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CUSTOMERS' PERCEPTION TOWARDS ROBOTIC VACUUM CLEANER IN COIMBATORE CITY

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Abstract:

Robotic vacuum cleaners are relatively new phenomenon, the idea itself having robotic cleaning assistant at home. People have dreamt about it for decades. Robot vacuum cleaners have been on the market for a few years now and, to an increasing extent, these products are taking over our chores. Most of the cases, they hire the cleaners to clean the home, office etc., but no trust on cleaners. To overcome the problem, Robotic Vacuum Cleaner has come up with the more advancement in technology and is designed to automate cleaning process. The application is used to initiate the robot. The navigation of the robot is according to the S-curve planning and with the help of sensors it detects and avoids obstacles. The cleaning robot are effective in assisting humans in floor cleaning applications at homes, hotels, restaurants, offices, hospitals, workshops, warehouses and universities etc. so they have taken more recognition in robotics research. In this study perception about Robotic Vacuum cleaners and the reasons for preferring is been analyzed with the help of 150 samples based on the snow ball sampling method and the suggestions are made.

Keywords : Robotic Vacuum Cleaner, Cleaning, Technology, Applications, Battery Power.

Introduction

Robot vacuum cleaners are vacuum cleaners that clean floorings autonomously and are among the first service robots that enter our homes. This type of vacuum cleaners is a new kind of presence to get used to. It exhibits autonomous behavior and it moves around our homes and affects our daily lives. This is very different from conventional, non-robotic vacuum cleaners. People are no longer in full control of what the product is doing, where and when. People need to understand and trust the robotic vacuum cleaner. Crucial for the user experience and acceptance of the product is the design of appropriate interaction between human and robot.

Back in the seventies Quasar Industries claimed to have developed a robot capable of carrying out chores in the home. It turns out to be a fake. But today, more than thirty years later, a variety of robotic vacuum cleaners is on the market. Since early 1950's, futuristic scenarios of our daily lives at home have included robots: robot maids, robot companions, robot nannies, robot guards. This vision has not substantially changed and it was only a couple of years ago that Bill Gates predicted in Scientific American that there will soon be "a robot in every home", so far, the only success of domestic robots can be noted in the field of floor cleaning robots; millions of these devices are used to vacuum people home today. All cleaning and operating mechanism of robotic floor cleaners has its own advantage and disadvantage. For example, robots utilizing mapping are relatively faster, and energy efficient but costly, while obstacle avoidance-based robots are relatively less time consuming and less energy efficient due to random cleaning, the robotic vacuum cleaner has been designed for consumer, office environments, hotels & restaurants.

These are developed by Electrolux, iRobot, Eufy, LG and Ecovacs, among others. Since robots are entering our homes now, it is interesting to study how users experience this new kind of presence in their domestic environment.

STATEMENT OF PROBLEM

In present days, robotic cleaners have taken major attention in robotics research due to their effectiveness in assisting humans in floor cleaning applications at home, hotels, restaurants, offices, hospitals, workshops, warehouses and universities etc. basically, robotic cleaners are classified on their cleaning technique like floor mopping, dry vacuum cleaning, sweeping, etc. some products are based on simple obstacle avoidance using infrared sensors while some utilize laser mopping technique. Majority of the people are aware only on the manual vacuum cleaner. Hence, this study is taken to identify the perception level of customers towards the Robotic Vacuum Cleaners in Coimbatore District.

OBJECTIVES OF THE STUDY

- To identify the customers awareness level towards robotic vacuum cleaner
- To know the preference level of customers about the robotic cleaners

RESEARCH METHODOLOGY

In this study snow ball sampling techniques has been used to find the samples. 150 sample respondents have been taken into consideration for research. Questionnaire is used for collecting the responses through online mode.

REVIEW OF LITERATURE

“Design and Development of Floor Cleaner Robot (April 2021),¹ "It's a wireless Bluetooth control floor cleaning machine and will be amazed at the simplicity and effectiveness of the idea Bluetooth connection between the system and mobile. By using Bluetooth module, we can direct and turn the system as the user needs. It works great and controlled manually based on the user convenience. Definitely makes cleaning easier and merrier while enabling anyone to build something rather than buy. In modern days interior decorations are becoming an important role in our life. Cleaning of floor is a very important one for our health and reduces the man power requirement. Hence our project is very useful in our day to day life".

Irawan, Yuda, Muhandi, Muhandi, Ordila, Rian, AND Diandra, Roni. “Automatic Floor Cleaning Robot Using Arduino and Ultrasonic Sensor” (July 2021).² This paper discusses about information regarding several parts, namely of an Ultrasonic Sensor, Motor Shield L298, Arduino Uno microcontroller, Servo, and Dc Motor. This tool works when the Arduino Uno microcontroller processes the ultrasonic sensor as a distance detector and a DC motor as a robot driver, then the DC motor is driven by the Motor Shield L298. When an ultrasonic sensor detects a barrier in front of it, the robot will automatically look for a direction that is not a barrier to the floor cleaning robot. The distance value on the sensor has been determined, that is, when the distance read by the ultrasonic sensor is below 15 cm. The results of testing the value of the ultrasonic sensor distance found different conditions that occur. In a distance of > 15 cm, the condition of the prototype cleaning robot for the road floor cleaning is obtained, while the distance < 15 cm, the condition for the prototype of the street floor cleaning robot has stopped".

Mr.Chavan Swaroop Chandrakant, Mr.Parulekar Sharvarish Shashikan, Mr. Gavali Omkar Raju, Mr. Gokhale Shantanu Bhalchandra, Mr. Shinde Vaibhav Tanaji " Semi-Automatic Floor Cleaner with Obstacle Avoidance for Indoor Applications” (Feb-2018).³ Presents a comprehensive overview of the technological advantages helped in the real life various. For the convenience of most of the people who are extremely busy in their chores. The need of the project has come up because of a busy schedule of a working in a corporate sector. So, this has resulted in coming up with an objective of making an automated vacuum cleaner. The study comprehends of automated vacuum cleaner which having components to DC motor operated wheels, roller brush, cleaning mop, the garbage container and obstacle avoidance sensor. A 12V rechargeable battery is used as power supply. Other than this is compresses of special technique of UV germicidal cleaning technology. The study has been done keeping in mind economic cost of product".

Table No: 1 Demographic Factor

	Category	Frequency	Percentage
Gender	Male	77	51.3
	Female	73	48.7
	Total	150	100
Age Group	Below 20years	49	32.7
	21-30years	60	40
	31-40years	23	15.3
	41-50years	13	8.7
	Above 50years	5	3.3
	Total	150	100
Educational Qualification	No formal education	2	1.3
	School level	21	14
	Undergraduate	98	65.3
	Postgraduate	19	12.7
	Professional	10	6.7
	Total	150	100
Occupational Status	Student	88	58.7
	Employed	34	22.7
	Professional	2	1.3
	Business	14	6.3
	Home maker	12	8
	Total	150	100
Monthly Income	Below Rs.20000	42	28
	Rs.20001-Rs.30000	36	24
	Rs.30001-Rs.40000	40	26.7
	Above Rs.50000	32	21.3
	Total	150	100
Type of Resident	Rent	97	64.7
	Owned	32	21.3
	Individual villa	12	8
	Apartments	9	6
	Total	150	100.0

The above table indicates that, majority of the respondents are Male, Below 20years, those who are undergraduates studying in colleges and whose family monthly income would be between Rs.30001-Rs.40000 staying in a rented house mostly preferred the Robotic Vacuum Cleaners.

Table No: 2 AVERAGE SCORE ON THE LEVEL OF AWARENESS TOWARDS VARIOUS BRANDS OF ROBOTIC VACCUMM CLEANERS

Brand	Level	Highly Aware (3)	Aware(2)	Not Aware (1)	Total	Average score
Mi	No	58	81	11	150	2.31
	Score	174	162	11	347	
Eufy	No	14	71	65	150	1.66

	Score	42	142	65	249	
Inalsa	No	12	28	110	150	1.34
	Score	36	56	110	202	
Milagrow	No	9	85	56	150	1.68
	Score	27	170	56	253	
iLife	No	12	53	85	150	1.51
	Score	36	106	85	227	
iRobot	No	94	25	31	150	2.42
	Score	282	50	31	363	
Eureka	No	22	36	92	150	1.53
Forbes	Score	66	72	92	230	
Ecovaca	No	17	34	99	150	1.45
	Score	51	68	99	218	
iBell	No	12	78	60	150	1.68
	Score	36	156	60	252	
Avishkar	No	6	19	125	150	1.20
	Score	18	38	125	181	

INTERPRETATION

From the above table it is inferred that the respondents are highly aware about iRobot (2.42) and Mi (2.31) when compared to the other brands.

Table No : 3 AVERAGE SCORE ANALYSIS ON PREFERENCE LEVEL OF VARIOUS BRANDS OF RVC

Brand	Level	Highly preferred (3)	Preferred (2)	Not preferred (1)	Total	Average score
Mi	No	75	60	15	150	2.4
	Score	225	120	15	360	
Eufy	No	29	77	48	150	1.92
	Score	87	154	48	289	
Inalsa	No	12	64	74	150	1.58
	Score	36	128	74	238	
Milagrow	No	15	58	77	150	1.58
	Score	45	116	77	238	
iLife	No	21	67	62	150	1.32
	Score	63	134	62	199	

iRobot	No	40	61	49	150	1.94
	Score	120	122	49	291	
Eureka	No	39	58	53	150	1.90
	Score	117	116	53	286	
Ecovacs	No	22	68	60	150	1.61
	Score	66	136	60	242	
iBell	No	16	64	70	150	1.64
	Score	48	128	70	246	
Avishkar	No	15	52	83	150	1.54
	Score	45	104	83	232	

INTERPRETATION

From the above table it is inferred that respondents are highly preferring Mi (2.4) and iRobot (1.94) when compared to the other mentioned brands.

SUGGESTIONS

- It will be good if the availability of different colors for the product
- May be the Storage capacity of the Robotic Vacuum Cleaner can be designed in largesize so that the work can be completed at a stretch
- The wifi connection can be changed more than 10 meters.
- In future the Robotic vacuum cleaner can be manufactured as solar robotic vacuumcleaner as the electricity can be saved
- Auto cleaning method can be upgraded to the next level by developing it as segments.

CONCLUSION

It is concluded from this study that Robotic Vacuum Cleaners are recent development which is more popular among the people. Vacuum cleaners' simple yet effective design has done away with having to clean dust and other small particles off surfaces by hand and turned house cleaning into a more efficient and fairly rapid job. Now a day it's so hard to find time to clean our residence as we engaged with the busy world. So, this robotic vacuum cleaner helps to clean our residence with smart technology which is known by the customers and here is no doubt that in future robotic vacuum cleaners will have greater technological advancements and might be preferred by large number of customers in future.

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