DISPLAY TECHNOLOGY

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Abstract:
A display is a projecting mechanism that shows video to the user using a cathode ray tube (CRT), liquid crystal display (LCD), light-emitting diode (LED), Organic light emitting diode (OLED) or by other projection technology. The demand for smart displays has increased significantly across the world owing to increasing demand for OLED- based devices and technology. Along with this, global digital TV subscription exceeded one billion in 2017. In this survey work we have attempted to find out awareness among the people of rural and urban area about TV display technology. We found that, around 79% people in urban area and 44% people in rural areas are using the TV display which is compatible with their TV subscription.

Keywords: *CRT display, OLED display, HD subscription*

1. Introduction:

Product display screens are output devices that are accustomed to represent output data or information. These are employed in most electronic devices like mobile phones, televisions, and computers. Some years ago, beam tubes (CRT's) were used as displays in televisions. Researchers explored this field, and with the assistance of various technologies, many other sorts of displays were invented; for example, light emitting diodes (LEDs), liquid displays (LCDs) and now organic light emitting diode displays (OLED) are being employed. The displays became bigger and thinner due to these technologies.1

Most high-definition HD and 4K TV's have OLED display. An organic LED (OLED) could be a LED (LED), within which the emissive electroluminescent layer could be a film of chemical compound that emits light in response to an electrical current. OLED's are accustomed to create digital displays on television screens. OLED display devices use organic carbon-based films, sandwiched together between two charged electrodes. One may be a metallic cathode and other a transparent anode, which is sometimes glass. OLED displays can use either passive-matrix or active- matrix addressing schemes. Active matrix

OLEDs have a skinny film transistor backplane to modify each individual pixel on or off, but yield higher resolution and bigger display sizes. An OLED display works without a backlight; thus, it can display deep black levels and might be thinner and lighter than a liquid display (LCD). In low ambient light conditions (such as dark room), an OLED screen can do a better contrast ratio than an LCD, no matter whether the LCD uses cold cathode fluorescent lamps or an LED backlight.2 At present, televisions come with full high-definition (HD) resolution and a thickness of approximately 25mm along with Wi-Fi support, voice recognition feature, 3D sound system and other attractive features.2

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Along with display technology consumers preference towards DTH service in India has also increased. DTH has helped keep broadcasters in direct touch with consumer. There it eliminates the necessity of local cable operators. DTH is the reception of satellite programmers with personal dishes in a personal home. It's a wireless digital audio-video service delivered to a consumer through satellite. DTH transmission has been received directly on the consumers television through decoded by a set-up box (STB). The founded box is that the drive that has

enabled subscribers to look at pay channels. This instrument decodes signals from the cable operators to look at pay channels. It can monitor the amount and duration of channels viewed by subscribers.

List of Players within the Broadcasting as on 2013

- Dish TV of ZEE group,
- Tata Sky
- Reliance BIG TV
- Airtel digital TV
- Videocon d2h

Customers gave an amazing response to the services. Thus preference, beliefs and perception of the shoppers on the DTH services had been so important that it's decided its inception, growth and sustainability.3

2. Review of Literature:

Experimental work has been done on OLED displays by Mr. Brijesh Patel and Mr. Mrugesh Prajapati. They observe that, different manufacturing process of OLEDs lends itself to many advantages over flat- panel displays made with LCD technology. • Lower cost within the future: OLEDs will be printed onto any suitable substrate by an inkjet printer or perhaps by screen printing, theoretically making them cheaper to provide than LCD or plasma displays. However, fabrication of the OLED substrate is more costly than that of a TFT LCD, until production methods lower cost through scalability.

Light weight & flexible plastic substrates: OLED displays are often fabricated on flexible plastic substrates resulting in the chance of flexible organic light emitting diodes being fabricated or other new applications like roll-up displays embedded in fabrics or clothing.

- Better power efficiency: LCDs filter the sunshine emitted from a back light
- Response time: OLEDs can even have a faster time interval than standard LCD screens.4

In a commentary by Jack Burden following are the benefits of OLED display.

1) OLED displays don't suffer from motion lag or motion blur as do LCD displays.
2) Also OLED display technology is that the most energy efficient TV technology ever produced.5

Fazia Batool in her review paper has mentioned that, as OLED has a fast time interval it can be used to make entertaining animations. LCDs reach as low as 1ms reaction time for their fastest colour transition. OLED time intervals are 1000 times faster than LCD providing 10 micro seconds of response time.6

A research paper by Askari Mohammad Bagher explains that when OLED runs through a lower current results in a longer life. This improvement within the lifetime allows for the technology to be employed in more applications and provides further protection of product longevity.7

C. E. Vegiris in his research paper mentioned that, digital multimedia broadcasting will bring a replacement era to the cultural and academic world prospects.8

Ramesh C. Raina and Dr, Manosi Chaudhary in their research paper mentioned that, in 2008 out of 134 million TV homes, 83 million homes had opted for cable connections and 15 million for DTH connections.9

3. Objectives:

The main objective for doing this survey project is to find the awareness among the people of rural areas about display technology. In the last two decades there have been a lot of changes in the TV broadcasting system as the space wave propagation transmission method is replaced by satellite communication and therefore signal transmission system are digitized. Thus the transmitted signal is of good quality due to amplification. To view this good quality signal at the reception, we need a display which can support this digital signal. Hence CRT displays are replaced by LCD, LED and OLED displays. By doing this survey project we can find out whether the technology changes which have taken place across the globe have been

reached to the urban and rural areas of our country.

4. Methodology:

For the present study, rural areas and urban areas from Navi Mumbai were selected for the survey. Data was collected from a number of houses in different areas by random sampling. About 100 forms from each area were collected where various questions were answered by the respondents

5. Result & Discussion:

Television content consumption has become a daily activity for men like consumption of food. As we always prefer to eat tasty food, the content of TV should even be viewed with better quality. To realize this, TV displays plays an important role. From our survey it's seen that 89% people of geographic area were responsive to TV displays like LCD, LED and OLED and from geographic region nearly all people were responsive to latest TV displays like OLED, HD and 4K.

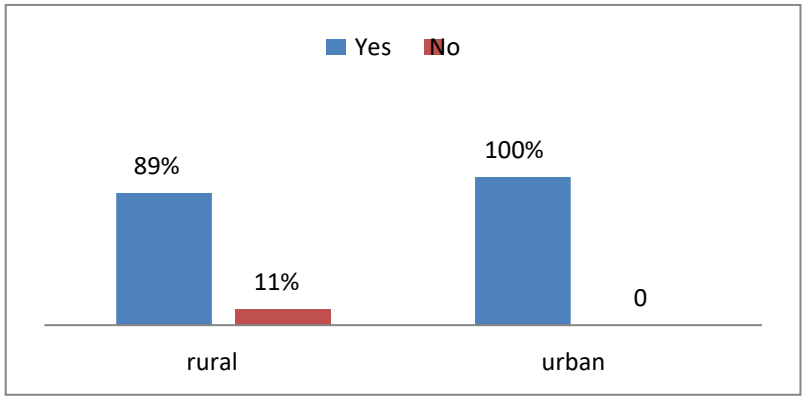

Fig 1: Awareness about display technologies

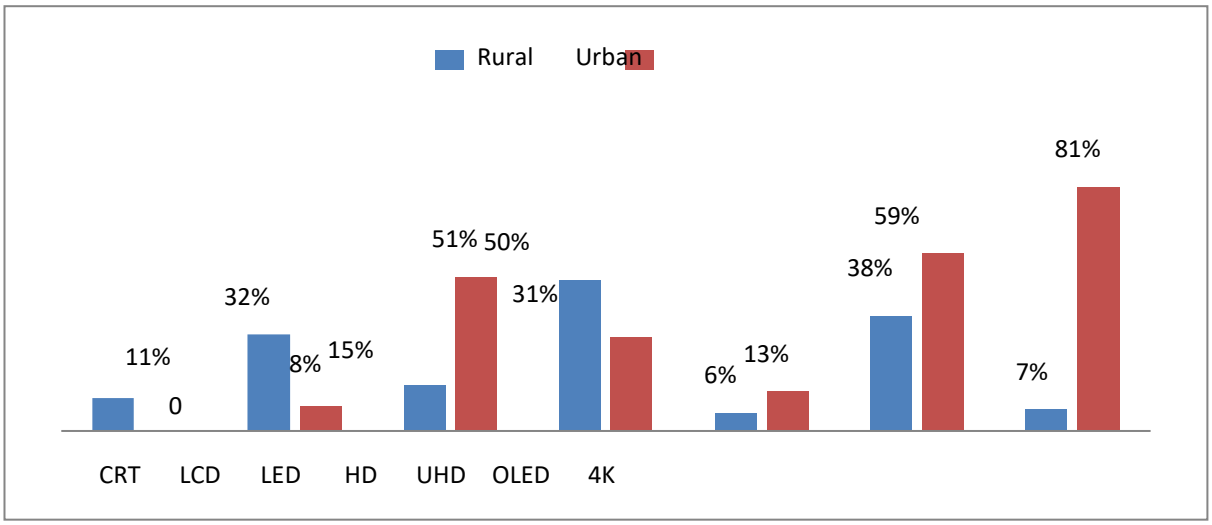

Fig 2: Knowledge about various display devices.

It is observed that around 38% of individuals from geographical regions are knowing about OLED TV and only 7% are having knowledge of 4K TV.

The selected area survey is additionally in dire straits the kind of TV subscription utilized by the people.

It is seen that only 18% of people in the country are using Dish HD TV and seven are using cable HD TV while in geographic region 45% of individuals are using Dish HD TV and 13% are using cable HD TV as a TV subscription.

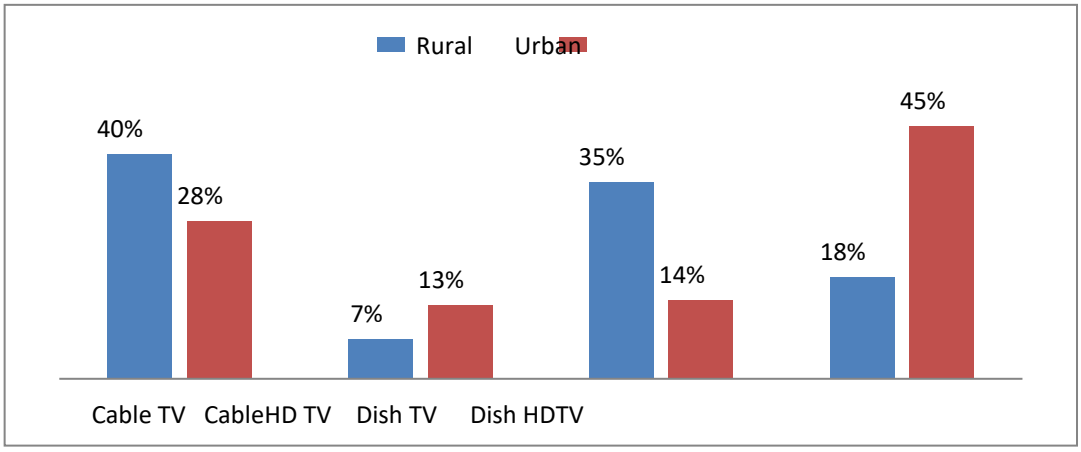

Fig 3: Use of TV subscription

It is observed that, in the geographic area 44% of individuals are watching standard definition SD subscription on LED TV display and in geographical region 79% people are watching high definition HD subscription on LED TV display which clearly indicates that in populated area more people are using and tuned in to latest TV broadcasting technology as their TV display is compatible with their TV subscription.

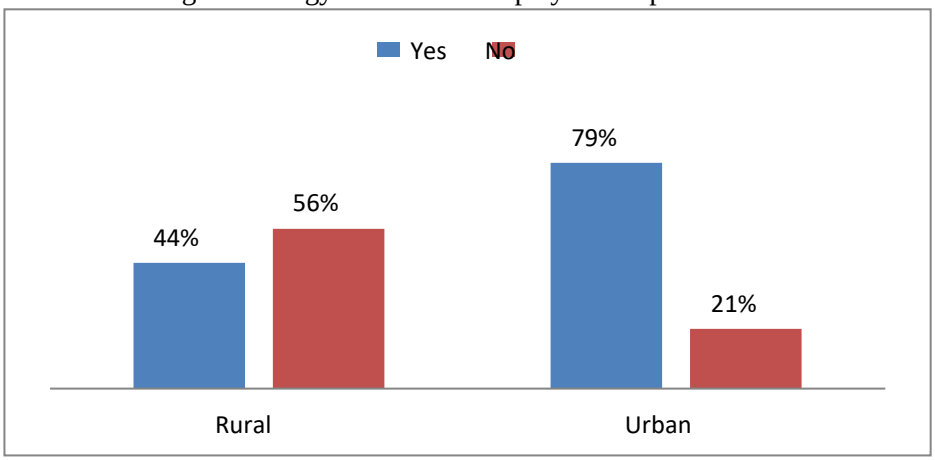

Fig 4: compatibility of TV display with TV subscription.

In our survey, it's seen that while purchasing a television priorities are different among the people of rural and urban areas. In urban areas, while purchasing a television set people consider the display quality first followed by cost and then brand while in rural regions people consider the price first followed by display quality so brand.

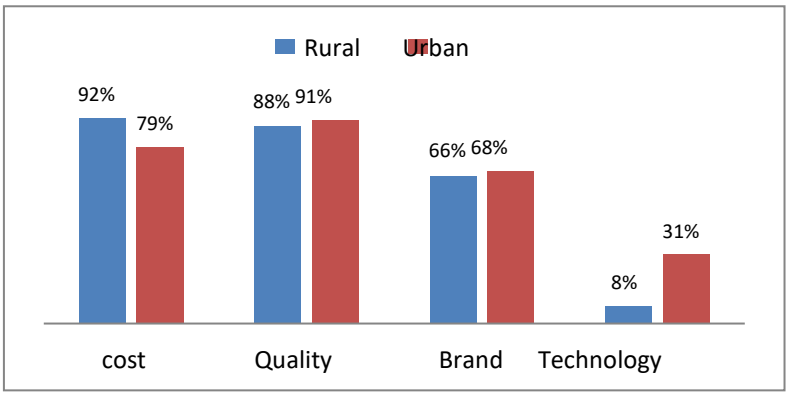

Fig: Priorities in purchasing TV set

6. Conclusion

From study, it's seen that just about all families of geographic regions are using TV broadcasting technology and their TV display is compatible with their TV subscription. But in rural regions there are around 56%

people with HD TV subscription and that they are using ordinary TV display's like CRT, LCD which clearly indicates that they're not conscious of modern digitized TV broadcasting system's yet as TV display technologies.

From the research work done by Jack Burden, one among the foremost important advantages of OLED display is, OLED displays are the foremost energy efficient i.e. by using this TV display there's low electrical power consumption. From survey work, it's observed that, while purchasing a TV set's people of the country give the priority to the price first and so most rural people are using ordinary TV displays like CRT or LCD. By using these ordinary display devices they're not utilizing modern digitized communication system which is well available to them and also there's loss of electrical energy. So they have to spread the attention among the people of the country about TV display technology to avoid wastage of electric energy.

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