

# Gesture Recognition: towards Making Future Retail Buying Experience Stimulating

Preeti Mehra, Balpreet Kaur

**Abstract:** *In the present study, an attempt was made to identify the core keywords through text mining and also to find out whether the core keywords are imperative for presence of gesture control technology in retail stores. First, we collected online reviews of respondents (customers) and unearthed core keywords from it by using method of text mining. And then text clustering analysis was applied to investigate the importance of the extracted core keywords. After that, empirical test was conducted for exhibiting the influence of core keywords through examination of the significance of a retail store's adoption of gesture control and other technologies. R programming software was employed for the analysis of the same. It was concluded that the customers consider 'Gesture Technology' assisted activities as being 'Fun' and 'Fulfilling'. On the other hand, the consumers believe these technologies can also be used to create a 'Social Bond'.*

**Key Words:** *Gesture Recognition, Retail Store, Visual, Text mining, R program.*

## I. INTRODUCTION

### Gesture Recognition

For centuries humans have been attempting to cognize human body language and have been very successful in bringing out nuances of human psychology. Complex human behaviour, intricate behavioural patterns have enabled use of computers and other technology to understand human emotions and draw inferences about human behaviour. Human sign language, postures and proxemics are being mined to get a deeper understanding of human emotions.

Gesture recognition, as the concept is popularly known involves the interpretation of human gestures with the aid of mathematical algorithms. The study involves understanding emotions usually from gestures mostly originating from the face or hands. These gestures are used to understand human body language and draw inferences about human thoughts and commands (R. Cipolla and A. Pentland, 1998). The concept of gesture recognition is being used in various sectors like Automotive, Home Automation Consumer Electronics, Gaming, Defence, Mobiles, sign language translation etc. (Chai et al., 2013).

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**Dr. Preeti Mehra**, Associate Professor, Mittal School of Business, Lovely Professional University, Phagwara, Punjab, India-144411. Email id- Preeti.23746@lpu.co.in.

**Dr. Balpreet Kaur**, Associate Professor, Department of Management Studies and Commerce, DIPS Institute of Management and Technology, Jalandhar, Punjab, India. Email id- Balpreetbanu@yahoo.co.in

### A. Using Gesture Recognition to Make Retail Experience Stimulating

Traditionally, retail was more of a business arrangement where in the success of the stores depended on the success of the business transactions. Emphasis was primarily on selling products, balancing costs and achieving profitability. With increased significance of customer brand loyalty, the focus soon shifted from just selling to making the overall shopping experience stimulating (www.onmsft.com).

A prospect visiting a retail store does not have only a wish of buying a product. It is journey of interaction and engagement with a brand across different rostrums of procurement that he wishes to embark. Technology has played a big role in building customer expectations on how a shopping experience should be. Starting from the availability of different sources used for information seeking, searching different options for purchase, comparing features, searching good deals, reading review technology aids the modern prospect in so many ways. The question here arises that can customer be cajoled further by giving the experience of look and feel?

There has been a radical change in the shopping behaviour of customers over the previous years. The retailer needs to understand that shopping has to be seen as a brand interaction and engagement story. This entails the creation of numerous interface points. These points can be created at different stages in the shopping experience. The more the level of interaction and engagement a brand is able to make, the better is the brand story going to be. Stories are living experiences; that create an emotional bond with the brand. Once, this bond is created the customer will come to the store for the bond retention not only for shopping.

### B. Tools Being Used for Building Connection

Microsoft has come up with a tool 'Kinect' which promises to be the future of retail shopping. This tool promises to engross retail customers in innate ways. The tool uses digital signs powered by Kinect for Windows to entice B2B customers into the business. The tool makes it possible for retailers to bring the entire 'display of brands' to life.

The key lies in the creation of a convenient, totally engaging and thoroughly enjoyable shopping experience in which a shopper feels thoroughly captivated. Appealing solutions are crafted to capture the attention of potential customer. Efforts are undertaken to convert a potential customer's normal shopping experience into a completely stimulating one. Interaction with brands, on colossal screens, reconnoitring brands virtually with the help of gestures are all a part of the overall package of the stimulating experience promised by the software (Chevalier and Mayzlin, 2006)

II. REVIEW OF LITERATURE

Jarboe and McDaniel (1987) uncovered that shopper who browsed in a mall, ended up making spontaneous purchases as compared to the ones who were non-browsers. The longer the browsing period, the possibility of encountering more stimuli would be there and will lead to an increase in the likelihood of feeling impulse urges. Choudhary (2016) examined variables that influenced shoppers’ impulse purchase urges like colours, lighting, visual displays. The study suggested that in order to achieve success in fierce competition, it is essential to control these impelling factors via retailing activities and tactical marketing.

Stern (1962) conceptualized that a retail shopper’s exposure to stimuli inside a store acted as an information aid especially for those customers who went for shopping without any plans of what they intended to buy. It was the stimuli that aided them in their pre-purchase decisions. The stimuli created a desire which ultimately turned into a motivation to procure something from the outlet. Han et al. (1991) in their study elaborated that the presence of stimuli like good visual merchandising inside a retail store can motivate the shopper to make a purchase. It was also suggested that the superior the stimuli the more would be its possibility to create an urge to shop among the customers.

III. OBJECTIVES

1. To understand the effect of visual display of a brand on customer satisfaction and perception.
2. To explore the possibilities of using gesture recognition to make retail shopping experiences more stimulating.

IV. METHODOLOGY

The present study focuses on qualitative data. These data usually contain information like the text, quality, and consistency of the data. The data of the study includes the online reviews of retail customers that were posted on social media sites of popular retail stores. Some of the biggest retail stores of the world were covered. The data consisted of comments, experiences, and expectations of consumers who had visited these retail stores. The data covered an assessment of these services, online reviews, and possible recommendations after expending these services.

The period of study is two years that started on January, 2017 and ended on December, 2019. In that period, scores of reviews were collected from the websites of the retail stores. Social media sites of these retail stores were also visited and the content posted by people regarding their opinion on usage of technology in stores was gathered. So, the study collected the data in form of reviews of more than 800 people (irrespective to the place to which they belonged). After collection of text data, this was further used for extraction of core keywords. R programming software was used for the same.

V. ANALYSIS

A series of steps were followed to analyse the text data. Text mining process (as stated by in the studies of Hotho et al, 2005; Fan et al, 2006; Meyer et al.,2008; Netzer et al, 2012; Mostafa, 2013; Hong and Park, 2016) was undertaken for extracting the important words. After extraction, those words were clustered for further analysis. The comprehensive process is as follows:

A. Data Collection

The data was collected and an entire record of the data was maintained. A detailed report of the text was prepared for the purpose of analytics. The contents were in the form of word documents, feedback emails as well as content posted on social media platforms.

B. Key Word Extraction

A series of pre- processing steps was followed to increase the quality of text mining. The letters which are in uppercase are converted to lowercase. Punctuation symbols (like “, @, ”, #, “.) are removed from the text. Stop Words (common words) which are inbuilt in R program are also removed. These are a set of common words that are mostly used in a text like "again", "further", "then", "once", “here”, "there", "when", "where", "why", "how", "any", "both", "each", "few", "more", "most" "all" etc. were removed. Numbers were also removed from the text.

This resulted in extraction of a total of 1258 keywords. These keywords were arranged on the basis of their sparsity. A total of 32 keywords, extracted by applying the sparsity 0.8, were used for further analysis. As there are so many keywords which do not help in making a judgement about the perception of the people and fewer words hinder the analysis, so only few words emerge as significant that is a relatively good figure.

The keywords which have high frequency include “buying,” “impulse,” “informative,” “influences” “awareness,” “visual,” “choice,” and so on. Figure 1 indicates the frequency of keywords appearance by using word cloud method. Further, Table 1 displays the frequency distribution of these keywords and Figure 2 depicts the distribution chart of keyword frequency.

Wordcloud of KeyWords

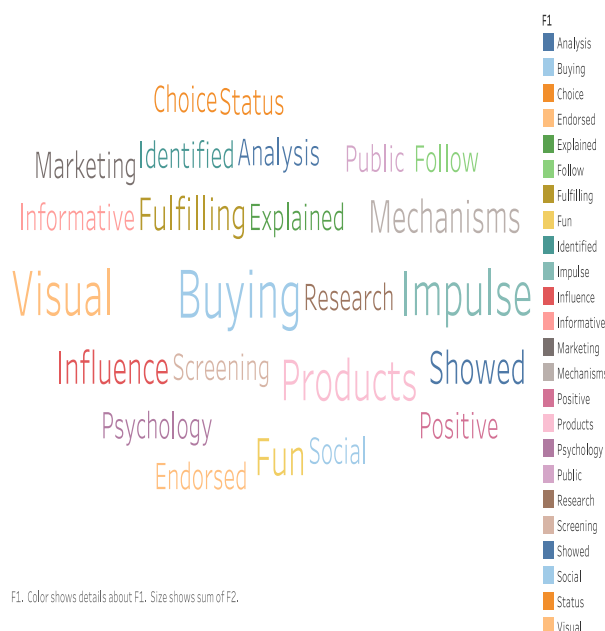
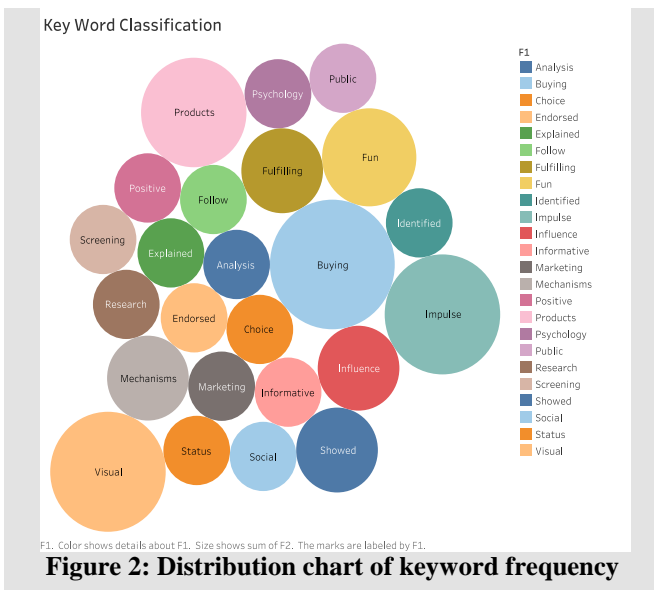


Figure 1 : Keywords appearance by word cloud method

**Table 1 : Frequency Distribution of keywords**

Buying	7
Impulse	6
Products	6
Visual	6
Fun	5
Fulfilling	4
Status	3
Informative	2
Choice	3
Social	2
Screening	2
Positive	2
Public	2
Analysis	2
Endorsed	2
Explained	2
Follow	2
Identified	2
Influence	3
Marketing	2
Mechanisms	3
Psychology	2
Research	2
Showed	2

Showing 23 of 32 entries



**C. Classification of keywords by Text Clustering**

In the present study, hierarchical clustering method was used for the analysis of keyword classification. The distance among the keywords was assessed by the Euclidean method. The set of 32 words was categorized into two clusters. Cluster 1 includes words expressing Consumer Perception like “Fun”, “Fulfilling”, “Positive”, “Explained”, “Informative”, “Social”, and “Influence, Identified”, “Psychology and “Showed”.

On the contrary, Cluster 2 consists of more Technology Service content such as “Visual”, “Products”, “Screening”, “Marketing”, “Mechanisms” and pointed to the attributes that effected customers’ satisfaction level.

**D. Effect of Core Keywords**

In order to provide practical insinuations to the retail industry, an analysis was further made with the help of keyword extraction. The core keywords as well as the clusters that have been formed can be considered to represent online reviews of retail customers who have been exposed to gesture technology in retail stores. We endeavoured to comprehend the significance of demonstrative keywords by scrutinising the impact of each evaluation notion on satisfaction levels of the customer.

Further, the effect of the five keywords includes (that are the foremost keywords relating to the content of Cluster 1) “Visual,” “Buying,” “Fun,” “Impulse,” and “Fulfilling,” was examined. These keywords are indicative of ‘Customer Perception on Gesture Technology’.

In the analytical model, the words for ‘Service Content provided by Technology’ were related to “Products”, “Marketing”, “Screening” “Mechanisms”. These keywords were indicative of the attributes that lead to customer satisfaction towards technology services provided by retail outlets.

The customers related the ‘Mechanism’ of ‘Screening’ of a ‘Product’ on a ‘Visual’ screen or platform as an important attribute that influenced their buying patterns. These mechanisms directly influenced their ‘choice’ of a brand.

**VI. CONCLUSION**

To survive in the retail sector, there is need of using data mining techniques to understand behaviour of the consumers. In this study, text mining has been done to generate a cohesive understanding of keywords in the retail industry that has been adopting gesture control technology. Based on the data relating to retail customers reviews, a two way process involving extraction of keywords by text mining and then grouping these keywords into clusters was followed.

The gesture control technology has been adopted by retailers in many ways; Kinect for Windows Retail Shopping’, ‘Gesture Control Screen’, ‘Virtual Fitting Rooms’, ‘Retail Interactive Touch Screens’, ‘Use of Visual Mirrors’, ‘Augmented Reality Window Display’ and has been appreciated by the customers as well. The ‘Mechanism of Gesture’ Control directly influences the customer satisfaction.

The results depicted those keywords that affect the consumers’ satisfaction and the attributes of this technology that effects their perception and assists them in the buying decisions.

Customers consider ‘Gesture Technology’ assisted activities as being ‘Fun’ and ‘Fulfilling’. On the other hand, they consider these activities can be designed in a manner that promotes group activities. This will help in development of ‘Social Bonds’ among the shoppers. This implies that retailers should pay attention on creating multiple screens where people in groups can bond over shopping.



It was further observed that the customers believed that the technology lacked on being too 'Informative' and 'Explainable'. An effort can be made by the retailers to provide detailed and customised information on each product and also mention the company that has manufactured it. Minute but significant details especially in case of apparels and accessories can also be added to enhance its presentability.

This technology can be further made more 'Fun' by adding specially 'Endorsed' products. A special mention of the most popular or tried products can be made. Virtual awards can be given if an apparel looks well fitted. This will lead to building up of anticipation while shopping.

This study presents practical allusion for retail stores to competently achieve keywords. However, as the research range of the study was limited to few retail stores, collected data can be biased and limited to customers who were loyal to the store and were biased in expressing their experience. Further research can be carried out in an attempt to generalise the study.

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### AUTHOR PROFILE



PhD, MBA (Marketing)

**Preeti Mehra's** research focuses on Micro Branding; Sachet marketing; Rural Marketing Strategy and Brand Management. She has been a strong advocate of sachet marketing by global corporations. Her writings have focused particularly on brands, particularly Micro Brands and their evolution in the Indian markets especially the Rural Markets. She received her PhD from

Guru Nanak Dev University, Amritsar. She has written a number of papers for journals of SAGE and other journals of repute. She has been presenting

her research work in the IIMA conference on Emerging Technologies and few other international platforms as well.

Before entering academia, she has worked with UNIDO as a co-ordinator for the Sports Manufacturers. She co-ordinated with Govt Agencies and worked towards the development of the cluster. She has worked as a Marketing Co-ordinator for two companies and helped in designing their marketing programs.



**Balpreet Kaur** is Associate Professor in Department of Management Studies and Commerce at DIPS-IMT, Jalandhar. She did her Ph.D. from Guru Nanak Dev University, Amritsar. Her area of research is Viral Marketing. She has expertise in the field of Scale Development and Model Building, Structural Equation Modeling using AMOS. She has more than nine years of teaching experience. She has participated in various conferences and also published research papers in international and national journals of repute. She was the co-author of the paper which was awarded as Best Empirical Research Paper by the Indian Commerce Association in December 2013.