3.5.1 - Number of Collaborative activities for research, Faculty exchange, Student exchange/ internship during the year

(2020-2021)

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S.NO	PAPER TITLE	AUTHOR	Co- Author	DEPARTMENT	PAGE NO
1.	Hydrothermal synthesis of samarium(sm) doped cerium oxide(ce)2) nanoparticles: characterization and antibacterial activity	S.RAVIKUMAR Sengunthar Arts and Science College, Tiruchengode	A. Balamurugan , Government Arts and Science College, Avinashi	Physics and electronics	4
2.	Assessment of service quality on customer satisfaction in five star hotels in chennai city	S.SEKAR Sengunthar Arts and Science College, Tiruchengode	Dr.B.Sudha Periyar University College of Arts and Science, Pappireddipatti, Dharmapuri-Dt,	B.Com CA	5
3.	The effect of service quality on customer satisfaction Towards star hotels in tamilnadu	S.SEKAR Sengunthar Arts and Science College, Tiruchengode	Dr.B.Sudha Periyar University College of Arts and Science, Pappireddipatti, Dharmapuri-Dt	B.Com CA	6
4.	Measuring service quality and customer satisfaction towardss five star hotels in tamilnadu	S.SEKAR Sengunthar Arts and Science College, Tiruchengode	Dr.B.Sudha Periyar University College of Arts and Science, Pappireddipatti, Dharmapuri-Dt	B.Com CA	7
5.	A study on financial performance of oil industries in tamilnadu	R.MUKESH KANNA Sengunthar Arts and Science College,	Dr.N.Pasupathi ParkS College Tiruppur	B.Com CA	9

		Tiruchengo de			
6.	Enhanced lda based input selection towards the sentimental analysis	DR.J.K. KANIMOZ HI Sengunthar Arts and Science College, Tiruchengo de	1C. Suresh Kumar, Cheran Arts Science College, Kangeyam	PG COMPUTER SCIENCE	10
7.	Structure-based virtual screening, in silico docking, adme properties prediction and molecular dynamics studies for the identification of potential inhibitors against sars-cov-2 mpro	A.JEEVA Sengunthar Arts and Science College, Tiruchengo de	Anbuselvam Mohan1 Selvamm Arts and Science College (Autonomous), Namakkal,	Biotechnolog y	11

Hydrothermal synthesis of samarium (Sm) doped cerium oxide (CeO$_2$) nanoparticles: Characterization and antibacterial activity

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ARTICLE INFO

ABSTRACT

This work describes the synthesis, characterization and antibacterial activity of samarium (Sm) doped cerium oxide nanoparticles. The Sm doped CeO$_2$ nanoparticles were prepared by hydrothermal method with various concentrations ranges from 2 mol % to 8 mol %. The XRD pattern revealed crystalline nature with size of 58.3 nm–43.47 nm. The Ce–O chemical bonding nature was confirmed using FTIR. FESEM exhibited fascinating shapes like agglomerated octahedral and grow rod arm on octahedral phases of nanoparticles. UV–Vis was used to measure the optical behaviors of CeO$_2$ nanoparticles. The samarium doped CeO$_2$ nanoparticles showed better antibacterial activity against the pathogenic bacteria.
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1. Introduction

Rare earth metal oxides play a vital role in diverse areas such as chemistry, physics, material science and biology. Among the rare earth metals ceria (CeO$_2$) nanoparticles has received enormous interest in the present frontier research, because of their wide application such as UV absorber and blocker, solid oxide fuel cell, optics, antibacterial agents, gas sensor and three way catalyst for automotive emission control [1–5]. There are several methods such as co-precipitation, sol-gel, micelle, chemical vapour deposition, sonochemical micro wave and hydrothermal method for the synthesis of CeO$_2$ nanoparticles [6–10]. Among them hydrothermal methods are finding increasing application in material science and solid state chemistry. Hydrothermal method is technologically important for crystal growth and synthesis of new material with useful properties. In this method the use of high pressure provides an addition parameter for obtaining fundamental information on the structures, behavior and properties of solid [11].

Ceria nanoparticles show tremendous potential in antibacterial activity against the bacteria such as *E. coli, B. cereus, S. aureus* and *S.*

typhi. Fluorite lattice of CeO$_2$ NP's antibacterial capability is of great influenced by morphology (Cube, octahedral and rod structure etc) with exposed crystal planes of 111, 110 and 100 [12]. In addition, an oxygen vacancy in crystal lattice enhances the CeO$_2$ NPs antibacterial potential. The metal/metal oxides nanoparticles antibacterial activity interacts with microbial cells through different mechanism. The nanoparticles can either directly interact with the microorganism cells (interrupting trans-membrane electron transfer, disrupting or penetrating the cell envelope) or oxidizing cell compound or producing reactive oxygen species (ROS) to damage the microorganism cells. The mechanism of antibacterial activity of CeO$_2$ NPs could be oxidative stress associated with the bacteria. The CeO$_2$ NPs interacts with bacteria membrane, which disturbs the mesosomal process of cellular respiration, DNA replication and cell division [13,14]. In antibacterial activity, intracellular functional damages are due to ROS generation of excess oxygen radical and hydroxyl radicals in CeO$_2$NPs. The oxygen vacancies have great contribution to ROS generation in CeO$_2$ NPs for antibacterial activity [15].

To improve the antibacterial efficiency of CeO$_2$ NPs, oxygen vacancies are better through doping certain amount of trivalent rare earth metals on CeO$_2$ NPs, which decreases the lattice parameter compared with pure CeO$_2$ NPs and results from Ce^{4+} ions to
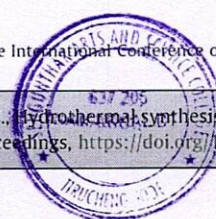
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ASSESSMENT OF SERVICE QUALITY ON CUSTOMER SATISFACTION IN FIVE STAR HOTELS IN CHENNAI CITY

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Abstract

The purpose of this study was to examine effects of service quality on customer satisfaction in selected five- star hotels in Chennai. The study was guided by the following objectives: to assess the composite elements that comprising the service quality performance indicators and to assess the effects of service quality on customer satisfaction in five star hotels. The research hypothesis was: There is no significant relationship between service quality and customer satisfaction. A survey of 72 customers was conducted in selected five star hotels in Chennai. Customers consisted both domestic and international tourists. Data was collected using self-administered Questionnaires. In this analysis, the P-value was 0.018 in the same hand Beta value was 0.517. The results showed that there was a significant relationship between service quality performance measurements and customer satisfaction because P-value was less than 0.05. The beta value of 0.517 was accounted for 51.7% of the likelihood of service quality performance which influences customer satisfaction. The results indicated a close correlation between these variables.

In assessing the level of customer satisfaction against service delivery, it was found that 49.4 percent of the customers were very satisfied, 38.3 percent were satisfied while 12.3 percent were not satisfied with the level of service provided in five star hotels. Hence for the business sector to have an edge, service quality must be considered a primary element for effective delivery of service and the succeeding customer satisfaction. In conclusion the null hypothesis

THE EFFECT OF SERVICE QUALITY ON CUSTOMER SATISFACTION TOWARDS STAR HOTELS IN TAMILNADU

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ABSTRACT

Service quality is the bond that the delivery with the Customer Satisfaction. It is a strong desire to stay as a member of a particular hotel industry and they maintain (or) exercise high levels of efforts on behalf of the PLA hotel. It is also termed as the individual's psychological attachment to the hotel industry. The study is basically to customer satisfaction and providing products or services with high quality. The service quality is a major challenge for the service industry. The objective of the study is to find out the factors that vary between demographic variables of the respondents and independent factors. The researchers have taken the independent factors, it was chosen on both primary and secondary data. This study identified five factors of service quality by focusing on the front office staff only, and explored the customers' expectations and perception levels of these services. The results of this quantitative assessment of service quality might provide some insights into how customers rate the service quality and assessed customers' satisfactions. The study implies that service quality plays an important role as a driver for higher customer satisfaction level in hotel service. Managers would focus on Empathy, Reliability, Responsiveness, and Assurance to achieve high degree of customer satisfaction which leads to customer loyalty and business profit.

Key words: customer satisfaction, hotel, service quality, customer perception.

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MEASURING SERVICE QUALITY AND CUSTOMER SATISFACTION TOWARDS FIVE STAR HOTEL IN TAMIL NADU

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ABSTRACT

From the last decade, the service sector has become greater economic importance. The elimination of waste due to poor quality and meeting customer expectations are the major challenges facing managers in the service sector. This chapter presents the reasons why we should measure service quality, customer satisfaction in hotel industry as well as their measures. Time by time, different researchers tried to find out the way to measure of service quality and customer satisfaction in the hotel industry. Next scientist generation improved the model of the precedents or invented a new one. Among all, three most popular models to measure customer satisfaction and service quality in the hotel industry are SERVQUAL, HOLSERV and lodging quality index. Each model has its own strong point and has been used flexibly in hotel industry. Moreover, it reports the difference in thecustomer expectations and perceptions for men and women, Asian and European guests relatedto the hotel services. It includes more detailed analysis such as service offerings, hotel facilities,hotels factors, etc. That affects their choices. The study is mainly focused to measure the service quality of the five stars hotel in Tamil Nadu

INTRODUCTION

Among service industries, hospitality is the fastest-growing service sector throughout the world9. The core hospitality economy today (2010 estimate) has an estimated turnover of £90 billion10.Hotel industry in India has been an important industry to the Indian Economy. It is one of the largest foreign exchange earners, to the country and also one of the largest employers, both directly and indirectly. For every room constructed, 3-5 jobs are created. The

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THE EFFECT OF SERVICE QUALITY ON CUSTOMER SATISFACTION TOWARDS STAR HOTELS IN TAMILNADU

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ABSTRACT

Service quality is the bond that the delivery with the Customer Satisfaction. It is a strong desire to stay as a member of a particular hotel industry and they maintain (or) exercise high levels of efforts on behalf of the PLA hotel. It is also termed as the individual's psychological attachment to the hotel industry. The study is basically to customer satisfaction and providing products or services with high quality. The service quality is a major challenge for the service industry. The objective of the study is to find out the factors that vary between demographic variables of the respondents and independent factors. The researchers have taken the independent factors, it was chosen on both primary and secondary data. This study identified five factors of service quality by focusing on the front office staff only, and explored the customers' expectations and perception levels of these services. The results of this quantitative assessment of service quality might provide some insights into how customers rate the service quality and assessed customers' satisfactions. The study implies that service quality plays an important role as a driver for higher customer satisfaction level in hotel service. Managers would focus on Empathy, Reliability, Responsiveness, and Assurance to achieve high degree of customer satisfaction which leads to customer loyalty and business profit.

Key words: customer satisfaction, hotel, service quality, customer perception.

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A STUDY ON FINANCIAL PERFORMANCE OF OIL INDUSTRIES IN TAMIL NADU

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Abstract - Finance is considered as life blood of business enterprise. The success and survival of any organization depends upon how efficiently it is able to raise funds as and when needed and their proper utilization. The object of the present study is to know the profitability and solvency managed. Hence, efficient management of every business enterprise is closely linked with efficient management of its finance. Financial performance is very most important for every company/ industries to measure and evaluate its performance in financial aspects. Financial performance may be used mainly to evaluate issues such as, overall performance, profitability, liquidity, solvency and effectiveness, credit policies and externally the potential investment as well as credit worthiness of borrowers etc. It helps to identifying the financial process, strength and weakness of the company/industry. One of the most important and powerful tool of financial performance is trend analysis. The study is based on secondary data collected from the Annual Reports of oil industry. Finance as a resource, in this industry needs to be improved today. Improvement of financial is possible by the way of proper planning and utilization of funds. Finance is a means which improves the performance of this core industry. Financial analysis helps a company to diagnose its profitability and financial soundness. For the purpose of the above reasons this study namely financial performance of oil industries in Tamil Nadu.

INTRODUCTION

Financial performance analysis is vital for the triumph of an enterprise. Financial performance analysis is an appraisal of the feasibility, solidity and fertility of a business. Out of the innumerable studies available on the subject some of the most appropriate studies have been revived. Financial ratios are important indicators of the company's health and are widely used by the investors and financial analyst to evaluate company's financial conditions. With passing time various types of ratios have been developed and used by the scholars and financial economists to analyse data and extract useful information for their decision making. However, most of these ratios are developed and devised by the developed and developing

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ENHANCED LDA BASED INPUT SELECTION TOWARDS THE SENTIMENTAL ANALYSIS

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Abstract

Big data creates considerable challenges for businesses due to its complexity. The fundamental challenge that firms face is processing and storing large amounts of data. In addition, strategies for dealing with a befuddling amount of raw data in various forms must be enhanced. It is also vital to develop scalable data storage in order to efficiently acquire and retrieve critical information. The importance of feature selection in today's society cannot be overstated. Feature selection is one of the most important factors that can affect classification accuracy. If the dataset has a large number of characteristics, the space will be huge and congested, reducing the classification accuracy rate. It is possible to employ a method that is both efficient and reliable for removing noisy, irrelevant, and redundant data. Then it's just a matter of determining what sentimental analysis entails. Single words from a text document can be utilized as features, or more complex pairings can be retrieved using a variety of approaches that add more information to the feature-document matrix representation. The huge number of properties and relationships that diverse feature types hold, however, causes the high dimensionality problem. As a result, feature selection helps to build effective and efficient sentiment analysis applications by selecting relevant and informative features to enhance classifier performance while reducing processing load. In this work, Enhanced LDA-based feature selection has been applied. LDA is one of the generative statistical models. In basic, the Latent semantic analysis has been the most widely used distributive model with the singular value decomposition. LDA is utilized for removing points from text that empower effective preparing, particularly for huge information analysis.

Keywords: sentiment analysis, LDA, NLP, KNN, SVM, NB

INTRODUCTION

Fundamentally, Sentiment Analysis (S.A.) is the examination of the emotions (for example, feelings, perspectives, assessments, musings, and so on) behind the words by utilizing Natural Language Processing (NLP) apparatuses. In case you're not mindful of what NLP apparatuses do – it's practically all in the name. Regular Language Processing basically expects to comprehend and make a characteristic language by utilizing fundamental devices and

ORIGINAL ARTICLE

Structure-based virtual screening, in silico docking, ADME properties prediction and molecular dynamics studies for the identification of potential inhibitors against SARS-CoV-2 M^pro

Anbuselvam Mohan[1] · Nicole Rendine[2] · Mohammed Kassim Sudheer Mohammed[3] · Anbuselvam Jeeva[4] · Hai-Feng Ji[2] · Venkateswara Rao Talluri[5]

Abstract

COVID-19 is a viral pandemic caused by SARS-CoV-2. Due to its highly contagious nature, millions of people are getting affected worldwide knocking down the delicate global socio-economic equilibrium. According to the World Health Organization, COVID-19 has affected over 186 million people with a mortality of around 4 million as of July 09, 2021. Currently, there are few therapeutic options available for COVID-19 control. The rapid mutations in SARS-CoV-2 genome and development of new virulent strains with increased infection and mortality among COVID-19 patients, there is a great need to discover more potential drugs for SARS-CoV-2 on a priority basis. One of the key viral enzymes responsible for the replication and maturation of SARS-CoV-2 is M^pro protein. In the current study, structure-based virtual screening was used to identify four potential ligands against SARS-CoV-2 M^pro from a set of 8,722 ASINEX library compounds. These four compounds were evaluated using ADME filter to check their ADME profile and druggability, and all the four compounds were found to be within the current pharmacological acceptable range. They were individually docked to SARS-CoV-2 M^pro protein to assess their molecular interactions. Further, molecular dynamics (MD) simulations was carried out on protein–ligand complex using Desmond at 100 ns to explore their binding conformational stability. Based on RMSD, RMSF and hydrogen bond interactions, it was found that the stability of protein–ligand complex was maintained throughout the entire 100 ns simulations for all the four compounds. Some of the key ligand amino acid residues participated in stabilizing the protein–ligand interactions includes GLN 189, SER 10, GLU 166, ASN 142 with PHE 66 and TRP 132 of SARS-CoV-2 M^pro. Further optimization of these compounds could lead to promising drug candidates for SARS-CoV-2 M^pro target.

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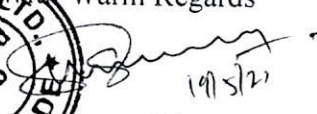
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To

Dr. P. VENKATACHALAM
Head & Associate Professor
Department of Microbiology
Sengunthar Arts and Science College
Tiruchengode-637205

Sir

Sub: AWE care Private Limited Funded Research Project – Approval letter – Reg.

Based on the discussion of presentation that you had with us for the AWE care Private Limited Funded Research Project entitled "Isolation and Characterization of Biosurfactant Producing Bacteria From Oil Contaminated Soil and Enhancing of Biosurfactant Production Using Agricultural Waste Material" presented before the Managing Director, Executive Committee for seeking approval, I am happy to inform that the Proposal has been approved for financial assistance (Rs. 47,000) by AWE care Private Limited. Further I wish to inform that the Project shall be initiated. We expect your kind cooperation for execution of this Project successfully at the earliest.

With Warm Regards

Director
AWE CARE Private Ltd

Copy to: The Principal
Sengunthar Arts and Science College
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