

**CERTIFICATE OF APPRECIATION**

We are happy to place on record, the support extended by the Department of Social Work, Dwaraka Doss Goverdhan Doss Vaishnav College, Chennai in piloting the Impact Study of various CSR activities conducted by MMA during the year 2022. Numerous CSR initiatives which were undertaken by MMA with the support of ACSYS Investments P Ltd, towards skill development of students from select government aided schools were analysed in detail and a report was rendered by the department.

The professional approach to the project and timely completion of the same, despite other academic commitments, is indeed highly appreciated and we thank the department for the whole-hearted cooperation in this regard. We thank in particular, the faculty team comprising the following members for their involvement, contribution and guidance to the students:

- Dr. B. Sulupriya (Head)
- Dr. Akileswari.S (Assistant Professor) &
- Dr. S. Madhusudanan (Assistant Professor)

We once again thank the College Management, Department of Social Work, faculty members and the student volunteers for the successful completion of CSR Impact Study.

Date: 3-4-23  
Place: Chennai

  
Gp Capt R Venkataraman (Retd)  
General Manager, MMA



# Stochastic Modeling & Applications

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**A CORRELATIONAL STUDY ON TOOLS OF INTEGRATED MARKETING COMMUNICATION ON THE PURCHASE OF FAST-MOVING CONSUMER GOODS****\*S. BALA MURALI AND S. GURUMOORTHY****ABSTRACT**

*This study is undertaken to understand the impact of Integrated Marketing Communication on the purchase of fast-moving consumer goods based on correlation and percentage analysis. Descriptive research method was used and samples were selected based in simple random sampling. Inter-relationships among the variables such as publicity and public relations, sales promotion, advertisement and internet marketing were studied to given suggestions on effective combination of Integrated Marketing Communication. All the above variables result in the purchase of fast-moving consumer goods independently. Results were not the same when it is integrated.*

*Keywords: Integrated Marketing Communication, fast-moving consumer goods, IMC, FMCG*

**INTRODUCTION**

Marketing communications are vitally important in order to increase the purchase of fast-moving consumer goods. All fast-moving consumer goods (FMCG) companies spend millions of dollars on marketing communications. However, it is still up in the air as to which communication tool or integrated communication strategy will provide the most value. This research paper investigates the relationship between Integrated Marketing Communication tools (internet marketing, Sales Promotion, Advertising, Public relations and Publicity) and purchase decision on fast-moving consumer goods

**REVIEW OF LITERATURE**

**Ruswanti et al. (2019)**, predicted the influence of Integrated Marketing Communication (IMC) techniques (sales promotion, advertising, direct marketing, and personal selling) on customers' intent to buy organic goods in a local Indonesian supermarket was projected. The primary data was gathered through the distribution of questionnaires to customers. A total of 128 consumers were included in the sample size. Before hypothesis testing, the data was subjected to a reliability and validity study. Only direct marketing had a substantial beneficial effect on the intention to buy organic products, according to the findings. Integrated Marketing Communication informs consumers about organic product purchasing policies.

**Abdul Haseeb et al. (2017)**, discovered how Integrated Marketing Communication, such as internet marketing, public relations, advertising, sales promotion, and direct marketing, influences consumer purchasing decisions of internet services. The primary goal of this research study was to investigate the impact of Integrated Marketing Communication on consumer purchasing decisions for Mobilink's internet service and make recommendations to marketing professionals. 435 To acquire primary data from respondents, questionnaires were employed. The findings revealed that online marketing, public relations, advertising, sales promotion, and direct marketing all have a favourable influence on customer purchasing decisions. It is recommended that marketing managers focus more on digital promotion and public relations when designing an Integrated Marketing Communication programme in the future, which will build a better image about the company and its internet services, influencing customer purchasing decisions.

**Agodi Joy and Aniuga (2016)** investigated the impact of Integrated Marketing Communication on the creation of customer-based brand value for enterprises and their customer. In today's technology-driven marketing environment, traditional promoting media such as TV, radio, magazines, and newspapers look to be losing their hold on consumers. Because of the shift in the type of media brought about by the dynamic marketing situation, advertisers have been forced to reassess how they must connect with consumers and increase the brand value for the company and its customers, applying the concept of Integrated Marketing Communication has shown to be a viable option. Marketing communications are the tactics used by businesses to educate, persuade, and remind customers of the presence of a brand. Integrated Marketing Communication tries to mix and match communication options – that is, how to use communication options in an orderly or coordinated manner to create customer-based brand value. According to the customer-based brand value model, marketing communication can increase market value by making customers familiar with the brand; connecting the brand's purposes of equality and point-of-contrast relationship in shoppers' memories; evoking good brand decisions or emotions; and encouraging a more grounded customer brand association and brand resonance. The primary focus of this study is on the impact of Integrated Marketing Communication on customer-based brand value.

## IMPACT STUDY ASSESSMENT OF MMA-ACSYS CSR INITIATIVE

10<sup>th</sup> JANUARY, 2022 TO 31<sup>ST</sup> JULY, 2022

### Introduction

The Madras Management Association (MMA) approached the PG Department of Social Work, Dwaraka Doss Goverdhan Doss Vaishnav College (DDGDVC), Chennai to conduct an unbiased and external assessment of the impact of the CSR project of MMA-ACSYS Systems Private Limited. The team of faculty comprising Dr. B. Sulupriya (Head of the Department) Dr. Akileswari.S (Assistant Professor) & Dr. S. Madhusudanan (Assistant Professor) and the student volunteers of the Second MSW students Mr. Bharath Kumar S, Mr. Naveen Kumar R, Mr. Vishal M, Ms. Kaviya S, Ms. Swetha R, Mr. Soorya R, Ms. Lavanya Durga S A, Mr. Karthik M, Mr. Syed Askar Methappa, Mr. Venugopal S, Mr. Senthil Kumar V & Mr. Natraj J from Department of Social Work collected the data from the field. First MSW students Mr. Sai Balaji P, Mr. Venkatesh P, and Ms. Sowmiya. S & Ms. Reshma Nancy. F supported in the data analysis.

The team assessed the outcome of the programme from three aspects: students who took part in the programmes of the CSR project, the headteacher/teacher coordinators and the parents of the students. Appropriate variables for the study were designed to assess the study outcomes and these were presented in the subsequent sections of this report.

Low learning outcomes, at both primary and secondary levels, have always plagued our education system due to a lack of human resources, lack of adequate training and capacity building, lack of awareness regarding the importance of early years concerning education, etc. A need was felt for the provision of good quality co-curricular upskilling in the STEM domain (Science, Technology, Engineering & Maths), among students of government schools and government-aided schools. This was found necessary particularly to close the learning gap of government school children vis-à-vis students from affluent schools, especially among first-generation learners.

Towards this objective MMA carried out a detailed study taking advice from experts in the field, and also obtaining valuable inputs directly from several educational institutions, both government and government-aided. Based on the inputs received, a plan for enhancing students' intellectual capacity through continuous learning programs and the upgradation of school infrastructure was drawn out, with CSR support from ACSYS Systems Pvt Ltd and MMA as the implementation agency for the project. During 2021-22, with the main focus

being the poor students in government and government-aided schools as primary beneficiaries of the MMA-ACSYS CSR initiative the following schools were identified after a thorough study:

- PS Higher Secondary School for boys, Chennai
- The Children's Garden Higher Secondary School
- PS Matriculation School, Chennai

### **Please Note**

The CSR Training had commenced in another new school SR Kalyanaraman Memorial PS School, Mylapore identified for the purpose but since the program '*Science Made Easy*' is a six-month duration program, the outcome for the same can be considered only at the end of the training program.

### **Areas of Focus**

Students were exposed to several programs that incite interest in maths, physics, and natural sciences besides working on their grooming through behavioural programs and communication programs conceptualized and designed exclusively for the school, keeping in mind their requirements. Some of the programs conducted for students from classes VII to XII are:

- Upskilling the students through short-term, practical, hands-on courses to encourage students for STEM streams through short-term programs in Robotics.
- For Students of classes XI and XII from the Commerce stream, short-term Tally Courses were organized to provide employment opportunities in accounting
- Spoken English and Communication programs
- Creative Art Therapy sessions and behavioural/soft skill programs for developing confidence, positive attitude, and overall personality development.
- Entrepreneurial skills through 15-day workshops and demonstration of their creative talent and entrepreneurial skills through student bazars at the end of the course.

### **Offline Sessions**

During COVID-19 online sessions were certainly beneficial to the students however they had certain limitations. Hence, on the opening of schools during the latter part of the

year, the following courses were conducted offline at respective schools strictly adhering to Covid protocols, which were very well received by the school, students and parents.

- Hands-on Robotics with Embedded Programming,
- Memory Skills
- Spoken English
- Basic Tally
- Young Entrepreneurship
- Creative Art Therapy &
- Super Brain Yoga

A unique program for dispelling fear of examinations among students was also organized to help the students before their examinations.

### **Workshops for Teachers (It is repetition)**

Recognizing the competency gap among teachers, particularly in dealing with the post – COVID-19 scenario in teaching with technical gadgets, a need felt for upskilling the teaching faculty with digital tools and new-age digital coaching skills. Hence 3 days’ workshop on the use of online media for education, such as Google Classroom, Google Meet, etc., was conducted. The workshop included a wide spectrum of topics including creating reference material, sharing assignments, and conducting assessments and evaluations. A tab-based program was conducted, as teachers will be using tablets in teaching-learning.

### **Impact Study**

It was felt that the overall impact of the numerous CSR activities conducted in all three schools needs to be assessed professionally by an independent team. In this connection, the PG Department of Social Work, DDGD Vaishnav College has agreed to conduct the impact study and render a detailed report about each school separately, with a focus on the following:

- **Benefit for students:** Through an exclusively designed questionnaire, inputs from the students who have undergone the respective program would be obtained
- **Assessment of Teachers:** Each training program was coordinated by a set of teachers from the school, with overall guidance from the Headmistress/Principal. The inputs from the teachers would be obtained to ascertain the overall impact of the MMA-ACSYS CSR Programmes.

- **Opinion of Parents:** Through a specially designed questionnaire, inputs would be obtained from parents of the students who have undergone various training programs.



## **Broad Objective of the Impact Assessment Study**

- To assess the benefits derived by the students of these schools as normally such programs are available only for affluent schools.

## **Research Methodology**

A ‘descriptive research design’ was adopted in this impact study and the study is predominantly quantitative in nature. An important characteristic of descriptive studies is that “the variables of interest are not manipulated and thus do not represent any deliberate intervention or interference with their natural state” (D’Cruz & Jones, 2004). Those students who have undergone the program have been included in the impact study to understand the impact of the program conducted. The parents of the students who participated in the research were also included along with teachers of all three schools.

## **Sampling Strategy**

In the quantitative analysis, **proportionate stratified random sampling** was used to collect the data from all three schools.

## **Tools for Data Collection**

The **structured questionnaire** was prepared for the quantitative part. Feedback from the students who have undergone the programme was obtained through the questionnaire. Feedback from the Principal/Head Teacher and teaching coordinators and parents was obtained through the questionnaire designed specifically for them.

## **Method for Data Collection**

1. For the quantitative method, the structured questionnaire was administered to the respondents in a face-to-face situation through an interview

## **Inference from the Impact Study**

At the outset, the students, parents, and coordinating teachers expressed a positive note on the programmes. This could be inferred from the overall feedback and also from the school-wise feedback of the students. The teachers said they have observed a visible change in the students’ after attending such programmes. The inferences are drawn out from students who actively took part in the programme, the headteacher/ teacher coordinators and parents as listed in Table 1.

**Table 1 Details of Annexure in the Impact Study**

Sl. No	Annexure	Description
1	I	Quantitative analysis of Students' response
2	II	Quantitative analysis of Parents' response
3	III	Quantitative analysis of Teachers' response
4	IV	Photographs during the interaction with stakeholders

**Recommendations**

1. It was opined by the Headteacher/ coordinating teachers to include all students from their school in these programs
2. It was cited that in Tally classes the theoretical aspect had an upper edge over the practical aspects. Hence the teachers said more time could be allotted for practical classes
3. Teachers reiterated during the discussion that these sessions would be useful for their careers and suggested providing printed materials to serve as a compendium.

**Conclusion**

The study findings and recommendations based on the study findings were submitted to MMA. The assessment showed a positive outcome from the stakeholders of this program (students, teachers and parents). The parents were overwhelmed by seeing the progress in their wards. Teachers also expressed that there is significant progress in students. These programmes bring out the better citizens in the children.

## Annexure - I

### Quantitative analysis of Students' response

This section deals with the student response to the programs attended quantitatively. Simple tables and charts are used for the analysis.

**Table 2 Distribution of School**

Sl. No	School Name	Frequency	Per cent
1	PS Higher Secondary School, Mylapore, Chennai	39	26.5
2	PS Matriculation Higher Secondary School, Mylapore, Chennai	24	16.3
3	The Children's Garden Higher Secondary School, Mylapore, Chennai	84	57.1
Total		147	100.0

Table 2 depicts the distribution of students who participated in the MMA-ACSYS CSR project, based on the school. Nearly three-fifths (57.1%) are from The Children's Garden Higher Secondary School and slightly more than one-fourth (26.5%) are from PS Higher Secondary School.

**Chart 1 Gender distribution**

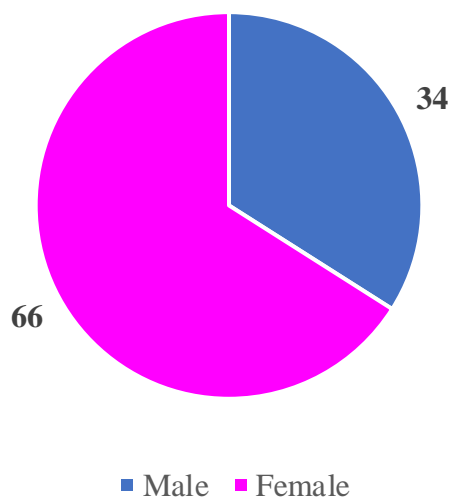


Chart 1 shows the gender distribution of the students who took part in the MMA-ACSYS CSR project. Exactly two-thirds (66%) of the students are female and slightly more than one-third (34%) are male students.

**Table 3 Programs attended by the students**

Sl. No	Course Attended	Frequency	Per cent
1	Robotics	34	23.1
2	Memory Skills	10	6.8
3	Young Entrepreneurship	30	20.4
4	Tally	10	6.8
5	Spoken English	14	9.5
6	Super Brain Yoga	39	26.5
7	Creative Art Therapy	10	6.8
Total		147	100.0

Table 3 shows the list of courses attended by the students from all three schools. Super brain yoga tops the list and Robotics stands second in the per cent of student attendance.

**Chart 2 Student's response on the asset provided**

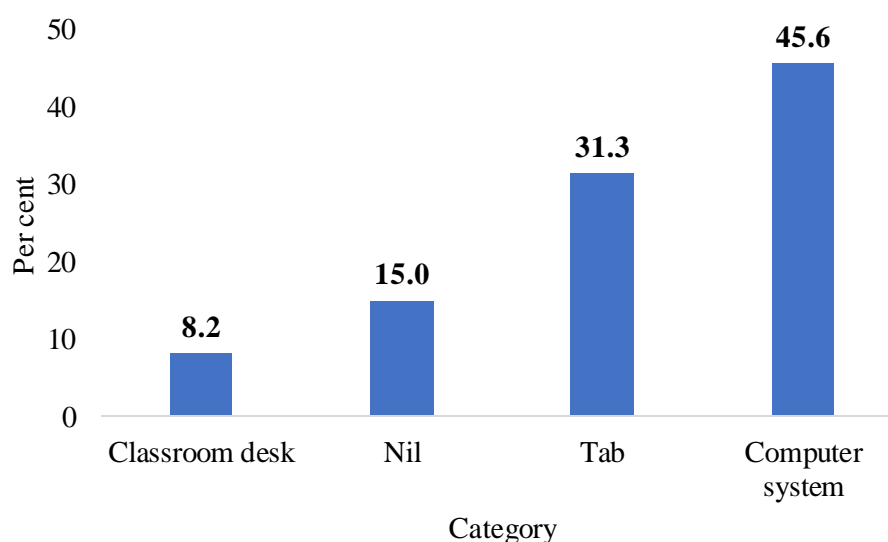
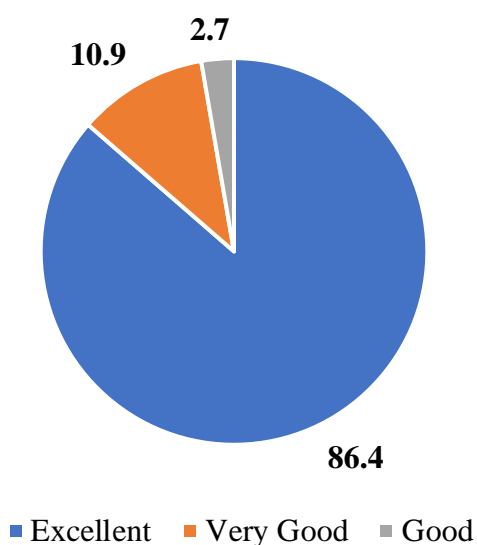


Chart 2 explains the assets provided by the MMA-ACSYS CSR project to the schools. This chart shows the student's response towards the asset.

**Chart 3 Student's Overall Feedback**



The overall feedback from the students is presented in chart 3. The majority of the students (86.4%) have commended the programs as excellent and 10.9% of the students said the programs conducted as very good.

**Table 4 Course-wise Feedback from the students**

Sl. No	Courses Attended	Excellent	Very Good	Good
1	Robotics (n=34)	67.6	17.6	14.7
2	Memory (n=10)	100	-	-
3	Young Entrepreneurship (n=30)	80	20	-
4	Tally (n=10)	90	10	-
5	Spoken English (n=14)	100	-	-
6	SB Yoga (n=39)	94.9	5.1	-
7	Creative Art Therapy (n=10)	100	-	-

Table 4 depicts the course-wise feedback for the courses handled by the MMA-ACSYS CSR project to the schools. The table highlights majority have given 'excellent' as the rating for all the programs that they have attended.

**Chart 4 Gender-wise Feedback on the Courses offered**

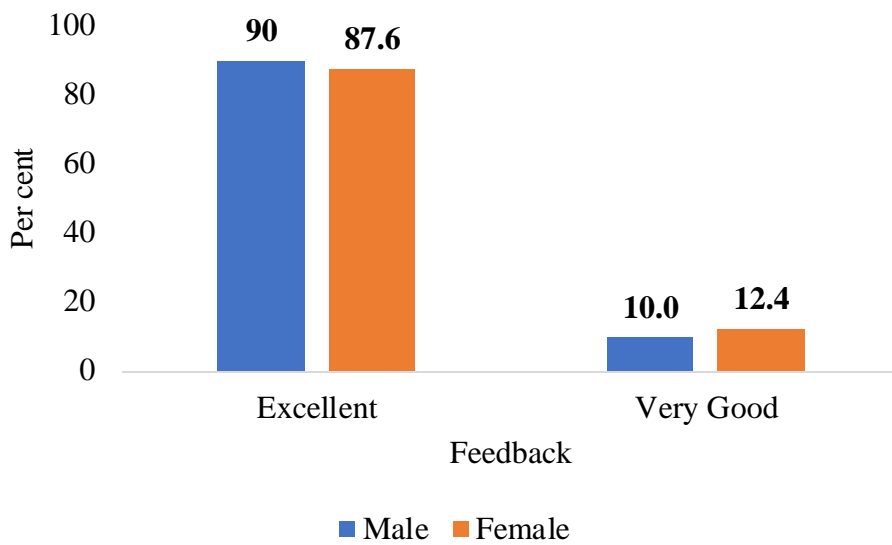
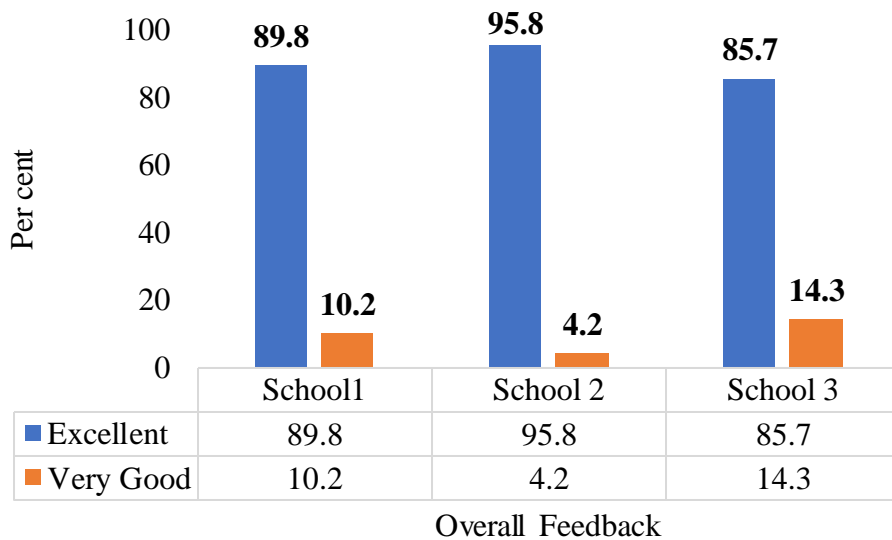


Chart 4 shows the gender-wise feedback. Irrespective of gender (male/female) the students have given an excellent rating for the courses handled by the MMA-ACSYS CSR project to the schools.

**Chart 5 School-wise Feedback**



**Note:**

School 1: PS Higher Secondary School, Mylapore, Chennai

School 2: PS Matriculation Higher Secondary School, Mylapore, Chennai

School 3: The Children’s Garden Higher Secondary School, Mylapore, Chennai

The school-wise feedback for the programs conducted is provided in chart 4. The majority of the students gave feedback as ‘excellent’ from all three schools. The positive feedback shows the impact of the programs.

**Table 5 Overall Student's Response for all the programs – Training aspects**

Sl. No	Statements	Strongly Agree	Agree	Neither agree nor disagree
1	The training courses provided were need-based and to my satisfaction	69.4	27.9	2.7
2	Before the training, my level of knowledge of the topic was almost nil	32.7	53.1	14.3
3	After the training, my level of knowledge on the topic has increased to give me confidence	72.1	27.9	-
4	The faculty of the course cleared all my doubts during the course	72.1	27.9	-
5	These courses have induced interest in me to join further courses on the subjects for my development	63.3	36.7	-
6	The materials and/or content provided for the courses were adequate for understanding the subject	63.9	30.6	5.4
7	My school teachers encouraged me to join this course	77.6	18.4	4.1
8	I got all the necessary support from the school during the course period	78.9	21.1	-
9	My parents encouraged me to participate in these courses actively on knowing about such training	67.3	32.7	-
10	Courses of this kind need to be conducted on regular basis for the development of the students	63.9	36.1	-
11	After attending this course, I can see an improvement in my confidence level and understanding	73.5	26.5	-
12	I am confident that these courses have improved my scope for higher education and employment	67.3	32.7	-

The majority of the student participants strongly agreed with the statements presented in table 5 on the training aspect which highlights the overall impact of the MMA-ACSYS CSR project on the schools.

**Table 6 Overall Student's Response for all the programs – Infrastructure aspects**

	<b>Infrastructure</b>	Agree	Strongly Agree
i.	The usage of the new assets is full during the training period	27.9	72.1
ii.	I am using the new asset outside the training period also	44.9	55.1
iii.	I feel more comfortable getting the new asset	25.8	74.2

The majority of the student participants strongly agreed with the statements presented in table 6 on the infrastructure aspect which highlights the overall impact of the MMA-ACSYS CSR project on the schools.

### Annexure - II

#### Quantitative analysis of Parents' response

**Table 7 Ward's studying school**

Sl. No	School Name	Frequency	Per cent
1	PS Higher Secondary School, Mylapore, Chennai	23	26.7
2	PS Matriculation Higher Secondary School, Mylapore, Chennai	15	17.4
3	The Children's Garden Higher Secondary School, Mylapore, Chennai	48	55.8
Total		86	100.0

Table 7 shows the ward's studying school. The parents whose son/daughter attended the MMA-ACSYS CSR project have responded.

**Table 8 Parent's response on the assets provided to the school**

Sl. No	Description	Frequency	Per cent
1	Classroom desk	12	14.0
2	Computer system	42	48.8
3	Tab	11	12.8
4	Nil	21	24.4
Total		86	100.0

Table 8 shows the parent's response to the assets given through the MMA-ACSYS CSR project. Nearly one-half (48.8%) have said their ward's school was given a computer system.



**Table 9 Program attended by their wards**

Sl. No	Course Attended	Frequency	Per cent
1	Robotics	18	20.9
2	Memory Skills	9	10.5
3	Young Entrepreneurship	15	17.4
4	Tally	9	10.5
5	Spoken English	5	5.8
6	Super Brain Yoga	29	33.7
7	Creative Art Therapy	1	1.2
Total		86	100.0

The parent's response from table 9 concurs with the student's response (table 3)

**Chart 6 Parent's overall feedback on the programs**

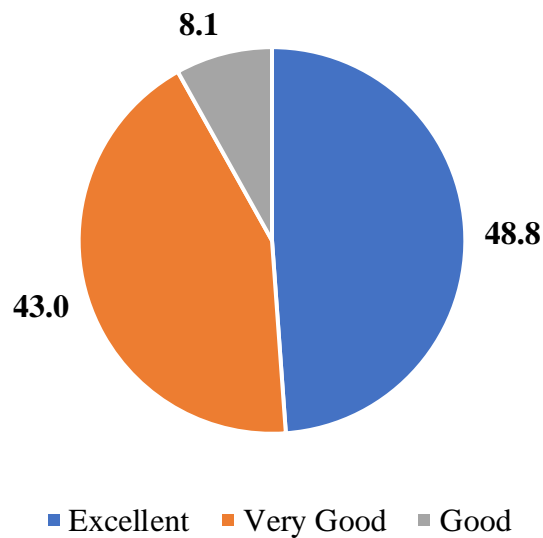


Chart 6 explains that the parents have excellent feedback (48.8) on the programs conducted. Overall, the parents have expressed a positive response.

**Table 10 Parent’s overall responses for all the programs – Training aspects**

<b>A</b>	<b>Training</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neither agree nor disagree</b>
i.	The training provided was need-based and in tune with the requirement for their future education and employment.	76.7	20.9	2.3
ii.	I got input from my son/daughter/ward that the trainers had cleared all doubts of the students during the training	60.5	34.9	4.7
iii.	I find that my son/daughter/ward with newfound confidence after the training	76.7	20.9	2.3
iv.	Courses of this kind need to be conducted on regular basis for the development of the students	59.3	36	4.7
v.	These training programmes are conducted through the CSR activities	68.5	31.4	-

Table 10 depicts the parent’s overall responses to the programs conducted by the MMA-ACSYS CSR project. On the training aspect, the parents have expressed high compliance towards the statements.

**Table 11 Parent’s overall responses for all the programs – Infrastructure aspects**

<b>Sl. No</b>	<b>Infrastructure</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neither agree nor disagree</b>
i.	The assets added were in consultation with the school	68.6	26.7	4.7
ii.	After the training programme the students have started using the assets in full for their development	68.6	31.4	-

Table 11 explains the parent’s agreement towards the infrastructure facilities provided by the MMA-ACSYS CSR project.

### Annexure – III

#### Quantitative analysis of Teachers' response

Chart 7 Teacher's Feedback on the program

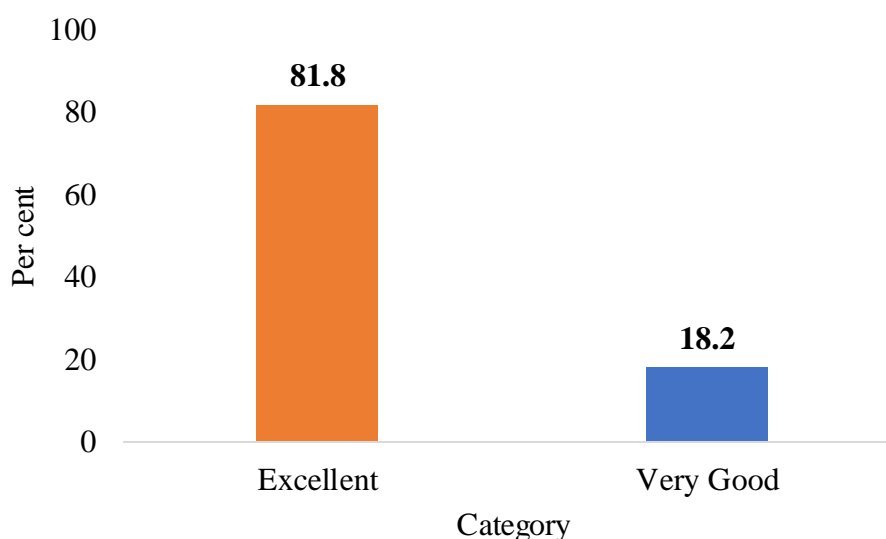


Chart 7 represents the teacher's feedback on the courses conducted by the MMA-ACSYS CSR project. Nearly four-fifths (81.8%) of the teachers have rated the courses conducted as excellent.

Table 12 Teacher's overall responses for all the programs – Training aspects

	Training	Strongly Agree	Agree
i.	The training provided was need-based and in tune with the requirement for their future education and employment.	90.9	9.1
ii.	Before the training, the level of knowledge of the topic was almost nil for the students	63.6	36.4
iii.	After the training, their level of knowledge on the topic has increased to give them confidence	72.7	27.3
iv.	The faculty of the course cleared all the doubts during the course	90.9	9.1
v.	The materials and/or content provided for the courses were adequate for understanding the subject	72.7	27.3
vi.	I encouraged the students to join this course	100	-
vii.	Courses of this kind need to be conducted on regular basis for the development of the students	81.8	18.2

Table 12 reveals the teacher's overall responses on the training aspect. The majority of the teachers have expressed strong agreement towards the training module.

**Table 13 Teacher’s overall responses for all the programs – Infrastructure aspects**

	<b>Infrastructure</b>	<b>Strongly Agree</b>	<b>Agree</b>
i.	The usage of the new assets is full during the training period	90.9	9.1
ii.	Our students have started using the new asset outside the training period also	63.6	36.4
iii.	The students have got additional learning hours due to the new assets	54.5	45.5

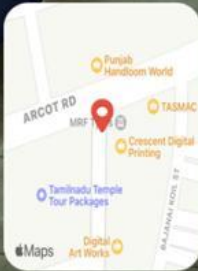
Table 13 divulges the teacher’s overall responses on the infrastructure aspect. The strong agreement with the statements shows the positive impact of the program.

## Annexure IV

### Interaction with the stakeholders - Photographs







Chennai, TN, India  
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## REASONS & REMEDIES OF A MOUNTING NON-PERFORMANCE ASSETS OF PUBLIC SECTOR BANKS IN INDIA

S.Bala Murali

Assistant Professor, Department of BBA, Dwaraka Doss Goverdhan Doss Vaishnav College, Chennai.

Subhashini.S<sup>2</sup>

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### ABSTRACT

Raising non-performing assets in banking sector is a great threat to banks' survival and growth. NPA affects banks profitability negatively and the worst leads to closure of bank/merger/acquisition. This research paper explores the causes for increasing NPA in public sector banks through conceptual research method using literature review method. Public sector banks have more NPA than private sector banks, public sector banks have diluted control over disbursement of loans, less effectiveness of present credit rating methods and political influence is more on public sector banks are the main findings of the study. The researcher suggested that RBI must reengineer the parameters of CIBIL and Basel III ratings to appraise the loans in an effective to prevent disbursement of loans in the wrong hands. Banking operations must be free from political and other pressures. Banks must adopt an automated reporting system of clients financial status monthly. This will help to reduce NPA of public sector banks.

**Key Words:** NPA, Loan, Public sector banks

### Introduction

Financial Soundness of the most of the bank is a big question mark today, as NPA - Non performing assets of banks became unmanageable crisis which in turn affected the profitability of banks. Most of the Public sector banks are victims of NPA. This paper explores the reasons behind sky rocketing NPA in Public sector banks.

### Objectives of the study:

- To understand the reasons of mounting NPA in public sector banks.
- To suggest the suitable solution to the bank, implement to control NPA.

### Research Methodology:

The researcher followed conceptual research method to view the existing literature extensively. Only secondary data was used to arrive findings and discussions. Existing literature were reviewed systematically on the chronological basis.

### Review of literature:

This chapter provides an overview of various area related to the research as well as theoretical background for management of Non-Performing Assets of Public Sector Banks in India. Jayraj Javheri et al. (2022) studied the selected commercial and public sector banks in India's non-performing assets". The study examines the trends in NPA levels over a ten-year period (2011-2020) in order to assess the status of private and public sector banks with regard to NPAs. The study analyses the



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## Report on One Week International Workshop on Omics Data Analysis -Concepts, Methods and Applications, February 18<sup>th</sup> to 23<sup>rd</sup>, 2023


Soft copy of the invitation:

**18<sup>th</sup>-23<sup>rd</sup> February, 2023**

**ONE WEEK INTERNATIONAL VIRTUAL WORKSHOP ON**  
**OMICS data analysis**  
Concepts, Methods & Applications

**ORGANISERS**  
NyBerMan Bioinformatics Europe, Orleans, France  
Madurai Kamaraj University, Madurai, India  
Dr.M.G.R Educational & Research Institute, Chennai, India  
Quanta Calculus Pvt Ltd, India

**CO-ORGANISERS**  
Parul University, Vadodara Gujarat, India  
Bannari Amman Institute of Technology, CBE, India  
Dwaraka Doss Goverdhan Doss Vaishnav College, Chennai, India

<b>International Workshop on OMICS Data Analysis</b>		
Inaugural Session (Day 1) 1:00-1:45 PM		
<b>18 February 2023 (Saturday), (Indian Standard Time)</b>		
<b>Time</b>	<b>Participants Joining to Google Meet</b>	<b>1:00 to 1:05 PM</b>
<b>1:00 PM to 1:45 PM</b>	<b>Welcome address by Program Convener &amp; Moderator : Dr. K. Gomati</b> Dean-ASC, Dr.M.G.R Educational & Research Institute University	<b>1:05 to 1:10 PM</b>
	<b>Guest of Honor Address: Prof. Dr. J. Kumar,</b> Vice-chancellor, Madurai Kamaraj University, Madurai, India	<b>1:10 to 1:15 PM</b>
	<b>Guest of Honor Address: Dr. M. Murugan</b> Vice-chancellor, Madurai Kamaraj University, Madurai, India	<b>1:15 to 1:20 PM</b>
	<b>Chief Guest Address: Dr. K. Gireesh Babu,</b> Professor & Head, Department of Life Sciences, Parul University, Gujrat, India	<b>1:20 to 1:25 PM</b>
	<b>Chief Guest Address: Dr. M. D. Balakumaran,</b> Head & Asst Prof PG Department of Biotechnology, Dwaraka Doss Goverdhan Doss Vaishnav College, Chennai, India	<b>1:25 to 1:30 PM</b>
	<b>Coordinator Address: Dr. I. Shanmuga Sundari</b> Asst Professor level II, Department of Biotechnology, Bannari Amman Institute of Technology, Sathyamangalam, India	<b>1:30 to 1:35 PM</b>
	<b>Coordinator Address: Dr. Sudarshana Sundarajan</b> Co-Founder, NyBerMan Bioinformatics, Netherlands	<b>1:35 to 1:40 PM</b>
	<b>Coordinator Address: Dr. Vivek Dhar Dwivedi,</b> Founder, Quanta Calculus Pvt Ltd, Uttarpradesh, India	<b>1:40 to 1:45 PM</b>
<b>Contact for assistance:</b>	 <b>info@nyberman.com</b>	



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- Event name** : One Week International Workshop on Omics Data Analysis -Concepts, Methods and Applications
- Date** : 18.02.2023-23.02.2023
- Time** : 1.00 pm – 6.00 pm
- Mode** : Online mode (Meet link: <https://meet.google.com/frk-xjxg-zkk>)
- Organizers** : PG Department of Biotechnology, Dwaraka Doss Goverdhan Doss Vaishnav College, Chennai, India  
NyBerMan Bioinformatics Europe, Orleans, France  
Madurai Kamaraj University, Madurai, India  
Dr.M.G.R Educational & Research Institute, Chennai, India  
Quanta Calculus Pvt Ltd, India  
Parul University, Vadodara Gujarat, India  
Bannari Amman Institute of Technology, CBE, India
- Organizing secretaries:** Dr. M.D. BalaKumaran and Ms. G. Shoba
- Resource Person** : **Dr.Saurabh Gupta**, Postdoctoral Researcher, Curtin University, Perth, Australia  
**Dr.Meenakshi Iyer**, Postdoctoral Fellow, National Centre of Biological Science, Bangalore  
**Dr.Priyanka Narad**, Associate Professor, Centre for Bioinformatics Amity University, India  
**Mr.Pranavathiyani G**, Doctorate Student, Pondicherry University, India
- Contact details:**  
E-mail: [omicsteam@nyberman.com](mailto:omicsteam@nyberman.com), [info@nyberman.com](mailto:info@nyberman.com)

**No. of Student Participants:** 129

**No. of Staff Participants:** 2

### Report of the programme:

Post Graduate Department of Biotechnology, **Dwaraka Doss Goverdhan Doss Vaishnav College**, Arumbakkam, Chennai – 106, in collaboration with NyBerMan Bioinformatics Europe, Orleans, France organized One Week International Workshop on Omics Data Analysis -Concepts, Methods and Applications February 18<sup>th</sup> -23<sup>rd</sup>, 2023.

Inaugural session was held on February 18, 2023 and Dr. M.D. BalaKumaran, Head & Asst. Prof., delivered Chief Guest address on behalf of Dwaraka Doss Goverdhan Doss Vaishnav College. That was followed by session on Assistance for Prerequisites & Installation. On Day 2 (19.02.2023)- Introduction to genomics, NGS and transcriptomics and Introduction to Linux:



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navigate the file system, create, copy and move Linux command-line and writing bash scripts  
Dr.Saurabh Gupta, Postdoctoral Researcher, Curtin University, Perth, Australia.

On Day 3 (20.02.2023), Dr.Meenakshi Iyer, Postdoctoral Fellow, National Centre of Biological Science, Bangalore, India delivered a session on Genomics sequencing data analysis. On Day 4 (21.02.2023) Dr.Priyanka Narad, Associate Professor, Centre for Bioinformatics Amity University, India have explained about Basics of microarray, followed by hands on session on GEO database, Microarray data using R. Last session (22.02.2023) was about Fundamentals of Systems Biology & Genomics and Hands on session on Network Reconstruction, Analysis and Visualisation using Cytoscape and R by Mr.Pranavathiyani G, Doctorate Student, Pondicherry University, India. Doubt clarifying session, assessment and valedictory session was held on On 23<sup>rd</sup> February, 2023. Followed by feedback.

### Outcome of the programme

1. The workshop provided an excellent opportunity for the participants to gain knowledge on genomics approach.
2. The session gave insights microarray data analysis and explore linux platform.
3. Participants were benefitted through hands on session on various softwares and tools related to omics approach.

### Photos (Geo tagged) & Snap shots:

International Workshop on OMICS Data Analysis		
Inaugural Session (Day 1) 1:00-1:45 PM		
18 February 2023 (Saturday), (Indian Standard Time)		
Time	Participants Joining to Google Meet	1:00 to 1:05 PM
	Welcome address by Program Convener & Moderator : Dr. K. Gomathi Dean-ASC, D.M.G.R Educational & Research Institute University	1:05 to 1:10 PM
	Guest of Honor Address: Prof. Dr. J. Kumar, Vice-Chancellor, Madurai Kamaraj University, Madurai, India	1:10 to 1:15 PM
	Inaugural Address: Dr. M. Murugan HOD, Department of Microbial Technology, Madurai Kamaraj University, Madurai, India	1:15 to 1:20 PM
	Chief Guest Address: Dr. K. Gireesh Babu, Professor, Head, Department of Life Sciences, Pannu University, Gujrat, India	1:20 to 1:25 PM
1:00 PM to 1:45 PM	Chief Guest Address: Dr. M. D. Balakumaran, Head & Asst Prof PG Department of Biotechnology, Dwarka Doss Goverdhan Doss Vaishnav College, Chennai, India	1:25 to 1:30 PM
	Coordinator Address: Dr. I. Shanmuga Sundari Asst. Professor level II, Department of Biotechnology, Bharan Anjanan Institute of Technology, Sathyangalam, India	1:30 to 1:35 PM
	Coordinator Address: Dr. Sudarshana Sundarajan Co-Founder, NyberMan Biomaterials, Netherlands	1:35 to 1:40 PM
	Coordinator Address: Dr. Vivek Dhar Divivedi, Janta Calcutta Pvt. Ltd. Uttarpradesh, India	1:40 to 1:45 PM



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Inaugural Session invitation for OMICS data analysis February 18, 2023 (2023-02-18 08:34 GMT+1)

**International Workshop on OMICS Data Analysis**  
Inaugural Session (Day 1) 1:00-1:45 PM

**18 February 2023 (Saturday), (Indian Standard Time)**

Time	Participants Joining to Google Meet	1:00 to 1:05 PM
1:00 PM to 1:45 PM	<b>Welcome address by Program Convener &amp; Moderator : Dr. K. Gomati</b> Dean-ASC, Dr.M.G.R Educational & Research Institute University	1:05 to 1:10 PM
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	<b>Coordinator Address: Dr. I. Shanmuga Sundari</b> Asst Professor level II, Department of Biotechnology, Bannari Amman Institute of Technology, Sathyamangalam, India	1:30 to 1:35 PM
	<b>Coordinator Address: Dr. Sudarshana Sundararajan</b> Co-Founder, NyBerMan Bioinformatics, Netherlands	1:35 to 1:40 PM
	<b>Coordinator Address: Dr. Vivek Dhar Dwivedi,</b> Founder, Quanta Calculus Pvt Ltd, Uttarpradesh, India	1:40 to 1:45 PM

Contact for assistance: [info@nyberman.com](mailto:info@nyberman.com)

## Inaugural session

Recording | Saurabh Gupta is presenting

NyBerMan Bioinformatics Europe-Orleans, France

### Genomics

- Study of the complete set of genetic information for a given organism
- Human genome size: ~3 billion base pairs
- Arabidopsis genome size: ~135 million base pairs

Source: <https://www.genome.gov/genetics-glossary/Genome>

Participants: Saurabh Gupta, Pradip Gawande, Bhavani Sridharan, Gayatri Panda, Sandhya Harikris..., Alicia Vidal Ortega, 82 others, You

## Session by Dr. Saurabh Gupta

## Certificate



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Madurai Kamaraj University  
Madurai, India



Parul University  
Vadodra, India



Dr. M.G.R Educational  
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Chennai, India



Bannari Amman Institute  
of Technology, India



Quanta Calculus Pvt  
Ltd, India

## CERTIFICATE OF APPRECIATION

*This certificate is presented to*

**SHOBA G**

*In recognition of your outstanding contribution to the International workshop titled below as*  
ORGANISER

**OMICS DATA ANALYSIS:  
CONCEPTS, METHODS & APPLICATIONS**

*Dated: 18th-23rd February 2023*

ABOUT US

<https://www.nyberman.com/>

Certificate ID FANMA-CE000007

Issued on 2/26/2023

WORKSHOP SECRETARY

HOD, Department of Microbial Technology  
Madurai Kamaraj University, Madurai, India

WORKSHOP CONVENER

Dean-ASC, Dr.M.G.R Educational & Research  
Institute University Chennai, India

WORKSHOP COORDINATOR

CEO & Founder, NyBerMan Bioinformatics Europe  
Orleans, France



## Chemoprofiling and *insilico* prioritization of bioactive compounds from *Laetiporus versisporus* (Lloyd) Imazeki reveals potential Bcl-2 inhibitor

Shoba G<sup>a,b</sup>, Samdani A<sup>c</sup>, Umashankar Vetrivel<sup>d</sup> and Usha Raja Nanthini Ayyakannu<sup>a</sup>

<sup>a</sup>Department of Biotechnology, Mother Teresa Women's University, Kodaikanal, Tamil Nadu, India; <sup>b</sup>Department of Biotechnology, Dwaraka Doss Goverdhan Doss Vaishnav College, (Autonomous), University of Madras, Chennai, Tamil Nadu, India; <sup>c</sup>Centre for Bioinformatics, Kamalnayan Bajaj Institute for Research in Vision and Ophthalmology, Vision Research Foundation, Chennai, Tamil Nadu, India; <sup>d</sup>National Institute of Traditional Medicine, Indian Council of Medical Research, Belagavi, India

Communicated by Ramaswamy H. Sarma

### ABSTRACT

*Laetiporus versisporus* (Lloyd) Imazeki is an edible mushroom that grows abundantly in kodaikanal hills (India) during rainy season. Till now, there is a dearth of reports on chemoprofile and anticancer potential of this mushroom. In our recent study, *L. versisporus* ethanolic extract was reported to confer hepato-protective activity against DEN-induced HCC rats and also found to downregulate Bcl-2 activity. Moreover, the phytochemicals of a related species namely, *L. sulphureus* is also reported to potentially modulate Bcl-2 in glioblastoma. Hence, by this study, the bioactive compounds from *L. versisporus* ethanolic extract were profiled using LC-MS analysis and were virtually screened against ligand binding site of Bcl-2 in order to predict potential moieties with anticancer efficacies. Further, the top 3 potential hits were shortlisted based on MMGBSA score, ADME properties and stable complex formation during MD simulation. Amongst these hits, (6S)-1 $\alpha$ , 25-dihydroxy vitamin D<sub>3</sub>, 6,19-sulfurdioxide adduct was found to be highly promising in terms of binding affinity and ADME features comparable to the known inhibitor (DRO), thus shall be further probed for therapeutic efficacy using experimental validations for effective and natural mode of combating Bcl-2 mediated cancers.

**Abbreviations:** ADMET: absorption, distribution, metabolism, excretion and toxicity; Apaf-1: apoptotic protease activating factor 1; Bcl-2: B-cell lymphoma 2; BAD: BCL2 associated agonist of cell death; BAK: BCL2-antagonist/killer; BAX: Bcl-2-associated X protein; Bcl-2: B-cell lymphoma-2; BH: Bcl2 homology; DRO: 1-(2-[[[(3S)-3-(aminomethyl)-3,4-dihydroisoquinolin-2(1H)-yl]carbonyl]phenyl]-4-chloro-5-methyl-N,N-diphenyl-1H-pyrazole-3-carboxamide; HR-LCMS: High resolution Liquid chromatography–mass spectrometry; LBFGS: Limited-memory Broyden-Fletcher-Gold Farb-Shanno; LVEE: *Laetiporus versisporus* ethanolic extract; MM-GBSA: Molecular Mechanics Generalized Born Surface Area; PARP: Poly (ADP-ribose) polymerase; RMSD: Root Mean Square Deviation; RMSF: Root Mean Square Fluctuation; RT: retention time

### HIGHLIGHTS

- Chemoprofiling of *Laetiporus versisporus* ethanolic extract by LC-MS analysis.
- Anti-apoptotic Bcl-2 chosen as drug target based on documentation in similar Genus.
- Virtual screening of the profiled compounds vs. Bcl-2 inferred (6S)-1 $\alpha$ , 25-dihydroxyvitamin D<sub>3</sub> 6,19-sulfur dioxide adduct as a potential novel inhibitor.
- This molecule also featured significant binding affinity and complex stability during MD comparable to DRO (known inhibitor).

### ARTICLE HISTORY

Received 16 December 2021  
Accepted 31 July 2022

### KEYWORDS

anticancer; Bcl-2; *Laetiporus versisporus* (Lloyd) Imazeki; LCMS; Molecular docking

## 1. Introduction

Mushroom is a fleshy, spore-bearing fruiting body of fungus, usually grown above the ground on soil and also utilized as a source of food. Wild edible mushrooms have been consumed by humans for several decades due to their sensory characteristics. Mushrooms and its extract have several secondary metabolites that act as bioactive components. Many studies have shown that these bioactive metabolites to modulate particular cellular responses by modulating

different signal transduction pathways, thereby enhancing the immune system (Chaturvedi et al., 2018). Mushrooms also show protective effects against the growth of tumours and inflammation and have numerous medicinal properties, including antioxidant, anticancer, antidiabetic, immune-modulating, cardiovascular protective, anticholesterolemic, detoxifying and hepatoprotective impacts (Zhang et al., 2011).

Over the centuries, mushroom has been used by the tribals due to its flavour and taste. Polypore mushrooms of





## Research Article

## Molecular docking studies of bioactive compounds from reclaimed seed extracts against bacteria causing urinary tract infections

Jayasree A<sup>1</sup>, Rajamathanghi R<sup>2</sup>, Venkat S<sup>1</sup>, Pavithra M<sup>1\*</sup>, Shoba G<sup>1</sup> and Sai Ramesh A<sup>2\*</sup>

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Received: June 09, 2022; Accepted: September 15, 2022

### ABSTRACT

Seeds from various plants are known to have many phytochemicals that are capable of defending them from oxidative damage and protect them from possible pathogens like yeast, fungi, virus and bacteria. Through this work we aim to study the antimicrobial activity of *Annona squamosa*, *Mangifera indica* and *Syzygium cumini* seed extracts of four different solvents like hexane, chloroform, methanol and ethanol. About twenty five microbial samples were isolated from different sources and used against these solvents and the antimicrobial activities of the seed extracts were studied. Standard biochemical tests were carried out for the characterization of gram-negative bacteria. Molecular interaction analysis for the 13 compounds of seed extracts against the 3 protein antigens of food-borne diseases causing organisms (protein-ligand docking) were carried out using bioinformatics tools. The chloroform seed extracts showed potential anti-microbial activity and thus can be used as a natural therapeutic substituent against food borne diseases and to prevent concerns over drug resistance caused by antimicrobial agents.

**Keywords:** Molecular interaction analysis, antimicrobial activity, biochemical tests, food borne diseases

### INTRODUCTION








Many indigenous fruits that we consume day-to-day have inedible seeds that do not form a part of the human diet. However, such seeds have proven to be useful in Ayurvedic preparations to cure many diseases. Seeds have sturdy defense mechanisms to withstand extreme conditions and growth (Taran *et al.*, 2020). The presence of phyto constituents in the seeds contribute to antioxidant activity and form a part of the defense mechanism (Ravi Kiran *et al.*, 2012). Moreover, a large variety of peptides and proteins that are produced by these plant seeds have been reported to have antimicrobial activity (Wang *et al.*, 2009).

Molecular docking has facilitated in the progress of drug discovery for a long time. It has helped in many important proceedings during the process of drug discovery. Molecular docking method predicts the preferred orientation of a compound while it binds with another compound to form a stable complex. This method finds its frequent application in in-silico pharmaceutical design. The compounds mangiferin, bergenins and flavylum extracted from different seeds were taken for analysis during this study due to its antimicrobial properties as mentioned in the articles (Martin and Qian, 2008). Mangiferin was obtained from *Mangifera indica* seeds exhibits a larger range of properties including, anticancer, antimicrobial, antioxidant anti-atherosclerotic,

\*Corresponding author e-mail: pavithram@dgvaishnavcollege.edu.in

## Article

# Prediction of Putative Epitope Peptides against BaeR Associated with TCS Adaptation in *Acinetobacter baumannii* Using an In Silico Approach

A. S. Smiline Girija <sup>1,\*</sup>, Shoba Gunasekaran <sup>2</sup>, Saman Habib <sup>3</sup>, Mohammed Aljeldah <sup>4</sup> , Basim R. Al Shammari <sup>4</sup> , Ahmad A. Alshehri <sup>5</sup> , Ameen S. S. Alwashmi <sup>6</sup> , Safaa A. Turkistani <sup>7</sup>, Abdulsalam Alawfi <sup>8</sup>, Amer Alshengeti <sup>8,9</sup> , Mohammed Garout <sup>10</sup>, Sara Alwarthan <sup>11</sup>, Roua A. Alsubki <sup>12</sup> , Nouran M. Moustafa <sup>13,14</sup> and Ali A. Rabaan <sup>15,16,17,\*</sup> 

- <sup>1</sup> Department of Microbiology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences [SIMATS], Saveetha University, P.H. Road, Chennai 600077, India
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**Citation:** Girija, A.S.S.; Gunasekaran, S.; Habib, S.; Aljeldah, M.; Al Shammari, B.R.; Alshehri, A.A.; Alwashmi, A.S.S.; Turkistani, S.A.; Alawfi, A.; Alshengeti, A.; et al. Prediction of Putative Epitope Peptides against BaeR Associated with TCS Adaptation in *Acinetobacter baumannii* Using an In Silico Approach. *Medicina* **2023**, *59*, 343. <https://doi.org/10.3390/medicina59020343>

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**Abstract:** *Background and Objectives:* The BaeR protein is involved in the adaptation system of *A. baumannii* and is associated with virulence factors responsible for systemic infections in hospitalized patients. This study was conducted to characterize putative epitope peptides for the design of vaccines against BaeR protein, using an immune-informatic approach. *Materials and Methods:* FASTA sequences of BaeR from five different strains of *A. baumannii* were retrieved from the UNIPROT database and evaluated for their antigenicity, allergenicity and vaccine properties using BepiPred, Vaxijen, AlgPred, AntigenPro and SolPro. Their physio-chemical properties were assessed using the ExPASy ProtParam server. Immuno-dominant B-cell and T-cell epitope peptides were predicted using the IEDB database and MHC cluster server with a final assessment of their interactions with TLR-2. *Results:* A final selection of two peptide sequences (36aa and 22aa) was made from the 38 antigenic peptides. E1 was considered a soluble, non-allergenic antigen, and possessed negative GRAVY values, substantiating the hydrophilic nature of the proteins. Further analysis on the T-cell epitopes, class I immunogenicity and HLA allele frequencies yielded T-cell immuno-dominant peptides. The protein-peptide interactions of the TLR-2 receptor showed good similarity scores in terms of the high number of hydrogen bonds compared to other protein-peptide interactions. *Conclusions:* The two epitopes predicted from *BaeR* in the present investigation are promising vaccine candidates for



## Bacteria Mediated Biosorption of Hexavalent Chromium - A Review

Kiran Sharma B<sup>1</sup>, Silambarasan Tamil Selvan <sup>2</sup>, Santhi Rasappan<sup>3</sup>, and Balakumaran Manickam Dakshinamoorthi<sup>1</sup>

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### ABSTRACT

*A good living standard is always a major priority of every human being in this world. The continuous industrialization, urbanization, and an increase in population has directly or indirectly accounted for the endless mass pollution of various basic needs such as water, air and land. This has created a significant havoc in the global environment leading to several health issues both for humans as well as other life forms. Hence, there is an imperative need for environment friendly procedures to help remove heavy metals from the ecosystem. The biosorption process has been considered as a supremely promising and appealing approach for heavy metal elimination from industrial wastewater. Recent research has focused on using biosorption to remove hexavalent chromium using various biosorbents. The major advantage of such a biological process includes good efficiency in nature and application of low cost biosorbents which can be reused. The present chapter provides an overview of the removal of hexavalent chromium using different types of bacteria extracted from various environments.*

**Keywords:** Biosorption, Biosorbents, Biomass, Hexavalent chromium, Pollution, Wastewater

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### INTRODUCTION

Heavy metal wastes generated from industry are the principal source of human-induced contaminants in the environment. Trace metals like lead, mercury, cadmium, and chromium also have a substantial effect on health. The occurrence of such wastes in the air, water or soil even in trivial amounts can threaten the long-term health of all living beings [1]. Trace metals namely Pb (lead), Hg (mercury), Cd (cadmium) and Cr (chromium) are of substantial consideration due to their ability to build up through the tropic levels of the ecosystem inducing a harmful ecological impact [2].

The massive industrial utilization of the non-biodegradable heavy metal Chromium (VI) is a serious environmental concern as it can accumulate in living organisms. This makes it imperative to treat such wastes prior to releasing them into the atmosphere. In order to serve this purpose efficiently and cost-effectively, the biosorption method can be employed [3]. Biosorption is identified as a process accomplished with the help of active/inactive microbial biomass called biosorbents that bind and concentrate the heavy metals. This approach when used for removal of Cr (VI) is prompt, reversible, passive and promising in contrast to the other conventional methods used like chemical precipitation, ion exchange, reverse osmosis etc.. The cell wall components of the microorganisms assist them in carrying out the biosorption process by adsorbing the inorganic contaminants. Major contribution to biosorption is attributable to the anionic ligand groups such as carbonyl, hydroxyl, phosphoryl and sulfhydryl [4].

### HEXAVALENT CHROMIUM

Heavy metal contamination is most commonly associated with copper (Cu), cadmium (Cd), lead (Pb), nickel (Ni), zinc (Zn) and chromium (Cr). Amongst these Chromium (Cr) is of major concern to life. Natural sources of it include soil, plants, animals, rocks, gases and dust particles. It subsists in a range of oxidative states with valency from +2 to +6, of which 0, +3 and +6 are accounted to be the most stable states. Trivalent and hexavalent forms of lead are becoming increasingly concentrated in the environment

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Original article

## Antimicrobial potential of *Chlorella sorokiniana* on MRSA – An *in vitro* study and an *in silico* analysis on ClpP protease



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### ABSTRACT

**Objective:** Methicillin-resistant *Staphylococcus aureus* (MRSA) strains are a leading cause of communicable disease in community and nosocomial settings. They are responsible for high morbidity and mortality. Researchers currently pursue novel antimicrobials from natural sources against non-traditional drug targets of staphylococci to ensure a pipeline of potent drugs, in the face of rising drug resistance. The focus of this study was to screen compounds from a freshwater isolate of *Chlorella sorokiniana* for anti-staphylococcal activity, using traditional microbiology, phytochemical analysis and bioinformatics approaches.

**Methods:** *Chlorella sorokiniana* methanol extract was investigated for its antimicrobial potential on *Staphylococcus aureus* strains (ATCC and MRSA isolates) by Kirby Bauer disc diffusion, broth microdilution, cell cytotoxicity and thin layer chromatography-bioautography (TLC-BA). Two antimicrobial TLC-BA antimicrobial fractions (A and B) were subject to gas chromatography mass spectrometry (GCMS). The structures of 9 compounds representing GCMS peaks were tested *in silico*, for their pharmacokinetic properties and binding energy efficiency with the target, using Molinspiration tool and Autodock 4.2.

**Results:** Mean zone diameter of inhibition of growth by CSME (20 mg) was 21 mm, MIC/MBC was 0.31/2.5 mg/L. GCMS analysis of TLC fraction-A revealed 31 phytochemicals, of which 2-pentanone,4-hydroxy-4-methyl- had the highest area % (65.61) and TLC fraction-B revealed 4 peaks of which pentadecanoic acid and 1-(+)-ascorbic acid 2,6-dihexadecanoate had the highest area % (45.57, 48.09).

*In silico* analysis of 9 peak compounds on the target of interest showed that compound 2: 2-pentanone,4-hydroxy-4-methyl- and compound 7: 1,2 - benzene dicarboxylic acid, mono (2-ethylhexyl) ester, satisfied Lipinski's rule of 5, and displayed the least binding energies -6.93 and -5.74 with ClpP protease, thus holding pharmaceutical potential, and supporting further investment into *in vitro* and *in vivo* studies.

**Abbreviations:** CSME, *Chlorella sorokiniana* Methanol Extract; *C. sorokiniana*, *Chlorella sorokiniana*; MRSA, Methicillin resistant *S. aureus*; *S. aureus*, *Staphylococcus aureus*; CFU, colony forming units; SCCmec, (staphylococcal chromosome cassette mec); ClpP, (caseinolytic protease P); MIC, Minimum inhibitory concentration; MBC, Minimum bactericidal concentration; TLC-BA, (Thin-layer bioautography); CC, (Column chromatography); GCMS, (gas liquid chromatography).

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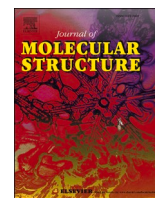


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# Synthesis and characterization of $(\text{Co}_{1-x}\text{Ni}_x)_3(\text{BTC})_2 \cdot 12\text{H}_2\text{O}$ ( $0 \leq x \leq 0.5$ ) MOF based Janus chemical micromotors

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## ABSTRACT

We report the synthesis and characterization of Metal–Organic Framework (MOF)-Based Janus chemical Micro motors that self-propel at 26 and 25  $\mu\text{ms}^{-1}$  in 5% and 12% of  $\text{H}_2\text{O}_2$ , respectively, via ionic diffusiophoresis. The synthesis of this MOF was achieved by solvothermal method. The TG -DT analysis study on  $(\text{Co}_{1-x}\text{Ni}_x)_3(\text{BTC})_2 \cdot 12\text{H}_2\text{O}$  ( $0 \leq x \leq 0.5$ ) micro motors, showed that water ligands can be easily removed. The  $\text{Co}_3(\text{BTC})_2 \cdot 12\text{H}_2\text{O}$  crystallized in orthorhombic crystal system with  $Pmmm$  space group and  $(\text{Co}_{0.8}\text{Ni}_{0.2})_3(\text{BTC})_2 \cdot 12\text{H}_2\text{O}$ ,  $(\text{Co}_{1.5}\text{Ni}_{1.5})_3(\text{BTC})_2 \cdot 12\text{H}_2\text{O}$  crystallized in monoclinic crystal system with  $C_2$  space group. The lattice constants, dislocation density and micro strain of the micro motors were calculated and the structure is discussed in detail using crystal viewer. The morphology of  $(\text{Co}_{1-x}\text{Ni}_x)_3(\text{BTC})_2 \cdot 12\text{H}_2\text{O}$  ( $0 \leq x \leq 0.5$ ) micro motors were scrutinized using the field emission scanning electron microscopy (FE-SEM). Energy dispersion X-ray (EDX) analysis was employed for the elemental analysis and chemical characterization. The vibrational characterization was studied by utilizing Fourier Transform Infrared Spectroscopy (FT-IR) and Raman spectroscopy. The asymmetric and symmetric stretching vibrations of 1,3,5 trisubstituted aromatic ring appeared as three bands at 1368, 1428 and 1219  $\text{cm}^{-1}$ . The optical properties were explored using UV–Visible DRS and the absorption edge of Co-BTC,  $\text{Co}_{0.8}\text{Ni}_{0.2}$ -BTC and  $\text{Co}_{0.5}\text{Ni}_{0.5}$ -BTC were observed at approximately 300 nm, 450 nm and 500 nm respectively. The direct band gap for  $(\text{Co}_{1-x}\text{Ni}_x)_3(\text{BTC})_2 \cdot 12\text{H}_2\text{O}$  ( $0 \leq x \leq 0.5$ ) micromotors was found to be 3.84 eV, 3.76 eV and 3.66 eV respectively. The pore-size distribution and specific surface areas were calculated using Barrett–Joyner–Halenda, BJH and Brunauer Emmett-Teller method respectively. The average pore diameter 8.727 nm and total pore volume of  $2.467 \times 10^{-2} \text{cm}^3 \text{g}^{-1}$  was obtained for the material. Insertion of nickel in the lattice of cobalt further accelerates the speed from 0.08  $\mu\text{ms}^{-1}$  to 26  $\mu\text{ms}^{-1}$ , which leads to a force of 7.29 fN and a power of  $4.9 \times 10^{-9}$  fW, which resembles bio molecular motors. Considering the investigation of MOFs as Microbots/Micromotors so far,  $\text{Co}_{0.8}\text{Ni}_{0.2}$ -BTC in both 5% and 12%  $\text{H}_2\text{O}_2$  can be represented as the best example of clear observation of bubble tails propelling spherical Janus micromotors.

## 1. Introduction

Metal–Organic Framework (MOF)-Based Janus Micromotors MOFs are crystalline functional materials composed of inorganic and organic units, whose coordination bonds determine their structure dimensionality (1D, 2D, or 3D) [1]. They have been of great interest for both

biomedical (e.g., drug delivery, bio imaging) and environmental applications (e.g., photo catalysis, pollutant removal) due to their porous structure and versatile reactivity. MOF with bimetals can serve as Janus motors [2]. We expect that Janus motors would act as intelligent micro and nano robots, for drug delivery and non-invasive surgery in the near future. Therefore, cost-effective techniques of the fabrication of Janus

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## SHORT COMICS: THE FIGHT AGAINST ANTIBIOTIC RESISTANCE

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**Intro:** Antibiotic resistance has become a major problem due to excessive and inadequate use of these drugs over the years. The awareness of the severity of this issue to society is necessary to promote health literacy. Furthermore, the awareness is essential to fight misinformation among the population and to ensure prevention. However, sometimes it is difficult to pass a simple, nonetheless accurate, message to the general public. This project is aimed at students, health professionals, and the public general to raise awareness at young ages and educate the general population about antibiotic resistance.

**Methods:** It was developed a comic strip about antibiotic resistance entitled “Fighting Bacterial Resistance”. Comics for pedagogical purposes are a very common and effective means of dissemination, considering their transversality. This cartoon was intended to demonstrate that bacteria can acquire defense mechanisms against antibiotics, such as genetic modifications, thus becoming resistant. Consequently, resistance genes can be spread among bacteria. Moreover, it was shown some bacteria are multidrug-resistant which makes the treatment a challenge.

**Findings:** The comic strip was presented to both health professionals and general public. Both targets were very pleased and showed enthusiasm reading it.

**Conclusion:** A comic strip showed to be a effective way the reach different kinds of public since it creates a bonding with the public, no matter the level of education

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## INHIBITION OF BIOFILM FORMATION AND QUORUM SENSING- CONTROLLED VIRULENCE FACTORS OF CARIOGENIC ORAL PATHOGEN STREPTOCOCCUS MUTANS BY 4-HYDROXY-3-METHOXYBENZALDEHYDE

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**Intro:** Streptococcus mutans are considered to be the primary etiologic agents of dental caries and it is one of the major public health problems worldwide. The production of virulence traits that are regulated through a Quorum Sensing system confers resis-

tance to antibiotics. This includes exopolysaccharide (EPS) production, acidity and acidogenicity and biofilm formation.

**Methods:** The antibiofilm activity of 4-hydroxy-3-methoxybenzaldehyde (4-H-3-MB) was evaluated against the *S. mutans* UA159 (control strain) and clinical isolate of *S. mutans* isolated from patients with dental caries. The 4-H-3-MB (Sigma-Aldrich, USA) was procured from commercial sources. Crystal violet staining assay was performed to assess antibiofilm activity. Bacterial growth curve analysis, quantification of EPS and inhibition of acid production were performed. The ADME properties of the compound were predicted using Molinspiration tool. Molecular docking was performed using glucan binding protein, glucansucrase and antigen I/II active site of *S. mutans* as proteins and 4-H-3-MB as ligand using Autodock Program.

**Findings:** The compound 4-H-3-MB showed antibiofilm activity on *S. mutans* UA159 at low concentrations of 0.2, 0.1, 0.05 mg/ml (79.81%, 67.76% and 56.31% respectively) compared to the clinical strain (77.00%, 59.48% and 48.22% respectively). The 4-H-3-MB inhibited the EPS production and acid production on *S. mutans* UA159 and clinical isolates of *S. mutans* in a dose-dependent manner. The microscopic imaging revealed a dramatic reduction in the treated biofilm group as compared to the control. The 4-H-3-MB did not show any growth inhibition even at concentrations of 0.2–0.05 mg/ml. However, the 4-H-3-MB significantly reduced the biofilm thickness of both the control and the clinical strain. Autodock showed the lowest binding energy (-6.12 kcal/mol) with glucansucrase with six hydrogen bonds followed by GPBC (-5.32 kcal/mol) and antigen I/II (-4.87 kcal/mol).

**Conclusion:** The present study indicates the potent anti-biofilm activity of 4-H-3-MB compound for potential use against *S. mutans*.

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## A LABORATORY VALIDATION OF SELF-COLLECTED NASAL SWAB AND RHINOSWAB FOR THE DETECTION OF SARS-COV-2

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**Intro:** In Australia, the main methods to diagnose COVID-19 are through rapid antigen tests (RATs) and through nucleic acid amplification testing (NAAT, including polymerase chain reaction) on healthcare worker (HCW)-collected combined nose/throat swabs. With self-collection widely used by the public for RATs, the aim of this study was to evaluate the performance of self-collected samples using commercial NAAT for SARS-CoV-2.

**Methods:** Consenting participants aged 14 years and older were provided with a self-collection pack containing instructions and either a FLOQSwab (Copan) or a Rhinoswab (Rhinomed). Participants collected their own nasal sample unsupervised prior to having a HCW-collected combined nose and throat swab taken for standard of care NAAT. Paired self-collected and HCW samples were tested

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## (57) Abstract :

When building medication delivery systems, the objective is to distribute biologically active compounds safely and on time. Nano-carriers have helped precision medicine but not agriculture. This may be a way to reduce the environmental effect of crop protection and food production while increasing crop yield. We'll compare the advantages and downsides of numerous nanoparticle/nanocarrier kinds used in biomedicine with their synthesis procedures and explore their probable use in agriculture. In this, we discuss the obstacles and benefits of nano-delivery systems in medicine. We also explore issues this technology may face when transitioning from biomedical to agricultural use. Our invention includes nano-delivery system requirements and production constraints, including technical and environmental issues. These systems breed plants, encourage growth, control disease, and monitor post-harvest quality. Scaling up plant disease treatment, controlled fertiliser release, and plant breeding requires designing logical nano-carriers and finding research needs.

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Year: II

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1	'2113092020101	ANISH ARAVIND M	Submitted
2	'2113092020102	A BRANISH	Submitted
3	'2113092020103	DHIVAGAR R	Submitted
4	'2113092020104	DINAKARAN	Not Submitted
5	'2113092020105	DINESH P	Submitted
6	'2113092020106	JEEVAN VIJAYA KUMAR B V	Submitted
7	'2113092020107	NAVEEN S	Not Submitted
8	'2113092020108	PRAVEEN S	Submitted
9	'2113092020109	RAGUL R	Not Submitted
10	'2113092020110	SANTHOSH G	Not Submitted
11	'2113092020111	G SEKAR	Submitted
12	'2113092020112	SHANKAR MISHRA P	Submitted
13	'2113092020113	TAMIL ARASAN P	Submitted
14	'2113092020114	VIGNESH KUAMR E	Not Submitted
15	'2113092020115	BOOMIJA R	Submitted
16	'2113092020116	S KANIMOZHI	Submitted
17	'2113092020117	LOGESHWARI S	Submitted
18	'2113092020118	R MALAVIKA	Submitted
19	'2113092020119	MEHALA K	Submitted
20	'2113092020120	NALINI C	Submitted
21	'2113092020121	NITHYA S	Submitted
22	'2113092020122	RAJALAKSHMI V	Submitted
23	'2113092020123	SHAMINI J	Submitted
24	'2113092020124	SHARLI EMELDA A	Not Submitted
25	'2113092020126	P SUBHASHREE	Submitted
26	'2113092020127	SURYA M	Not Submitted
27	'2113092020128	VAASAVI V	Submitted
28	'2113092020129	VINISSA SHRI R	Not Submitted
29	'2113092020130	MITHUN KUMAR	Submitted

Class Teacher



# ALU STRUCTURE

#.14, Banadurai Thirumanjana Veedhi, Kumbakonam - 612 001. Cell : 97109 15571  
Bo.: No 30, G2, 3rd Cross Street, Pallavan Nagar, Maduravoyal, Chennai - 600 095  
Phone : 044 - 4006 0229, E-mail : alustructure121@yahoo.com Website : www.alustructure.net

The Principal  
DwarakaDoss Govrdhan Doss Vaishnav College (Shift 1)  
"Gokul bagh" 833, Periyar EVR Salai  
Arumbakkam  
Chennai-600106

Sir/Madam,

Reg: Internship at our Office -Mr.M.Anish Aravind Roll no: 21D3055  
M.A (Economics)

We refer your date 15-12-2022 on the above and hereby certify that Mr. M.Anish Aravind, Roll No.21D3055, M.A (Economics) II Year student of your institution has completed his Internship Training as a **Site Supervisor** at our Office From (10-01-2023 to 01-03-2023)

Thanking you,

For Alu Structure

Authorized Signatory



◉ INTERIOR & EXTERIOR ◉ CIVIL ◉ ELECTRICAL

B.O.: # 23B, Alappakkam Main Road, Maduravoyal, Chennai - 600 095.

GSTIN : 33AARFA7526L1Z2

PAN No : AARFA7526L

**वि ओरिएण्टल इन्श्योरेंस कम्पनी लिमिटेड**

(भारत सरकार का एक उपक्रम)

कोर्पोरेट ऑफिस, जी+4 फ्लोर्स, प्लेट ए  
ऑफिस ब्लॉक -4, एनबीसीसी ऑफिस कॉम्प्लेक्स,  
किदवाई नगर पूर्व, नई दिल्ली - 110023



**THE ORIENTAL INSURANCE COMPANY LIMITED**

(A Govt. of India Undertaking)  
Corporate office, G+4 Floors, Plate A,  
Office Block-4, NBCC Office Complex,  
Kidwai Nagar East, New Delhi - 110023.



**THE ORIENTAL INSURANCE COMPANY LIMITED**

**DIVISIONAL OFFICE NO 1**

**NO.115, 1ST FLOOR,**

**PRAKASAM SALAI, BROADWAY**

**CHENNAI - 108**

**PH: 23458228; 23458229**

**E-MAIL: 411100@orientalinsurance.co.in**

10.02.2023

The Principal  
Dwaraka Doss Govrdhan Doss Vaishnav College(Shift I)  
"Gokul Bagh" 833, Periyar, EVR Salai  
Arumbakkam  
Chennai – 600 106.

Sir/Madam,

Re: Internship at our office – Mr. A Branish, Roll No. 3056 -  
M.A (Economics) – II year

\* \* \* \*

We refer your dated 16.11.2022 on the above and hereby certify that Mr. A Branish, Roll No. 3056, M.A (Economics) – II year student of your Institution has completed her Internship Training at our Divisional Office from 13.12.2022 to 12.01.2023.

Thanking you,

For The Oriental Insurance Co Ltd



  
Divisional Manager

10 October 2022

TOWHOMSOEVERITMAYCONCERN

Dear Sir/Madam,

This is to certify that **Dhivagar R** Student of **Dwaraka Doss Goverdhan Doss Vaishnav College** pursuing **Master of Arts** has completed his internship from 02 August 2022 to 30 September 2022 in our organization. The Internship was for learning & Industry exposure only and no stipend was paid during his internship period.

During the internship, we found him to be enthusiastic and supporting our Human Resource – Talent Acquisition department in various activities.

We wish him all the best for his future endeavors

For Equitas Small Finance Bank Ltd,



(Authorized Signatory)



**BEYOND BANKING**

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Equitas Small Finance Bank Limited  
(Previously known as Equitas Finance Limited)

3089138

17 February 2023

TOWHOMSOEVERITMAYCONCERN

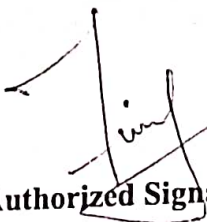
Dear Sir/Madam,

This is to certify that **Dinesh P (2113092020105)** student of **Dwaraka Doss Goverdhan Doss Vaishnav College** pursuing **Master of Arts (Economics)** has completed his internship from 05 December 2022 to 31 January 2023 in our organization. The Internship was for learning & Industry exposure only and no stipend was paid during his internship period.

During the internship, we found him to be enthusiastic and supporting our Human Resource – Talent Acquisition department in various activities.

We wish him all the best for his future endeavors

For Equitas Small Finance Bank Ltd,



(Authorized Signatory)



**BEYOND BANKING**

When you bank with us, you contribute towards a better society.

Equitas Small Finance Bank Limited  
(Previously known as Equitas Finance Limited)

**3196295**

**INSTITUTE FOR ADVANCED STUDIES AND RESEARCH (IASR)  
OXFORD CAMBRIDGE HARVARD FOUNDATION (OCHF)**

New G.15, Ninth St., Anna Nagar East, Chennai- 600102, India  
Phone: 044-26632801; --- 26633289. FAX: 044-2626 7167. E-Mail: vss108@gmail.com

President: DR VEDAGIRI SHANMUGASUNDARAM  
M.A.(Econ), M.A.(Pol.Sc), M.Litt., Ph.D., D.Phil.(Oxford)

Director, Institute for Advanced Study and Research (IASR); First Vice Chancellor, Manonmaniam Sundaranar University;  
Emeritus Professor of Economics, University of Madras; Ex - Director of Central Boards, Reserve Bank of India &  
Industrial Development Bank of India; Senior Visiting Member, Linacre College, Oxford University;

14<sup>th</sup> March 2023.

**TO WHOM SO EVER IT MAY CONCERN**

This is to certify that Mr. Jeevan Vijaya Kumar, II<sup>nd</sup> year M.A. Economics, D.G. Vaishnav College, has successfully completed three months internship - 01<sup>st</sup> November 2022 to 31<sup>st</sup> January 2023 at the Institute for Advanced studies and Research (IASR), Chennai.

During his period of internship, Mr. Jeevan learnt above the importance of news clippings, report writing, preparing a concept note, documentation, etc., He was sincere and hardworking during his course of internship. His skills on critical thinking and interpretation will most certainly guide him to pursue research and work towards doctoral degree.

Wishing him a good luck in all his endeavors.

Your sincerely



Vedagiri Shangugasundaram,  
Director IASR, Ch 600 102.



15 March 2023

TOWHOMSOEVERITMAYCONCERN

Dear Sir/Madam,

This is to certify that **Praveen S** student of **Dwaraka Doss Goverdhan Doss Vaishnav College Pursuing Master of Administration (Economics)** has completed his internship from 15 February 2023 to 15 March 2023 in our organization. The Internship was for learning & Industry exposure only and no stipend was paid during his internship period.

During the internship, we found him to be enthusiastic and supporting our Human Resource – Talent Acquisition department in various activities.

We wish him all the best for her future endeavors.

For Equitas Small Finance Bank Ltd,



(Authorized Signatory)

 **BEYOND BANKING**

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(Previously known as Equitas Finance Limited)

4<sup>th</sup> Floor, Phase II, Spencer Plaza, No.769, Mount Road, Anna Salai, Chennai, Tamil Nadu, India - 600 002

T: +91 44 4299 5000 | F: +91 44 4299 5050 | corporate@equitas.in | www.equitasbank.com | Toll Free: 1800 103 1222 | CIN No: L65191TN1993PLC025280

3233396



# ALU STRUCTURE

#.14, Banadurai Thirumanjana Veedhi, Kumbakonam - 612 001. Cell : 97109 15571  
Bo.: No 30, G2, 3rd Cross Street, Pallavan Nagar, Maduravoyal, Chennai - 600 095  
Phone : 044 - 4006 0229, E-mail : alustructure121@yahoo.com Website : www.alustructure.net

The Principal  
DwarakaDoss Govrdhan Doss Vaishnav College (Shift 1)  
"Gokul bagh" 833, Periyar EVR Salai  
Arumbakkam  
Chennai-600106

Sir/Madam,

Reg: Internship at our Office -Mr.G.Sekar Roll no: 21D3063  
M.A (Economics)

We refer your date 15-12-2022 on the above and hereby certify that Mr. G.Sekar, Roll No.21D3063, M.A (Economics) II Year student of your institution has completed his Internship Training as a **Site Supervisor** at our Office From (10-01-2023 to 01-03-2023)

Thanking you,

For Alu Structure

Authorized Signatory



10 October 2022

TOWHOMSOEVERITMAYCONCERN

Dear Sir/Madam,

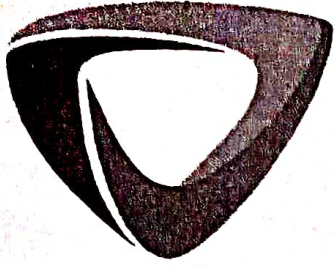
This is to certify that **Shankar Mishra P** Student of **Dwaraka Doss Goverdhan Doss Vaishnav College** pursuing **Master of Arts** has completed his internship from **02 August 2022** to **30 September 2022** in our organization. The Internship was for learning & Industry exposure only and no stipend was paid during his internship period.

During the internship, we found him to be enthusiastic and supporting our Human Resource – Talent Acquisition department in various activities.

We wish him all the best for his future endeavors

For Equitas Small Finance Bank Ltd,

  
(Authorized Signatory)



# Vedha Technologies

Software Development & Services

*Make IT Better*

## COMPLETION CERTIFICATE

To Whomsoever It May Concern

This is to certify that Mr. TAMIL ARASAN .P, Reg.No: 2113092020113, pursuing MA (ECONOMICS) in "DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE" has successfully completed his final year Internship in our concern in the title "HUMAN RESOURCE (HR)" from 05-12-2022 to 31-12-2022.

Thanking you,

For Vedha Technologies,

HR MANAGER

VEDHA TECHNOLOGIES  
Software Development & Training Company  
No. 26 Vengatesan Street,  
T. Nagar, Chennai - 600 017  
www.vedha.in Ph: 95000 12030

17 February 2023

TOWHOMSOEVERITMAYCONCERN

Dear Sir/Madam,

This is to certify that **Boomija R (2113092020115)** student of **Dwaraka Doss Goverdhan Doss Vaishnav College** pursuing **Master of Arts (Economics)** has completed her internship from 05 December 2022 to 31 January 2023 in our organization. The Internship was for learning & Industry exposure only and no stipend was paid during her internship period.

During the internship, we found her to be enthusiastic and supporting our Human Resource – Talent Acquisition department in various activities.

We wish him all the best for his future endeavors

For Equitas Small Finance Bank Ltd,



(Authorized Signatory)



ಶಿ. ಅರಿಯಲ್ಪಟ್ಟು ಪ್ರವೇಶಿಸಿ ಕಾರ್ಯನಿರ್ವಹಿಸಿ

(ಪ್ರತಿ ಸಂಸ್ಥೆಯಲ್ಲಿ ಒಂದು ಪ್ರತಿ)

ಅಧಿಕಾರಿಗಳಿಗೆ ಮಾತ್ರ ಉಪಯೋಗಿಸಬೇಡಿ  
ಅಧಿಕಾರಿಗಳಿಗೆ ಮಾತ್ರ ಉಪಯೋಗಿಸಬೇಡಿ  
ಅಧಿಕಾರಿಗಳಿಗೆ ಮಾತ್ರ ಉಪಯೋಗಿಸಬೇಡಿ



THE ORIENTAL INSURANCE COMPANY LIMITED

(A Govt. of India Undertaking)  
Corporate Office: 14th Floor, Plot 19,  
Office Block-4, NESCO Office Complex,  
Kodambakkam East, New Delhi - 110028



THE ORIENTAL INSURANCE COMPANY LIMITED

DIVISIONAL OFFICE NO 1

NO.115, 1ST FLOOR,

PRAKASAM SALAI, BROADWAY

CHENNAI - 118

PH: 23651221; 23651229

E-MAIL: 401010@orientalinsurance.co.in

11.12.2022

The Principal  
Dwaraka Doss Gowrdham Doss Vaidyanath College (Shift I)  
"Gokul Bagh" 833, Periyar, EVR Salai  
Arumbakkam  
Chennai - 600 116.

Sir/Madam,

Re: Internship at our office - Ms. S Kanimozhi, Roll No. 3070 -  
M.A (Economics) - II year

\*\*\*

We refer your dated 16.11.2022 on the above and hereby certify that Ms. S Kanimozhi, Roll No. 3070, M.A (Economics) - II year student of your Institution has completed her Internship Training at our Divisional Office from 13.12.2022 to 12.01.2023.

Thanking you,

For The Oriental Insurance Co Ltd

  
Divisional Manager



दि ओरिएण्टल इन्शुरेंस कम्पनी लिमिटेड

(भारत सरकार का एक उपक्रम)

कॉर्पोरेट ऑफिस, जी+4 फ्लोर्स, प्लेट ए  
ऑफिस ब्लॉक -4, एनबीसीसी ऑफिस कॉम्प्लेक्स,  
किडवाई नगर पूर्व, नई दिल्ली - 110023



THE ORIENTAL INSURANCE COMPANY LIMITED

(A Govt. of India Undertaking)  
Corporate office, G+4 Floors, Plate A,  
Office Block-4, NBCC Office Complex,  
Kidwai Nagar East, New Delhi - 110023.



THE ORIENTAL INSURANCE COMPANY LIMITED

DIVISIONAL OFFICE NO 1

NO.115, 1ST FLOOR,  
PRAKASAM SALAI, BROADWAY  
CHENNAI - 108

PH: 23458228; 23458229

E-MAIL: 411100@orientalinsurance.co.in

10.02.2023

The Principal  
Dwaraka Doss Govrdhan Doss Vaishnav College(Shift I)  
"Gokul Bagh" 833, Periyar, EVR Salai  
Arumbakkam  
Chennai – 600 106.

Sir/Madam,

Re: Internship at our office – Ms. S Logeshwari, Roll No. 3061 -  
M.A (Economics) – II year

\* \* \* \*

We refer your dated 16.11.2022 on the above and hereby certify that Ms. S Logeshwari, Roll No. 3061, M.A (Economics) – II year student of your Institution has completed her Internship Training at our Divisional Office from 13.12.2022 to 12.01.2023.

Thanking you,

For The Oriental Insurance Co Ltd



  
Divisional Manager

**दि ओरिएण्टल इश्योरेंस कम्पनी लिमिटेड**

(भारत सरकार का एक उपक्रम)

कोर्पोरेट ऑफिस, जी+4 फ्लोर्स, प्लेट ए  
ऑफिस ब्लॉक -4, एनबीसीसी ऑफिस कॉम्प्लेक्स,  
किदवाई नगर पूर्व, नई दिल्ली - 110023



**THE ORIENTAL INSURANCE COMPANY LIMITED**

(A Govt. of India Undertaking)  
Corporate office, G+4 Floors, Plate A,  
Office Block-4, NBCC Office Complex,  
Kidwai Nagar East, New Delhi - 110023.



**THE OREINTAL INSURANCE COMPANY LIMITED**

**DIVISIONAL OFFICE NO 1**

**NO.115, 1ST FLOOR,**

**PRAKASAM SALAI, BROADWAY**

**CHENNAI - 108**

**PH: 23458228; 23458229**

**E-MAIL: 411100@orientalinsurance.co.in**

10.02.2023

The Principal  
Dwaraka Doss Govrdhan Doss Vaishnav College(Shift I)  
"Gokul Bagh" 833, Periyar, EVR Salai  
Arumbakkam  
Chennai – 600 106.

Sir/Madam,

Re: Internship at our office – Ms. R Malavika, Roll No. 3073 -  
M.A (Economics) – II year

\* \* \* \*

We refer your dated 16.11.2022 on the above and hereby certify that Ms. R Malavika, Roll No. 3073, M.A (Economics) – II year student of your Institution has completed her Internship Training at our Divisional Office from 13.12.2022 to 12.01.2023.

Thanking you,

For The Oriental Insurance Co Ltd



*[Signature]*  
Divisional Manager





# Shakas Technologies

Date: 16.03.2023

To  
The Head of the Department  
Dwarak Doss Goverdhan Doss Vaishnav College,  
"GOKUL BAGH" 833, EVR ROAD  
Arumbakkam,  
Chennai - 600106

Sir/Madam

Re : Internship at our office - Ms.Mehala Roll No: 21D3066 MA ECONOMICS II YEAR

We refer your dated 16.11.22 on the above and hereby certify that Ms.Mehala Roll No: 21D3066 student of your institution has completed her training at our office from 16.12.22 to 15.01.23

Thanking you.



Shakas Technologies,  
Assistant General Manager – Administration

#13/19, 1<sup>st</sup> Floor, Municipal Colony, KN Road, Gandhi Nagar, Vellore-632006.

Off: 0416-2247353 Mo: +91 9500218218 / 8870603602.

Website: [www.shakastech.com](http://www.shakastech.com), Email-ID: [shakastech@gmail.com](mailto:shakastech@gmail.com),  
[info@shakastech.com](mailto:info@shakastech.com).



# Shakas Technologies

Date: 16.03.2023

To  
The Head of the Department  
Dwarak Doss Goverdhan Doss Vaishnav College,  
"GOKUL BAGH" 833, EVR ROAD  
Arumbakkam,  
Chennai - 600106

Sir/Madam

Re : Internship at our office - Ms.Nalini Roll No: 21D3075 MA ECONOMICS II YEAR

We refer your dated 16.11.22 on the above and hereby certify that Ms.Nalini Roll No: 21D3075 student of your institution has completed her training at our office from 16.12.22 to 15.01.23

Thanking you.

  
Shakas Technologies,  
Associate General Manager – Administration

---

#13/19, 1<sup>st</sup> Floor, Municipal Colony, KN Road, Gandhi Nagar, Vellore-632006.

Off: 0416-2247353 Mo: +91 9500218218 / 8870603602.

Website: [www.shakastech.com](http://www.shakastech.com), Email-ID: [shakastech@gmail.com](mailto:shakastech@gmail.com),

[info@shakastech.com](mailto:info@shakastech.com).

Now everyone  
can make their  
own 'Pahchan'



*Hamari Pahchan*

Ref No.: HP/INT/6218/2023

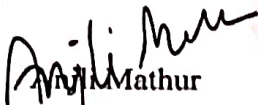
Dated: 20/01/2023

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that Ms. Nithya. S has worked as a virtual intern for the period starting from 12/12/2022-12/01/2023 with our organization. Her primary work includes designing posters, designing content for social media, Crowdfunding, Digital Media Marketing, working on an individual project as a social entrepreneur, Drafting and filing legal documents, etc. She has provided us with extensive hours of volunteer service and going past the quick obligations to be extremely useful for the association in giving assistance to the network.

During her service, she was found punctual, hardworking and inquisitive.

We wish her a bright future ahead

  
Anjali Mathur  
(President)

in association  
with:



Free Medical Camps



Legal Advice



Awareness camps with Delhi Police

 INTERNSHALA

Hiring Partner

Office Address: H. No. 1121, Mahipalpur Bypass Road, opposite Arjun Camp, New Delhi- 110037

Website: [www.hamaripahchan.org](http://www.hamaripahchan.org) | Contact No. 9911173557, 7600043888

Email id: [pahchan@vaida.org](mailto:pahchan@vaida.org) | [info@hamaripahchan.org](mailto:info@hamaripahchan.org)

17 February 2023

TOWHOMSOEVERITMAYCONCERN

Dear Sir/Madam,

This is to certify that **Rajalakshmi V(2113092020122)** student of **Dwaraka Doss Goverdhan Doss Vaishnav College** pursuing **Master of Arts (Economics)** has completed her internship from 05 December 2022 to 31 January 2023 in our organization. The Internship was for learning & Industry exposure only and no stipend was paid during her internship period.

During the internship, we found her to be enthusiastic and supporting our Human Resource – Talent Acquisition department in various activities.

We wish him all the best for his future endeavors

For Equitas Small Finance Bank Ltd,



(Authorized Signatory)



# Shakas Technologies

Date: 16.03.2023

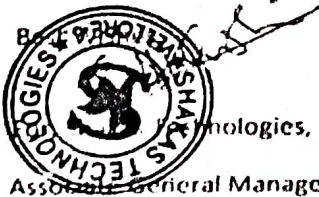
To  
The Head of the Department  
Dwarak Doss Goverdhan Doss Vaishnav College,  
"GOKUL BAGH" 833, EVR ROAD  
Arumbakkam,  
Chennai - 600106

Sir/Madam

Re : Internship at our office - Ms.Shamini Roll No: 21D3074 MA ECONOMICS II YEAR

We refer your dated 16.11.22 on the above and hereby certify that Ms.Shamini Roll No: 21D3074 student of your Institution has completed her training at our office from 16.12.22 to 15.01.23

Thanking you.



Associate General Manager - Administration

---

#13/19, 1<sup>st</sup> Floor, Municipal Colony, KN Road, Gandhi Nagar, Vellore-632006.

Off: 0416-2247353 Mo: +91 9500218218 / 8870603602.

Website: [www.shakastech.com](http://www.shakastech.com), Email-ID: [shakastech@gmail.com](mailto:shakastech@gmail.com),

[info@shakastech.com](mailto:info@shakastech.com).

17 February 2023

TOWHOMSOEVERITMAYCONCERN


Dear Sir/Madam,

This is to certify that **Subhasree P (2113092020126)** student of **Dwaraka Doss Goverdhan Doss Vaishnav College** pursuing **Master of Arts (Economics)** has completed her internship from **05 December 2022** to **31 January 2023** in our organization. The Internship was for **learning & Industry exposure only** and no stipend was paid during her internship period.

During the internship, we found her to be enthusiastic and supporting our Human Resource – Talent Acquisition department in various activities.

We wish him all the best for his future endeavors

For Equitas Small Finance Bank Ltd,

  
(Authorized Signatory)

# MAAN PHARMACEUTICALS

Date: 24-01-2023

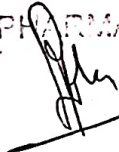
## To Whom It May Concern

We are glad to inform you that **MS. Vaasavi.V** from Dwaraka Doss Goverdhan Doss Vaishnav College, Chennai, has successfully completed her Internship at Maan pharmaceuticals from **6<sup>th</sup> December 2022 to 24<sup>th</sup> January 2023.**

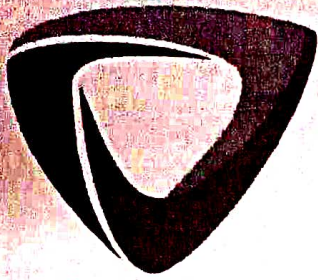
During the entire tenure of internship, she was punctual and hardworking. She was very much interested to learn about the pharmaceutical industry.

Her Participation with us was very good and we wish all the best in her future endeavors.

Thanking you,  
For MAAN PHARMACEUTICALS



Proprietor



*Make IT Better*

# Vedha Technologies

Software Development & Services

## COMPLETION CERTIFICATE

### To Whomsoever It May Concern

This is to certify that **Mr. METHUN KUMAR .P**, Reg.No: 2113092020130, pursuing MA (ECONOMICS) in "DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE" has successfully completed his final year Internship in our concern in the title "HUMAN RESOURCE (HR)" from 05-12-2022 to 31-12-2022.

Thanking you,

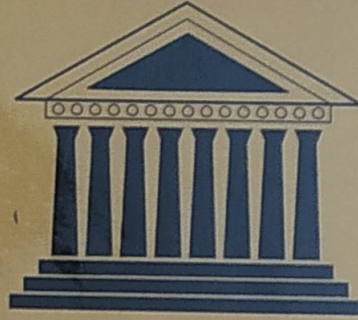
For Vedha Technologies,

**HR MANAGER**

VEDHA TECHNOLOGIES  
Software Development & Training Company  
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## INFLUENCE OF CONSUMER PREFERENCE ON CONSUMER SATISFACTION AND BRAND LOYALTY

**Dr. R. Tamilselvi**

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### ABSTRACT

Customer satisfaction and brand loyalty is determined by the price and quality of the products the customer wants. The price and quality of a product is the foundation for building consumer satisfaction and brand loyalty. Hence, research sought to examine the influence of consumer preference on consumer satisfaction and brand loyalty. Convenience sampling technique was used for primary data collection. Sample size was 125 Aavin product users in Cuddalore district. Data analysis was done through path analysis. The analysis found that there is impact of price and quality on customer satisfaction. The research also identified that there is impact of customer satisfaction on brand loyalty. Finally, the analysis discovered that there is impact of price and quality on brand loyalty. Hence, It is concluded that the Aavin management should implement price strategy and product quality to influence the buying intentions of consumers.

**Keywords:** Consumer Preference, Price, Quality, Consumer Satisfaction, and Brand Loyalty.

### INTRODUCTION

As a result of globalization more and more competitive companies want to improve their performance. By improving their performance, Aavin can compete with other competitors' products (Arokiya milk products, Amul milk products, etc.) (Stucke, 2013; Chattopadhyay & Bhawsar, 2017). Only a company that understands and acts on consumer demand can improve their performance (Lemon & Verhoef, 2016; Iqbal, et al. 2016; Peighambari, et al. 2016). Thus Aavin should design an effective marketing strategy that understands consumer needs.

Customer satisfaction and brand loyalty is determined by the price and quality of the products the customer wants. According to Bei and Chiao (2001) the price and quality of a product is the foundation for building consumer satisfaction and brand loyalty. Khan and Ahmed (2012) stated that the price and quality of a product is an important determinant of consumer satisfaction. Furthermore, Ehsani and Ehsani (2015) stated that based on the price of the product can increase both profit and customer satisfaction. Another factor affecting customer satisfaction is the quality of the product, as proposed by Ma and Ding (2010).

The quality distribution of the product can satisfy the customer demand. Likewise, Sugiarti, et al. (2013) stated that satisfied customers with better product quality and price than what competitors offer. Also, product quality and price will make customers loyal. Based on the many expert opinions above,

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# A COMPARATIVE STUDY ON THE ANALYSIS OF THE SELECTED LARGE CAP MUTUAL FUNDS IN INDIA

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## Abstract

Mutual funds are very popular investment vehicles in India. Many middle class people invest in systematic investment plan under Mutual Funds. In India, 44 AMFI (Association of Mutual Funds in India)-registered fund institutions offer more than 2,500 mutual fund plans collectively. The vast selection of funds can make it difficult for investors to select the optimal scheme. It is necessary to study the fund performance based on various criteria such as expense ratio, NAV, Sharpe Ratio, Treynor Ratio, NAV, Beta, Credit Rating, Risk Vs returns etc; The main objective of this paper is to analyse the performance of selective large cap mutual funds in India. The results were based on secondary data analysis and it is concluded that UTI Mastershare Fund, Kotak Blue-chip Fund and ICICI Prudential Fund have maintained healthy statistical and financial metrics.

**Keywords :** Mutual funds, Sharpe Ratio, Treynor Ratio, NAV, Beta, Credit Rating, Fund analysis

## INTRODUCTION TO THE STUDY:

The mutual fund industry has thrived in the past two decades and has seen many days of successful existence. This is because of its minimum risk and maximum returns policy and government initiatives to promote investment in our country. This phenomenal growth has attracted many national and international players into the Indian mutual fund industry.

Due to the co-existence of many mutual funds, it becomes difficult for retail investors to analyze every fund or get into the technical data. This paper tries to render the complete information required to fundamentally understand the mutual fund by explaining the structure, types, expenses involved etc.

This paper is to analyze the financial performance of select equity mutual funds with the help of statistical tools like Beta, Standard Deviation, Sharpe Ratio, Treynor's Ratio, Jensen's Alpha etc. This paper considers the data of past 3 years and tries to analyze and determine the best performing mutual funds among the selected funds, and to discover the best portfolio mix for the financial markets. This paper also finds the minute details and notable characteristic of certain parameters and tries to give suggestions for its findings.

The researchers have identified research gap in large cap mutual funds, as many research papers have shown that, large cap gives capital safety but slow growth. The researchers wanted to examine the agreeability of the above, from the practical point of view.

## REVIEW OF LITERATURE:

**Mayank Malviya & Prateek Khanna. (2020)** analyzed the performance of large cap, mid cap and small cap mutual funds and found that large cap funds and small cap funds give higher returns in long term, but small cap funds do not have guarantee for future existence. Whereas mid cap funds give higher returns in medium to long term.

**Kalpesh P Prajapati and Mahesh K Patel (2012)** used a performance index, risk-return analysis, Treynor's measure, Sharpe measure, Jensen's measure, and Fama's measure to examine the performance of Indian mutual funds. The relevant data examined was daily closing NAVs from January 1, 2007 to December 31, 2011, and it was concluded that the majority of mutual funds performed well during the study period.



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**Prof. Dr. M. Mala, M.A., M.Phil.**  
Chairperson



### Chairperson's Message

I am glad that the elites from the Department of Aeronautical Engineering, Civil Engineering, Computer Science Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering, Mechanical Engineering, Information Technology, Science and Humanities, and Master of Business Administration are conjoined in organizing an **"International Conference on Recent Trends in Science, Engineering and Management (ICRASEM–2022)"** and are publishing the conference proceedings on the rejoiceful occasion. I am confident that this conference will deliberate the advancements made in the field of Science, Engineering and Management which will immensely benefit the participants and the society.

I congratulate the hard work and dedication of our eminent faculty members in organizing the international conference.

I wish the conference **ICRASEM–2022**, a grand success.

Date : 25.01.2023

**Prof. Dr. M. Mala**  
Chairperson



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**Dr. R. Ramesh, M.E., Ph.D.**  
Principal & Conference Chair



### Principal's Message

I am exhilarated that the Department of Aeronautical Engineering, Civil Engineering, Computer Science Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering, Mechanical Engineering, Information Technology, Science and Humanities, and Master of Business Administration are unitively organizing an "**International Conference on Recent Advances in Science, Engineering and Management (ICRASEM-2022)**" on 25th January 2023. The conference aims to provide premier interdisciplinary forum for researchers and academicians to present and discuss the most recent innovations, trends, practical challenges encountered and the solutions adopted in the corresponding field of Engineering.

I would like to manifest my gratitude to all authors for their outstanding contribution and in particular the members of the organizing committee for their competent evaluation of the large number of submission. I thank the management for the fullest support in organizing ICRASEM-2022 in a grand manner. Likewise, I would also like to express my appreciation and sincere thanks to Co-chair and all the HODs of Departments concerned for their dedicated work towards the successful conduct of the ICRASEM-2022. I thank all the keynote speakers and session chairs for accepting our invitation.

My hearty congratulations to those involved in bringing out the proceedings of the conference. I thank all the sponsors for their support in conducting this conference. I hope that the conference provides a great intellectual enlightenment to all the participants. I wish **ICRASEM-2022** a memorable and successful event.

**Date :** 25.01.2023

**Dr. R. Ramesh, M.E., Ph.D.**  
Principal and Conference Chair



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**Dr. K. Srinivasan**  
Conference Co-Chair



**Dr. P. Priyadarsini**  
Conference Co-Chair

## Preface

As Co-Chair of the conference, we take immense pleasure in welcoming all the delegates for the two day “**International Conference on Recent Advances in Science, Engineering and Management**” scheduled on 25<sup>th</sup> January 2023. The spectrum of delegates ranges from all over India and the papers were received towards the conference in the domain of technical session in Aeronautical Engineering, Civil Engineering, Computer Science, Electrical and Electronics Engineering, Electronics and Communication Engineering, Mechanical Engineering, Information Technology, Science and Humanities, and Master of Business Administration for presentation in various sessions.

Conference of this nature provides platform for academicians, industrialists, researchers and student community to discuss and deliberate matters pertaining to modern trends in their respective fields. The entire cross section of the participants are mostly teachers and post graduate students and our thanks are due to the Principal and the Management of the respective colleges for permitting them to participate in the conference. We hope and request all the participants to sincerely take part in the deliberations instead of merely attending the conference.

The organizers take this opportunity to thank whole heartedly the Chair Person, and the Principal, Tagore Engineering College for permitting the conduct of the conference and granting financial assistance.

Our sincere appreciation for the HOD’s of Aero, Civil, CSE, EEE, ECE, Mech, IT, S&H and MBA departments and their entire faculty for their meticulous effort, sorting all issues from calling of papers and bringing out the conference proceedings. Our thanks are due to all technical and supporting staff of the college, both teaching and non-teaching, for their whole hearted support and help rendered directly or indirectly towards the successful conduct of the conference.

Date : 25.01.2023

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## **A STUDY OF THE IMPACT OF PROFITABILITY ON REAL ESTATE COMPANY STOCK PRICES (2018–2022) WITH MODERATING VARIABLES SUCH DEBT EQUITY RATIO, EARNINGS PER SHARE, AND PRICE EARNINGS RATIO**

**S. Rajeswari<sup>1</sup> & Dr. D. Anitha Kumari<sup>2</sup>**

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Indian Real Estate market has regained a significant recovery in spite of growing construction costs and increasing in the repo rate. After the pandemic lockdown, real estate market in Tier I, II, III Cities has increased the sales. The study has focused on the impact of Profitability on stock price with moderating variables such as Debt equity ratio, Earnings Per Share and Price to Earnings Ratio of top performing Real Estate companies on the Indian Stock Exchange for the 2018 - 2022 Period. The Researcher has used descriptive quantitative research. The nature of this research is due and effect/casual. The sample is top 10 Performing companies in Real Estate. Profitability has a partial effect on company value in real estate company on Indian Equity market. Debt to equity ratio, Earnings Per share & Price to Earnings ratio is contribute for the increase in the stock price. The research has focused on the limited variable and companies in the industry. This research is expected to benefit for increase the share price of the company, determine the financial performance factors including Debt Equity ratio, Earnings per share and Price Earnings Ratio. This study's methodology is cause-and-effect. The top 10 performing real estate companies are shown below. For real estate companies listed on the Indian equity market, profitability has a limited impact on corporate value. Earnings per share, price-to-earnings ratio, and debt-to-equity ratio all help drive up stock prices. The study is only focused on a select few variables and firms in the Indian equity market for the years 2018 to 2022. It is anticipated that this research will help the company's stock price rise and identify financial performance indicators, including the debt-to-equity ratio, earnings per share, and price-earnings ratio.





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# **A Study On Differences In Purchase Frequency For Social Commerce With Special Reference To Education Background**

**Dr. V Sasirekha** Professor – Management Sri Sairam Engineering College, Chennai

**Dr. N. Sarulatha AP** - Business Administration, Dwaraka Doss Goverdhan Doss Vaishnav College, Chennai.

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## **INTRODUCTION**

The popularity of social networking sites, greater accessibility to internet and technological advancements has evolved a subset of e-commerce – social commerce. Social media has empowered users to be content writers in sharing their viewpoints, experiences, and information. This provides an opportunity for business to capitalize the social media in understanding, communicating and facilitating commercial transactions with customers. The key values businesses derive from social media are popularising the brand (de Vries et.al., 20212), eWOM (Chen et.al.), improve sales (Lu & Hsiao, 2010 & Agnihotri et.al., 2012), developing support for consumers in social context (Ali, 2011; Ballantine & Stephenson,2011).Companies develop strategies accordingly in social media for influencing consumers (Adjei et.al., 2010)

## **REVIEW OF LITERATURE**

Social networks are referred as web-based services. Social networking sites provide means for individuals to develop their profiles, share & interact with interrelated users and view relationships of themselves and shared with other users (Ellison, 2007). Social networking sites have become the hub in e-commerce (Fue et al. 2009), and it facilitates users to build social connections and involve in communications. Lai & Turban (2008) states social networks develop trust and build stronger relationships. Enjoyment is the highly influential factor for individuals using social networking sites. The other reasons cited for using social networking sites are the number of peers and usefulness. Also, influence on social networking sites varies with gender differences.(Lin & Lu 2011). Bae & Lee (2010)

investigated and found significant gender differences in consumer's perception of online consumer reviews.

E-commerce activities & commercial transactions assisted by social media are referred as social commerce. This is enabled through applications in social networking sites and/or providing access to social networking connectivity in e-commerce sites (Liang & Turban, 2011). Marsden (2011) refers social commerce as gaining monetary benefits from e-commerce through social media. Any exchange-related activities occurring/influencing in online and offline environment facilitated by computer-mediated social environments and correspond to the various stages of consumer decision-making process – Need recognition, pre-purchase and post-purchase is termed as social commerce from the marketing perspective (Yadav et al. 2013). Social commerce emerged first on Yahoo in 2005 (Rubel, 2005) when it added a feature "Pick Lists" for users to review products and suggest comments (Rothberg, 2005). Purchase circles by Amazon and internal social networks built by Epinions analogous to recommendations and online communities today were the pioneers before Yahoo introduced Social commerce (Curry & Zhang, 2011).

The web-based technology enables social platforms such as Ratings & Reviews, Recommendations & referrals, Forums & communities for building user-generated content. These social platforms are known as social commerce constructs with same functions and different technical capabilities (Hajli, 2015). Adoption of social commerce tools such as ratings & reviews, recommendations provides a simple means for sharing users views and experiences about a product/service (Amblee & Bui, 2011). Ratings & Reviews aids people to share the product feedback with independent views and experiences. These ratings & reviews can be viewed by everyone whereas Recommendations and Referrals are usually personalized. Using social media to get and make recommendations on the activities such as what to purchase or do or visit is referred as a recommendation. Referral programs are the rewards offered by retailer due to consumer promotion. Forums & communities are the tools used for social interactions in a moderating environment (Shadkam & O'Hara, 2013). Social commerce adoption model was developed with social commerce constructs (Ratings & Reviews, Recommendations & referrals, Forums & communities) and trust which results in intention to buy.

### **OBJECTIVE OF THE STUDY**

To find relationship between education background and purchase frequency for fashion products in social networking sites.

H<sub>0</sub> : There is no significant relationship with education background and purchase frequency for fashion products in social networking sites.

### RESEARCH METHODOLOGY

The study was carried among social networking sites users who purchased fashion products in the recent past (Within six months). Pilot study was carried out questionnaire refinement. Final Data was collected through structured questionnaire using convenience sampling method both online and offline. Chi-square test is used to identify the significant difference in gender and purchase frequency of fashion product(s) in social networking site(s).

### RESULTS OF THE STUDY

Chi-square test is used to understand whether there is significant relationship between purchase frequency of fashion products online in the recent past (Less than 6 months) and education. The table below reveals the row wise and column wise percentage of purchase frequency of fashion products online in the recent past (Less than 6 months) based on education with chi-square value and pvalue.

**Table 1. Chi-square test for respondents educational qualification and purchase frequency of fashion products online in the recent past (Less than 6 months)**

Purchase frequency of fashion products online in the recent past (Less than 6 months)	Educational Qualification				Total	Chi-square value	pvalue
	Up to HSC	UG	PG	Professional			
Only once	19 (13.6%) [19.8%]	38 (27.1%) [23.5%]	83 (59.3%) [42.3%]	0 (0.0%) [0.0%]	140 (100.0%) [24.1%]	255.585	0.001**
Twice	21 (11.2%) [21.9%]	71 (38.0%) [43.8%]	48 (25.7%) [24.5%]	47 (25.1%) [37.0%]	187 (100.0%) [32.2%]		
Three	20 (28.6%) [20.8%]	15 (21.4%) [9.3%]	12 (17.1%) [6.1%]	23 (32.9%) [18.1%]	70 (100.0%) {12.0%]		

Four	29 (31.5%) [30.2%]	24 (26.1%) [14.8%]	28 (30.4%) [14.3%]	11 (12.0%) [8.7%]	92 (100.0%) [15.8%]		
Five	7 (15.2%) [7.3%]	14 (30.4%) [8.6%]	2 (4.3%) [1.0%]	23 (50.0%) [18.1%]	46 (100.0%) [7.9%]		
Six	0 (0.0%) [0.0%]	0 (0.0%) [0.0%]	1 (4.2%) [0.5%]	23 (95.8%) [18.1%]	24 (100.0%) [4.1%]		
Six and Above	0 (0.0%) [0.0%]	0 (0.0%) [0.0%]	22 (100.0%) [11.2%]	0 (0.0%) [0.0%]	22 (100.0%) [3.8%]		
Total	96 (16.5%) [100.0%]	162 (27.9%) [100.0%]	196 (33.7%) [100.0%]	127 (21.9%) [100.0%]	581 (100.0%) [100.0%]		

Source : Computed from primary data

\*\* denotes significance at 1% level

Note : Figures in ( ) represents row%,

Figures in [ ] represents column %

It is inferred from the above table among the overall purchase frequency levels for fashion products online in the recent past (Less than 6 months) across education levels, 33.7% of the respondents are post graduate which is comparatively higher among other education levels. It is followed by 27.9% of the respondents in the under graduate category, 21.9% of the respondents are professionals and 16.5% of the respondents has school level education.

By comparing the purchase frequency level for shopping fashion products online in the recent past (Less than 6 months) for school level education, it is inferred that 30.2% of the respondents has purchase frequency four which is comparatively higher than other purchase frequency levels. It is followed by 21.9% of the respondents with purchase frequency twice, 20.8% of the respondents with purchase frequency three, 19.8% of the respondents with purchase frequency four and 7.3% of the respondents with purchase frequency five. There are no respondents for purchase frequency level six , six and above.

By comparing the purchase frequency level for shopping fashion products online in the recent past (Less than 6 months) for undergraduate education, it is inferred that 43.8% of the respondents has purchase frequency twice which is comparatively higher than other purchase frequency levels. It is followed by 23.5% of the respondents with purchase frequency only once, 14.8% of the respondents with purchase frequency four, 9.3% of the respondents with purchase frequency three and 8.6% of the respondents with purchase frequency five. There are no respondents exhibited for purchase frequency six, six and above.

By comparing the purchase frequency level for shopping fashion products online in the recent past (Less than 6 months) for undergraduate education, it is inferred from the above table 42.3% of the respondents has purchase frequency only once which is high compared with other purchase frequency levels. It is followed by 24.5% of the respondents with purchase frequency twice, 14.3% of the respondents with purchase frequency four, 11.2% with purchase frequency six and above, 6.1% of the respondents with purchase frequency three, 1.0% of the respondent with purchase frequency five and 0.5% of the respondents with purchase frequency six.

By comparing the purchase frequency level for shopping fashion products online in the recent past (Less than 6 months) for undergraduate education, it is inferred from the above table 37.0% of the respondents ha purchase frequency twice which is high compared with other purchase frequency levels. It is followed by 18.1% of respondents for purchase frequency level three, five and six respectively. 8.7% of the respondents has purchase frequency four and there are no respondents exhibited for purchase frequency only once, six and above.

By comparing the purchase frequency only once for fashion products online in the recent past (Less than 6 months) across education levels, it is inferred from the above table that 59.3% of the respondents has post graduate education which is very high compared with other education levels. It is followed by 27.1% of the respondents with undergraduate education and 13.6% of the respondents with school education and there are no respondents exhibited for professional education with purchase frequency only once.

By comparing the purchase frequency twice for fashion products online in the recent past (Less than 6 months) across education levels, it is inferred from the above table that 38.0% of the respondents has undergraduate education which is compared with other education levels followed by almost equal number of respondents – 25.7% and 25.1% of respondents

with education level post graduate and professional respectively, 11.2% of the respondents with school education.

By comparing the purchase frequency three for fashion products online in the recent past (Less than 6 months) across education levels, it is inferred from the above table that 32.9% of the respondents has professional education which is high compared with other education levels. It is followed by 28.6% of the respondents with school education, 21.4% of respondents with undergraduate education, 17.1% of the respondents with post graduate education.

By comparing the purchase frequency four for fashion products online across education levels, it is inferred from the above table that almost equal number of respondents -31.5% and 30.4% respondents has post graduate and school education respectively and is high compared with other education levels. It is followed by 26.1% of respondents with undergraduate education and 12.0% of the respondents with professional education.

By comparing the purchase frequency five for fashion products online in the recent past (Less than 6 months) across education levels it is inferred from the above table that 50.0% of the respondents has professional education which is high compared with other education levels. It is followed by 30.4% of the respondents with undergraduate education, 15.2% of the respondents with school education and 4.3% of the respondents with post graduate education.

By comparing the purchase frequency six for fashion products online in the recent past (Less than 6 months) across education levels it is inferred from the above table that 95.8% of the respondents has professional education which is very high compared with 4.2% of the respondents with post graduate education. There are no respondents exhibited for school and undergraduate education.

By comparing the purchase frequency six and above for fashion products online across education levels it is inferred from the above table that all the respondents has post graduate education and there are no respondents exhibited with other education levels.

It is also inferred from the above table, chi-square( $\chi^2$ ) =255.585 and pvalue is less than 0.01 and hence statistically significant at 1% level for relationship between education level and purchase frequency of fashion products online in the recent past (Less than 6 months). i.e, There is significant relationship between purchase frequency of fashion products online in the recent past (Less than 6 months) and education level.

## **FINDINGS OF THE STUDY**

The above study reveals that purchase frequency level for shopping fashion products online in the recent past (Less than 6 months) varies with education level of customers.

Based on the above comparisons, the following conclusions are made regarding purchase of fashion products online in the recent past (Less than 6 months) : the purchase frequency is high among customers with education level of post graduate and low among respondents with school level education.

Also, more than one –fourth of the customers constitute the majority for customers with school and professional education has a purchase frequency four and twice respectively. Nearly half of the customers constitute the majority for customers with undergraduate and post graduate education with purchase frequency twice and once respectively. Also, more than half of the customers constitute the majority with purchase frequency only once has post graduate education, more than one fourth of the customers constitute the majority with purchase frequency twice has undergraduate education,

More than one fourth of the customers, one half of the customers and almost all the customers constitute the Majority with purchase frequency three, five and six respectively has professional education. All the customers with purchase frequency six and above have post graduate education.

There are no customers with purchase frequency six, six and above for school level and undergraduate education. Also, there are no customers with purchase frequency only once, six and above with professional education.

## **IMPLICATIONS & LIMITATIONS**

The study revealed the significant relationship and differences between education and purchase frequency in social networking site. The study servers as a basis for marketers to devise tactics in accordance with their education background and purchase frequency in social networking sites. The research is limited to top 4 social networking sites namely Facebook, Twitter, Google Plus & Instagram and active online shoppers in those sites. The study also provides further scope to carry out across each specific social networking sites for a thorough understanding.

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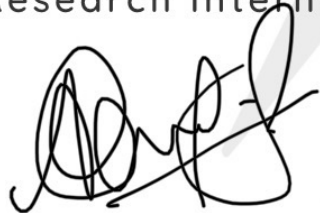
# CERTIFICATE OF INTERNSHIP

This is presented to

**KARTHIK S**

Identified by PAN: HZMPK5670J

for successfully completing the 1 month  
Research Internship program at Pioneer One Consulting LLP



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Head of Research  
**Anand Sridhar**



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DATE: 28-01-2023

## TO WHOM IT MAY CONCERN

This is to certify that Mr. T.Varun Arasu , B. Com (Accounting and Finance) Final year student from Dwaraka Doss Goverdhan Doss Vaishnav college, Chennai, has successfully completed internship programme at BHARTI KOTHARI & ASSOCIATES, Chartered Accountants, From 01/12/2021 to 28/01/2023.

During the internship Training, he had been learning Accounting and Audit work and he was found to be hardworking, inquisitive, committed to work and sincere.

We wish him for a successful career and future in life.

For BHARTI KOTHARI & ASSOCIATES

Chartered Accountants

FRN : 021226S

BHARTI KOTHARI

(Prop.)

(M no. 227666)



# CERTIFICATE OF INTERNSHIP

This is presented to

**PRIYADHARSHINI M**

Identified by PAN: DJLPP7519A

for successfully completing the 1 month  
Research Internship program at Pioneer One Consulting LLP



Head of Research  
**Anand Sridhar**



Designated Partner  
**Thiyagarajan T S**

## TO WHOM IT MAY CONCERN

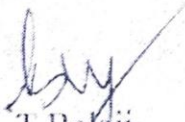
This is to certify that Mr. Shreevarshan C. B. Com (Accounting and Finance) Final year student from Dwaraka Doss Goverdhan Doss Vaishnav college, Chennai, has successfully completed internship programme at T Balaji and Associates, Chartered Accountants, From 4<sup>th</sup> Jul 2022 to 4<sup>th</sup> Jan 2023. During the internship Training, he had been learned Accounting and Audit work and he was founded to be hardworking, inquisitive, committed to work and sincerity in work.

We wish him for a successful career and future in life.

For T Balaji and Associates

Chartered Accountants

FRN:014113S

  
T Balaji



Proprietor

M No 205635

Date: 9<sup>th</sup> Jan 2023

Place: Chennai