Advanced Internet of Things (IoT) Based Technique for Prevention of Road Accidents

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Abstract: **Population in the countries like India is growing very rapidly which results in increase in traffic in cities. WHO (World Health Organization) gave the report of accidents that occurred in the world in 2021 due to the accidents. As per reports around 50% to 60% of the accident cases are leading to the death of the individual. Many reasons state the cause of accidents. One case states that accident deaths occur majorly with two-wheeler riders due to the head injuries. Another case states that due to the drowsiness of the driver. Alcohol consumption is also the major reason for accidents to occur which might result in the loss of life of a driver. Survey done by road safety department states that majority of road accidental deaths are occurring in youth due to rash driving or driving with alcohol consumption. In this work, an advanced way of dealing with the accidents is proposed which further prevents the accidents to occur. An Internet of Things (IOT) based system is designed in such a way that bike or scooter gets started only the rider wears a helmet and also passes the alcohol test. One more methodology is also added where the alarm system gets ON when the driver reaches the over speed. Sensors and microcontrollers are used in the proposed work.**

Keywords: **Alcohol, Over Speed, Raspberry PI, Internet of things (IOT), Micro Controller, Sensors.**

I. INTRODUCTION:

The purchase of vehicles is directly proportional to the growth of the population which results in heavy traffic on roads. Many youngsters are passionate about riding bikes on the roads. Due to their adolescent age, they are least bothered about the safety measures on the roads which results in their rash driving which further leads to accidents. Either the drivers of cars, Lorries, truck, auto or any bike riders are violating the traffic rules by driving when they are drunk. This also leads to many accidents on roads. If we look at the statistics of road safety department around 1.7 million people are dying due to the accidents on the roads. If the same trend continues, reaching 3 million deaths per year with accidents is not far. Wearing helmet or using seat belts in cars while driving are the important safety measures. Missing [1] of these safety measures are also the major factors of the raise in death rates in road accidents. Road accidents and related deaths can be prevented by using technology [2].These days technology has brought a drastic change in living style of human beings. Many technologies like Image processing, cloud computing, IOT and many more brought revolution in human health care system. Internet of Things (IoT) supports in Human health care monitoring system and also in human safety measures. Now a day's IoT technology is being implemented in sports, Heart attack patients monitoring, Asthma patients monitoring, Covid-19 patients monitoring and many more. Here this

advanced technology of IoT can also be utilized as traffic monitoring system and also as road accidents prevention system which is discussed in this paper. In this paper methodologies described for the people who do not wear helmet or do not wear seat belt. Here methodologies also described for the people who are drunk and drive the vehicle

II. LITERATURE SURVEY

With the help of the Atmel microcontroller, the authors in [3] proposed collision prevention and a vehicle alert system. In their paper, it is also mentioned and highlighted the reason for the cause of an accident as drowsiness of the driver. Lack of sleep of the driver is the reason for the drowsiness. Atmel microcontroller-based system works effectively for alarming the driver when their body movement is very lazy. But lazy[4] body movement can be of any other reason where this proposed system becomes less effective in prevention of road accidents. A specialized system for road accident prevention was proposed by [5] authors in their work. Accident detection in parking lots was only the parameter for the detection of accidents. Hence this model also does not work effectively on roads with heavy traffic. RFID-based road accident prevention system was proposed by [6].In their work, pollution was considered as a parameter for the prevention of accidents. RFID with the gas sensor was used in their work. Sensors collects the data related to the pollution of each vehicle and measures the chance of occurrence of the accident and further alarms about the precaution to be taken.

This method also proved to be ineffective when pollution from many [7]vehicles occurs at the same time and it is difficult to prevent the accident or sometimes alarm buzzes even there[8] is no sign of any accident over there. The automated control system was proposed by [9] authors, where SMS based accident prevention system was proposed.SMS is sent to the driver when any vehicle comes near to the driver with the system. For a person who drives the vehicle, it is not possible to check the [10] SMS each time. In fact, looking at mobiles while driving may become the cause of the accident and hence this system also has some flaws which are tried to overcome in this work. An alcohol-based road accident prevention system was proposed in [11] RF transmitter-based system was proposed which detects road accidents with a timer of 10 sec. Here alcohol detection and also helmet detection were taken as constraints. This work is the basic motivation of the proposed work. In this work, there were few drawbacks as it lacks the effectiveness of detecting alcohol. Perfume or any deodorant smell is also considered as alcohol by this model where the purpose goes wrong.Fig.1 shows the literature review of few works with their benefits motivates the proposed model in this paper.

S. No	Author and Year	Techniques	Benefits
1.	Aishwarya et al. (2015)	Eye Blink Monitoring using IoT technology	• Fast response to take fast action • User friendly interface • Easily implementable
2.	Malik et al. (2014)	Automated Speed Detection System with DIP	• Involves manpower with a gun to inform a Toll Plaza
3.	Shabibi, Jayaraman and Vrindavanam (2014)	Automobile Speed Violation Detector using GSM & RFID technologies	• Reliable, low cost and efficient results • It provides real time notification
4.	Prasanth and Karthikeyan (2016)	Vibration Sensor Devise	• Find out acceleration faults • Estimated speed is accurate and vigorous on driving atmosphere
5.	Rangan (2017)	MQ 9 Gas sensor device using IoT, GSM and GPS	• Green city concept • Reduce speed and control air pollution

Fig.1 Literature review of few works with their benefits

III. METHODOLOGY

At present drowsy driving is a major problem and the outcomes with the drowsy driving leads to the accidents on roads and also leads to the deaths of individuals. Driving after consumption is also the major threats of accidents and followed by life loss.Fig.2 shows the proposed model for the people who drives in alcohol consumption mode or drives in drowsy model or sometimes both. Raspberry pi based[12 systems is connected to the sensors. The system checks initially whether the person who is going to drive contains Driving License or not. If yes, then it checks whether the driving license is valid or not using the RFID. Here the sensors are used for detection of the eye blinking movement. One more sensor is connected where the duty of the sensor is to check [13] whether the person consumed alcohol or not. RF transmitter and RF Receiver are connected to the Raspberry Pi where the results of whether the driver is in drunken mode or in drowsy mode are shown in LCD display.
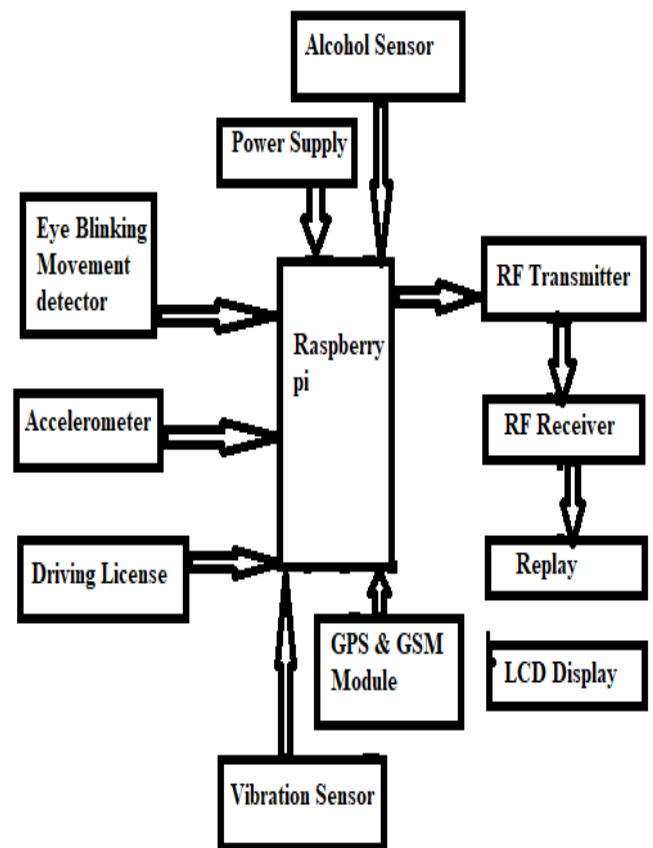
Fig.2 Block diagram of the raspberry pi

Idiosyncratic detection and prevention system is provided by the system which ensures the safety of the driver and also prevents loss of life. Ultrasonic sensors which are connected keep the continuous track of distance [14] maintained by the vehicles in between. Here the threshold value of 0.5 meters is taken and if the distance between the vehicles is less than the threshold value then a warning alarm alerts the driver and helps to avoid accidents.Fig.3 shows the working of ultrasonic sensors.
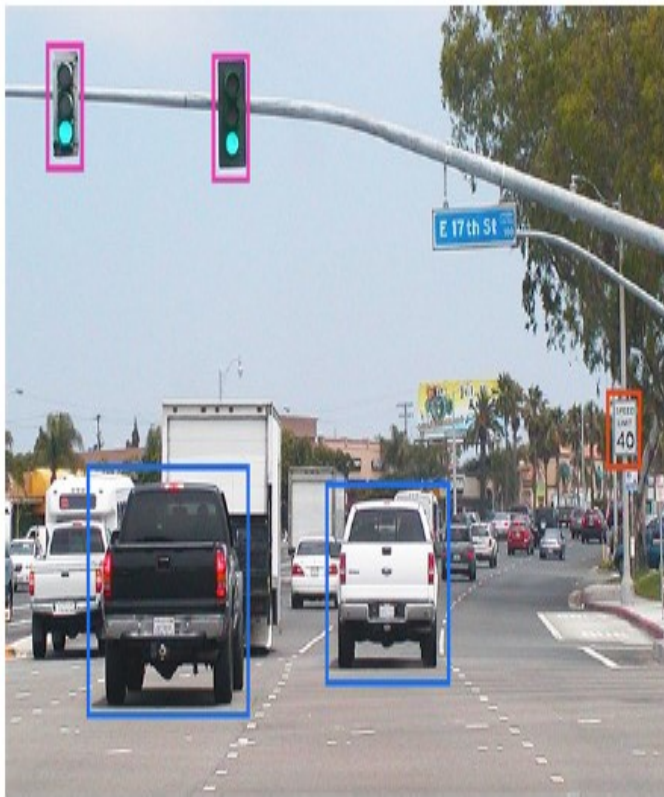

Fig.3 Continuous monitoring using ultrasonic sensors

Fig.4 shows the process of V2V communication between using Raspberry Pi. In figure it can be seen clearly how sensors are connected to the Raspberry Pi and using the same V2V communication is done and where the distance reaches the threshold value.
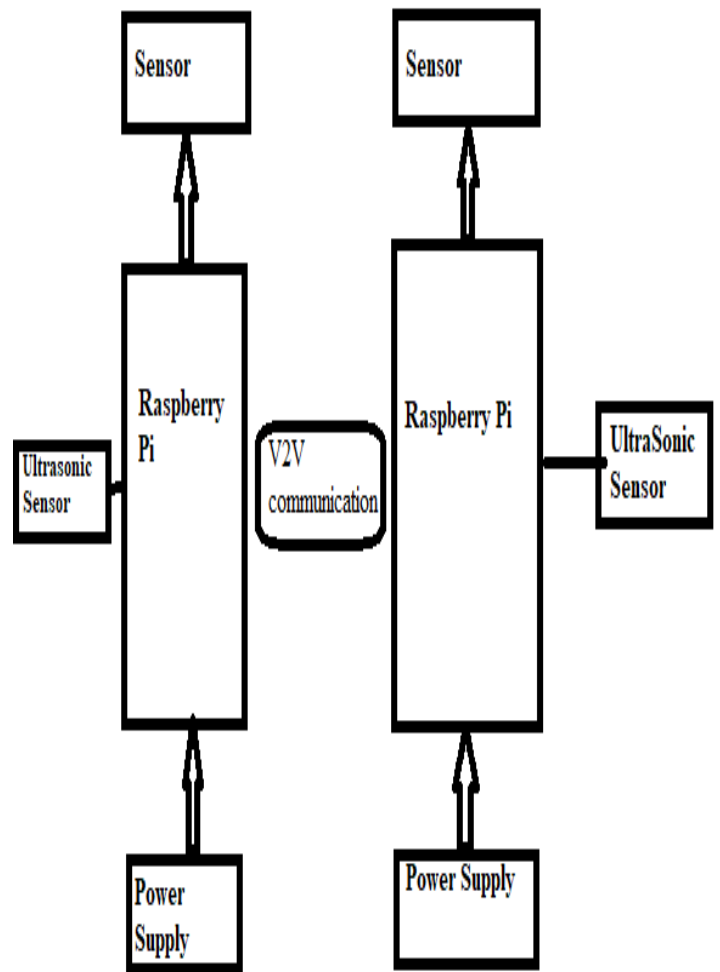
Drivers get the signal and which results in avoiding the accidents. Distance maintenance between vehicles is to be tracked and this is done by ultrasonic sensors. Here V2V communication helps in warning the driver if driver speed exceeds the speed limit

Fig.4 working of ultrasonic Sensors and V2V communication using Raspberry Pi

a.V2V communication:

V2V communication is a vehicle-to-vehicle communication that helps in communication in a

wireless mode. This checks the positions of vehicles and helps in avoiding crashes..Table.1 shows list of hardware items.

Table.1 List of Hardware Items

List of hardware Items
Eye Blink Sensor detector
Alcohol Sensor
RF transmitter
RF Receiver
LCD display
Vibration Sensor

b. Eye Blink Senor:

Fig.5 shows the eye blink sensor which supports the system very effectively. The working process of this eye blink sensor is based upon the driver's eye blinking. Here [15]whenever the driver shuts his/her eyes for more than 3 seconds, immediately [16]the sensor gets activated and raises and buzzer alarm sound which awakens the driver from the sleeping mode.

Fig.5 Eye Blink Sensor

Fig.6 Shows the Alcohol Sensor. The specialty of this sensor is, [17] it identifies on the breath of the driver where the sensor catches the Liquor and gives the resistive [18] yield on liquor fixation. It defects when it finds the [19] liquor gas [20]exist and immediately it doesn't allow the vehicle to start.

Fig.6 Alcohol Sensor

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IV. Results and Discussion:

The parameters like eye blinking, Alcohol consideration through breathe, Driving License detection using RFID are taken and applied on the model proposed in this paper. Once the alcohol is detected from the driver then this proposed system gives the values of alcohol which can be seen in Fig.7.

Fig.7 Reading values of Alcohol

The entire work done here are on the basis of the toolkit and the toolkit used in this model can be seen in the fig.8

Fig.8 IOT Tool Kit

V. Conclusion:

Results obtained in the work proposed helps to avoid accidents. As road accidents are becoming a major threat for loss of people, this proposed model helps in detecting the driver with alcoholic position also detects whether the driver is having a valid driving license and also the model helps to check the drowsiness of the driver. These many parameters are taken in the model and as compared to the model at present this can be taken as the better model for the prevention of road accidents.

a. Future Work:

In future work, this model can be enhanced to the consideration of multiple more parameters than the parameters taken in this paper. Also in future work 2 wheeler accident prevention with a helmet checker also can be taken.

References:

1. M. A. Khan and S. F. Khan, "IoT based framework for Vehicle Over-speed detection," 2018 1st International Conference on Computer Applications & Information Security (ICCAIS), 2018, pp. 1-4, doi: 10.1109/CAIS.2018.8441951.

2. A. Raza, "Road Safety in the Age of Mobile Phones: IoT and Milgram," 2017 IEEE International Conference on Internet of Things (iThings) and IEEE Green Computing and Communications (GreenCom) and IEEE Cyber, Physical and Social Computing (CPSCom) and IEEE Smart Data (SmartData), 2017, pp. 384-389, doi: 10.1109/iThings-GreenCom-CPSCom-SmartData.2017.63.

3. R. CHALLA, R. YAMPARALA, S. S. KANUMALLI and K. S. KUMAR, "Advanced Patient's Medication Monitoring System with Ardunio UNO and NODEMCU," 2020 4th International Conference on Electronics, Communication and Aerospace Technology (ICECA), 2020, pp. 942-945, doi: 10.1109/ICECA49313.2020.9297420.

4. S. Torres, S. Céspedes, J. Bustos-Jiménez and M. Serrano, "IoT solutions for Sustainable Cities: An Online Adaptation for the Driver Intent Inference Algorithm," 2019 IEEE 5th World Forum on Internet of Things (WF-IoT), 2019, pp. 967-972, doi: 10.1109/WF-IoT.2019.8767264.

5. A. Bekkanti, G. Parasa, A. Krishna, S. Karimunnisa and C. Z. Basha, "Computer Based Detection of Alcohol Consumed Candidates Using Face Expressions with SIFT and Bag of Words," 2021 5th International Conference on Trends in Electronics and Informatics (ICOEI), 2021, pp. 1636-1640, doi: 10.1109/ICOEI51242.2021.9453057.

6. J. Lee, M. Kim, S. Park, J. K. Choi and Y. Hwang, "Driver Identification for Different Road Shapes Using Vehicle IoT Sensing Data," 2021 IEEE International Conference on Consumer Electronics (ICCE), 2021, pp. 1-5, doi: 10.1109/ICCE50685.2021.9427668.

7. L. J. Rao, R. Challa, D. Sudarsa, C. Naresh and C. Z. Basha, "Enhanced Automatic Classification of Brain Tumours with FCM and Convolution Neural Network," 2020 Third International Conference on Smart Systems and Inventive Technology (ICSSIT), 2020, pp. 1233-1237, doi: 10.1109/ICSSIT48917.2020.9214199.

8. C. Z. Basha, A. Krishna and S. S. Kumar, "Automatic article detection in a jumbled scene using point feature matching" in Examining Fractal Image Processing and Analysis, IGI Global, pp. 188-195, 2019.

9. S. Agrawal and P. Maheshwari, "Controlling of Smart Movable Road Divider and Clearance Ambulance Path Using IOT Cloud," 2021 International Conference on Computer Communication and Informatics (ICCCI), 2021, pp. 1-4, doi: 10.1109/ICCCI50826.2021.9402497.

10. K. Srividya, G. Priyadarsini, U. Durga, M. Charanya and S. Nandhini, "Labour-saving road test with wireless speed sensing mechanism using IOT," 2017 International Conference on Communication and Signal Processing (ICCSP), 2017, pp. 0354-0359, doi: 10.1109/ICCSP.2017.8286376.

11. C. K. Priya, M. Sudhakar, J. Lingampalli and C. Z. Basha, "An Advanced Fog based Health Care System Using ANN for the prediction of Asthma," 2021 5th International Conference on Computing Methodologies and Communication (ICCMC), 2021, pp. 1138-1145, doi: 10.1109/ICCMC51019.2021.9418248.

12. A. Sharma, Y. Awasthi and S. Kumar, "The Role of Blockchain, AI and IoT for Smart Road Traffic Management System," 2020 IEEE India Council International Subsections Conference (INDISCON), 2020, pp. 289-296, doi: 10.1109/INDISCON50162.2020.00065.

13. P. Vijayaraman and P. J. Jayarin, "Prediction and Automation of Road Traffic using Internet of Things," 2019 Third International conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC), 2019, pp. 173-175, doi: 10.1109/I-SMAC47947.2019.9032489.

14. M. Akhtar, M. Raffeh, F. ul Zaman, A. Ramzan, S. Aslam and F. Usman, "Development of congestion level based dynamic traffic management system using IoT," *2020 International Conference on Electrical, Communication, and Computer Engineering (ICECCE)*, 2020, pp. 1-6, doi: 10.1109/ICECCE49384.2020.9179375.

15. . Madhura, S. "IoT Based Monitoring and Control System using Sensors." Journal of IoT in Social, Mobile, Analytics, and Cloud 3, no. 2 (2021): 111-120.

16. M. Navin Kumar, S. Pravin Kumar, R. Premkumar and L. Navaneethakrishnan, "Smart Characterization of Vehicle Impact and Accident Reporting System," *2021 7th International Conference on Advanced Computing and Communication Systems (ICACCS)*, 2021, pp. 964-968, doi: 10.1109/ICACCS51430.2021.9441797.

17. Tesfamikael, Hadish Habte, Adam Fray, Israel Mengsteab, Adonay Semere, and Zebib Amanuel. "Simulation of Eye Tracking Control based Electric Wheelchair Construction by Image Segmentation Algorithm." Journal of Innovative Image Processing (JIIP) 3, no. 01 (2021): 21-35.

18. Madhura, S. "IoT Based Monitoring and Control System using Sensors." Journal of IoT in Social, Mobile, Analytics, and Cloud 3, no. 2 (2021): 111-120.

19. S. Rana, M. R. H. Faysal, S. C. Saha, A. A. Noman and K. Shikder, "Road Accident Prevention by Detecting Drowsiness & Ensure Safety Issues," *2021 2nd International Conference on Robotics, Electrical and Signal Processing Techniques (ICREST)*, 2021, pp. 348-352, doi: 10.1109/ICREST51555.2021.9331043.

20. S. Karimunnisa, A. Bekkanti, U. Haritha, G. Parasa and C. Z. Basha, "Advanced IOT based System for Cricketers Health Supervision," *2021 5th International Conference on Computing Methodologies and Communication (ICCMC)*, 2021, pp. 404-408, doi: 10.1109/ICCMC51019.2021.9418314.

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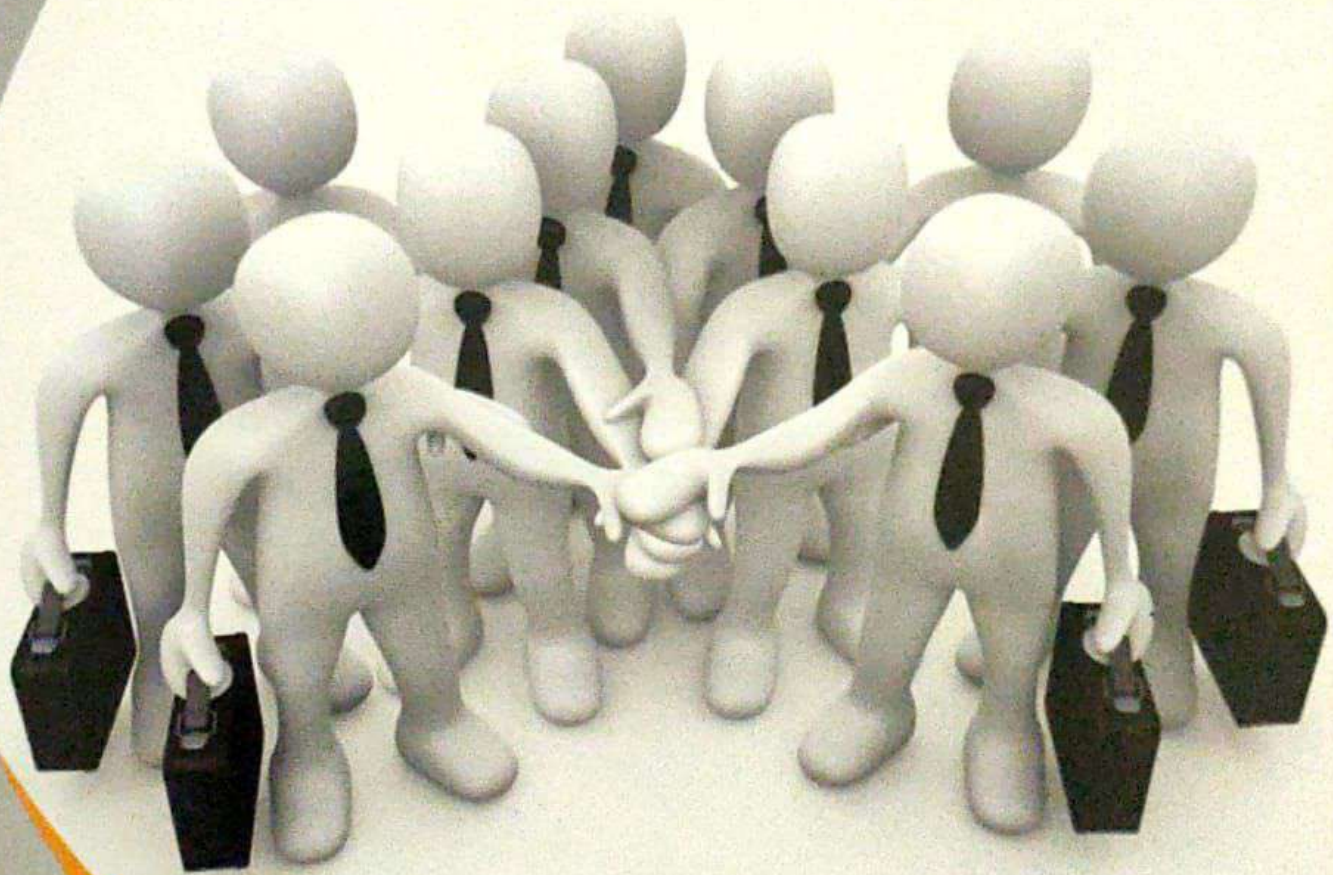
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Principles of Management

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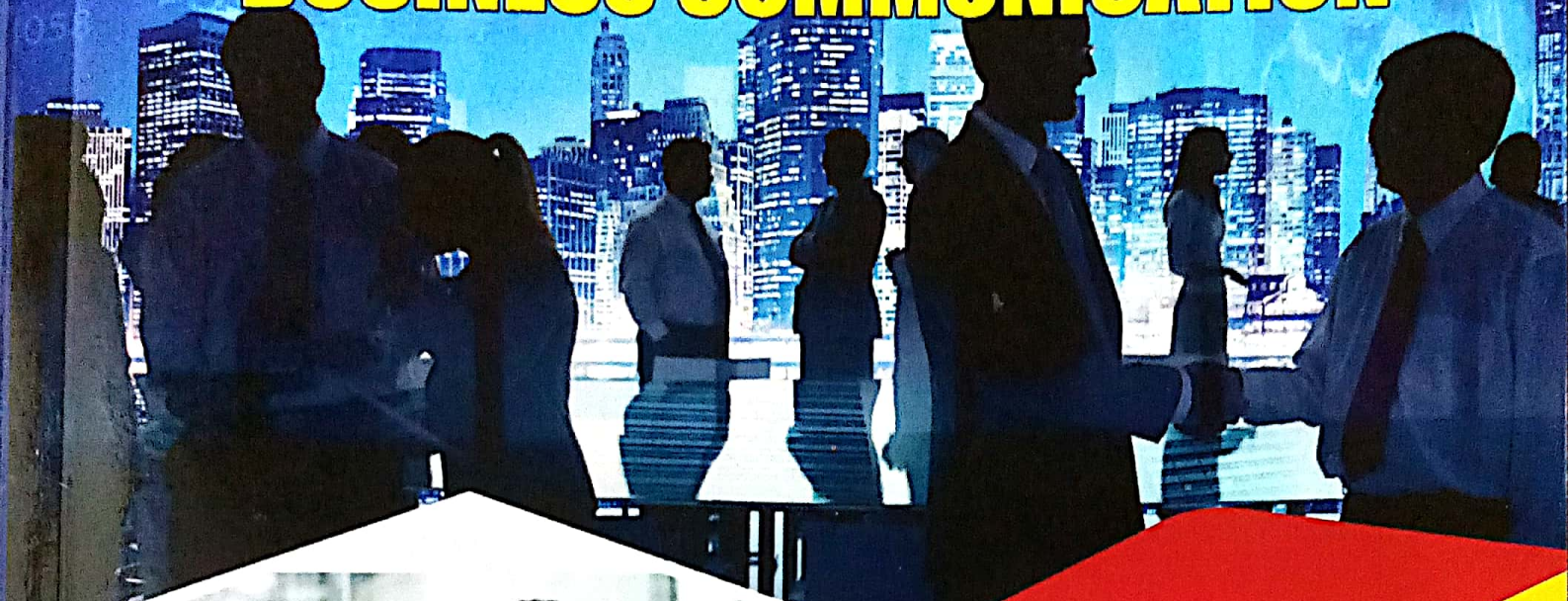
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PREFACE

I am glad o present this book to the students who believe that the value of their professionalism in any organization depends upon their proficiency at work. Their domain knowledge, competency and communication skills play an important role In their professional life. They have to face new challenges in the dynamic environment. One has to inculcate the necessary skills of business communications to excel in one's career.

The IT revolution and globalisation has the concept of business communication to the forefront of academia and industry. Communication has become an integral part of business. The book will encourage the students in building competency in in communicating effectively in oral and written communication.

Every attempt has been made to keep the book detailed and yet simple. The language that has been used is simple, clear and self-explanatory. The concepts in communications are explained with examples for easy understanding of the students. Most of the concepts are well supported with necessary illustrations.

The subject matter in the book has been presented systematically which enable the reader to master without any additional guidance. An honest and sincere attempt is made to present the information in non-technical, simple and lucid manner to enable the reader to understand the subject with ease.

Although every care has been taken to make the book error free, both in text as well as examples, however, mistakes might have been crept inadvertently. Readers coming across any errors are requested to bring the same to my notice so that the errors can be rectified for the future editions.

I owe my gratitude to "Shree Publishing House", Visakhapatnam to publish the book and special thanks to Editor Sri. G Malleswara Rao for keen interest taken by him in bringing out this book.

Any clarification or suggestions for improvement of the book are most welcome at email dr.lbc.mba@gmail.com

Finally, I would like to acknowledge the Almighty who has blessed me with the health and knowledge for writing this book.

—Author, Dr. Chamoli Anjana

ABOUT THE BOOK

This book "Business Communication" provides comprehensive coverage and an in-depth knowledge of the basic and core concepts of Communication. It covers all topics encompassing the curriculum of the Business Communication course, providing insights into various aspects of communication.

With up-to-date coverage including the illustrations and examples, this book introduces the students with the key concepts of business communication. At the same time, it also helps them to develop essential skills associated with it. The language used in the book is very simple and easy to understand. The examples and illustrations will help the students in integrating and simplifying the complicated topics.

Key features:
- Covers all important topics concerning written and oral communication with examples.
- Covers contemporary topics like social media and cross-cultural communications.
- Examples and illustrations for easy understanding.

ABOUT THE AUTHOR

Dr. Chamoli Anjana is an academician and a mentor for more than 15 years with an expertise in Marketing and Human Resources Management. She is the Head of the Department of Management Studies (PG) and Asst. Professor in Dr. Lankapalli Bullayya College, Visakhapatnam. She believes in overall development of the students by integrating personality and skill development along with the regular class mode. She has been a member of Board of Studies for BBA course offered by Andhra University from 04-07-2017 to 03-07-2020. To her credit there are a number of national and international publications in reputed journals. She has also attended and participated in an international conference in Colombo, Sri Lanka. She is also a Member of Management Committee of Indian Society of training and Development, Visakhapatnam Chapter. She is a member in the Editorial Board of reputed International Journals. She is a reviewer in many reputed international journals. She was a member in Scientific committee and in National Advisory committee in International Conferences. Her academic qualifications are PhD., MBA and MHRM from Andhra University. She has achieved a gold medal in PGDFM from IGNOU and has qualified UGC NET and APSET.

Survey and Reporting

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Survey and Reporting

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PREFACE

Designing a survey involves many more decisions than most researchers realize. Survey specialists, therefore, speak of the art of designing survey questions. However, this book introduces the methods and procedures that can make questionnaire design and conduct of survey a scientific activity. This requires knowledge of the consequences of the many decisions that researchers take in survey design and how these decisions affect the quality of the questions.

I am glad to present this book to the students who believe that the value of their professionalism in any organization depends upon their proficiency at work. Their domain knowledge, competency and research skills play an important role in their academic and research activities.

This book provides a state-of-the-science presentation of essential survey methodology topics and techniques. Key topics in survey methodology are clearly explained in the book's chapters, with coverage including sampling techniques, sample design, development of questionnaires, evaluation of questions, alternative modes of data collection, post-collection processing of survey data, and practices for maintaining scientific integrity.

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Survey and Reporting

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With up-to-date coverage including the illustrations and examples, this book introduces the students with the key concepts of survey, collection and analysis of data and report writing of the analysis. The book covers key concepts like sampling techniques, questionnaire design, data collection, basic statistical tools for data analysis and reporting the analysis. The language used in the book is very simple and easy to understand. The examples and illustrations will help the students in integrating and simplifying the complicated topics.

Key features:

- Covers all important topics concerning conduct of survey with examples.
- Covers contemporary topics like online survey and types of questionnaires with software applications.
- Solved Examples and illustrations for easy understanding.

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