

E-BALL TECHNOLOGY

*A Technical Seminar Report
Submitted to*

Jawaharlal Nehru Technological University-A, Ananthapuramu

*In partial fulfilment of the requirements
For the award of the degree of*

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE AND ENGINEERING

By

**K. DILLI
(17AK1A0521)**



**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::TIRUPATI
(AUTONOMOUS)**

Venkatapuram(V), Karakambadi(Po), Renigunta(M), Tirupati-517520, A.P.

2017-2021

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Venkatapuram(V), Karakambadi(Po), Renigunta(M), Tirupati-517520, A.P.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



CERTIFICATE

Certified that this is a bonafide record of the technical seminar report entitled, "**E-BALL TECHNOLOGY**", done by **Ms. K. DILLI, REG NO. 17AK1A0521** Submitted to the department of Computer Science and Engineering, in partial fulfilment of the requirements for the Degree of **BACHELOR OF TECHNOLOGY** in **Computer Science and Engineering** from Jawaharlal Nehru Technological University-A, Ananthapuramu during the year 2017-2021.

Head of the Department
Smt. B. Rupa Devi, M.Tech, (Ph.D.)
Assistant Professor,
Dept. of CSE,
AITs, Tirupati

Faculty Coordinator1

Date: _____

Place: Tirupati.

Faculty Coordinator 2

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ABSTRACT

A new concept of pc is coming now that is E-Ball Concept pc. The E-Ball concept pc is a sphere-shaped computer which is the smallest design among all the laptops and desktops. This computer has all the features like a traditional computer, elements like keyboard or mouse., DVD, large screen display. E Ball is designed to be placed on two stands, opens by pressing and holding the two buttons located on each side of the E-Ball pc, this pc is the latest concept technology. The E-Ball is a sphere-shaped computer concept which is the smallest design among all the laptops and desktops have ever made. This PC concept features all the traditional elements like mouse, keyboard, large screen display, DVD recorder, etc, all in an innovative manner. E-Ball is designed to be placed on two stands, opened by simultaneously pressing and holding the two buttons located on each side. After opening the stand and turning ON the PC, pressing the detaching mouse button will allow you to detach the optical mouse from the PC body. This concept features a laser keyboard that can be activated by pressing the particular button. The E-Ball is very small, having only a 6-inch diameter sphere. It is having 120*120mm motherboard.

1.INTRODUCTION

E-ball is an emerging technology which was invented by a 31 year old Macedonian product designer, Apostol Tnokovski. This is a new concept of PC which features all the traditional elements like keyboard, mouse, webcam, DVD player, projector etc., and it is the smallest type of computer ever made. It is designed to ease the portability and work without any hardware. Predominantly this concept is based on laser rays technique which dwells all the features of a computer. Principally it was designed for Microsoft Windows Operating System and it comprises no external display units. This is the smallest model of this era.

When you close the e-ball no one can guess what is in it, that is none can find a whole computer set in that ball. But when it is opened we can see a whole computer set which contains all the conventional elements like display screen as well as the virtual keyboard and a mouse.

The E-ball is designed to be placed on two stands and can be opened by simultaneously pressing the two buttons which are located on either side of the sphere. It is provided for the projection through an LCD projector and navigation keys are given for adjustment purposes. Because of its unique way, the e-ball computer has taken computer technology to the peak.

THE CONCEPT OF E-BALL:

The E-BALL is a sphere shaped computer. Apostol Tnokovski decided to give the sphere shape to the pc because he considered the sphere to be the most attractive shape in nature that gathers the attention of all. The body of E-BALL is made up of aluminium and plastic parts. E-BALL is the smallest among all the PCs developed so far as it has a 120x120mm motherboard and is 6 inch in diameter. The EBALL pc has all the features and elements of conventional computer like mouse, keyboard, display etc



Figure 1.1 : E-Ball PC

2.ELEMENTS OF E-BALL

A. Size Of Eball

It is a spherical shaped ball of 6 inch in diameter and contains a motherboard of size 120x120mm.

B. Holographic Display

Holography is the best way of displaying true 3-Dimensional displays. It is a type of diffraction based display technology which reconstructs the light field of 3D in space with the coherent light.

C. Processor

It has a dual core processor with two disassociated cores on the same die, providing its own cache.

D. Ram

RAM (Random Access Memory) is the dominant type of memory in the computer. This computer uses 5 Gigabytes of RAM. It gets the name because we can randomly access the memory without considering the sequence.

E. Hard Disk Drive

It is a secondary storage device and non volatile in nature. It is made up of a metal plate coated with oxide that is magnetized to store the digital information. Data can be directly accessed from the hard disk. This computer has a storage capacity in the range of 250-500 Gigabytes.

F. Speakers

Prominently known as multimedia speakers. It has two inbuilt 50W speakers.

G. HD DVD Recorder

High definition DVD recorder is an independent unit which dwells the functions of Video Cassette Recorder. It records into a DVD disc or in the internal disc

H. Graphic Card And Sound Card

The graphic card is a hardware installed in the computer which is capable of generating output images on the screen. Almost all modern motherboards consist of ports so that the graphic card can be embedded. The sound card is an integrated circuit which generates the sound which can be heard through the speakers.

I. Power Port And Modem Port

The power port is used to plug-in any electronic devices such as DVD players. The modem port is used to connect the internet to the computer. The computer uses the ISP (Internet Service Provider) to deliver the information.

J. Webcam

Webcam is extensively used by all the computers. It can be connected to e-ball through USB cable or firewire cable.

K. Lan And Wan Cards

LAN card is used to connect the users to Local Area Network through wireless connection. WAN card is a Network Interface Card which connects the user to a Wide Area Network.

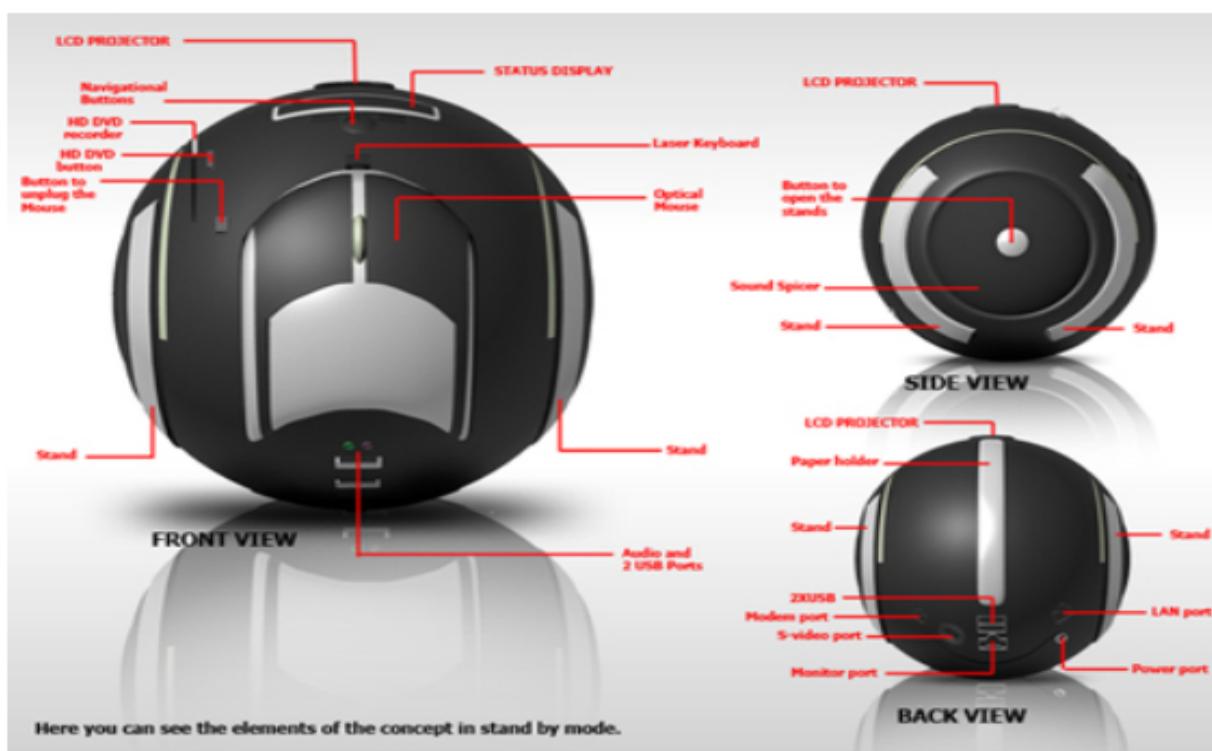


Figure 2.1 : Elements of E-Ball

3.WORKING OF E-BALL

The E-ball concept of pc is a spherical shaped pc that grabs everyone's attention. It is a modern system which doesn't require any conventional keyboard and mouse. Here we discuss the working of e-ball.



Figure 3.1: Working of E-Ball

A. Led Projector

E-ball uses LCD (Liquid Crystal Display) Projectors to display or project the information on a flat surface. It consists of three LCD panels and each comprises two glass panels with a layer of liquid crystals associated with them. It uses metal halide lamps to emit the light and a series of Di-chloric filters to separate the lights. Here the video signals are comprised of three colors: red, green and blue. These primary colors are making the images. LCD is generally more light efficient than DLP projectors. LCD projects the bright, vivid and sharper image with accurate color. This is the prominent advantage of LCD projector.

B. Dlp Projectors

DLP stands for Digital Light Processing. DLP technology is based on DMD (Digital Micromirror Device) chips. Each DMD chip consists of two million tiny mirrors. Each tiny mirror is capable of producing pixels. Color is fed to the DMD by a beam of light that passes through spinning color wheels. Basic color wheels support red, green and blue. After color reaches the DMD, the image is fed through the lens and onto the projection screen. The advantages of DLP projector are higher contrast and less door screen effect.

C. Optical Mouse

E-ball consists of an optical wireless mouse which uses the concept of LED (Light emitting diode) and a light detector to detect the movements relative to a surface.

D. Virtual Keyboard

It is a wireless laser projection keyboard which uses the principle of sensor technology. It is not a physical keyboard and it is interpreted through lasers. When the keyboard button is pressed, the keyboard is projected on the flat surface. Users have to touch the image of the key by moving the fingers through the air. Two technologies are used to transfer to the computer. In one technology, the Infrared sensor detects the stroke and sends it to the computer. In other technology, the selected keys are transmitted through wireless signals through the short-range Bluetooth technology. The keyboard layout can be changed through the software. This is more portable and takes less space rather than the conventional keyboards. The advantages of virtual keyboard are speed text entry, portability, flexibility, accuracy and the ability to minimize the risk of strain injuries.

E. Paper Sheet Holder

Paper sheet holder can be used in the absence of walls. It is at the back of the pc. The lower part has to be pressed to open the paper sheet holder. The projector will recur by pressing the paper sheet holder button for five seconds. It is used to portrays the presentation.

What if there is no wall ?

- When we are working in an open place we can make use of a paper sheet as a screen.
- Paper sheet holder is placed at the back panel of this computer.
- The holder can be opened by pressing it in the lower part

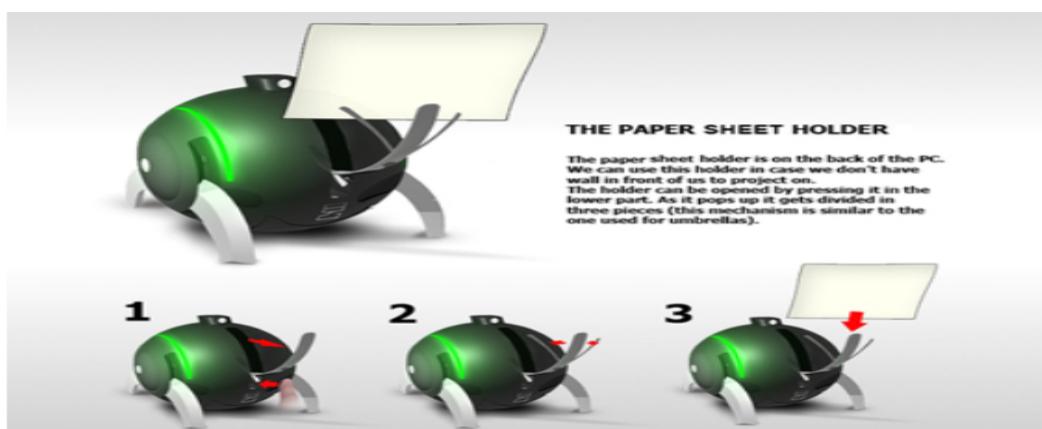


Figure 3.2: Working of E-ball using paper

4. VIRTUAL KEYBOARD

Virtual Keyboard is just another example of today's computer trend of 'smaller and faster'. It uses sensor technology and artificial intelligence to let users work on any surface as if it were a keyboard.

Virtual Keyboard is a small Java application that lets you easily create multilingual text content on almost any existing platform and output it directly to web pages. Virtual Keyboard, being a small, handy, well-designed and easy to use application, turns into a perfect solution for cross platform multilingual text input.

The main features are: platform-independent multilingual support for keyboard text input, built-in language layouts and settings, copy/paste etc. operations support just as in a regular text editor, already existing system language settings remain intact, easy and user-friendly interface and design, and small file size.



Figure 4.1 : Virtual Keyboard

The Virtual Keyboard uses light to project a full-sized computer keyboard onto almost any surface, and disappears when not in use. Used with Smart Phones and PDAs, theVKey (TM) provides a practical way to do email, word processing and spreadsheet tasks, allowing the user to leave the laptop computer at home.

VKey technology has many applications in various high-tech and industrial Sectors. These include data entry and control panel applications in hazardous and harsh environments and medical markets. Projection keyboards or virtual keyboards claim to provide the convenience of compactness with the advantages of a full-blown QWERTY keyboard. An interesting use of such keyboards would be in sterile environments where silence or low noise is essential like operation theaters. The advantage of such a system is that you do not need a surface for typing, you can even type in plain air. The company's Virtual Keyboard is designed for anyone who's become frustrated with trying to put information into a hand held but doesn't want to carry a notebook computer around. There is also the provision for a pause function to avoid translating extraneous hand movements function, so that users can stop to eat, drink etc ..

This system comprises of three modules,

1. The sensor module,
2. IR-light source
3. The pattern projector

1) SENSOR MODULE :

The Sensor Module serves as the eyes of the Keyboard Perception technology. The Sensor Module operates by locating the user's fingers in 3-D space and tracking the intended keystrokes, or mouse movements. Mouse tracking and keystroke information is processed and can then be output to the host device via a USB or other interface. Electronic Perception Technology.

Electronic perception technology enables ordinary electronic devices to “see” the world around them so they can perceive and interact with it. Now everyday electronic devices in a variety of markets can perceive users actions, gaining functionality and ease of use.



Figure 4.2: Sensor Module

The tiny electronic perception chips and embedded software work by developing a 3D “distance map” to nearby objects in real-time. This information is factored through an on-chip processor running imaging software that translates the image into defined events before sending it off-chip for application-specific processing. It’s an action that is continually repeated, generating over 30 frames of 3D information per second.

2) IR-LIGHT SOURCE:

The Infrared Light Source emits a beam of infrared light. This light beam I designed to overlap the area on which the keyboard pattern projector or printed image resides. This is done so as to illuminate the user's fingers by the infra-red light beam. This helps in recognizing the hand movements and the pressing of keys. The light beam facilitates in scanning the image. Accordingly the information is passed on to the sensor module which decodes the information. An invisible infra-red beam is projected above the virtual keyboard. Finger makes keystroke on a virtual keyboard. This breaks the infrared beam and infrared light is reflected back to the projector. Reflected infrared beam passes through the infrared filter to the camera. The camera photographs angles of incoming infrared light. The Sensor chip in the sensor module determines where the infrared beam was broken, detected coordinates determine actions or characters to be generated.



Figure 4.3: IR Light Source

3)THE PATTERN PROJECTOR:

The Pattern Projector or optional printed image presents the image of the keyboard or mouse zone of the system. This image can be projected on any flat surface. The projected image is that of a standard qwerty-keyboard, with all the keys and control functions as in the keyboard. The Projector features a wide-angle lens so that a large pattern can be projected from relatively low elevations. A printed image, with replaceable templates allows system flexibility, permitting most any kind of keyboard configuration for greater functionality. In some types of virtual keyboards, a second infra-red beam is not necessary. Here the projector itself takes the inputs, providing dual functionality. A sensor or camera in the projector picks up the finger movements, and passes the information onto the sensor modules.



Figure 4.4: The Pattern Projector

FEATURES OF E-BALL

- It contains wireless optical mouse and laser keyboard, and LCD projector.
- It has around 350-600GB of Hard Disk Drive.
- It contains 5GB RAM.
- It has two 50W speakers.
- It has a LAN and WLAN card and a Webcam.
- i-tech Virtual keyboard
- Dual core processor Integrated graphics and sound card.
- LCD projector Paper holder

ADVANTAGES AND DISADVANTAGES OF E-BALL:

Advantages:

- Portable.
- Large Memory.
- Very easy to use.
- Have greater speed.
- More secure than another computer.
- Efficient.
- Supports user defined keyboard layouts.
- Useful for making video presentations.

Disadvantages:

- Normal operating systems cannot work in these computers.
- Cost of E-BALL is very high.
- It is difficult to understand if any problems occur in the hardware part.

APPLICATIONS

- High-tech and industrial Sectors.
- Used with Smartphones, PDAs, email, word processing and spreadsheet tasks
- As computer/PDA input
- Gaming control
- Future Scope:
 - ❖ Operation Theatres

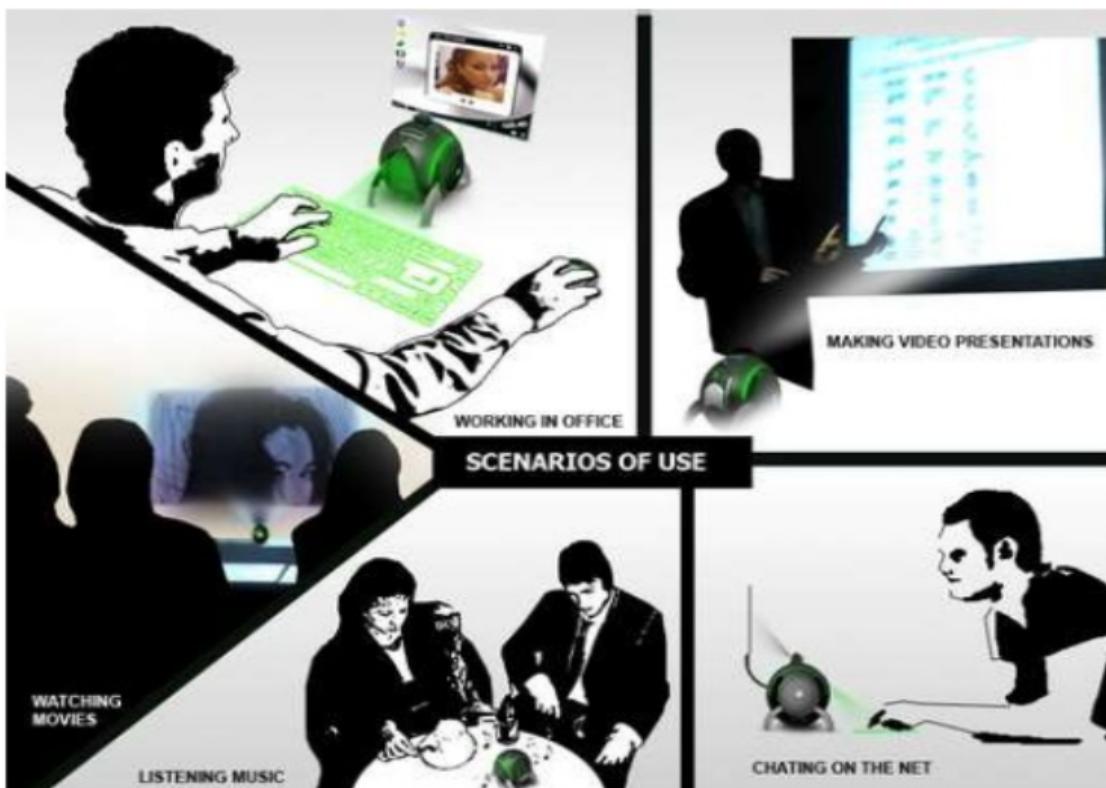
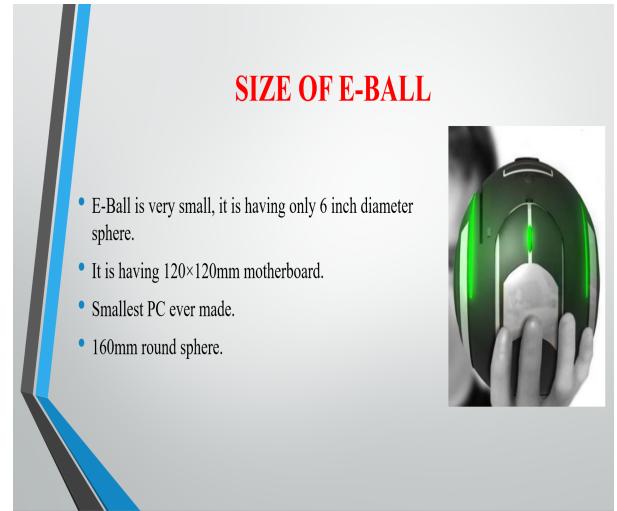
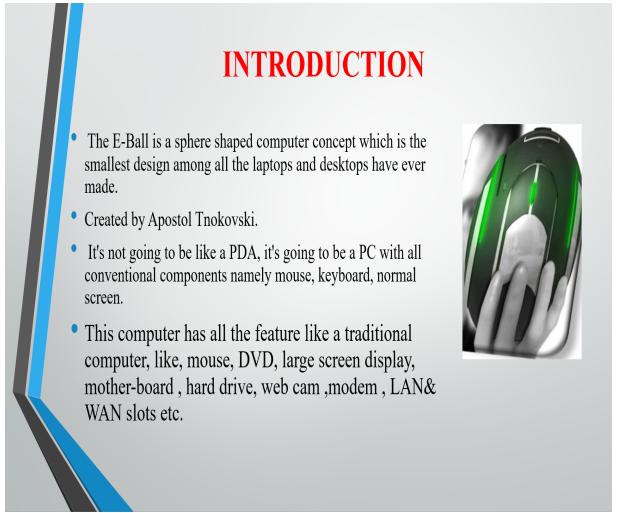
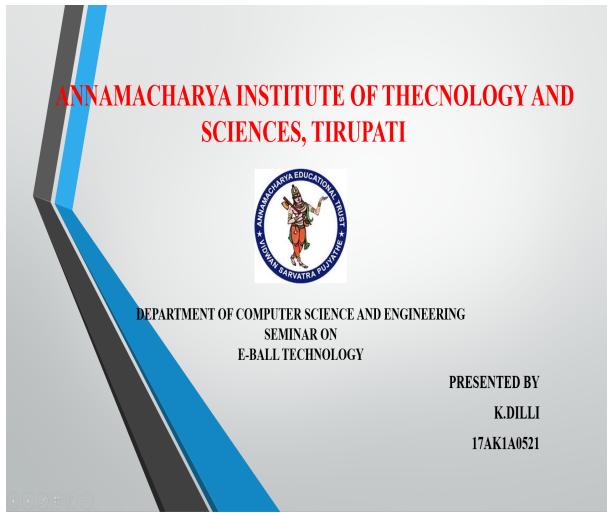
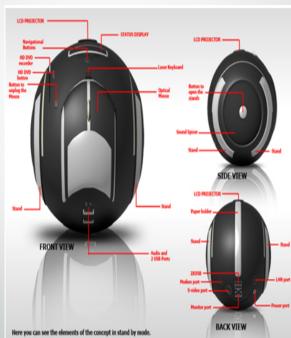


Figure 7.1: Working Areas Where E-ball is used



ELEMENTS OF E-BALL

- I-tech Virtual keyboard
 - Dual core processor
 - 2GB RAM
 - 350-500GB hard drive
 - Integrated graphics and sound card
 - Speakers
 - Wireless optical mouse
 - LAN & WAN card
 - Modem
 - Web cam
 - LCD projector
 - Paper holder



WORKING OF E-BALL

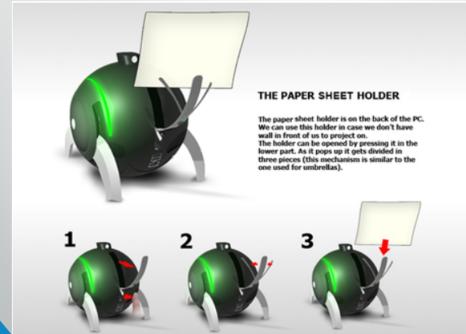
- Press and hold the power button for 5 sec.
 - Adjust the LCD projector.
 - Detach the optical mouse.
 - Activate the virtual keyboard.
 - Do whatever you want.
 - Keyboard: infrared rays & laser
 - Mouse : RF receiver and RF transmitter



WORKING OF E-BALL(Contd....)

- What if there is no wall ?
 - When we are working in an open place we can make use of a paper sheet as a screen.
 - Paper sheet holder is placed at the backpanel of this computer.
 - The holder can be opened by pressing it in the lower part

WORKING OF E-BALL(Contd....)



VIRTUAL KEYBOARD

- A virtual keyboard is a projection keyboard that is projected and touched on any flat surface
- Virtual keyboard basically uses the principle of sensor technology and artificial intelligence to let users work on any surface.
- Whenever we press the keyboard button, it is projected optically on the flat surface and, as the user touches the image of the key, the optical device detects the stroke and sends it to the computer



VIRTUAL KEYBOARD(Contd....)

- Virtual keyboard basically consists of three components:-

- **1.The Sensor Module:**- The sensor module serves as the eyes of the Keyboard Perception technology.

❖ The Sensor Module operates by locating the user's fingers in 3-D space and tracking the intended keystrokes.



VIRTUAL KEYBOARD(Contd....)

- **2.IR-light source:-** The Infrared Light Source emits a beam of infrared light.

❖ This light beam is designed to overlap the area on which the keyboard pattern projects.
❖ This is done so as to illuminate the user's fingers by the infrared light beam.



- **3.The Pattern Projector:-** The Pattern Projector basically presents the image of the keyboard.

❖ This image can be projected on any flat surface.
❖ The projected image is that of a standard QWERTY keyboard, with all the keys and control functions as in the keyboard.



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ADVANTAGES

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- Very easy to use.
- Have greater speed.
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- Efficient.
- Supports user defined keyboard layouts.
- Useful for making video presentations.

DISADVANTAGES

- Normal operating systems cannot work in these computers.
- Cost of E-BALL is very high.
- It is difficult to understand if any problems occur in hardware part.

APPLICATIONS

- High-tech and industrial Sectors.
- Used with Smart phones, PDAs, email, word processing and spreadsheet tasks
- As computer/PDA input
- Gaming control
- Future Scope:
 - ❖ Operation Theatres



CONCLUSION



- As the year passes, the computer size is becoming smaller.
- Today's technology is at its peak point beyond what we could ever imagine.
- At last this ball technology has taken the computer technology to new horizons.

CONTENTS

- Introduction
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ANY QUERIES ?



THANK YOU

CONCLUSION

- As the year passes, the computer size is becoming smaller.
- Today's technology is at its peak point beyond what we could ever imagine.
- New inventions and innovations are emerging on daily basis
- Our imaginations have dressed into reality and today it has become possible to have a whole computer in our pocket all the time
- At last this ball technology has taken the computer technology to new horizons

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