LED Television

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Period of Time

1977- First true LED screen developed by James Mitchell. Only monochrome as blue LEDs were not invented until the early 1990s

2004- The first mass-produced LED TV was released

Some more history of LED technology:
1960s- First practical visible-spectrum LED was invented
1970s & 1980s- Brightness and Efficiency of LEDs improved
1990s- Red, green, and blue LEDs combined to create full-color displays
Late 2000s- LED-backlit LCD displays become relevant
Late 2010s & Early 2020s- Micro-LEDs gained attention

Impacts

Negative Impacts:
Sleep quality: LED light from televisions can disrupt the production of melotonin. This can lead to sleep problems, especially if the device is used at night. Blue LED light is particularly harmful because it is associated with wakefulness.

Environmental Impact: The production and use of televisions contributes to carbon emmisions.

Positive Impacts:
Lifespan: LED screens last longer than LCD screens, which typically last five years

Television Broadcast: LED lighting is an important componant of television broadcasts.

Operating Principle

LED TVs, or Light Emitting Diode TVs, use a backlight of LEDs to illuminate an LCD panel to create an image

Backlight: The backlight is made up of LEDs that are placed behind the LCD panel. The backlight can be configured in different ways, such as edge-lit, full-array, or direct-lit.

LCD Panel: The LCD panel is made up of millions of pixels that can be turned on or off to create different colors and shades

Polarizing Material: Two layers of polarizing material with a liquid crystal solution in between are used to illuminate the image. When an electric current passes through the solution, the crystals align to allow light to pass through

Applications/Uses

Backlighting: LEDs are used behind the display to improve contrast and reduce costs. LED strip lights can also be used to backlight Tvs, computer monitors, and artwork.

Energy Efficiency: LEDs are an efficient power reduction choice

Response Time: LEDs have a short response time, with some LEDs achieving full brightness in less than a microsecond

Commercial Homes

Communication Technology Systems Model

Human to Machine: Inputs on TV remote; volume, changing channel.

Human to Human: News stations, TV shows

Future Projections

Immersive and Customizable displays

Standard features (UHD, HDR)

Increased Interactivity

Self-service

Larger Screens

Automated multi-angle adjustments

Voice Control

Smart TV Market