Establishment of a Universal Size Conversion Chart for Men's Sportswear

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Abstract - *Size labeling is a communication system between manufacturers and consumers. Today's clothing industry, particularly for the sportswear is based on ready- to- wear sizes. Most of the size designations are not accurate enough to find clothing that fits our body. The increasing shift from shop tailing to e-commerce has been a major impact on fit in terms of sales and higher return, not only because of sizes and measurements, but because of so many brands have their own disparities within clothing sizes used today among different countries. In this study, major men's sportswear particularly top- wear size charts that are available in the web, of top most popular brand manufacturer (Nike) which is categorized based on their profits gained in 2016, were collected. Similarly, five major online purchasing countries like USA, UK, South Korea, France and Germany were taken for this study, based on a survey conducted in 400 online respondents. Categorization and evaluation of the same were done based on popular brand & countries. A critical examination and analysis were made. Finally, one universal size conversion chart has been developed by using all the information, which helps in minimizing confusions and errors, from the customers and e-tailers perspective, by feeding the home country & size of the particular brand that will give the equivalent size of a brand of these desired countries and vice-versa. Right fit of a garment enhances confidence, comfort as well as performance & efficiency while sporting.*

Keywords: Size, Conversion, Chart, fit, Comfort

1. INTRODUCTION

Dressing requires finding clothes that fit our bodies and the way we look, as well as the society and occasions we are part of [1]. The fit of a garment contributes, among other things, to the confidence and comfort of the wearer [2]. Most importantly, for sportswear the right fit garment influence the efficiency and performance of the wearer during sport. Today's apparel industry is based on a system where clothes are made in Ready- To- Wear (RTW) sizes. The industry faces challenges as RTW clothes are supposed to fit a variety of bodies while at the same time balancing economic and practical limitations in production and profitability. It is costly to produce clothes in several different sizes, and therefore the industry concentrates the selection of sizes to fit the target customer groups.

Most of the Sports garments are made up of Ready-To-Wear clothing. During sports, the way they are dressed to represent for their country that will give them more proud [3]. They feel their dressing will also give dignity to the nation where they have represented for.

1.1 Development of Size Designation Systems and Ready-To-Wear Clothing

Ready-To-Wear clothing has existed since the industrial revolution. Previously, clothes were made to fit each individual either by the wearer themselves, family members or professional dressmakers or tailors. The first grading systems were the proportional dressmakers' systems used between 1820 and 1838. They used a single body measurement, such as bust measure, from which the other pattern dimensions were then graded in equal proportions [4]. These were based on tailors' experience and not on scientific anthropometric studies.

During the first half of the twentieth century, British sizing was often organized by 2 inch division in the bust, waist or hip size and sets of size designation codes were used. Already then the different size designation systems were considered confusing, and efforts were made in the later part of the twentieth century, both in the US and Europe, to develop standardized sizing through body measurement surveys and the use of statistical methods [5]. The first scientific size charts were published by the British Standards Institution (BSI), including a set schedule of code sizing related directly to body measurements in 1953. In the US, the first standard clothing sizes, CS 215-58, were published in 1958 (US Department of Commerce). Development of an international sizing system for clothing started in 1969 and the first international standard for clothing size designations, including definitions and body measurement procedures, was finally published in 1977 [6]. The European committee for standardization has adopted a modified version of this

standard in to their work [7] and is now working to develop a new European size designation system [8]. They have experienced problems in reaching a common size code, it has to be informative and indicate sizes accurately, but at the same time not too complicated for the consumers from different nations to understand or for the apparel industry to use [9].

1.2 Fit Problems with Size Designations

Size labeling is a communication system between manufacturers and consumers. The purpose of the system is to make it simpler for the consumers to find clothes that fit. The following 3 things are more important, the manufacturers must label the sizes correctly, the consumers must understand and trust the size labeling and the clothes must fit the consumers' bodies. The material revealed flaws in all these three areas. Producers label the clothes incorrectly sometimes [10].

Several studies have shown that there are disparities within clothing sizes used today. The most obvious disparities are the national labeling differences between countries [11] found that there were significant differences even though clothing would have the same size designation. For sports garments, these problems are quite common and there are differences between brands also. The sizing differences are not only a problem within the international markets, but also on a national level, region level as great disparities can be found within sizes.

Today, many consumers express frustration over the sizing systems and the incorrect use of the system. Several consumers report the need to actively seek out different apparel brands in order to identify brands that sell clothes that fit their body size and type [12]. Such frustration is typical of how sizing systems are experienced today, it is complicated to find clothes that fit the body.

Sport can be played anywhere in the world and if anyone wanted to purchase a sportswear in some other country, it is very difficult to choose his desired size as the size label designation is confusing, that is meant for home country/ region. Sportswear or any garments are made according to the sizes of their region, area as well as country. Universal standardization of sizes is not easy as human body proportions are varying among regions/ countries. Giving all information in the size label are also confusing while choosing right fit garment. Size charts / size standards developed so far are for particular region people/ or particular country which is not suitable for other countries/ other regions. For example, size designation in the size label 'L' is for chest measurement 44 inches in India is different

size for Chinese there 'L' means 38 inches of chest measurement.

To overcome this problem, a conversion chart will be useful, like other conversion charts by feeding our desired size or any familiar sizes that will give the equivalent size of local designation or vice versa.

Thus, the researcher developed a universal size conversion chart of men's sportswear category for top wear in which they tried to narrow down the differences between top brands and top online shopping countries. Using this converter a sport person can choose his desired brand/ clothing of his exact body size wherever he goes.

2. METHODOLOGY

Developing a universal size converter for men's sportswear (top wear) category, needs, available standard sizes in the categories such as different countries and different top brand sportswear manufacturers. We have collected all these size information by a consumer survey supplemented with interviews, market analysis on availability of sizes. Some in-depth interviews were conducted in order to obtain more profound data than could be supplied by the web survey. Web based survey, Market research of size selections and in-store clothing measurements contributed with information are the major sources for our study.

2.1 Collecting data

For collecting data, following three methods such as Quantitative Data, Qualitative Data and Market Research have been used.

Method 1: Quantitative Data

Data of consumers' experiences and opinions concerning size labeling and online shopping was collected through a web-based survey in all countries with clothing purchases including the search for the correct size, as well as experiences with different size designation systems. The available size charts for men's top wear of all top branded sports manufactures were collected through web.

Method 2: Qualitative Data

The survey was subsequently supplemented with in-depth half-structured interviews in order to gather information about customers' experiences with the size labeling systems. Size data were collected from sports persons who are all visiting the above said online shopping.

2.2 Selecting top brand sportswear manufacturer

Researchers have selected the brand for the study based on their revenue and the profit of 2016 and Nike comes first in terms of m$ (Revenue12377 & Profit 1232) followed by Adidas (Revenue 18606.5& Profit 792), Puma (Revenue 30601& Profit 792), Reebok (Revenue 7605&Profit 572), Fila (Revenue 7,270&Profit 330), Under Armor (Revenue 3963.313& Profit 233), Jordon (Revenue 3147& Profit 93.1567), Columbia Sportswear(Revenue 2326& Profit 174.337), ASICS(Revenue 3899.314&Profit 792) and Converse (Revenue 3725.7& Profit 40.7), based on the profit analysis of 2016, conducted by http:// www. mbaskool.com/fun-corner/top-brand-lists/16272-top-10-sportswear-brands-of-the-world-2016. html.

As per the profit analysis of 2016. Conducted by http:// www.mbaskool.com/fun-corner/top-brand-lists/16272-top-10-sportswear-brands-of-the-world-2016. html.
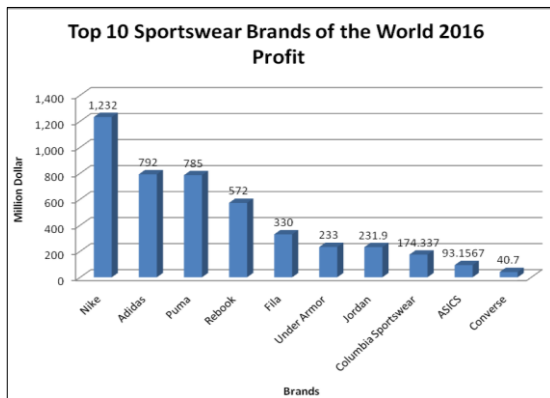

Chart -1: Selection of Sportswear brands for the study

2.3   Selecting the countries for the study

In Chart 2, Out of 400 respondents, 77 (19%) of them are of United Kingdom customers shop online which are more than the actual physical shops, followed by the countries are Germany74 (18%), South Korea 72 (18%), USA 66 (17%), France 64 (16%) and other countries 47 (12%) of replied.

Chart -2: Selection of the Countries for the study based on the survey conducted @ www.dw.com

Clothing stores in the USA, UK, South Korea, France and Germany were also visited online in order to study and collect the availability of clothing in different sizes of Nike brand sportswear in men's top wear category

3.   DATA ANALYSIS

Collected data were critically examined and the right size information's were picked among them. Random sampling technique was followed for choosing the required size information among the collected and segregated.

In our study, since Nike brand being trading in all these five Countries based on availability of the sizes in the market, we found that as in Chart 3.   Nike is an international brand and the sizes which they offer to the customers are S,S,M,L,XL,XXL,XXXL in France, Germany and United States of America, South Korea has 4 size categories like S,M,L,XL and United Kingdom has 6 sizes XS,S,M,L,XL,XXL.

Chart -3: Sizes available online for the brand Nike in different countries.

The following assumptions were made from the findings

Assumption 1: Among 5 countries majority of the countries offer 7 sizes, for analysis researchers have taken Large size which is found to be the middle of 7 size categories.

Assumption 2: In online size guide the parameters are in class intervals so the data is considered a start of interval as minimum range and end of the interval as maximum range of size number.
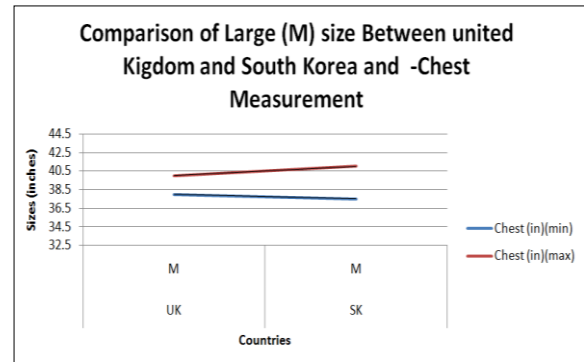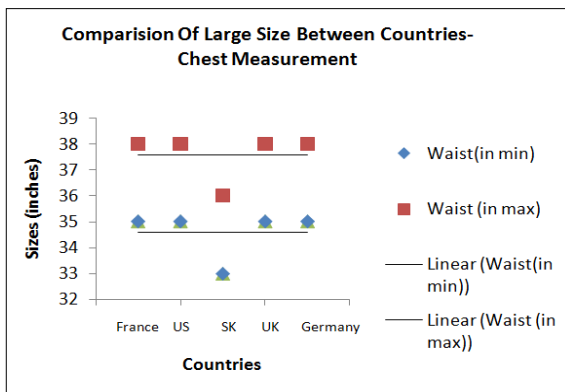

Chart -4: Comparison chart between the Countries based on Chest measurement- Large Size
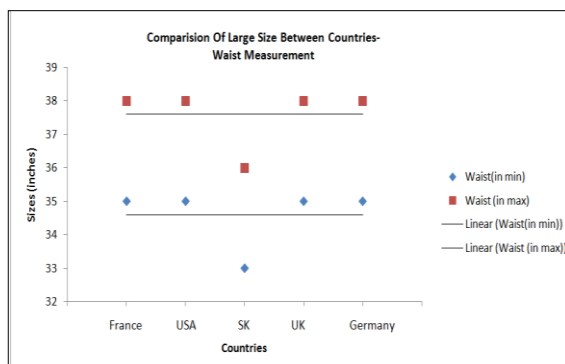

Chart -5: Comparison chart between the countries based on Waist measurement -Large Size.

Chart 4, and 5 show, for both chest and waist measurements, France, US, UK and Germany follows the same pattern whereas SK only deviates. In Chart 6, we found the odd group of countries like UK and SK also having variations among the maximum chest measurements in the large size.

Chart -6: comparison of Large Size between South Korea and United Kingdom.

3.1 Establishment of universal size conversion chart converter

The researchers have concluded that the Nike being an international brand, they follow the same size guide among the 3 countries and except the South Korea and United Kingdom. As the researchers have seen from the analysis, South Korean measurement chart differences from other 4 countries due to their body propositions which differs from other 4 countries. For example, if a South Korean travel to USA and wanted to purchase a 'Nike t-shirt' he might find it difficult till before a universal size converter has been established. A Universal Size conversion chart for Nike brand for 5 countries has made after using all these information's in Excel sheet as in Table 1.for the quick and easy access of the customer, a programme has been formulated if anyone can feed the necessary input in the window for example, home country, brand, home size and desired country, then the output window shows the equivalent size of the buying country ie. desired country's size.

Table -1: Universal Size Chart for Nike

COUNTRY	BRAND	SIZE	COUNTRY	SIZE
France	Nike	XS	Germany	XS
France	Nike	XS	USA	XS
France	Nike	XS	UK	XS
France	Nike	XS	SK	S
France	Nike	S	Germany	S
France	Nike	S	USA	S
France	Nike	S	UK	S
France	Nike	S	SK	M
France	Nike	M	Germany	M
France	Nike	M	USA	M
France	Nike	M	UK	M
France	Nike	M	SK	L

France	Nike	L	Germany	L		USA	Nike	S	UK	S
France	Nike	L	USA	L		USA	Nike	S	SK	M
France	Nike	L	UK	L		USA	Nike	M	France	M
France	Nike	L	SK	XL		USA	Nike	M	Germany	M
France	Nike	XL	Germany	XL		USA	Nike	M	UK	M
France	Nike	XL	USA	XL		USA	Nike	M	SK	L
France	Nike	XL	UK	XL		USA	Nike	L	France	L
France	Nike	XL	SK	NA		USA	Nike	L	Germany	L
France	Nike	2L	Germany	2L		USA	Nike	L	UK	L
France	Nike	2L	USA	2L		USA	Nike	L	SK	XL
France	Nike	2L	UK	2L		USA	Nike	XL	France	XL
France	Nike	2L	SK	NA		USA	Nike	XL	Germany	XL
France	Nike	3L	Germany	3L		USA	Nike	XL	UK	XL
France	Nike	3L	USA	3L		USA	Nike	XL	SK	NA
France	Nike	3L	UK	NA		USA	Nike	2L	France	2L
France	Nike	3L	SK	NA		USA	Nike	2L	Germany	2L
Germany	Nike	XS	France	XS		USA	Nike	2L	UK	2L
Germany	Nike	XS	USA	XS		USA	Nike	2L	SK	NA
Germany	Nike	XS	UK	XS		USA	Nike	3L	France	3L
Germany	Nike	XS	SK	S		USA	Nike	3L	Germany	3L
Germany	Nike	S	France	S		USA	Nike	3L	UK	NA
Germany	Nike	S	USA	S		USA	Nike	3L	SK	NA
Germany	Nike	S	UK	S		UK	Nike	XS	France	XS
Germany	Nike	S	SK	M		UK	Nike	XS	Germany	XS
Germany	Nike	M	France	M		UK	Nike	XS	USA	XS
Germany	Nike	M	USA	M		UK	Nike	XS	SK	S
Germany	Nike	M	UK	M		UK	Nike	S	France	S
Germany	Nike	M	SK	L		UK	Nike	S	Germany	S
Germany	Nike	L	France	L		UK	Nike	S	USA	S
Germany	Nike	L	USA	L		UK	Nike	S	SK	M
Germany	Nike	L	UK	L		UK	Nike	M	France	M
Germany	Nike	L	SK	XL		UK	Nike	M	Germany	M
Germany	Nike	XL	France	XL		UK	Nike	M	USA	M
Germany	Nike	XL	USA	XL		UK	Nike	M	SK	S
Germany	Nike	XL	UK	XL		UK	Nike	L	France	L
Germany	Nike	XL	SK	NA		UK	Nike	L	Germany	L
Germany	Nike	2L	France	2L		UK	Nike	L	USA	L
Germany	Nike	2L	USA	2L		UK	Nike	L	SK	XL
Germany	Nike	2L	UK	2L		UK	Nike	XL	France	XL
Germany	Nike	2L	SK	NA		UK	Nike	XL	Germany	XL
Germany	Nike	3L	France	3L		UK	Nike	XL	USA	XL
Germany	Nike	3L	USA	3L		UK	Nike	XL	SK	NA
Germany	Nike	3L	UK	NA		UK	Nike	2L	France	2L
Germany	Nike	3L	SK	NA		UK	Nike	2L	Germany	2L
USA	Nike	XS	France	XS		UK	Nike	2L	USA	2L
USA	Nike	XS	Germany	XS		UK	Nike	2L	SK	NA
USA	Nike	XS	UK	XS		UK	Nike	3L	France	NA
USA	Nike	XS	SK	S		UK	Nike	3L	Germany	NA
USA	Nike	S	France	S		UK	Nike	3L	USA	NA
USA	Nike	S	Germany	S		UK	Nike	3L	SK	NA

SK	Nike	XS	France	NA
SK	Nike	XS	Germany	NA
SK	Nike	XS	USA	NA
SK	Nike	XS	UK	NA
SK	Nike	S	France	XS
SK	Nike	S	Germany	XS
SK	Nike	S	USA	XS
SK	Nike	S	UK	XS
SK	Nike	M	France	S
SK	Nike	M	Germany	S
SK	Nike	M	USA	S
SK	Nike	M	UK	S
SK	Nike	L	France	M
SK	Nike	L	Germany	M
SK	Nike	L	USA	M
SK	Nike	L	UK	M
SK	Nike	XL	France	L
SK	Nike	XL	Germany	L
SK	Nike	XL	USA	L
SK	Nike	XL	UK	L
SK	Nike	2L	France	NA
SK	Nike	2L	Germany	NA
SK	Nike	2L	USA	NA
SK	Nike	2L	UK	NA
SK	Nike	3L	France	NA
SK	Nike	3L	Germany	NA
SK	Nike	3L	USA	NA
SK	Nike	3L	UK	NA

Following are the steps to use the universal size converter

Step1: Select the Home country	Step 2: Select the Brand which you want to buy.

Step 3: Select the size which you usual buy in your home country	Step 4: Select the country from which country want to buy
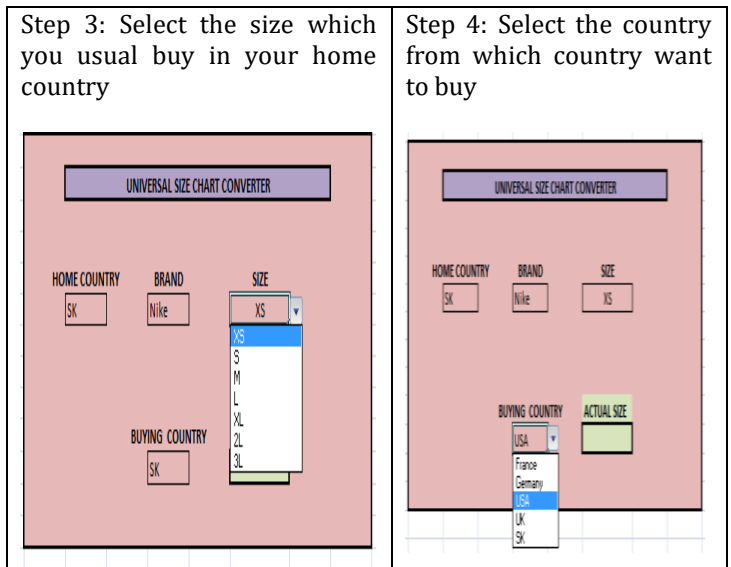
Step 5: The converter show the Actual size which you have to purchase in that country.

4. CONCLUSIONS

Thus, the Researchers developed a universal size converter of men's sportswear category for top wear of Nike brand, like other conversion charts by feeding our desired size or any familiar sizes that will give the equivalent size designation of local country's or vice versa, in which it narrows down the differences between nations. Using this table a sport person can choose his desired brand/ clothing of his exact body size wherever he goes. In this study, the Researcher have tried only sportswear category, it is very useful for the consumers and manufacturers if all the categories have the similar conversion charts. In future, researchers may extend their research in universal standardization of sizes, revised size charts that become customer & manufacturer friendly.
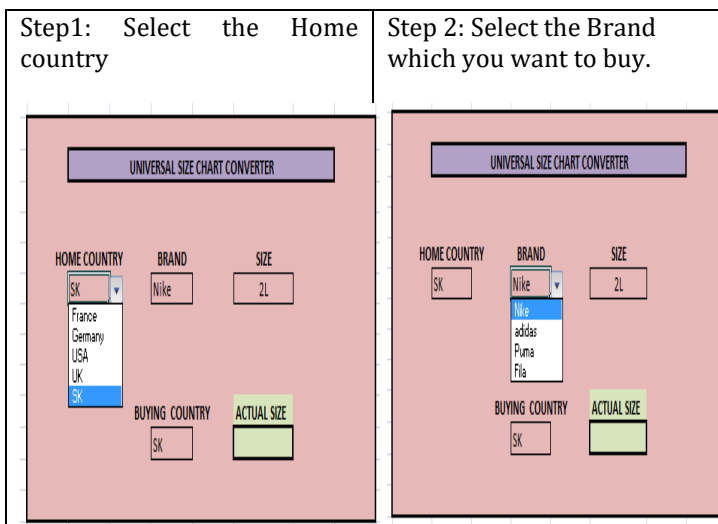
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