinese have shorter legs and a significantly shorter waist-hip distance. Their body shape is similar to the Germans classified. These results reason that garment sizing should be adjusted to the Asian body.

The fifth chapter analysed different approaches for garment labeling. It outlines the problems of ad-hoc sizing systems and size conversions. It shows specific examples of garment labeling methods. The Chinese and German national size standards were compared together with the use of a competitor analysis and consumer questionnaire. A system based on body measurements is recommended.

The last chapter concludes the findings with a model that defines the different levels of developing a sizing system for Asia. It answers the main question, stating that European based brands can develop an effective sizing system in different stages depending on brand strategy. The top level that classifies the highest effectiveness of an Asian sizing system defines that garment size and proportions need to be adjusted for tops and bottoms as well as the size-labeling system needs to be adjusted to the Asian needs.
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   GB/T 1335.2-2008 Standard sizing systems for garments –Women
8. EN13402 DIN EN 13402-3:2011-12
   Titel (deutsch): Größenbezeichnung von Bekleidung - Teil 3: Maße und Sprungwerte; Deutsche Fassung prEN 13402-3:2011
9. SGS Leaflet on GB5296.4-1998 Instructions and Labeling

Pdf

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Websites

E-mail correspondence

Images
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A. Sizing a complex system

The diagram illustrates the complex relation of the topics that influence sizing.
B. SWOT Scheme of a brand
The following Swot Analysis was a quick brain storm method on sizing analyzing the impacts on a brand.

External analysis:

Threats
- No established brand image, no market position
- Budget for size research is limited
- New sizing development is time-consuming
- Assuming that product appeal to Asian consumers is the same fashion
- Sizing regulations in Asian nations (size designation in labels)
- Counterfeiter: if new sizing is made public and brand is successful...copies

Opportunities
- niche market
- Asian fashion trends
- size/fit education and communication
- sizing benefits: profit, market share etc.
- availability in large size range > shops are often organized like second-hand
- target different age groups >
- personal shopping experience > service for size selection
- size research is available such as size standards, Alvanon reports
- international trends can be introduced in Asia as the ‘new’ thing
- new products – exclusively available in Asia
• size communication to consumers: education
• new technology to gather size research: 3D scanners etc.

Internal analysis:

**Strengths**: resources and capabilities!
- Experience in product development
- Existing size standards can be tested in the new market > for example size designation, grading guides, size intervals
- Feedback of the consumers: the shops reflect the success (Welbers), evaluation of sizing is possible (surveys, etc.)
- Product specialization/variety?
- Exclusivity/ uniqueness? – price = reach large audience, big sales

**Weaknesses**
Activities that the organization doesn’t do well
- Too many collections, product lines – focus is lost (less is more)
- Quality control is therefore difficult to manage (Intersport overload)
- sizing evaluation
- trend research based on Asia (Japan, Korea, China)
- Copy, trial & error...

Resources that a company needs but doesn’t possess
- size experts with experience in clothing production for Asia > knowledge resources are based on European size standards
- China history of executing > development towards creating
- Asian size standards
- Anthropometric studies of Asian populations
- Language skills
C. Data Acquisition

Brands can make use of different resources to gather information on sizing. A few are highlighted in the following sections.

Body Measurements
Anthropometry is the study of the measurements and proportions of the human body. Therefore, this data research is in general very useful for brands to define their body size standard. Anthropometric studies however vary in detail for the reason that they are conducted by different interest groups that follow different aims. For example studies are conducted to find the relationship of the body measurements to intelligence, to physical health, nutrition or to evolutionary trends.

National Size Standards
In the last years sizing surveys on Asian populations were increasingly conducted by national standardization institutes. The results are published in form of voluntary or mandatory sizing standards that have the objective to meet the needs of government, businesses and society. They provide rules and guidelines of using a sizing system to ensure product quality and competitiveness of national businesses in world trade. Standardization Institutes usually combined different interest groups such as garment manufacturers, brands and retailers, consumers, service providers and government regulators. It is not easy to find out which interest groups build the standardization institutes in Asian countries for the reason that participants are not always communicated. For example the ISO is part of the standardization institute in China, but it is not sure if Chinese manufacturers or consumers had a say in the methods of developing the sizing system. Recent size standards were published for example in Korea in 2009 (e.g. KSK0051 Sizing systems for male adult’s garments), in China in 2008 (e.g. GB/T 1335.2-2008 Standard sizing systems for garments –Women) and in Japan in 2001 (e.g. JIS L 4004 Sizing System for Men’s Garments). Chapter four uses the example of the Chinese size standard to show Body measurements example of the Chinese size standard.

Human resources – Quality Specialists
Expanding global companies like Woolworth limited or Warnaco with a sourcing or product development office in Asia are searching intensively for quality specialists. This is another proof for the increasing demands of high quality products and services in the Asian market. With hiring experts, companies act to the need of developing and controlling sizing systems for Asian collections. Although it is not always mentioned in the job offer, the tasks often involve the work on foreign and domestic garment collections. On the Hong Kong website www.careerjet.hk, twenty-seven job offers were published only in the month of May 2012 searching for garment technicians with a job experience of 5-20 years. The following tasks are often described: managing technical standards, checking or correcting paper patterns, sample development, grading and fit evaluation. Puma especially announced that the garment specialist will be responsible for “check[ing] fitting / workmanship / grading on garment and sample approval for both International and Far East ranges.” The example of this typical job offer can be viewed in the appendix. Lucy Wang, human resource manager at Intersport Far East, says that with the expansion to the Asian market, the quality team needs to grow as well in order to secure the companies quality standards. She says it is however not an easy task to find Chinese employees that fit into the International company culture having good technical experiences and good English language skills.

40 Anthropometry – early anthropometric believes, modern, the modern population perspective. [online] Available at: http://encyclopedia.jrank.org/articles/pages/5956/Anthropometry.html [Accessed on 23 March 2012]
41 http://about.puma.com/garment-technician/
43 Appendix interview with Lucy Wang
D. Overview of recent size standards in Europe and Asia

ISO (International Organization for Standardization)

DIN (Deutsches Institut für Normung)
DIN EN 13402-1: Größebezeichnung von Bekleidung - Teil 1: Begriffe und Verfahren für die Messung am Körper (2001)
DIN EN 13402-3 Größenbezeichnung von Bekleidung - Teil 3: Maße und Sprungwerte (2011)

KATS (Korea)
KSK0051 Sizing systems for male adult's garments (2009)
KSK0052 Sizing systems for female adult's garments (2009)
  ➢ For special target groups: young male, young women, elderly women, infants
  ➢ product groups pantyhose, socks, skirts, hats, foundation garments

JIS (Japan Industrial Standard)
JIS L 4004 Sizing System for Men's Garments (2001)
JIS L 4005 Sizing System for Women's Garments (2001)
Size standards are also available for infants, boys and girls
  ➢ JIS S 4051:2009 Sizing system and pictogram for adult gloves

SAC (Standardization Administration of the People's Republic of China)
GB/T 1335.1-2008 Standard sizing systems for garments –Men
GB/T 1335.2-2008 Standard sizing systems for garments –Women
Size standard for children is also available

SPRING (Singapore Standards)
SS262: garment sizing part 1-5, 1982 (withdrawn)
See SS ISO 4416:1981

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45 http://www.textilnorm.din.de/
47 JSA Web Store. http://www.webstore.jsa.or.jp/webstore/JIS/FlowControl.jsp
48 http://www.codeofchina.com/gb/textile/
E. Excerpt of the German and Chinese size standard
Size designation of garments Part 2 Women (TIS 784 Part 2-2531 (1988))
Size designation of garments Part 3 Men (TIS 784 Part 3-2531 (1988))

<table>
<thead>
<tr>
<th>German Women Size</th>
<th>32</th>
<th>34</th>
<th>36</th>
<th>38</th>
<th>40</th>
<th>42</th>
<th>44</th>
<th>46</th>
<th>48</th>
<th>50</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bust</td>
<td>76</td>
<td>80</td>
<td>84</td>
<td>88</td>
<td>92</td>
<td>96</td>
<td>100</td>
<td>104</td>
<td>110</td>
<td>116</td>
<td></td>
</tr>
<tr>
<td>Waist</td>
<td>63</td>
<td>66</td>
<td>69</td>
<td>72</td>
<td>76</td>
<td>80</td>
<td>85</td>
<td>90</td>
<td>96</td>
<td>103</td>
<td></td>
</tr>
<tr>
<td>Bust-Waist Difference</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>15</td>
<td>14</td>
<td>14</td>
<td>13</td>
<td>14.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>German Men Size</th>
<th>42</th>
<th>44</th>
<th>46</th>
<th>48</th>
<th>50</th>
<th>52</th>
<th>54</th>
<th>56</th>
<th>58</th>
<th>60</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bust-Waist Difference</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>13</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>10</td>
<td>9</td>
<td>9</td>
<td>10.6</td>
</tr>
</tbody>
</table>

F. Body shape classification by Chinese national standard
Answer from Carole Law from the textile test institute SGS via email on April 16, 2012

“It is recommended the buyer to have the China sizing standard for their selection. They can select the appropriate body height, and girth from the size table.

GB/T 1335.1-2008 Standard sizing systems for garments –Men
GB/T 1335.2-2008 Standard sizing systems for garments -Women
GB/T 1335.3-2009 Standard sizing systems for garments–Children

Example: for Men, Women 175/80Y
175: height
80: Girth: chest circumference/waist circumference (for top item, label the chest circumference, for bottom item, label the waist circumference)
Y: body type, (4 types, e.g. A, B, C, Y)

Body type
Men:
Y: difference between chest circumference and waist circumference range from 17 cm-22 cm
A: difference between chest circumference and waist circumference range from 12 cm-16 cm
B: difference between chest circumference and waist circumference range from 7 cm-11 cm
C: difference between chest circumference and waist circumference range from 2 cm-6 cm

Body type
Women:
Y: difference between chest circumference and waist circumference range from 19 cm-24 cm
A: difference between chest circumference and waist circumference range from 14 cm-18 cm
B: difference between chest circumference and waist circumference range from 9 cm-13 cm
C: difference between chest circumference and waist circumference range from 4 cm-8 cm

The thinnest body type is Y, and the fattest body type is C.

Children: No body type e.g. 80/48
Girth system
Height from 52 cm - 80 cm infant, interval in height is 7 cm, interval in chest circumference is 4 cm, interval in waist circumference is 3 cm
Height from 80 cm - 130 cm children, interval in height is 10 cm, interval in chest circumference is 4 cm, interval in waist circumference is 3 cm
Height from 135 cm - 155 cm girl, Height from 135 cm - 160 cm boy interval in height is 5 cm, interval in chest circumference is 4 cm, interval in waist circumference is 3 cm”


G. Asian size-label systems

<table>
<thead>
<tr>
<th>Size-Label system</th>
<th>Example</th>
<th>Method</th>
<th>Product type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese</td>
<td>170/92A (Height/bust/shape)</td>
<td>Body size</td>
<td>Two sizes (Tops,Bottoms)</td>
</tr>
<tr>
<td>Korean</td>
<td>90 (chest)</td>
<td>Body size</td>
<td>Two sizes (Tops,Bottoms)</td>
</tr>
<tr>
<td>Thai</td>
<td>32 (chest in inch)</td>
<td>Body size</td>
<td>One size (based on tops)</td>
</tr>
<tr>
<td>Unified</td>
<td>X (not available)</td>
<td>Body size</td>
<td>Two sizes (Tops, Bottoms)</td>
</tr>
<tr>
<td>European</td>
<td>38 (ad-hoc)</td>
<td>Ad-hoc</td>
<td>Numerous sizes (Tops/Bottoms, short, long, petite, shirts, etc.)</td>
</tr>
<tr>
<td>‘International’</td>
<td>XL (ad-hoc)</td>
<td>Ad-hoc</td>
<td>One size (Tops/Bottoms)</td>
</tr>
</tbody>
</table>

H. Interview with the Hohenstein research expert Elfriede Kirchdörfer
Company: Hohenstein Institute, Internationales Textilforschungszentrum, Boennigheim, Germany
Interviewee: Elfriede Kirchdörfer
Position: Function & Care, Research in pattern construction and sizing
Date: 18. April 2012
Interview method: Telephone interview (German)

Brief introduction about the Hohenstein Institute:

The Hohenstein Institute is a family business that was established 1946 in Boennigheim, Germany. It offers services in textile testing, research and certification. Hohenstein offices operate worldwide. Since December 2011, the Hohenstein Institute opened the second testing laboratory in Hong Kong, P.R. China.

1. Seit wievielen Jahren beschäftigen sie sich beruflich mit Groessen und Passform?
   Seit fast 30 Jahren
2. Welche Aufgaben haben Sie bei Hohenstein?
Ich bin in der Forschung tätig und beschäftige mich haupsächlich mit Schnittkonstruktion und Größendefinition.

3. **Was sind die Kennmaße die man benötigt um die Größe zu definieren?**

   Das kommt auf die Bekleidungskategorie an. Bei Oberteilen ist das haupsächlich der Brustumfang. Bei Unterbekleidung ist das Basismaß für Frauen die Hüfte und für Männer die Taille.

4. **Ist das Taillenmaß also bei Männern wichtiger als bei Frauen?**

   Der Unterschied ist, dass bei Frauen die Hüfter stärker ausgebildet ist und die Hosen häufig eine andere Passform im Vergleich zu Männerhosen haben. Der Bund sitzt häufig niedriger bei Damen. Wenn die Hose nicht über die Hüfte passt, ist es egal ob das Taillenmaß stimmt. Männerhosen sitzen im Vergleich häufiger leger beim Hüftmaß, der Taillenumfang (bzw. Bauch) ist deshalb wichtiger als das Hüftmaß.

5. **Sind die Groessenintervalle von Land zu Land unterschiedlich?**


7. **Wissen sie woher das letter size system seinen Ursprung hat? Wer hat es definiert?**

   Ich glaube es wurde aus den USA übernommen. Die EU Norm EN 13402 definiert diese Größen.

8. **Seit 1986 versucht das Deutsche Institute fuer Normung einen Standard fuer ein einheitliches Groessensystem zuverabschieden. Wie schaetzten Sie die Erfolgschancen dieses Projekts in der Zukunft ein?**


   Die Weite eines Kleidungsstückes bestimmt ja die Optik. Da die Mode diese Vorgaben angibt, ist es wichtig die Körpermaße anzugeben für die ein Kleidungsstück bestimmt ist.


9. **Die Normen sind nur Richtlinien welche die Industry herausgibt, sie sind nicht Gesetz. Warum ist die Kommunikation von einem Groessensystem fuer die Marken auf freiwilliger Basis?**

10. Anthropologische Studien in Deutschland definieren Groessen mit einer gleichbleibenden Koerperhoehe. Warum ist das so, sind andere Studien falsch?
SizeGermany hat auch Massstabellen herausgeben mit unterschiedlichen Körperhöhen. Der Grund für die einheitliche Körperhöhe ist, dass die Personen unterschiedlich lange Beinlängen haben auch wenn sie die selbe Körperhöhe haben. Es ist wichtiger auf die Beinlänge zu achten als auf die gesamte Höhe. Naturlich gibt es viele Personen mit unterschiedlichen Koerperhoehen, aber die deutsche Studie achtet haupsächlich auf Koerperform.

11. Wie wuerden Sie Passform definieren?

12. Wie testen Sie die Passform eines Kleidungsstueckes?

13. Haben sie viele Auftraege die das Testen von Passform anfordern?

14. Wird das Hohenstein Institut auch in Asian bald einen Passformtest anbieten?
In naher Zukunft ist es noch nicht geplant, aber ich bin mir sicher, dass dieser Service in Asien auch die steigende Nachfrage bedienen kann.

I. Interview with the quality assurance expert Beate Schindel
Company: Intersport International Cooperation, Bern, Switzerland
Interviewee: Beate Schindel
Position: Head of Quality Assurance
Date: 18 April 2012
Interview method: Telephone interview

1. What are your tasks and responsibilities in the job?
As head of the quality assurance department, I am managing the work of our textile technicians and pattern maker. With our expertise in fabrics and garment construction, we work closely together with the product managers giving advice on product development related issues.

2. How has Intersport defined the sizing system in Europe?
The IIC body size measurements are based on the
- Grössentabelle für Herren und Knabenoberbekleidung, herausgegeben vom Verband der Herrenbekleidungsindustrie
- Grössenreihe für Mädchen und Damenoberbekleidung herausgegeben vom Verband der Damenbekleidungsindustrie

3. What body shape(s) has Intersport defined for their target group?
   It’s the straight type. People who do sports usually are not so very extreme in their figure.

4. Based on what information have you defined the size range?
   We have different growth intervals depending on the gender and the collection. We develop a size range of 10 sizes for women and men, but it’s the buyers who decide.

5. How do you test the fit of garments?
   We compare body and garment measurements to judge the quality of the product. In addition we use fitting mannequins and models to perceive the fit of the garment. The advantage of models is that they can also comment on the wear comfort of the garment.

6. What do you think about the idea of unifying the sizing systems in Europe?
   People are shopping based on personal preferences. I don’t think it makes a big difference which information the label states as people recognize the size label they are used to.

7. Do you think it is important to develop an Asian sizing system for Intersport?
   Definitely. It is common knowledge that the average Asian body is different compared to the European average, however we need to find out how much different they are. We also need to evaluate whether we need to adapt our size labels to the Asian market.

8. Do you think it is an easy task to develop an Asian sizing system for Intersport?
   No I don’t think so. The work load is often underestimated. Communication is very important, but not always easy since people have different understanding of the topic and perceive fit differently. People who make strategic decisions sometimes have less understanding of the consequences that expansion in a new market brings along. The budget is at the moment small so that it is difficult to access the data that would help in making sizing decisions. Overall it will not be an easy task to develop a new Asian sizing system, since it involves many different stages in product development. We need to assess whether our size specs and labels need to be adjusted. The company needs to invest in size data and in human resources to ensure that product quality is consistent around the world. Building a similar team with size expertise in Asia like we have here in Switzerland is a long process since people with good knowledge on Asian sizing are difficult to find.

J. Interview with the expansion expert Alexander Welbers

Company: Intersport Asian Pacific Ltd., Hong Kong, P.R. China
Interviewee: Alexander Welbers
Position: Commercial Director
Responsibilities: strategic leadership, driving growth across the business activities of Intersport in Asia, identifying new commercial opportunities
Date: 16. April 2012
Interview method: Personal interview

1. When did you start to work in Asia or since when do you work for Asia?
   By mid of 2008 I started working with Asian customers. I work in Hong Kong since September 2009.

2. In how many countries does Intersport sell?
   Intersport is present in 42 countries.

3. Does Intersport sell already in Asia? What are the goals in Asia?
Yes since Fall/Winter 2011 in Korea. Our new partners in China and Lebanon will soon open stores in 2013. We also negotiate with new partners in Singapore, Malaysia and India. We want to have 500 shops in Asia in ten years with a turnover of 1 Billion dollar.

4. **Where do you see Intersport’s potential in Asia?**
   Intersport positions itself as the multi-sport retailer offering products in many different categories. This business model is sporadic found in Asia. Compared to Europe, the mono-brand concept is dominating. However we believe that the sports person in Asia will value the opportunity to compare products. We want to offer a variation to people. This is one of the reasons why we see great potential for introducing the Intersport concept to the Asian market.

   Referring to Maslow’s hierarchy of needs, China for example has moved in high speed from the lower level of securing food supply to the higher level of self-actualization. For sure there are still large differences in the population; nevertheless the economic growth brings along an increase in disposable income for individuals and a change in life style and consumption patterns. The current 5 year plan of China for example, includes that every person should have the opportunity to sport. So the government also takes measures to introduce people to regular exercise by building more sport facilities for the public instead of only focusing on gold-medalists.

   Another development that can be observed is that bad eating habits from western cultures become popular among Asian people. The fast food chain KentuckyFriedChicken is one of the most successful restaurants in China. So for sure the need to focus on a healthy lifestyle will be more recognized in the future. Well-being is one of the megatrends that will influence Asian consumers too. Sport will grow in all categories and Intersport will bring the sport to the Asian people.

5. **How does the Asian market differ from the European one?**
   The market is much different than assumed, but similar to Europe the global sport brands like Nike and Adidas also have the biggest market share in Asia. The product level is different compared to Europe though. Measurable indicators are size, color, material and technology. The lifestyle and casual category is much larger in Asia compared to Europe. People wear sport clothes mostly for fashion and lifestyle.

   The spending power is also different compared to Europe. People in Singapore spend an average of USD 200 on sportswear per year, whereas Germans might spend only half of that amount.

   What needs to be recognized is that there are also huge differences between Asian countries. The average Chinese consumer might buy only one sports shoe per year, which is worn to do many different sports inside and outside of the gym. People from Singapore buy a shoe for each specific purpose, e.g. one for running, one for basketball, one for hiking, etc.

6. **Is the target group for Intersport products different in Asia compared to Europe?**
   Our vision remains the same. We want to offer products to people who do sport, rather than wear sport. We want to become the sport retailer for sporting people in Asia with a focus on performance. Our shops give us the best feedback, so we will be able to monitor the development of sport in Asia and adapt our products to the market needs.

7. **What do you think are the consequences for Intersport when expanding into the Asian market?**
   Our focus is to gain great insight into the Asian market. Gaining more knowledge will be our continuous process. I am sure that we cannot implement our home strategy 1:1 in Asia, so we will have to adapt to the local needs. Our strategy adaptation will also be defined by time, when the consumer perception of sport towards well-being rather than lifestyle will eventually change. As you know it’s about the equilibrium of supply and demand.

8. **Do you think it is an easy task to develop an Asian sizing system for Intersport?**
   I think it is a matter of knowledge whether something is easy or difficult. We have taken action to adapt our products to the Asian consumer needs and it is an ongoing progress to reassess our decisions.

Company: Intersport Asian Pacific Ltd., Hong Kong, P.R. China
K. Interview with human resource manager Lucy Wang

Company: Intersport Office Far East, Shezhen, P.R. China
Interviewee: Lucy Wang
Position: Head of Human Resource Management
Date: 10. April 2012
Interview method: Personal interview

The Intersport Office Far East is a service provider to the head quarter in Switzerland. Sourcing and merchandising are the main service areas of the company.

1. **How many people are working at Intersport in Shenzhen?**
   We have about 120 employees now.

2. **How does the company adapt to the new expansion strategy in the Far East market?**
   We are constantly expanding to provide satisfying services to our customers.

3. **How many people work in the quality control department now?**
   About 35 employees are out for quality inspections most of the time. We are restructuring at the moment since production companies shift to different regions.

4. **Does the company have a product development team at the moment for the Asian market?**
   No not yet. We have designers and merchandisers for special European costumers, but we are at the moment hiring additional staff to support the product managers in Hong Kong in the future.

5. **What kind of professionals are you recruiting at the moment?**
   We aim to hire an additional pattern maker and experienced garment technicians to set up a similar quality assurance team here for the Asian market. In the future we aim to establish similar quality assurance teams like we have for the European market in our Swiss headquarter.

6. **Is it an easy task to hire new people with the demanded skills and experience?**
   We have to work with a tight budget at the moment, which makes it difficult to hire skilled people in China. One of the requirements is that they speak fluent English, but it is easier to recruit people from Hong Kong with these skills, who do however request higher salaries. It is a long process to set up the new business structure, so I’m constantly having interviews with potential people.
L. Survey results on size labeling

<table>
<thead>
<tr>
<th></th>
<th>European group</th>
<th>Asian group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>19</td>
<td>29</td>
<td>48</td>
</tr>
<tr>
<td>Gender</td>
<td>14 female, 5 male</td>
<td>26 female, 3 male</td>
<td>40 female, 8 male</td>
</tr>
<tr>
<td>What size do you have?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Answer: Numeric system</td>
<td>12</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Answer: Letter system</td>
<td>7</td>
<td>25</td>
<td>32</td>
</tr>
<tr>
<td>What size do you try one?</td>
<td>17</td>
<td>22</td>
<td>27</td>
</tr>
<tr>
<td>Answer: size range &gt;1</td>
<td>2</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>Do you know your body height?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15</td>
<td>24</td>
<td>39</td>
</tr>
<tr>
<td>No, Not sure</td>
<td>3,1</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Do you know your body measurements (chest, waist, hip)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>No, not sure</td>
<td>16</td>
<td>13, 15</td>
<td>44</td>
</tr>
<tr>
<td>Do you know what the size label represents?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>6</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td>No, Not sure</td>
<td>13</td>
<td>10</td>
<td>23</td>
</tr>
<tr>
<td>The information in the size label is</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: important</td>
<td>19</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>B: relevant</td>
<td>22</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>C: not important</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

This survey was conducted in March - Mai 2012 by Sandra Bast via thesistools.com.

M. Job offer – Garment Technician
Company Woolworth Limited
Job title: Quality Specialist - Garment Fit
Published on 3.May 2012 on www.jobdb.com

You will be responsible for:
- Coordinating the evaluation of Private Label, Exclusive and Controlled branded products in accordance with the QA Framework for the category.
- Ensuring all products are safe and compliant.
- Consulting and providing advice to business teams on product selection and development to ensure products meet the customer and brand functional quality requirements as determined by the business team.
To succeed in this role you will have:

- Extensive experience in Apparel product - women’s wear, men’s wear and kids wear
- Experience in pattern making and garment size grading skills in woven products, and cut and sew knit product.
- Experience in how to measure apparel product
- Technical Garment Specification skills - understand how to update and grade Technical Specification Sheets
- Garment Construction knowledge
- Strong commitment to safety.
- Excellent customer focus.
- Strong business acumen and negotiation skills
- Well developed planning and organizing skills.
- Ability to communicate at all levels of the business.
- Strong team player.

Company PUMA
Job Title: Garment Technician
Published 15.February 2012 on http://about.puma.com/garment-technician/

Your Responsibilities

- Provide fitting and technical support to designers in R&D team and technical team in branch office
- Check fitting / workmanship / grading on garment and sample approval for both International and FE ranges
- Ensure and follow up all fit comments with designers and communicate between own R&D teams and suppliers
- Minimize fault in production process with technical suggestion
- Ensure and follow up samples are reviewed within committed time frame
- Lead Far East fitting and manage proto fitting comments
- Travel with development teams is required

We expect

- Polytechnic / Technical Institute graduate in Textiles / Clothing preferred
- Minimum 5 years of textile fitting experience with fashion sense
- Strong technical knowledge with paper pattern knowledge is an additional advantage
- A self starter who is able to work independently, under pressure and dynamic environment
- Good communication and interpersonal skill
- Good computer skills
- Proficiency in spoken and written English and Putonghua
N. Methods of measuring body dimensions

Traditional Anthropometry vs. Three-dimensional body scanners

The technical developments that make full body scanners now possible were far off when Johan Sigismund Elsholtz invented the anthropometer to measure widths and lengths of human body parts in the 17th century as seen in figure two. Compared to early scientists, tailors have used for hundreds of years the tape measurement to gauge the body of the consumer. Measuring the body can take up to one hour compared to scans that can be processed within twelve seconds nowadays. Although the tape itself is inexpensive, body research of populations is compared to 3D body scanners less accurate and more time consuming. The European clothing size standard EN13402 states that the “dimensions are meant to be measured preferable without or as few as possible clothes.”

Depending on the expertise of the measuring person, the position of taking a measurement such as the waist girth is interpreted differently among people. The risk of human error is another disadvantage which the scanner can overcome. Different technologies have been developed, such as laser-scanners and white light projection to develop 3D body images. The company Alvanon, a mannequin producer which provides size and fit solutions for apparel companies, uses millimeter wave scanners to conduct 3D size surveys. These use high frequency radio waves, which can penetrate clothing and reflect the human body. This active sensor technology made body surface contact and even undressing unnecessary. Speed, data accuracy and the opportunity to assess the virtual image of the body at any time are the main reasons why scanners have superseded the traditional measurement method. The textile industry also develops the field of virtual fit analysis and mass-customization using 3D scanners. Although the techniques of taking measurements have evolved over time and accuracy levels may vary between methods, the information that was acquired in previous surveys is still useful for brand with heritage. Companies can check the validity of the sizing system by comparing size trends in populations over long time periods.

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50 Anthropometry – early anthropometric believes, modern, the modern population perspective. [online] Available at: http://encyclopedia.jrank.org/articles/pages/5956/Anthropometry.html [Accessed on 23 March 2012]


