International Journal of Advance Research in Science and Engineering
Vol. No.6, Special Issue (01), September 2017, BVCNSCS 2017
www.ijarse.com
IJARSE
ISSN 2319 - 8354

Smart Living with Smart Things – A Progress to Tech-Reality

Dr. K. Sreelatha Reddy
Hod. Dept. of Commerce
Bhavan's Vivekananda College,
Sainikpuri, Secunderabad.

Ms. S.Jayalaxmi,
Lecturer in Dept. of Computer Science
Bhavan's Vivekananda College,
Sainikpuri, Secunderabad.

ABSTRACT: We started living decades of digital life and moving to virtual zone with sensor devices. According to study there are more than 7.2 billion sensor devices connected per person for 25 billion individuals. People are becoming more depended on devices, usage of pen and paper was replaced with pen drives and mobile phones. Now the Sensor technology is ruling the life of individual. IOT replaces the Physical items of daily life with sensor devices which can be controlled remotely and can act as physical access points to Internet services. IoT creates a link between sensors devices and people, enabling a free-flowing conversation between man and machine, software and hardware. Using sensors, they are able to perceive their context, and built-in networking capabilities to communicate with each other and access Internet services and interact with people. With the growing power of Internet of Things (IoT), sensors are playing a crucial role in enabling communication between devices over the Internet by embedding into numerous IoT applications as electricity, networks, infrastructure, mobile, wearable, home automation, smart city conversion and Health security devices. The present study is conducted with an aim to understand the availability of various sensor devices which can simplify the daily life of an individual. The study is also focused on finding out the awareness, implementation and security issues of IOT devices and consider the progress of the human from technology to real world applications.

Keywords: Sensor, Technology, Digital, Networking, Communication.

I. INTRODUCTION

A network of smart objects and devices equipped with sensors to acquire data, process and control the real life environment physically is termed as Internet of Things. In Internet of Things, the focus is on creating logically rich data sets and automated analytical tools to optimize operational efficiencies.

IoT is persistently changing the way we live, work and get entertained. It is creating massive opportunities and possibilities for businesses to innovate new digital sensor products and services into the market. IOT is not only embedding intelligence into digital device but launching into environment, and enabling them to capture real time data. This harnessing of intelligence will definitely enhance and increase human capabilities to understand and manage their lives in a better way.

As per a study, by 2020 more than 50 billion devices are going to be connected to internet . These devices got to be intelligent and self reliant with the help of intelligent computers embedded into devices, the primary aim is to make things autonomous. This process will obviously build a parallel society of more than 100 billion smart, intelligent, self reliant and autonomous machines in parallel to human society. These machines will certainly help us in making business and production processes efficient. Though we already entered into an intelligence driven world some obligation are stopping for fully autonomous sensor life to partial autonomy digital life. Main aim of our study to identify the obligations and suggest required conclusion and ascertain"smart life with smart things".

II. LITERATURE REVIEW

Manufacturing of Internet of Things Sensors - Vibrant Gujarat ,8th global summit (2017), comparative analysis made in the summit taking into consideration of global and national statistics reveal that ,the global IoT sensors market is forecasted to grow at a CAGR of 24.3% during 2014-23 to reach US$34.7 billion by 2023.The growth is being driven by rising demand for smart consumer appliances (such as smart TVs) along with growing consumer electronics market in emerging economies. Consumer electronics was the largest contributor to the global market in 2014. Furthermore, growing IoT applications in the automotive and industrial markets are expected to drive the market during the forecast period. By geography, while North America and Europe accounted for more than 60% of the market in 2014, Asia Pacific is expected to be the fastest growing region during the forecast period.

Indian market overview - Sensors

The sensor industry in India was valued at US$0.11 billion in 2015, growing from US$0.09 billion in 2013 at a CAGR of 6%, driven by rising demand for IoT-connected devices across verticals. Indian sensors market, one of the fastest growing markets in Asia Pacific, is expected to witness tremendous growth on account of rising sensor content in automotive and consumer electronic products, growing need for automation in industries and increasing security concerns. The market is dominated by major global sensor players, which operate in the country through subsidiaries and design centers.

2. **Jonathan Holdowsky, Monika Mahto** in their article "Inside the Internet of Things (IoT)" , opines that IoT is relatively nascent stage, the IoT ecosystem is fragmented and disorganized. Over time, the IoT ecosystem should undergo a streamlining and organizing process and a "knitting together" of its individual pieces. Because the IoT will play an increasingly important role in how we live and run our businesses.

III. OBJECTIVES

- To study the influence of demographical factors on awareness of IOT Products/services.
- To study the Customer preference for purchasing

various IOT devices.

- To assess the satisfaction levels of people after products have been purchased and used .
- To study the reasons which refrain smart living.

IV. RESEARCH METHODOLOGY

Our study focus on 3 major IOT technologies as Smart Homes, Smart Health products and Smart Cars. The study is to consider various factors influencing the consumers from using IOT technology, also analyze the awareness about IOT devices which are already available in the market and create a center of attention in understanding the reasons which refrains the customers from not adapting the New era technology.

1. Methods of data collection

The Primary data is collected by distributing structured questionnaires consisting of closed ended questions to the respondents. Before final distribution pilot survey on selected group has also been done. Data from the secondary sources such as relevant information from articles, journals and websites also contributed for the study.

2. Sample Technique

Stratified random sampling method was used to collect the data. The data is analyzed and projected with Graphs and charts by using pivot table and filters, and also various statistical tools like ANOVA ,Factor analysis, Comparative means, reliability tests ,KMO and Bartlett's Tests were implemented using SPSS application.

3. Sample Size

Sizes of 105 respondents are taken for the collection of data which is distributed to various people using digital aid with social media networks.

IV. DATA ANALYSIS AND INTERPRETATION

Objective:1

To study the influence of demographical factors on awareness of IOT Products/services.

RESEARCH HYPOTHESES

HO: Demographical factors influences the awareness of IoT.

H_1 : Demographical factors does not influence the awareness/implementation of IoT.

The Study considered the impact of various Demographic factors as Gender, age, Occupation, Living area and type of mobile phone used on awareness about IOT devices among the consumers.

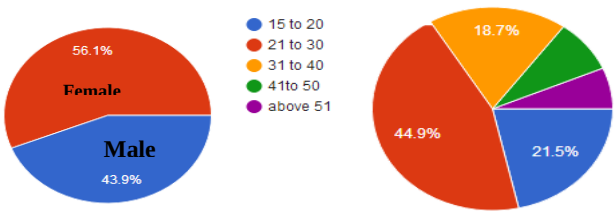
ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
AGE	Between Groups	7.347	2	3.674	3.250	.043
	Within Groups	115.281	102	1.130		
	Total	122.629	104			
Gender	Between Groups	.055	2	.027	.109	.897
	Within Groups	25.660	102	.252		
	Total	25.714	104			
Ocupation	Between Groups	1.855	2	.927	1.877	.158
	Within Groups	50.393	102	.494		
	Total	52.248	104			
Mobileused	Between Groups	.350	2	.175	1.167	.315
	Within Groups	15.307	102	.150		
	Total	15.657	104			
Stay area	Between Groups	1.690	2	.845	.842	.434
	Within Groups	102.443	102	1.004		
	Total	104.133	104			

Awareness of IOT devices are taken as factor and 5 demographical factors as age, gender, occupation, mobile used, stay area are taken as dependent variable for one way ANOVA.

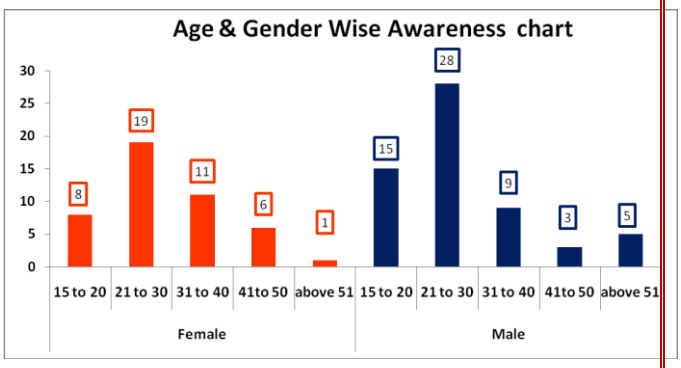
It is observed that F = 3.250 for (2) d.f @ 5% l.o.s .p value= .043 which is > .05 for age and other dependent variables Sig value is >.05 hence the null hypothesis (H_0) is Accepted and H_1 is rejected and we conclude that the Demographical factors does not influence on the purchase or awareness of IOT.

Chart 1: Representing analysis of Gender and Age of the respondents.



In reference to Chart 1:Out of total 105 respondents there were 56.1% female and 43.9% male consumers. 21.5% of consumer with 15 to 20 age group , 44.9% with 21 to 30 age group and18.7% in 31 to 40 % and above 41 and 50 above with 9 and 7% respectively.

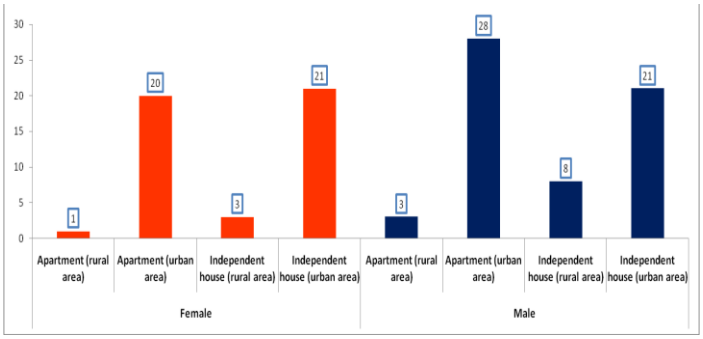
Chart 2: Age and Gender With awarness of IOT Pivot chart.



In reference to Chart 2: the Picture inteprets the awarness

about the IOT products base on age and gender. Out of 56% of female and 44% male respondents 28 % of male and 19% of female with 21 to 30 age group are aware about the IOT products. This Study clearly proves that current generation is more advanced in using new digital technology than the older.

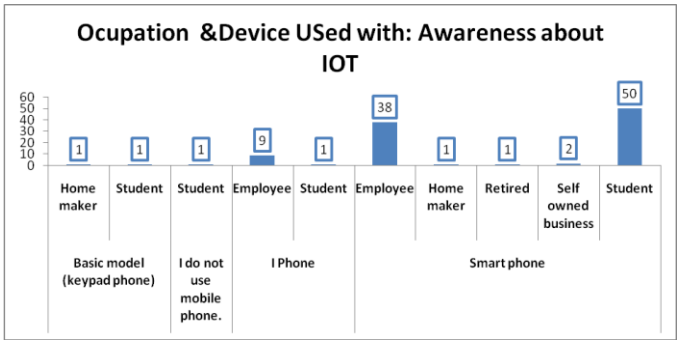
Chart 3: Gender and Area of Living with Awareness of IOT



In reference to chart 3: 2nd Demographical factor Area of Living have influence on the Awareness on IOT technology the above chart evidently proves that 28%,21% male and 20%,21% female living in apartment , independent houses in (urban) area are aware about the Product and services of IOT. Compared to 4% of female and 11% male living in Rural area

This shows that awareness about the product should be explored in rural areas compared to urban.

Chart 4:



Next comparing with the device used and awareness factor, the above chart predicts that the students and employees who are using smart phone are aware about the IOT technology than others. IOT is the technology to connect all objects and provide digitally access and control the objects from anywhere with using mobile, desktop and tablets, considering this as major factor out of 105 respondents 80 members have adopted to digital smart phone technology and viewed themselves slightly further along the adoption curve than others.

Objective 2 :

To study the Customer preference for purchasing various IOT devices.

Smart Home Technology: Imagining a world where everything in daily lives is connected to the internet and each other, from smart phones and computers to our home's lights, windows, thermostats, water system and more.

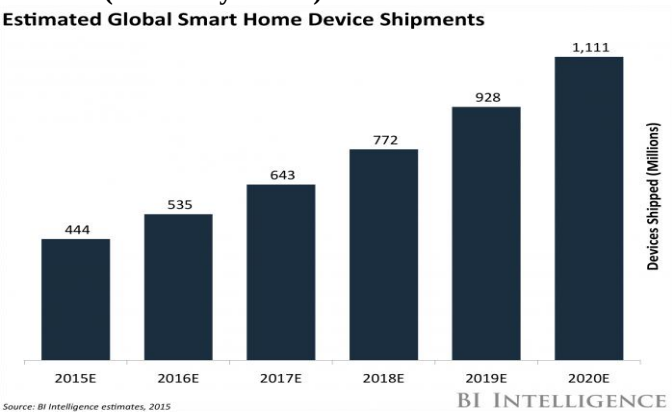
A world where all of these devices can be in constant communication and controlled by users remotely via voice command or with simple push button. With the fast growth of the internet of things, the home automation has become a reality. Smart homes filled with connected products are loaded with possibilities to make one's life easy, more convenient, and more comfortable.

Image 1: Describes about Smart Home services: Assume that the consumer is driving home in hot summer feels to rest in cool AC room immediately he/she reach home, but now this is possible with IOT, they can access home devices with cell phone and give instructions as turn on the AC before reaching home and enjoy the cool weather. Also used to lower the temperature with smart thermostat before leaving to office, or ask the smart voice assistant to read news paper or order pizza when busy. Not only these IOT smart home devices are also used to identify the person standing in front of the main door and alert the user with digital image and details, electricity management, smart security, smart entertainment many more are the smart home services.

There is no scarcity of potentials for smart home IoT devices. Home automation is likely to be the wave of the future. There are more than 100 devices launched in the market by top most companies, but still people are not aware of the products with of many reasons.

Several smart home IoT devices have already hit the market and made the way into thousands of houses around the world.

Chart 5: (Secondary source)

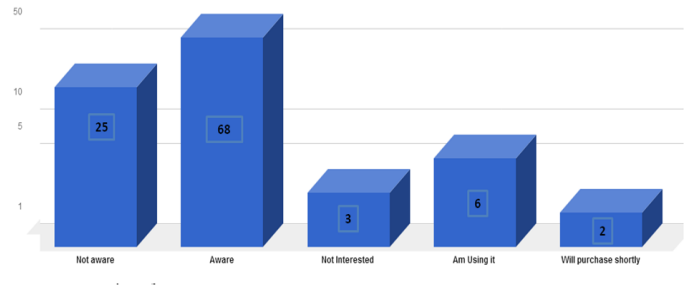


The smart home market will take off if IoT device prices come down and the general public comes to understand the benefits of these products and yet, smart homes are just one small part of our daily lives that the Internet of Things will transform in the coming years.

But what do consumers really think about these smart home devices? Are they ready to clinch a connected life, no matter the cost? All the way through our survey on series of focus groups we try to find the reason for not adapting the devices which are already available in the market. In our questioner we have listed more than 15 IOT products and asked the respondent to specify the options as aware, not aware, not interested, ready to buy, am using it, will purchase shortly.

Chart 6:. Have you ever heard or experienced any of following products?(offered by famous web site in India).

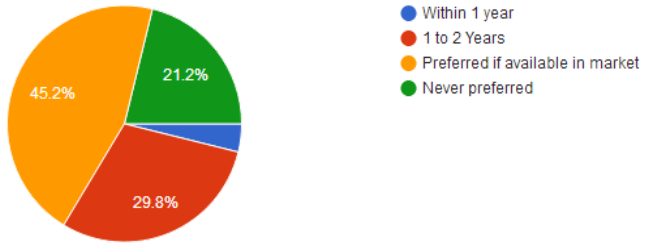
International Journal of Advance Research in Science and Engineering
Vol. No.6, Special Issue (01), September 2017, BVCNSCS 2017
www.ijarse.com
IJARSE
ISSN 2319 - 8354



Out of 50 products offered by a well known online website 20 products were listed in the questioner to find out the experience of the consumers where in 68% were aware about the products and 25 % were unknown about the availability of the products in the marks but 6% are already using the product and 3% are ready to purchase the product and 3% showed there negative response for adopting IOT.

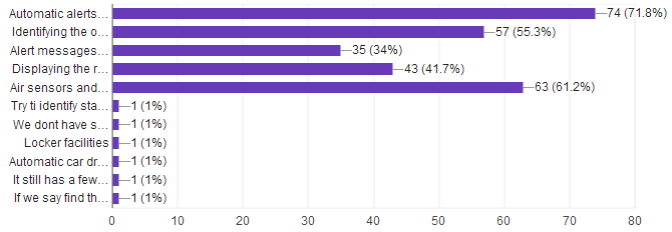
And most of the people are aware about smart nest (home security camera, and Philips smart light system. And have very less awareness about smart thermostat, Amazon Dash Buttons:(automatically order the need), Awair an air-quality sensor. This study proves that though the products are available in feasible rates in local market people are not preferring because of lack of awareness.

Chart 7: Consumer preference towards Smart home products:



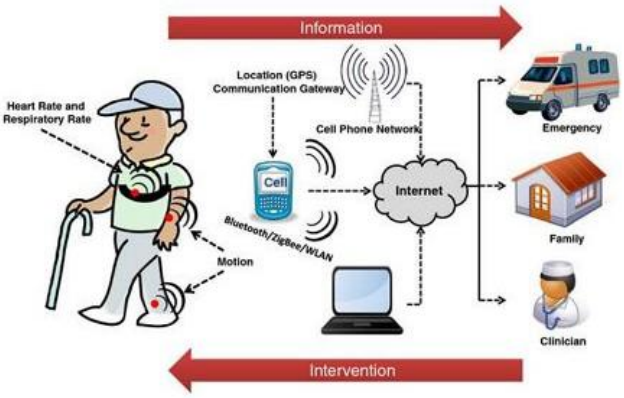
Above chart display the consumer preference towards smart home products, where in 45% want to purchase the products if available and 30% have shown a positive approach in purchasing the products with in1-2 years, yet 21% of consumers have contradictory willingness towards the new technology.

Chart 8: Services Expected from Smart home products.



The consumers using Various Smart home products are satisfied to 70%, but have specified many more options to the existing products to increase their comfort levels, 71.8% responders have expressed that automatic alerts from door sensors for identifying the person in front of door will be more helpful. Where in 55.3% expressed their view on smart refrigerator for pop in up with alerts and ordering required items in case of shortage and 61.2 have expressed their opinion on air sensor and refreshers that is should be used to control temperature automatically.

Smart health products



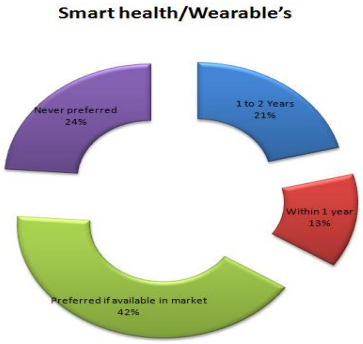
Wearable devices are a hot topic these days, Busy life schedule made man lazy to care about his self own things, people started ignoring their health with fear of cooperate hospitals or other physiological issues.

Image 2: Describing smart Health wearable's services

IOT smart health devices are hear to take care of the users and alert when necessary to the user family members, Ambulance service (by locating the GPRS) and also send alerts to doctor/nurse. Wearable fitness applications and technology stand to see the most growth in the short term among wearable technology.

International Journal of Advance Research in Science and Engineering
Vol. No.6, Special Issue (01), September 2017, BVCNSCS 2017
www.ijarse.com
IJARSE
ISSN 2319 - 8354

Chart 9: Consumer Preference towards Smart health wearable's.

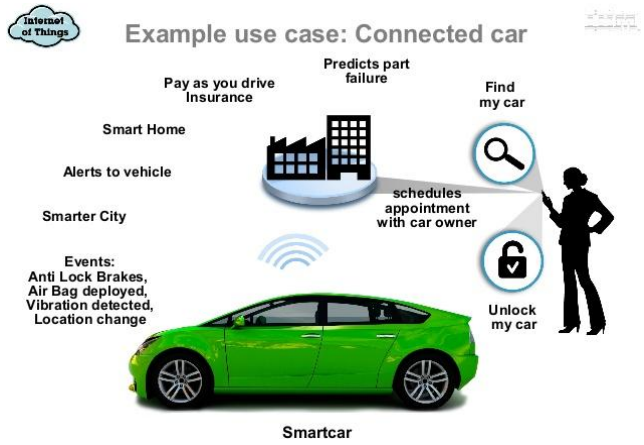


Form the above chart considering the preference for purchasing smart health products 13% of consumers planning to purchase within the next year and 24% of consumers showed their negative response of adapting the technology by specifying the reason of concern about side effects of radiation generated by the wearable devices, but with 21% gave a positive response of planning to purchase in the next two years and a total of 44 percent planning to adopt shortly if product is available in Indian market. Smart watches are the second most popular wearable device, Smart clothing and heads-up displays are the least likely to catch on in the wearable technology.

Smart Car:

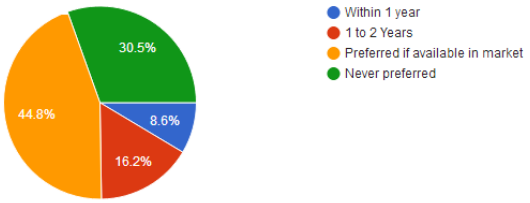
The world we once thought was fictional is becoming a reality. Almost anything we want will someday be available at the touch of our fingertips, and a push of a few buttons could replace hours of work or even eliminate our worries. The Internet of Things (IoT) is set to enable these changes and drive us into the next age of efficiency. Tasks that were once time-consuming and perhaps dangerous, or that required precise calculations, will be turned over to our devices.

Image 3: Describing the various services provided by automatic Cars.



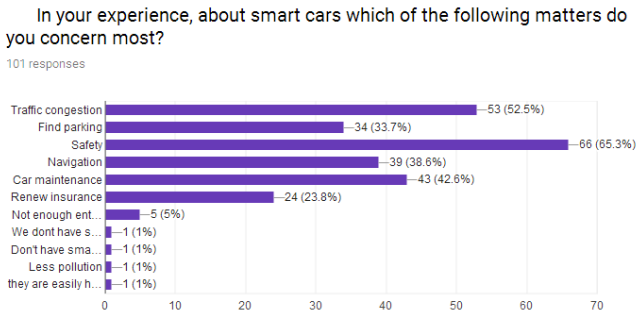
The IoT is break through for car manufacturers by introducing entirely new layers to the traditional concept of a car. This upgrade the smart car as a revolutionary way for us to drive and stay in touch with the world around at the same time.

Chart 10: Preference of purchasing Smart Cars.



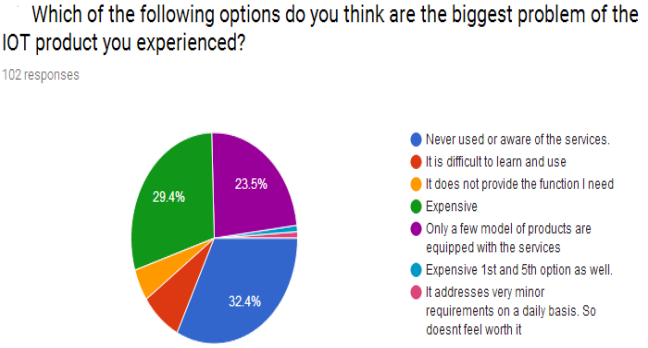
Based on the survey conducted 45% of consumers does not own automatic cars but prefer to have it shortly if available with viable cost, 30.5% doesn't want to prefer on fully automatic car as the dependency level may increase more, still 16.2% and 8.6% are willing to transform them self's with driver less cars and enjoy the automatic driving respectively.

Chart 11: Services needed from smart car's are:



Consumers who are already experiencing the automatic/semiautomatic driving facility still have some thoughts to add to the available technology, 53% of consumers want alert messages on traffic congestion and 34% for finding parking area and 43% want alerts regarding car maintenance and insurance renew alerts or some automatic system to control the above mentioned services, in other phase 65% of consumers expressed that smart cars are more secured than normal cars.

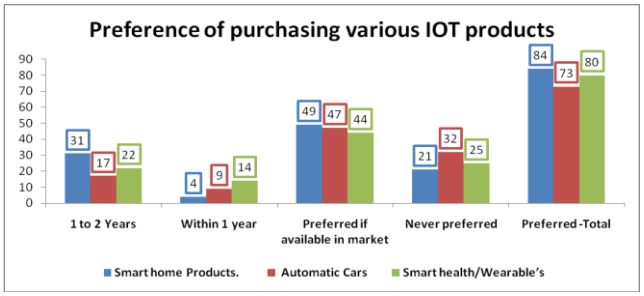
Chart 12: Problems Expressed by the consumers for IOT products.



From the chart12 it is interpreted that 32.4% of consumers are not aware about the product and services, but awareness is not the main issue leaving it 32.4% e consumer who are aware with the products expressed that only few model of devices are implemented with smart technology which are available now. And 39.4% consumer expressed that IOT

products are bit costly comparatively.

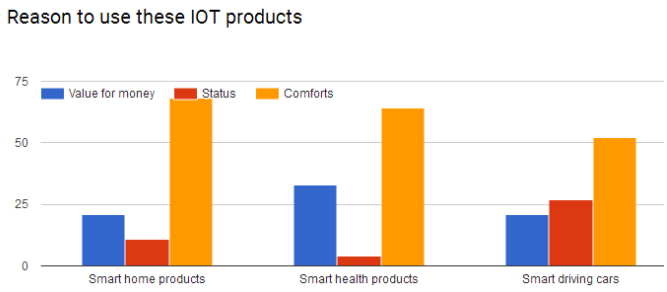
Chart 13: Consolidated image to represent the Preference of Consumer on all 3 IOT Products.(smart home products, smart health products, and smart cars).



In reference to above chart, Consumer adoption of network-connected devices, such as in-home smart appliances and wearable technology, is on the rise. Thirty one percent of consumers already own or plan to purchase an in-home IoT device in the next two years. Smart Home IoT devices include Smart refrigerators, smart thermostats, self-driving vacuum cleaners and smart air sensors& smart AC. Forty nine percent of consumers are ready to adapt the Smart home technology if preferred in the market, forty four percent are willing to use smart health wearable's if available in reasonable prize, forty seven percent of consumers are willing to experience automatic driver less smart car technology. While consumer adoption of connected technology will be more gradual in the short term, widespread adoption will be inevitable over the next five years if the products are available in Indian market with feasible prize.

Objective 3:

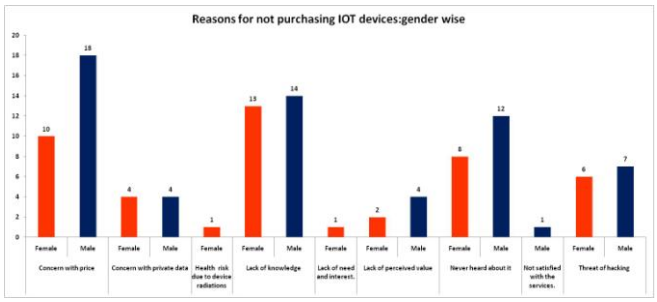
To study about the products been used and the satisfaction levels.



Most of the consumers have specified that comfort is the main reason to convert them self's to new sensor technology and also mentioned that status is also one of the reason to purchase automatic cars.

Objective 4:

To study the reasons which refrain smart living.



Awareness and Perceptions Differ by Gender and Technology Adoption Preferences

There were several important differences throughout the demographic categories.

In terms of gender differences, men viewed themselves as not satisfied consumers than women's. Men showed twice response than women for IOT products also less likely to consider themselves as adopters. 18% of men and 10% of women express that price is the factor for not preferring IOT devices. Men and women answered similarly concerning adoption of IOT devices projected with 15% of lack of awareness about the product and 4% of both gender specified their opinion on security concern to share their data with internet. 7% of men felt that the data used for IOT may be open for hackers.

V. Conclusion : There are three primary factors driving the deployment of sensor technology: price, capability, and size. As sensors get less expensive, "smarter," and smaller, they can be used in a wider range of applications and can generate a wider range of data at a lower cost. It is observed in the study that Awareness and Perceptions Differ by Gender and Technology Adoption Preferences.

According to the study on demographical factors influence on awareness of IOT Products/services it was proved that current generation male with smart phone are more advanced in using new technology than the older.

According to study on Customer preference for purchasing various IOT devices, Consumer adoption of network-connected devices, such as in-home smart appliances and wearable technology, is on the rise. While consumer adoption of connected technology will be more gradual in the short term, widespread adoption will be inevitable over the next five years if the products are available in Indian market with feasible prize.

Factors refrain for the adoption of smart living are Price and Awareness.

VI. References:

1. Jonathan Holdowsky, Monika Mahto, "Inside the Internet of Things (IoT)" ,Deloitte University Press, pp no 1-54,
2. Article content from from https://vibrantgujarat.com/writereaddata/images/pdf/project-profiles/Internet-of-Things-Sensors.pdf