Proposed solution

Overview of Recommendation System

The era of recommendation systems originally started in the 1990s based on the widespread research progress in Collective Intelligence. During this period, recommendations were generally provided to consumers based on their rating structure [52]. The first consumer-focused recommendation system was developed and commercialized by Goldberg, Nichols, Oki and Terry in 1992. Tapestry, an electronic messaging system was developed to allow users only to rate messages as either a good or bad product and service [53]. However, now there are plenty of methods to obtain information about the consumer's liking for a product through the Internet. These data can be retrieved in the forms of voting, tagging, reviewing and the number of likes or dislikes the user provides. It may also include reviews written in blogs, videos uploaded on YouTube or messages about a product. Regardless of communication and presentation, medium preferences are expressed in the form of numerical values [52,54]. Table 1 presents the history of the progress of fashion recommendation systems over the last few decades.

Proposed methodology

In this project, we propose a model that uses Convolutional Neural Network and the Nearest neighbour backed recommender. As shown in the figure Initially, the neural networks are trained and then an inventory is selected for generating recommendations and a database is created for the items in inventory. The nearest neighbour's algorithm is used to find the most relevant products based on the input image and recommendations are generated.

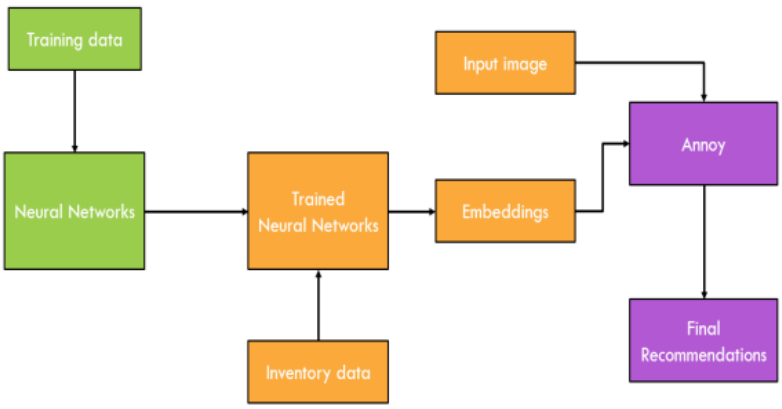

Figure 1. Block diagram of proposed system

Training the neural networks

Once the data is pre-processed, the neural networks are trained, utilizing transfer learning from ResNet50. More additional layers are added in the last layers that replace the architecture and weights from ResNet50 in order to fine-tune the network model to serve the current issue. The figure shows the ResNet50 architecture.

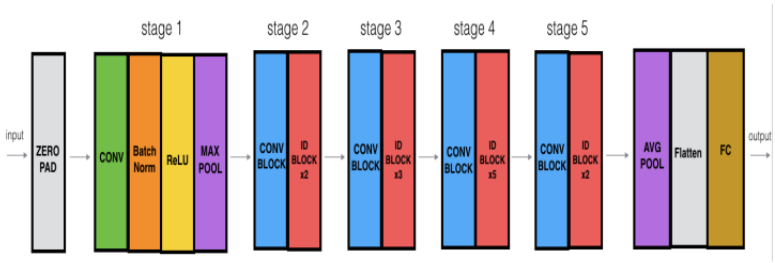

Figure 2. ResNet50 architecture

Recommendation System

Recommendation system (RS) is referred to as a decision-making approach for users under a multidimensional information environment [61]. RS has also been defined as an e-commerce tool, which helps consumers search based on knowledge that is related to a consumer's choices and preferences [59]. RS also assists in augmenting social processes by using the recommendations of other users when there is no abundant personal information or knowledge of the alternatives [52]. RS handles the complication of information overload that consumers usually encounter by offering customized service, exclusive content, and personalized recommendations [57]. There are multiple phases involved in the recommendation system that develop the foundation of any state-of-the-art recommendation system. These are defined as the information collection phase, the learning phase, and the recommendation phase. Figure 2 shows the interrelationship of these phases involved in the recommendation process. It shows that information collection is the initial stage of RS, which is followed by the learning phase and the recommendation phase. The recommendation provided in the last phase can be generated based on information gathered during the information collection phase.

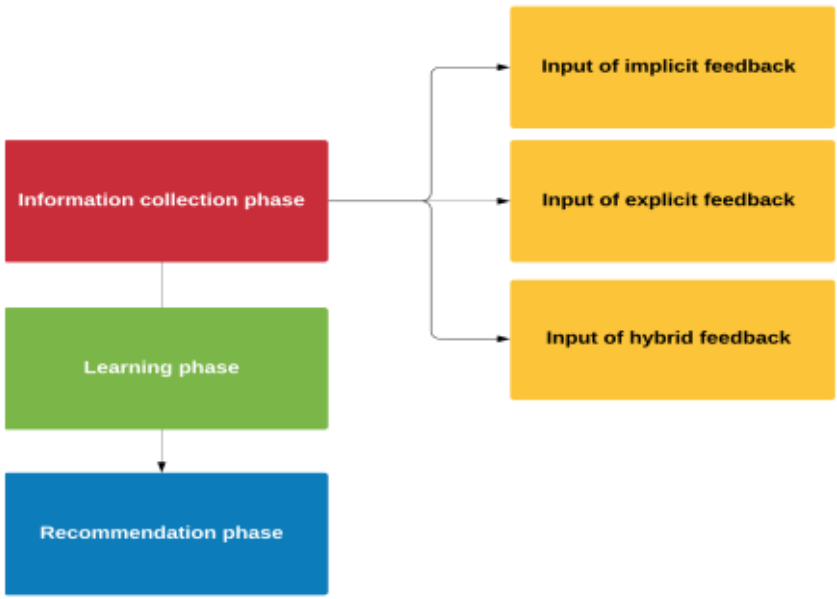

Figure 3. Phases of recommendation process