

Exploring the Role of Touchscreen in our Daily Life

Sweta

Department of Computer Science and Engineering
Gulbarga, Karnataka, India

Abstract— A touchscreen is an input device normally layered on the top of an electronic visual display of an information processing system. A user can give input or control the information processing system through simple or multi-touch gestures by touching the screen with a special stylus/pen and-or one or more fingers. The touch screen enables user to interact directly on the display screen, without requiring any intermediate device. Touch screen is interactive, fast, user friendly and has simple interface, requires less space, low maintenance display screen. It has numerous applications in various industry sectors and daily use devices. This paper discuss about functions of touch screen, its components, types, advantages and some of its applications. The applications include use of touchscreen in different fields, like game consoles, ATMs, touch screen monitor, touch screen smart board, navigation device, ipads, tablet PCs, mobile phones, smart phones, entertainment, education, public information system, health care, transport, and banking.

Key words: Role of Touchscreen, Daily Life

I. INTRODUCTION

A touchscreen is an input device, which detects the presence and location of a touch within the display area, and is normally layered on the top of an electronic visual display of an information processing system. A user interacts with the computer by touching pictures or words on the screen, which is sensitive to pressure. Interaction is done using simple or multi-touch gestures by touching the screen with a special stylus/pen and-or one or more fingers to give input or control the information processing. An electronic visual display is display technology which incorporates flat panel displays, performs as a video display, output device for presentation of images transmitted electronically, for visual reception. The multi-touch refers to the ability of touchscreen to recognize the presence of more than one or more than two points of contact with the surface to implement advanced functionality such as pinch to zoom or to activate certain subroutines attached to predefined gestures. A stylus or stylus pen is a small pen-shaped instrument that is used to input commands to a computer screen, mobile device or graphics tablet to draw or make selections by tapping the stylus on the screen.

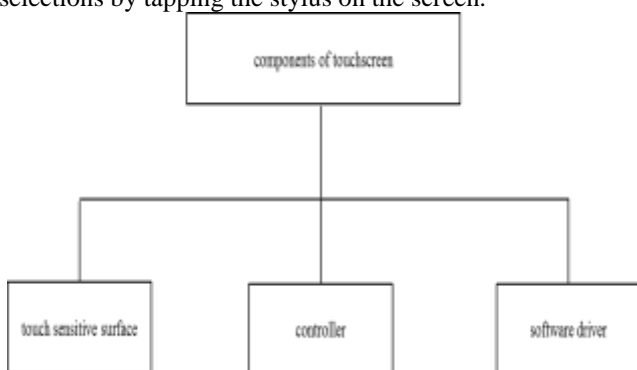


Fig. 1: Components of touchscreen.

The basic touchscreen has three main components: a touch sensor, a controller, and a software driver as shown in Fig.1. The touchscreen is an input device, so it needs to be combined with a display and a PC or other device to make a complete touch input system.

The touch sensitive surface, which is user's first contact with the system, is an extremely durable and flexible glass or polymer touch response surface, and this panel is placed over the viewable area of the screen. There is an electric signal going across the screen, and a touch on the surface causes change in the signal. It defines the quality and tactile feel of the touch system, and offers the only user interface, which allows the controller to identify the location of the touch. The controller contains a microprocessor, analog to digital converters, and microchips to enable communication, and acts as the intermediate between the screen and the computer. The main function of controller is to control the excitation, interprets the information received from the touchscreen, filter the returning touchscreen data. The software driver acts as a bridge, is an interpreter that converts signal from the controller to information that the operating system can process. The main functions of software driver is, to manage the raw coordinate data coming from the controller, apply calibration algorithms, position the mouse cursor, generate mouse clicks, routines to define the video alignment parameters, screening of incoming touch data for errors, and providing diagnostic information in troubleshooting situations. There are a variety of touchscreen technologies that have different methods of sensing touch, like resistive, surface acoustic wave, capacitive, infrared grid, and optical imaging.

II. ADVANTAGES

A touchscreen is a display which can observe the presence and sense location of a touch within the display area. The term in universal refers to touch or contact to the display of the device by a finger or hand. A touch screen is a transparent switch that is placed over a visual display. The switch enables interaction through physical contact by detecting the presence and location of a touch. A touch screen is one of the easiest to use and most intuitive of all computer interfaces and has various advantages as shown in Fig.2.

Touchscreen technology makes it possible to interact with a computer system using direct touch of the electronic display instead of using a keyboard and mouse, which has a touch-sensitive transparent panel covering the screen. Touch screen have virtually no moving parts and are therefore very durable and appropriate for frequent use in unlimited applications where user can simply touch an object on a screen. Touchscreen technology enhance the interface has become widely used as a way to interact with computer system, largely for mobile devices. It provides user an improved, easy, user friendly human-computer interface. It is guided by on-screen menus to an improvement in safety, reliability and productivity.

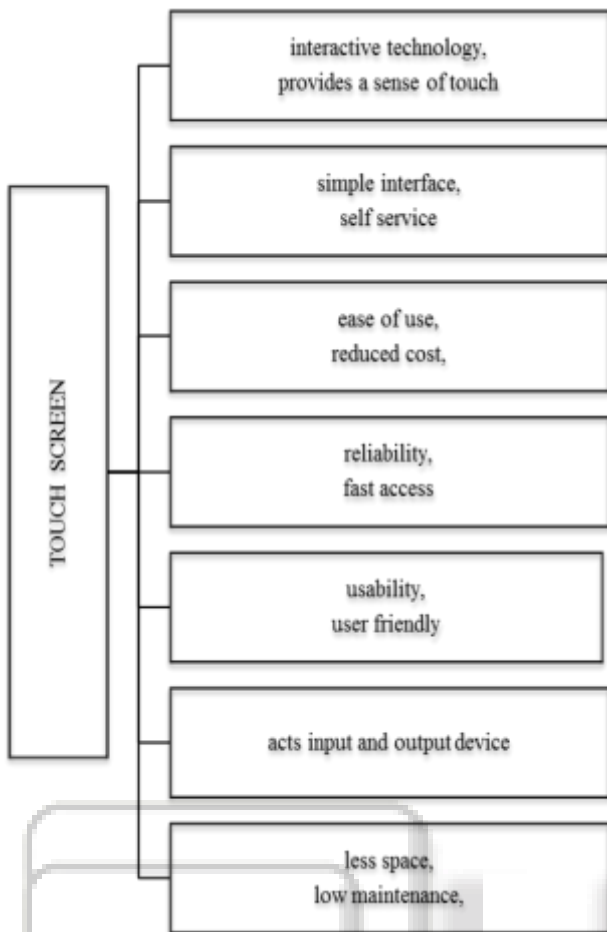


Fig. 2: Advantages of touch screen.

Touchscreen is designed to work with either finger or stylus pen. Tapping a specific point on the display will activate the virtual button or feature displayed at that location on the display. A touchscreen is an electronic visual display that a user can control by touching the display screen with one or more fingers. A touchscreen requires less space and provides much more direct interaction. Touchscreen have become very popular in tablet computers, smart phones and other mobile devices. Increasingly, regular laptop and desktop computers use touchscreen displays so user can use both touch as well as more traditional ways of input. Touch screen is found on larger displays, in phones with integrated PDA features. Touchscreen has found use in devices ranging from cell phones to supermarket checkouts because of its ease of use, reliability, expended functionality and reduced cost. It provides fast access and ensures that no space is wasted as the input device is completely integrated into monitor and is updated with simple software changes. Touch screen interface requires less concentration to use than a mouse and keyboard. Touch screen increase the speed of tasks because it requires less response time, allowing user to select icons directly. It can allow user to set up systems in areas where space is less and reduce the number of components exposed to the user. Touchscreen is compact and handy and provide fast access for better customer service in restaurants, hotels, movie theatre, and retail stores, which results in better quality of service. The touch screen technology is flexible, intuitive and requires no special skills to use and creates operational efficiencies by simplifying procedures and reduces the need for additional

capital investment. A touchscreen is made of glass or a similar hard-coated surface and requires low maintenance, easy to clean which is suited for the typical environments found in restaurants, hospitals, and the food and pharmaceutical industries. The large database is accessed quickly and easily, since touchscreen provides step-by-step, fail-safe sequences to guide the user through complex procedures. Touch screen allow for the convenience of self-service, which can facilitate transactions in stores and other establishments. Touchscreen displays provide large benefits to the end user enhancing the quality, performance. The touch Screen monitors and gadgets had reduced the size of a computer system. Use of touch screen reduces the hardware requirements, because it acts as both an input and output device. Touch screens are durable in public access and in high volume usage

III. APPLICATIONS

Touch screen provide accurate, fast and reliable needs of today's challenging environment and is used in many areas as shown in Fig.3.

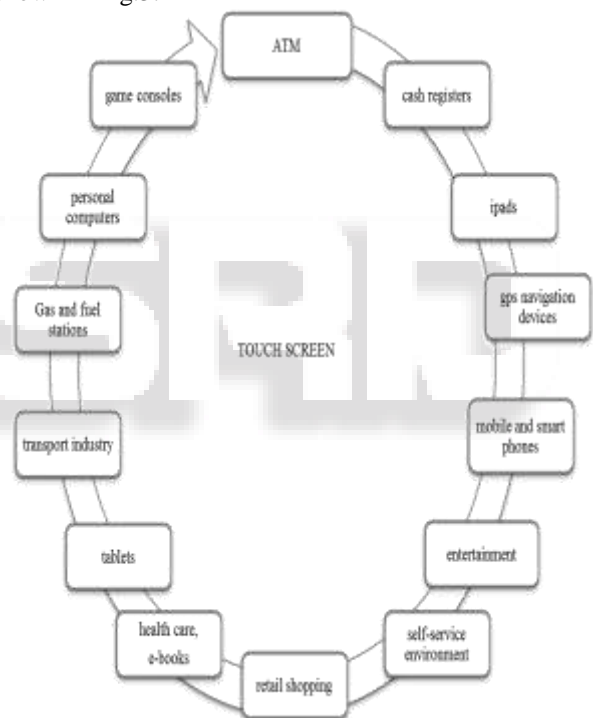


Fig. 3: Applications of touchscreen.

Touch screen is used in interactive learning and teaching tool. Touch screen smart board provides an easy interaction, and it shows presentation, playing multimedia clips and video conferencing. Touchscreen is used in public information displays, like information kiosks, tourism displays, trade show displays, and other electronic displays. Touch interfaces in healthcare are used with systems to access patient history, medical records access, pill dispensing equipment, diagnostic equipment, billing information, aid in diagnosis and educate patients on treatment options. Gaming applications are found worldwide and are increasing. Touchscreen provides bright displays that highlight the game's vivid graphics and many other features which enhance user experience. The bank and other financial institutions use touch screen to create efficiencies, reduce errors, and improve the user interaction experience.

It will guide the user through the required process, which can simplify the task. It is an electronic telecommunications device that enables the user of a financial institution to perform financial transactions, particularly cash withdrawal, without the need for a human cashier, clerk or bank teller. Addition to ATMs, information kiosk software has been developed for bill payment, money transfers and various other financial services for user. Touch screen used in navigation devices, like GPS navigation, satellite navigation, marine drive navigation provide user with up-to-date navigation and directions. Touch screen in monitors, laptops, mobile phones requires less space, and are easier and faster. Touchscreen used in transport system are used to dispense tickets for train, rail or airplanes, and allow the user to select the class of travel and specific seats. Interactive Touch Screen is used widely for learning environments and is comparable to interactive projectors with multi touch gestures. Touchscreen technology has found applications in public information kiosks, ticket machines at railroad stations, electronic voting machines, self-service grocery checkouts, military computers, and many similar applications, which instruct the user for providing service.

IV. CONCLUSION

Touch screen technology acts as an interface between computers and user which provide an easy visual experience for interaction to the user. The popularity of touch screen technology in PCs, smartphones, mobile phones, iPads, tablets, media players, game consoles, navigation devices and various other is rapidly increasing because, it is user friendly, fast, accurate and easy to operate. Mobile and tablets screen are the largest and popular application segment for touch screen technology. Touchscreen had turned into one of the fastest-growing display markets, which will undergo strong growth to accomplish user demand.

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