# Problem solution kit

Online business has been set up for around at least 30 years. The on-line media has extraordinarily influenced the whole lifestyle worldwide or, at least, 99% of it.

Everything started in the late 80's, when the web entered the lives of many individuals around the world. Regardless of the numerous issues it brought about in the mid 2000's, the internet business industry has developed quickly and impacted all sides of employment in the public area. There has been an expanded pace of improvement in the public eye due to internet business.

Recommendation systems have been described via many researchers in extraordinary ways. Some have described them as supporting systems which assist customers discover data about products for their pastime quicker than if it weren't for them (Park et al., 2011). They can additionally be defined as software programs which help users to decide and predict their wishes by analysing the consumers' behaviour and their shopping records (Jannach & Friedrich, 2013). They can additionally be defined as a statistics filtering techniques that are able to supply guidelines of commercial items for customers (Lee, 2012; Bobadilla et al., 2011).

The goal of recommendation systems is not to make money. However, some groups like Amazon have turned this into a money-making commercial enterprise as it helps improving their sales. Building recommendations has also resulted into a robust enterprise as it works with maintaining loyal customers (Claypool et al., 1999).
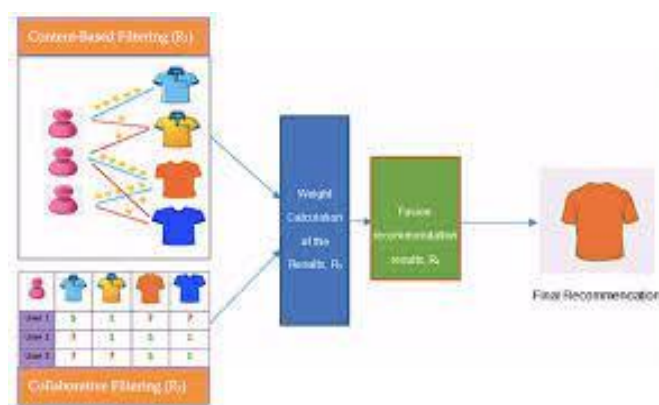
Recommender systems no longer consist only in calculating consumers' similarities to make recommendations, but also in analysing in detail the consumer's trends and in mining facts (Claypool et al., 1999). Since The adoption and introduction of an improved e-commerce in the last 30 years (Tian & Stewart, 2008; Mirescu & Maiorescu, 2010) has come with many problems which have impacted the operation of the recommendation systems.

These websites encompass many customers and the availability of too much information. Browsing from a webpage to another, shopping online based on many alternatives and a great deal of detail have been a setback for e-commerce. Despite all these problems, humans cannot renounce to use it. The more people use it, the more information is generated. Customers tend to discover it challenging to get access to the required and efficient information (Isinkaye et al., 2015).

In order to resolve this problem, e-commerce providers and shops have resorted to the use of recommendation systems. These are intelligent systems that can depend upon a single mouse click or key stroke to study the conduct of costumers and predict what their desires are (Krizhevsky et al., 2017) (Melville & Sindhwani, 2010). Pazzani's method (Pazzani, 1999) makes use of a person's profile as a vector illustration of weighted words derived from positive training example, by employing the Winnow algorithm. Several hybrid technics are considered to be the classification tasks (Pine, 1993, Schafer et al., 1999).

Fashion Recommendation System with Machine Learning
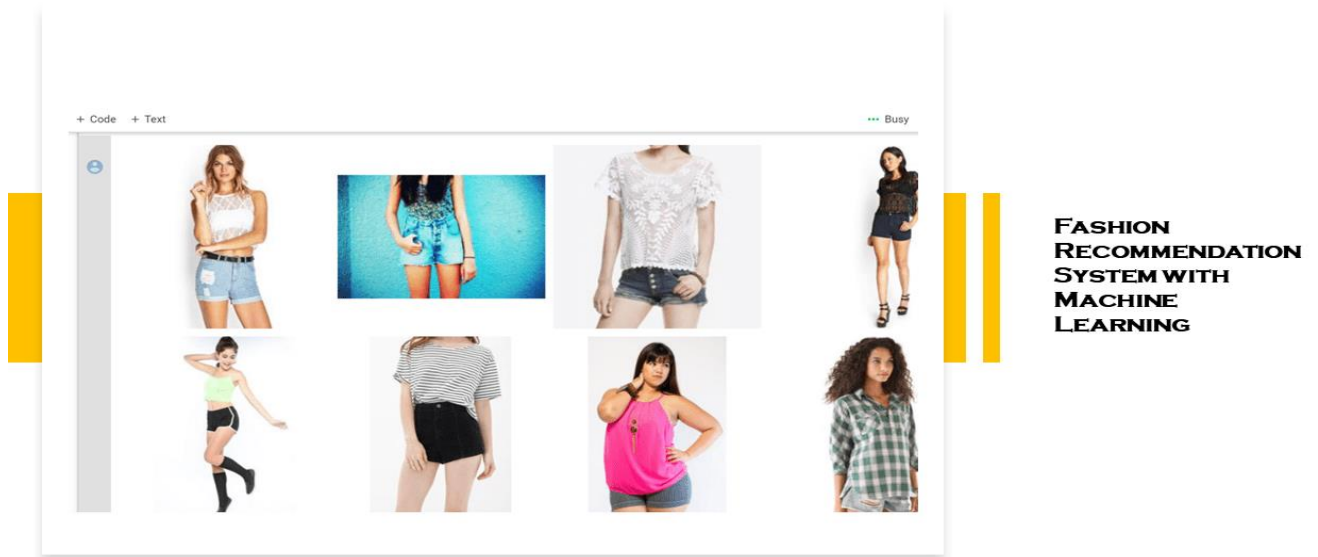
The recommendation system that is currently used by most e-commerce market-places selling clothing items is based solely on customer's previous purchases, trends in the street fashion industry and sponsored styles from brands. Though this recommendation system can give out a modest performance it doesn't feel personal to any of their shoppers. A style that may suit one body type not necessarily mean to suit the other body types as well [2]. To maximize growth in e-commerce profits the fashion item selling market places must understand the preferences of different customers and provide more intelligent recommendation services. Unlike generic consumer goods, clothes represent significant variations in visual appearances, which have a vital impact on consumer's satisfaction and their buying decision. Body shape compatibility with clothing styles is important [3]. When styling for the body type, it is essential that the recommendation models as well as the customer under-stands the unendingly different body shapes. Creating a recommendation model that fits for basic body types like hourglass, rectangle, triangle, inverted triangle, pear, round is a challenge. Possibly only theoretically as selecting the types of clothes that can accentuate every body's highlighting features and town down ones which a customer might not find appealing requires a wide training dataset. To determine the body shape, the proportion between body measurements is to be dealt with carefully. Many body shape calculators determine body shapes using alphabetical letters, fruit shapes and geometric objects, which are subjective to measure and

susceptible to multiple biases as there is a lack of standardization in the determination of body shapes. Upon understanding and analysing the type of body shape, to find a style that best suits would greatly affect the look and tidiness. It's critical to comprehend the limits, as well as the possible style and physical characteristics.

It is also critical that a deep learning model for classifying fashion apparel images is carefully selected and implemented emphasizes that state-of-the-art performance can be achieved by jointly performing deep representation learning for the content in-formation and collaborative filtering for the ratings matrix[4]. As far as the authors know, collaborative deep learning is the first hierarchical Bayesian model to bridge the gap between state-of-the-art deep learning models and recommender systems. The Bayesian nature of CDL provides potential performance boost if other side information is incorporated. The models achieve performance boost mainly by loosely coupled methods without exploiting the interaction between content information and ratings. To get started with our recommendation model we refer other related works, their inferences are highlighted.

Through our research we analysed that user centric Fashion Recommendation Models can be broadly classified into two categories, "interested outfit recommendation" and "recommending fashion goods to a user provided product" and how deep learning can be useful in performing image classification. To take this a step further our recommendation model focuses on recommending fashion good to a user. Body measurements, calculating their body types, analyzing and classifying fashion apparel image data annotated in terms of apparel suitability to body types are considered during experimentation. The present work aims to address the issues of personalization and the subjectiveness of fashion recommendation by making the recommendation user centric by taking into account the user's body type, other physical features, inter compatibility of recommended items etc. Therefore, proposed work is able to provide a personalized recommendation. Current recommendation systems on e-commerce platforms rely on recommending either the most popular product or products that are like the customers previous purchases. Even though the current recommendation system is gives satisfactory performance, but it does not feel personalized to the customer.

Another problem was that most images found of models online are slender hour glass body type which is not a very common body type hence body type prediction through image analysis was not a feasible solution. Another solution that has been seen in fashion recommendation is fashion consultants which recommend items that complement each other well and thus recommend a complete outfit but they also do not consider the body type while recommending the clothing apparel which is what we plan to do. We plan top provide recommendation completely based on body type.