International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056
Volume: 04 Issue: 06 | June -2017 www.irjet.net p-ISSN: 2395-0072

Finger Gesture Based Rating System

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Abstract - *Companies and organizations are trying to discover strategies to achieve enterprise competitiveness to improve their flexibility and responsiveness by changing or finding efficient and effective methods, technologies and/or operational strategies that involve product performance analysis and user satisfaction. This gave birth to the strategy of rating systems. This paper is focused on the new type concept of collective rating system based on hand gestures. The proposed system uses computer vision and cloud computing based business workflows to achieve the above goal. It further discuss the problems in the existing and proposed system along with the future prospects and improvements of the project.*

Key Words: Cloud Computing, Collective Data Manager, Computer vision, Costumer Rating system.

1. INTRODUCTION

With the increase in the competitive growth in the business market the facilities being provided to the end user are large. Speed delivery, live status tracking, online shopping and rating are few of the modern facilities being provided to the customer. Rating systems is important in the performance measurement. Performance measurement is the process of collecting, analyzing and reporting the in performance of an individual, group, organization, system or component [1]. The processes, strategies and growth of the company or organization can be measured by this process. Also helping the customer to compare and choose a better product based on usage experience by other users.

With the growth of business and industries from the manual paper work feedback, to the app-based and e-commerce rating, the rating system has seen a major evolution with time. In this paper we discuss a new proposed system for rating.

E-commerce, is a type of industry where buying, selling and processing of products or services are conducted over electronic systems such as the Internet and other computer networks. The concept of Cloud computing is a now applied to e-commerce. The integration of cloud computing and e-commerce has changed workflow of today's industries. It has a great influence of cost reduction, performance enhancement and customer satisfaction. E-commerce has revolutionized the business world. Majority of these type of sites comes with an integrated rating and feedback portal where the customer gives a rating system based on performance and usage.

The remainder of the paper is organized as follows. Section II summarizes related work for our paper. Section III describes the existing system and Section IV is the proposed system. Section IV presents our evaluation. Finally, Section V addresses the conclusions and the future work.

2. RELATED WORK

2.1. Cloud Computing Services

The area of cloud computing has grown massively. It provides all the necessary tools and services needed to sustain the entire business workflow hosting on the internet. Few of the services of which are focused for the need of this system are discussed as follows [1].

2.1.1. Database-as-a-Service (DbaaS)

A database is defined as a collection of data in an ordered fashion. Database-as-a-service (DbaaS) provides users with some form of access to a database without the need for setting up physical hardware, installing software or configuring for performance. The service provider takes care of the administrative tasks and the maintenance, with an option for users to do so, too.

2.1.2. Monitoring as a Service (MaaS)

Maas is a framework that run the interface for monitoring functionalities for various other services and applications within the cloud. MaaS is used to track states of applications, networks, system or any element that may be deployable within the cloud.

2.1.3. Storage as a service (SaaS)

Storage as a service (SaaS) is a business model in which a storage is provide to the companies on the internet thereby saving the cost of secondary hardware and devices. This is mostly used by small companies for managing backups, and providing cost savings in personnel, hardware and physical space.

2.2. Computer Vision

Prominent existing algorithms for computer vision exists in an open source framework known as OpenCV. Finger and gesture recognition is a well-studied area with several implementations already in use in several devices. There are filter based, neural network based approaches, and machine learning approaches. Facial and object recognition techniques based descriptors such HOG (Histogram Oriented Gradients) allow us to uniquely identify

a person or an object and there are several datasets available to do so.

2.3. Rating Systems

Starting from online shopping to restaurants to viewing any pages or blog in a social media, the process of rating is prevelant everywhere. Rating refers to the process where to mark product or individual within a certain parameter of prescribed experience of that particular dealing. In today's generation customers often judge a product by its rating. A major percentage of customers are acquainted in reviewing products and also buy products based on this system [5].

Rating is a system of ranking customers exposure to a certain experience. It is a marketing process in which, the particular company or any said organization gets a direct survey and tries to mold themselves in the needs accordingly. The utilitarian process also hands an idea to the customer about their choice of selection.

3. EXISTING SYSTEM

3.1. Individual Rating System

In the existing system all companies maintain their individual rating system. The user rating given to a particular group/organization or element is limited to the company. The companies needs to have a dedicated IT group to maintain and analyses this section of the company. On the other hand the users are only limited to the elements of a particular company and compare with the elements of the same company.

3.2. Application based rating System

Current application based rating software utilizes mobile software connected to a cloud database to manually input a rating from the customer. Each service provider usually have their own rating capturing system set up for their use, but most determine rating as out of 5.

The customer is required to manually input their desired rating. Other customers can view the ratings provided on the company's website or on the specific mobile application.

4. PROPOSED SYSTEM

4.1. Collective Master Data Manager System

In this case, unlike the current system, the companies can vend services from a common portal. The company does not need to have a special IT sector dedicated for this system. The portal enables the facilities of extraction of data, analyze and return a report to the end users. Many companies using services from the same company enables comparisons of products among services and rating of various companies on a common portal, thus opening up new horizons to big data analytics.

4.2. Hand Gestures (Finger Count) Based Rating

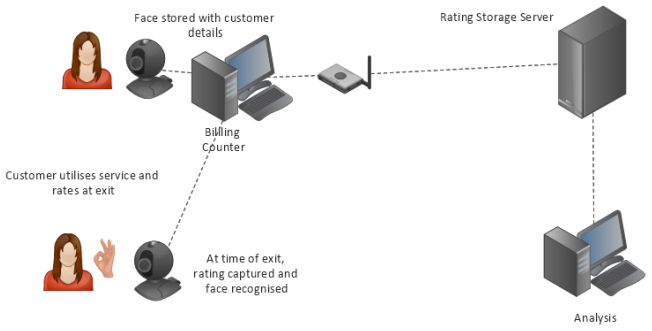
This proposal utilizes fingers held up by the customer as the basis for rating, with the number of fingers held up as the rating out of 5. The system also saves the descriptors of the person to prevent one person's rating to be counted multiple times. To prevent ambiguity and multiple people providing ratings, a designated area is marked for the person to stand in front of the camera which acts as a placeholder for the proposed algorithm. The person's identity can be determined easily by correlating his HOG descriptors with his name at the time of purchase and billing. The proposed system works on the following algorithm:

Algorithm

1. Determine if a person is standing at the place holder by comparing HOG descriptors with predetermined dataset.
2. If a person is present, capture image from the camera and retrieve name from image captured at billing counter.
3. Convert captured image to grayscale.
4. Apply Gaussian blur to the image for noise.
5. Apply background subtraction (to retrieve only the hand).
6. Extract contours or edges using any edge detection algorithm preferably Canny.
7. Determine convex hulls.

Fig -1: Hand gesture based rating

8. Count the individual fingers from convexity defects [4].



9. The number obtained is sent to the cloud database along with identity of the person as determined at the time of billing.
10. The data is stored in the cloud databases and along with the information about the product or service.
11. The ratings are monitored and verified against inappropriate content based on the list already stored in the server.
12. The data contained in the database is effectively analyzed based on required parameters and reports are sent to the company selling/providing the product or the service respectively.

5. CONCLUSIONS

This proposal allows customers to spend minimal time to provide valuable feedback to the service providers, thereby ensuring an honest and relevant feedback. The gesture aspect of it allows for more social engagement with the service providers. The universal rating collection allows the ratings to be relevant across multiple providers whilst facilitating analysis on a large scale. Further research can be performed on the analysis of universal ratings and their applications.

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