SHOES AND ITS GENETICS

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Abstract

Shoe is the product crafted by human being in primitives to protect their feet from the external things such as heat, cold, thorns and other sharp edges etc. As per the Darwin’s doctrines the human beings are originated from the apes so here we can conclude that while being a monkeys they no need to protect their feet why because they are used to jumping and climbing for transportations or moving one place to another places .And for climbing and jumping four number of legs has been used y them. When the human beings started walking and running instead of jumping and climbing they need to protect their feet from the external things as said above by the help of leafs and animal skins. After long discretion here we can deduce that shoes might be the aine products of this globe and shoe making astute may be the aine manufacturing methodology used /developed by the human beings. By empirical and consensual the followings are the basic needs of human beings and we all are emphasis the same to reach out the every individual in the world they are food ,clothes and dwellings .By deducing we can assure that in the primitives, the human beings give a more attention to the shoes after the food ,why because while they are chasing the food they might to protect their feet from the external things .Here we can confess once again shoe and shoe makings are the aine of human beings .The first shoe of human being might be the leaves and woods (I Personally experienced the wooden sandals with my father during my childhoods for trespassing the hedges) and this epoch may be the human beings are belong to the vegetation .And when they are started hunting, the animals skin become to come a usage to cover their feet .They may used to wrap their feet with an animal skins it is may given a more comfortable and durability while comparing the leaves and woods. Then slowly moved to wear the skins like a moccasin shoes which is having a hole on the edges and jute or coir may act as a straps. After a innumerous of civilizations and epoch (River based civilizations) human beings are started wearing a well designed and crafted footwears especially leather based footwears (example ice man).After acquiring of a complete civilization i.e., the people started inhabit with a clan groups the apartheid may permeated in the society. The nobles, cozy and canopy are wore the well designed and ornamented footwears, others are may not be permitted and these are followed globally. Can identify the person who is belonging to which type of clan and status, position. In 13th century people are habituated with long shoes with pointed toes, in 15th century as per law the royal families are weared a shoe with one length of toe and common folk weared the shoes with other length. In 16th century people are wore soft, high and thigh boots and In 17th century people wore low shoes with square toes .After
a French revolutions, influence of French fashion in 18th century decorated silk shoes, high heel shoes are in use and high heels was invented in France for the king French Louis (male) so the first high heeled shoes may be invented for male. And upto 1850 there is no left and right shoes all are wore narrowed only. Its shows there is a inertia, recession and slack lines of astuteness or cognitive, discrete of human beings in between the primitives and 18th century. Because the time taken to craft a left and right shoe is uncountable number of years and machine made shoes also produced in later of 18th century prior to that shoes are made by hand only. In 19th century, due to the distinct innovations and inventions the variety of machines and methodologies has been discovered in all the fields and shoe making too. So the mass volume of shoes has been manufactured in all kinds such as style, size, ornamentations, usage, material and etc. In 20th century the computer applications were permeated in the shoe making and shown the result of perspective boom. Now a days computer and robots playing a vital role in shoe making like computerized cutting, die less cutting, water jet cutting, laser jet cutting, reciprocal knife cutting, computerized stitching machines and computer aided designing’s. Robots may be used in sample or run production in developed countries. Shoe making is an unavoidable business for the developing countries and it is playing a vital role in their economy. During these period the basic styles of footwear and last were identified. Footwear – Derby, Oxford, Slip-on, Boot (Knee boot, Ankle boot, Thigh boot, and High boot), Moccasin, Ladies Court shoe and Sandals (Toe peg, V-straps, Multi straps, Toe band and Instep band). Most of the footwears are originated from the said styles only. Last-Solid block, Scoop block, Telescopic, Hinge and Throng were derived for distinct use. Identified the sizing systems too. After the globalizations the wearing of clothes may vary from one state to other and one religious to other but the wearing of shoe/footwear may stereotypes and people just following the globe trend and fascinated to wearing the variety of styles and procured often like a clothes.

![Figure 1-Darwin’s Evolution](image)

1.0 Introduction
The history of the use of Footwear by human kind can be traced back to the ice age about 5 million years ago. Due to unkind weather conditions the need for footwear started growing. Other evidences show that footwear came to use at the end of the Paleolithic Period, at about the
same time the early humans learned the art of leather tanning. Earlier footwear was made of wrappings of dried grasses and only later on the art making footwear from pieces of leather was developed. Until the mid-nineteenth century shoes were made as straights i.e., there was no distinction made between the right and left shoes (Veres, 2005). The left and right footwear were identical and hence could be worn on either foot. Only prolonged usage shaped them into right and left boots. The right and left shoes were invented by a fashionable boot maker, William Young from Philadelphia in 1800. The first crafted footwear is the Sandals, which are known to be the successors to these wrappings. In India these Sandals were called as Padukas, which were mainly worn by the Saints. Over centuries many varieties of footwear were made in the Himalayan region in order to protect the feet from cold weather. Footwear was made of leather, wool or remains of the plants. Since most part of India is warm, footwear was not a necessity and therefore Indians were barefooted for many years. Innumerable references to foot worship in Indian culture convey the impression that the foot is regarded as an important part of the human body. Touching the feet of elders was considered as the height of good manners. It was considered as a civilized behavior (Viswam S, 1997). Until half a century ago, India was described as a barefoot country. They were characterized by such toughness of foot that they can travel for long distances without any discomfort. It seems likely that the cultural adjustments lead to the adoption of footwear. Furthermore, the ascetic Hindu, Buddhist and Jain sects were not generally permitted the worldly luxury of footwear. Therefore footwear was considered as a luxury until half a century ago. But even then India was known for its traditional craft of footwear making.

2.0 Ancient footwear
Shoes are the foundation of every outfit. They allow a person to move safely and comfortably on unforgiving surfaces, protect the foot from the elements, and add that final statement of panache. The oldest surviving shoes date back around 10,000 years. These sandals made of rope were found in Oregon in the United States. The oldest leather shoe was found in a cave in Armenia and is about 5,500 years old. These simple shoes were made of a single piece of leather and were stitched with leather (see video at bottom of article).

Archeological evidence suggests that East Asians may have worn shoes 42,000 years ago. A skeleton studied by anthropologist Erik Thinkaus shows slimmer toe bones than most early humans who walked barefoot. Walking barefoot is thought to cause thicker lesser toe bones.
Studies of foot anatomy in several ancient skeletons show a general change between 26,000 and 30,000 years ago, when the smaller toe bones began to appear less robust, due, experts believe, to the support given by shoes. A 27,000 year old Russian skeleton was found to have small lesser toe bones and ivory beads on and around the ankle and foot, suggesting decoration and the fact that the shoes were not merely practical, but worn as a display of status.

2.1 Sandal
Sandals are a simple form of foot covering consisting of a sole held to the foot with straps. They can be made of leather, plastic, straw, rope, metal, or old tires. Suited well to hot, dry climates and rocky regions, sandals protect the foot from venomous insects, stones, and burning hot sand. They also help keep the foot aired out and cool.

- Between 8,000 and 10,000 years ago, the Anasazi of the American Southwest wore braided, woven, flexible sandals fastened to the foot with a V-shaped strap.
- The Japanese created the geta, a wood-soled sandal worn with socks called tabi. For over 2,000 years, the geta has been a clog or platform-style sandal very much like a flip-flop that keeps the foot elevated from dampness and mud.
- In India, tall, knobbed sandals made of water buffalo hide called chappli and a metal and wood called paduka have kept the foot slightly elevated from the ground for over 5,000 years.
- Sandals are depicted on the tomb reliefs of Ancient Egypt. Beautiful sandals were a status symbol worn by the elite outdoors. Even the Pharaoh did not wear sandals indoors. Though most Ancient Egyptians went barefoot, sandals became quite common to those who could afford them. Notice the picture of Ramses III (at the top of this page) wearing what appear to be glorified flip-flops curled up at the toe.
- Unlike most European shoes, archeological evidence shows that the Ancient Egyptians made shoes for the right and left foot.
- When Howard Carter discovered and opened the tomb of King Tut (1341–1323 BCE) he found 93 separate items or fragments of footwear, including elaborately decorated flip-flops with marquetry veneer.
- Alexander the Great unified Greece in the 4th century BCE, ushering in an unprecedented age of increased wealth and leisure, along with the development of science, the arts, and sports. This led to the creation of many sandal styles, and rules set out as to which sandal was worn for status or specific kinds of occasions.
- Rome, like Greece, restricted the use of the sandal. The word sandal comes from the Latin word "sandalium." Roman-style sandals, or gladiator sandals, have had several revivals in the 20th century and are quite popular today.

When the Christian Roman Empire decreed that bare toes were immodest in mixed company, the sandal disappeared, except for in cloistered monastic orders, from Western Culture for over 1,000 years.
2.2 Moccasins
A moccasin is a simple shoe often made out of a single piece of leather and stitched together, held closed with leather laces. Famous for being worn by indigenous, Americans and early American pioneers, the basic moccasin type of shoe was worn for thousands of years worldwide. Neolithic people made simple shoes like moccasins which were worn until the Middle Ages. Moccasins can be plain leather or decorated with beading to create beautiful footwear. They are still available in stores today.

![Figure 3-Image of Moccasin Upper](image)

2.3 Clogs, Pattens, and Sabot
Wood soled shoes are thought, by some experts, to have been worn by the Romans. Whenever they originated, clogs and other wood soled shoes have been popular footwear worn by peasants and workers throughout Europe since the middle Ages. Like the Japanese wood soled geta, the elevation provided by a thick, wooden sole protects the foot from mud, road debris, stones, cold, and dampness. Klompen are the all wood clogs worn in Holland and pop up today as souvenirs in the Netherlands.

**Pattens** were a type of slip-on wood soled over shoe worn during the Middle Ages and up until Victorian times. The wood sole was held on to the foot by straps. Usually worn outdoors, they were occasionally worn indoors for mopping or walking on wet, or cold stone floors. Later versions were made of two joined metal rings. In the Late Middle Ages, a form of platform clog called **chopines** became popular with the elite, at first to protect the thin shoes of the day, then as status symbols that increased the height of the wearer. When prostitutes began to wear them in order to be seen in the street, the style fell out of favor.

The **sabot** was the traditional French wood soled shoe worn by factory workers and peasants. Legend has it that angry workers used their sabots to damage factory machinery, leading to the word 'sabotage.'

**Clogs** came back in fashion in the 1970s. With leather uppers and some with rubberized or cork soles, they are still popular footwear for health-care professionals and others who appreciate the easy slip-on style and wide toes.
2.4 High Heels and Buckled Shoes

The Ancient Greeks introduced a type of platform sandal worn by actors in plays. The cork soled shoes showed the importance of the character depending on the height of the shoe. Later, 15th century Venetian women wore stilted mules (slip on shoes) or chopines to display their status. The finest shoes were embellished with tack work and punch work, earning the anger of the Church.

In the 1590's, high heels displaced platform mules, then rose higher during the reign of Louis XIV. The wearing of high heels signified status and wealth, creating a regal appearance for the wearer.

During the 17th and 18th centuries, metal buckles were added to the shoes, replacing laces. Buckles were made of brass, silver, or steel and could be decorated with jewels and gem stones. The most beautiful and expensively made buckled heels were worn by the wealthiest people, creating the term 'well heeled' to describe someone who was very rich. Lavishly made shoes with heels and elaborate buckles were abandoned after the French Revolution.

The high heel rose to varying heights during the 1700's with English heels that were low to medium in height, and thicker than on the continent. In France, they wore heels with a slight curve. But the Italians wore the high, narrow spiked heel we call stiletto heels.
3.0 Shoe Genetics

Foot dimensions, indices, and variables relating to shape characteristics of foot outlines taken for Japanese, Australian aborigines, Indonesians and French were analyzed and compared with existing data to identify the differences due to growth, generation and ethnic background. The following findings were obtained:

1) There has been rapid increases in foot length for Japanese born after ca. 1950.
2) Japanese born after ca. 1960 had a smaller foot girth and foot breadth for their foot length compared to Japanese born before ca. 1950.
3) Secular change rather than aging is responsible for the generation differences in foot size and proportion.
4) Elderly female Japanese born before 1930 had very wide feet and a weaker valgus tendency of the first toe. Special attention should be paid to the needs of older men, and especially older women in the production planning and designing of the toe shapes of shoe lasts.
5) Differences due to growth and secular change in foot out flare, which is represented by posterior flexion angle of the medial axis of foot outline, were not significant. Ethnic differences in foot out flare were not significant for females. This does not appear to be easily influenced by environmental factors, such as nutritional status and shoe-wearing habits.
6) Mongoloid populations including Japanese have a wider foot for foot length compared to Caucasoid and Australoid populations.
7) East Asian populations including Japanese have a smaller foot length for height compared to Southeast Asians and Africans. The causes may be both genetic and environmental.

Studies of variation in foot morphology are based on measurements, such as foot dimensions and angles. Apart from research on the development of the plantar arch, there are few studies concerning variation in foot shape due to growth and aging. This is partly due to the lack of appropriate methods to represent the shape characteristics of the foot, and partly due to the difficulties of obtaining mass data. Several angle measurements 162 Kouchi M.obtained from foot outlines have been used to represent shape characteristics of the foot(Kouchi, 1989), but these have only represented local
characteristics of the foot such as the fanning out of the toes. The posterior flexion angle of the medial axis (skeleton) of a foot outline is useful in representing the shape characteristics of the foot (Kouchi, 1995), and is related to the three-dimensional foot shape (Kouchi and Tsutsumi, 1996), and so to individual differences in shoe comfort. On the other hand, fanning out of the toes is influenced by the habit of wearing shoes (Lam Sim-Fook and Hodgson, 1958; Morioka and others, 1974), and is also related to shoe comfort. Therefore, it is important to identify the variation and distribution of shape characteristics; information about human foot morphology essential for the successful design of commercial products. Ethnic differences in foot morphology has been studied from the viewpoint of the influence of footwear on the foot (Hoffmann, 1905; Lam Sim-Fook and Hodgson, 1958; Stewart, 1970), and shoe comfort for different ethnic populations (Hawes and others, 1994). These studies are also mainly based on foot dimensions and somatoscopy. In this paper, changes due to age in the size and shape of the foot are analyzed based on cross-sectional data for more than 3000 Japanese, obtained from several somatometric researches, and the factors that influence differences in foot morphology due to age are examined. Also, the characteristics of the Japanese foot are investigated by comparing data for Indonesians, French, and also Australian aborigines, who are not in the habit of using footwear.

4.0 Gait cycle and analysis

Gait analysis is the study of human locomotion. In order to analyze and quantify how someone walks, it is necessary to isolate the shortest, unique, repeatable task during gait. This task is called the gait cycle. A single gait cycle can be measured from any gait event to the same subsequent event on the same foot, but the conventional tacit model considers gait cycle is measured from one foot strike to the subsequent foot strike of the same foot. Quantifying aspects of the gait cycle, such as time and spatial measures, allow for analysis of gait symmetry, variability and quality. The gait cycle can be broken down into two primary phases, the **stance** and **swing** phases, which alternate for each lower limb.

1. **Stance phase**: Consists of the entire time that a foot is on the ground.
2. **Swing phase**: Consists of the entire time that the foot is in the air.

The objectives of the swing phase of gait

1. Foot clearance over the ground
2. Forward swing of the limb
3. Preparation of limb for stance

The swing phase can be broken down into 4 sub-phases.

1. **Pre-swing** takes place during 50-62% of the gait cycle. Pre-swing is the transition phase between stance and swing, in which the foot is pushed and lifted off of the ground.
2. **Initial swing** goes from 62-75% of the gait cycle. During initial swing, the hip, knee, and ankle are flexed to begin advancement of the limb forward and create clearance of the foot over the ground.
3. **Mid-swing** goes from 75-87% of the gait cycle. During mid-swing, limb advancement continues and the thigh reaches its peak advancement.
4. **Terminal swing** is the final phase of the gait cycle going from 87-100% of the cycle. During terminal swing, the final advancement of the shank takes place and the foot is positioned for initial foot contact to start the next gait cycle.

![Figure 7-Human Gait Cycle](image)

Gait analysis has become a widely used tool to provide kinematic and kinetic data required by the physical therapists and doctors for choosing suitable treatment for their patients. Since the 1960s, study of gait analysis became more famous in clinics compared to research labs, as gait measurements were found useful in the management of patients with walking disorders. For humans, walking is like a speech or a breathing activity. The study of human locomotion has been conducted for many decades that describe the relationship between the motion and the muscle. Foot motion study has been amplified and complemented by a continuous stream of technological advances over a century. Full understanding of a normal gait includes study of muscle activities during different phases of the gait cycle. Advances in the study of muscle activities were made available during the 1940s and the 1950s. The contributions in the study of mechanical analysis of gait cycle were available in the 1950s that performed free-body diagrams and calculations that developed the effects of hip, knee, and ankle joints for the ground reaction forces. Many research studies have also focused on the mathematical modeling to demonstrate the motion of the body segments and actions of different muscles since the 1960s. Great improvements came in the 1970s and the 1980s in gait measurement methods. This led to accurate kinematic study using electronics rather than images that took a long time to gather information. Force platforms and EMG systems were made available that produced reliable results in minutes. These innovations provided high quality three dimensional (3D) data on the kinetics and kinematics of walking and created a sophisticated mathematical model that could calculate muscle, ligament, and joint contact forces during human locomotion.

### 5.0 Seven basic styles of footwear

Footwear is classified according to uses. Invariably the styling and design of footwear vary according to users too like for gents, ladies, and children. Climatic requirements in different seasons of the year, price, comfort, locally available materials all these affect the styles and designs. Broadly we may classify footwear as follows.

- Casual wear
- Dress wear
- Sports footwear
- Children’s wear
- Industrial wear

There are seven basic styles are followed in shoe making
1. Derby
Most commonly used formal and casual shoe of unisex. shoe characterized by quarters with shoelace eyelets that are sewn on top of the vamp. This construction method, also known as “open lacing”. In American English the derby shoe may be referred to as a blucher, although technically the blucher is a variation of Derby. The derby became a popular sporting and hunting boot in the 1850s. In North American English it is also called gibson.

2. Oxford
An Oxford shoe is characterized by shoelace eyelets that are attached under the vamp, a feature termed Closed lacing. This contrasts with Derbys, which has shoelace eyelets attached to the top of the vamp. Originally, Oxfords were plain, formal shoes, made of leather but they evolved into a range of styles suitable for both formal, uniform, and casual wear. The newest of the shoe styles Oxford is over 300 years old. The name is derived from oxford, England. When the laced shoe was introduced there in 1640. It gained popularity among the university students. This is a formal shoe of unisex.

3. Boot
Boot is a type of footwear where the top of shoe crosses ankle. Originally a two-piece unit shoe below, legging above- “boot” made its mark when these two pieces were joined together. When the Normans crossed the channel to England in 1066, the English adopted this style and called “Boot”. Different types of boots are Ankle boots, High boot, Knee boot & thigh boots.

4. Court Shoe
A court shoe (British English) is a UK classic shoe with a low-cut front, the vamp, and without a fastening. They are usually worn by women, but are still traditional menswear in some formal situations, where the style is sometimes called an opera slipper or patent pump. Pump shoe (American English), generally a low heel, thin soled slip-on shoe was worn by the carriage.
footmen, who pumped the carriage pedals. When adopted as a fashion by the gentry, they retained the name “pumps”. Pump, this style is used in Americans have Sexy high-heel, usually pointed.

5. Slip-on
Slip-ons are typically low, lace-less shoes. Also called loafer & Pantafola. Shoe upper made in two parts, the top sewn onto the sides as a design detail. As the name says ‘Slip-on’, the foot can be slipped in easily.

6. Sandal
Most universal of all shoe styles “sandal” had its beginning from a slab of leather sole held on to foot with raw hide thongs. This we called as Shoe with open toe and (usually) straps around the ankle / across the foot.

7. Moccasin
The oldest known shoe construction, dated back around 14,000 years earlier. “Moccasins” (meaning foot covering) is American Indian origin. Bottom will covered with upper leather at the forepart. This is the most comfortable shoe to wear. This is expensive because more leather is consumed.
6.0 Sizing system
Shoe sizes are based mainly on the length of the shoe. In modern times, the length meant is the length inside the shoe – the length of the last, the form on which the shoe is made—not the length of the sole. Obviously, the last length must be greater than the length of the foot the shoe will contain. The shoe sizing system has been found out by the measuring the more than 10,000 people foot measurement as well as the body weight and propulsion of the person. English shoemakers apparently measured customers' feet with a ruler marked in thirds. When shoe sizes were systematized, the one-third inch difference between whole sizes was retained, and size 0 was a length of 4 inches. Sizes went from 1 to 13 for children and then from 1 to 13 again for adults. Half-sizes did not appear until late in the nineteenth century. A shoe size is an alphanumerical indication of the fitting size of a shoe for a person. Several different shoe-size systems are still used today worldwide. In some regions, it is even customary to use different shoe-size systems for different types of shoes (e.g., men's, women's, children's, sport or safety shoes).

A sizing system can be defined as a method of Measuring, Recording and Marking the various lengths of Foot, Last and the Shoe. Different Countries employ the different systems. a) Using a special size unit as well as b) A method of marking or notation There are six types of sizing system are being followed by the footwear world.
1. British or English Sizing System
2. American Sizing System
3. French or Continental Sizing System (Paris Point)
4. Japanese Sizing System
5. Mondopoint Sizing System
6. Euro point Sizing System.

6.1 British or English Sizing System:
The British shoe sizing system was created by Edward II in 1374 (i.e. 14th Century) form Norwich, UK and that sizing system is still used to manufacture footwear for the UK. The King’s system is based on the size of a barleycorn. The Romans had used the barleycorn as a measurement for years, so the King agreed that that system made perfect sense. Each barleycorn measures 1/3 of an inch and 36 barleycorns placed end to end was the size of Edward’s foot. His shoe size was labeled 12. The longest foot measured 13 inches or 39 barleycorns at that time, so it was labeled a size 13. Smaller sizes were graded down by 1/3 of an inch and marked accordingly. Of course today’s feet sizes are much larger, so the size scale has been extended. The average UK size today is a 9; five years ago it was an 8. It is the oldest sizing system and it is based on F.P.S. System (Foot, Pound, Second system) and the units are in inches. British Shoe size is based on the length of the last, measured in barleycorn (approx 1/3 inch) starting from the smallest practical size, which is size zero. It is not formally standardized. The size “zero” (0) starts at 4 inch length and continues up to 13 for children’s and then again it starts from 1 to 11 or onwards for adults. The difference between two sizes is 1/3rd inch (8.46mm) or one Barleycorn and for half sizes is 1/6th inch (4.23mm).
6.2 American Sizing System
American Edwin Simpson developed a new sizing system in 1880 and it is still being used today. Simpson’s system is based on a 1/3 inch difference between whole sizes and 1/6 inch difference in half sizes. His system measures the length, waist, ball width, heel and instep and those measurements are used to make shoes lasts, which are the templates that give the shoe its form. The American colonies adopted the English system, but made the zero size 3 11/12 inches. Shoe sizes in North America are similar to those in Britain sizing system. The sizing system in England is one size different than the American system in width as well as length. The English system starts at 0 and the American system starts at 1. The American shoe sizing system is used to produce shoes for the US and Puerto Rico, Parts of Asia and Africa, the Caribbean Island and sometimes of Canada.

6.3 French or Continental Europe Sizing System (Paris Point)
Under this system, shoe size is the length of the "last" (the length of the foot * two-third of centimeters) – expressed. In Europe, a shoe sizes increment of 2/3 cm or 6.66mm or 0.265 inch or ¼ inch known as a "Paris Points or French Points" or, in Germany, a Stritch.

6.4 Japanese Sizing System
Shoe sizes in Japan are represented by the length of the shoe in centimeters\(\) • This scale is based on C.G.S System (Centimeter-Gram-Second system) and the units are in CM. • The notation zero (0) size starts at 0 cm and continues up to no repetition. • A size increment of 1 cm and with half sizes of ½ cm. • Since, there are 5cm to 2 inches, these give 5 sizes to every 2 inches, as against English sizes. However, for women sizes typically range from 23 cm to 25 cm (in increments of 0.5 cm); for men the sizes typically range from 24 cm to 28 cm (increments of 0.5 cm). Japanese feet (hence shoes) appear to be on average shorter and wider than those of American or Europeans. Children's shoes are also measured in centimeters.

6.5 Mondopoint Sizing System or Metric Sizing System
This is based on C.G.S system (Centimeter-Gram-Second system). It is developed by International Standards Organization (SATRA), 1980’s. The unit of size is millimeter. It is based on the mean foot length and width of the foot for which the shoe is suitable, measured in millimeters. Mondo point is a world system of footwear sizing. The foot measurement being taken with weight on and wearing hose. A size increment would be of 5mm or 7.5mm. In multi-fitting ranges the width interval between fittings should be either 3mm or 4mm. It is based on the mean foot length and width of the foot for which the shoe is suitable, measured in millimeters

6.6 Euro point Sizing System
This is based on Metric system. The unit of size is millimeter. 2. It is calculated from the actual length of the foot measurement when standing. 3. It is deals only with length and not with width and fitting. 4. It is simple to use since it is nothing more than jus the conversation of English size system into the metric measure and the unit size are taken to be as i) 4mm for women’s size ii) 6mm for men’s size .However it has not yet become wide spread.
7.0 Last for shoe making

Last is the replica of our human foot. Normally last is manufactured from wood or polymeric material. The shoe last is the form used to define the shape of the shoe. The last is critical to the shape and function of your shoe. The shoe last used by the factory will decide the look, fit, and shape of the shoe. The right last can make your shoe a high fashion hit and the wrong last can make your design look like an ill-fitting brick. The Pattern Master creates the shoe pattern to fit the last tightly. Each different type of shoe will need its own specific shape of last. The shoe last for a running shoe has a very different shape than a last used for a hiking boot or basketball shoe.

8.0 Conclusion

As per the philosopher note, people belongs to developed countries procure / owning 6 pairs of footwear but in developing countries like India may be 1.65 pairs. Shoe making it’s a unavoidable business and offer a millions of employments especially for the women and unemployed youths that’s why the governments belongs to various countries has introduced a number of institutions and colleges to impart a skills. And a conspicuous, renowned brands like Bata, Addidas, Nike, Puma, Bugatti, Clarks eco and etc. are playing a vital role in shoe making, trading and merchandizing. This may be the empirical explicit of the shoes and its genetics and there is no destruction for shoes and shoe making until a human race.
9.0 References
2. Vidya K. Nandikolla,1 Robin Bochen,2 Steven Meza,1 and Allan Garcia1“Experimental Gait Analysis to Study Stress Distribution of the Human Foot” -Hindawi Journal of Medical Engineering Volume 2017, Article ID 3432074, 13 pages.
5. Text book of shoe sizing system by Mr.R.SenthilKumar.
6. Manuals from Footwear Design and Development Institute (FDDI).
7. Manuals from Central Leather Research Institute (CLRI).
8. www.leathersscorg.in
9. www.assignmentpoint.com
10. www.worldwidescienceorg.in