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# INTERACTIVE WHITEBOARDS

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## AN OVERVIEW

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**Phoenix AV Solutions Ltd**

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## INTERACTIVE WHITEBOARDS – AN OVERVIEW

The following are outline overviews of the technology associated with the various boards as well as some hints and tips on choosing which is best.

### 1. The Concept

The interactive whiteboard allows any user to interface with their computer from the boards position. The board is connected to the computer usually by serial or USB cable (although wireless options are becoming increasingly available) and the computer's screen image is projected back onto the board via a separate data video projector also connected to the computer.

The user can then control their computer via the board using either their finger or a special stylus. This is usually done after a quick calibration or orientation process whereby the user clicks onto a number of projected points on the screen. This in turn tells the computer where the mouse should be when the user touches the board image. (Note – for permanently installed systems, this procedure should normally only need doing every few months).

In this basic format, the user can now work with any programme on their computer in the normal way using the stylus or their finger to control the mouse.

Most interactive boards will also have their own software to allow greater levels of interaction. Some systems are more geared towards education whilst others are excellent for business as well. It is this IWB software that contains the additional features such as turning the system into an electronic flipchart or allowing the user to annotate over their computer programmes. (See 'Software' at the end).

This means the user can now sort their notes, add a wide variety of formats such as Microsoft documents, images, pdfs and html pages into their notebook pages, convert handwriting to text and convert their notes into a variety of formats for dissemination. No more transcribing flipchart sheets or losing material from marker boards. (Note: IWB software capability varies from system to system).

### 2. The Technology

Interactive Whiteboard technology is divided into 3 main areas.

#### a. Electromagnetic

These boards have a hard surface with a form of electromagnetic grid behind. The user has either an 'active' (contains a battery / is rechargeable) or 'passive' (no battery) 'stylus' pen which is used to control the computer software. Each time the pen touches the board, a signal is sent to the PC to tell it where the 'mouse' position should be.

These boards tend to be generally more durable and are better as projection screens with less reflective shine; the stylus pen is easy to use and control and offers greater speed and calibration accuracy across the surface of the board. They have a 'control' element in that only the person with the stylus can control the board. Conversely, the interactive board will only work with the correct input device.



**Advantages:** Durability; speed and accuracy, user control of board (via stylus)

**Disadvantages:** Requirement for stylus (batteries with some)

**Current systems include:** Hitachi Cambridge (*highly recommended*) / InterWrite / Promethean

## b. Resistive Membrane

These boards are also covered by a thin 'plastic feel' membrane. The user does not require any specific input device and can now operate the board using their fingers to control the software. As they touch the board with their hand or 'dummy stylus', the membrane makes contact with the backing and sends a signal to the PC to tell it where the mouse position should be.

Whilst the obvious advantage for these systems is not being 'tied' to a stylus, users must be aware of issues of durability and the fact that the board remains 'live' at all time making it susceptible to accidental initiation during presentations if the users touch with their hands, arms or clothing. Furthermore, the board surface can become sticky over a period with the build up of body moisture slowing down the smooth operation by touch.



There are also a number of membrane systems available for LCD and Plasma screens allowing these to be converted into interactive systems.

**Advantages:** No stylus required

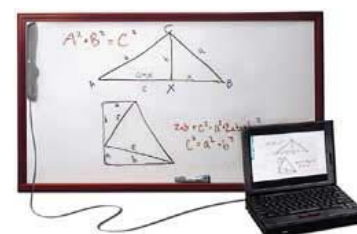
**Disadvantages:** Susceptibility to damage (membrane); 'accidental initiation' (screen always live); screen can get sticky if not maintained, pinpoint accuracy not as good as many of the electromagnetic systems

**Current systems include:** SMARTboard, PolyVision, TeamBoard

## c. Triangulation

These systems are available both as permanent board mounted fixtures and as highly portable stand-alone systems for use with existing whiteboards and flipcharts.

The principle is based on a scanning unit mounted along the top, side or corner of the board and a stylus pen which operates either by infra-red or ultra-sound. The scanning unit monitors the location of the stylus and calculates by triangulation its position, thus relating to the mouse position on the computer.



These boards are often highly durable and marker safe offering establishments peace of mind regarding their use. The portable systems are excellent for mobile lecturers, trainers, HR and sales personnel.

**Advantages:** Board systems are price competitive; clip- on systems mobile and easy to use; technology is simple and easy to repair / replace

**Disadvantages:** Requirement for stylus with battery, older systems may show a slight 'pen lag' when writing; possibility of higher reflectivity of surfaces (for both board and clip- on systems)

**Current systems include:** PolyVision Eno, Hitachi FX/Duo (*highly recommended*), Mimio, eBeam, eBeam Integral,

### NOTES:

Other considerations are required when choosing a board and these include the software packages, board size, connectivity and projector systems.

### 3. Board Software

Each board comes with a 'driver' required to be loaded onto the computer in order to control the board. In addition, each will have its own software to allow interaction with the computer and applications. These software packages and their capabilities can vary greatly between the boards and will probably have a greater influence on board choice than the hardware.

Most software systems will allow a 'dual mode' capability for whiteboard use and interactive PC.

#### a. Whiteboard Mode:

The screen is converted to a blank sheet. The user can select a range of pen colours and vary pen thickness to draw and write onto the blank page. Options such as an eraser will be to hand to correct mistakes. Many have additional capabilities such as multi-coloured pens and so on. The user can add to the notebook any number of additional pages and move between them like a flip-chart.

In addition to basic annotations, most will allow the user to import a range of external documents such as pictures, Microsoft documents / spreadsheets / PowerPoint etc so they can be annotated over and stored within the notebook pages. All objects and annotations can be moved, resized etc (not with PolyVision 'Walk & Talk boards') and the handwriting converted to text on the page.

#### b. PC Mode:

In this mode, the user is working and controlling their computer via the board. Either from a free floating icon / toolbar or shortcut icons on the board, they can annotate over anything they are looking at (including internet pages) and capture those pages / annotations into their notebooks.

This is excellent for referring back to various subject matters that would otherwise have been lost. Again, some systems have the capability to annotate directly into 'live' documents including handwriting recognition capability.

#### c. Saving & Dissemination

All the software packages save the data into their own format. This means when re-opened, it can be re-manipulated and the objects re-sited etc.

However, in recognition that not everyone will have the software within a training session or meeting, most will allow you to not only print the pages, but export to a variety of formats including pdf, html, jpeg, bmp and even PowerPoint. This way, all members of the meeting or training can have a copy of the notes including relevant annotations.

#### d. Additional Features

Some software products have additional features that are worth considering such as the ability to play document cameras / video conferencing and web-cam images through them, capturing clips to the notebook. The Hitachi Cambridge is unique in that it has free networking capability built-in allowing users to network over 40 boards in varying locations for real time, live interaction between them.

Some of the better known and featured software packages include:

- i. Starboard (Hitachi Cambridge / FXDuo) - *outstanding multi-functional, incl. Networking capability*
- ii. InterWrite (GTCO) - *excellent for business and education*
- iii. SMARTnotes (SMARTboard) - *good all-round software*
- iv. ACTIVinspire (Promethean) - *education software*
- v. Lynx (CleverBoard) - *good all-round software*
- vi. MimioStudio (Mimio) - *excellent for business and education, interactive and capture*

#### 4. Board Sizes

Interactive boards are measured diagonally and are normally divided into standard 4:3 and widescreen format, with large and small variations in each group. Each manufacturer has their own standard but generally,

- a. 4:3 Format: Small board are 60" diagonal and large boards 75" – 78" diagonal
- b. Widescreen: Small boards from 63"- 71" and larger boards 71" – 83" diagonal

#### 5. Connectivity

The standard connection for the majority of boards is now USB. Some still offer the choice of serial whilst a few others – particularly portable systems are now offering wireless connectivity.

A few systems also offer the ability for users to connect their laptop to the board in conjunction with a USB 'key' or 'dongle' allowing limited control and annotation without uploading the full software. This is particularly useful in meeting rooms with transient users.

#### 6. Marker Safe

Another area for consideration is the question of the board being 'marker safe'. It does not follow that hard boards are and membrane boards are not, being very much related to the manufacturer and the system brand. Using marker pens on 'non marker safe boards' can leave them badly streaked with ghost images and difficult to clean.

- a. **Marker Safe include:** Hitachi Cambridge / Hitachi FX/DUO / InterWrite / PolyVision Eno  
PolyVision Walk & Talk / CleverBoard / eBeam Integral / TeamBoard
- b. **Non Marker Safe include:** SMARTboard / Promethean

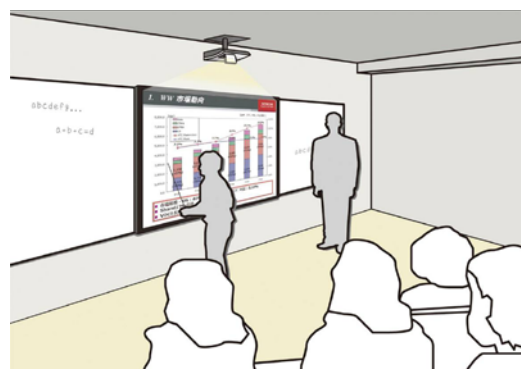
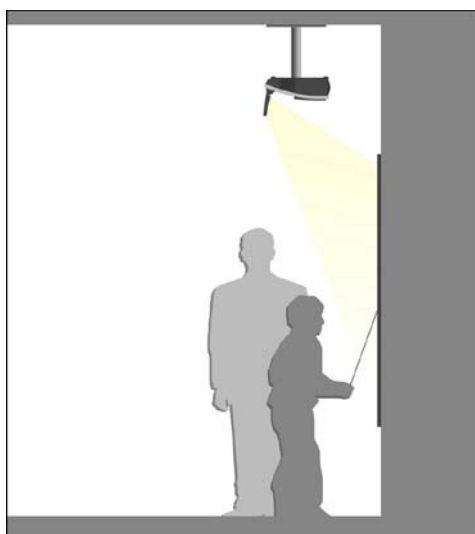
#### 7. Projection Systems

Interactive Whiteboard work in conjunction with projectors, usually via front projection directly onto the screen. Unfortunately, this does mean that there is a shadow effect whereby the user is required to stand to one side with arm outstretched. Although initially awkward, one gets used to it very quickly and it becomes a minor issue.

However, there are now a new breed of Ultra-Short Throw Projectors, the best of which are designed to sit above the board with a throw distance of 50 – 70 cms. This means that the user can now stand in front of the board and write / annotate normally with the shadowing falling below their line of sight.

Furthermore, when they turn to face the audience or class, there is no bright light shining into their faces.

Highly recommended is the Hitachi CP-A100 system.



## 8. ACCESSORIES & ALTERNATIVES

In addition to the standard interactive whiteboard format, there are a number of alternative products and accessory items that can be added on and increase functionality or user capability.

### a. Interactive LCD / Plasma

Either custom-made systems or standard screens with touch overlays. These allow users the same functionality as a screen without the cost of a projector or the other added implications such as shadowing and ambient conditions.

### b. Interactive Rear Projection

Usually a cabinet with built-in rear projection system, these offer a large format interactive system with the ability to move between room locations

### c. Interactive 'Through-Glass'

These systems allow you to convert glass into an interactive medium. Excellent for shop windows or information offices for example, where passers-by can access catalogues and information pages.

### d. Interactive Panel

Usually between 15" – 19" diagonal, depending on brand. These can be connected to the computer and out to a projector. The user can control their annotations in the same way as an IWB without moving from their position. Excellent for disabled users or large screen areas such as halls and lecture theatres.

### e. Interactive Tablet

Usual between A4 and A5 in size, they are connected wirelessly or by Bluetooth. Working in the same way as a graphics tablet, they allow the user to control their presentations including annotations etc from anywhere in the room.

### f. Response / Voting Systems

Another excellent training aid. Many variants exist in different shapes and sizes. Questions can be set either on screen such as using PowerPoint or verbally and answers collated on the PC, again for public or private display. Answers and results can also be maintained in a database for later recall.

### g. Visualisers / Document Cameras

Project images of documents, pictures, 3D objects up onto the screen. Especially good for science and medical use where items or too small or not convenient to pass around.