Virgin Media TiVo Apps

Design & Developer Guidelines

Design principles and developer specifications for connected television applications on TiVo

Table of contents

What makes a good TV app?	03
Making it televisual	04
Designing for the 10 foot interface	05
Screen specifications	07
On-screen text	08
Colour, graphics, & animation	09
Common UI elements and groupings	10
Navigation	15
App packaging	17
Programming	18

What makes a good TV app?

Enhancing what we already love about TV

A TV application on TiVo is a way to access the internet on your television. Is designing a TiVo app, then, simply adjusting a web page for a bigger screen and a remote control?

That's not quite how we see it. We believe a good TV app should not try to turn a television into a PC, but should try to enhance what we already love about TV.

Today's TVs and PCs look very much alike, but they still have very different souls on the inside.

Television is inherently a 'leanback' medium that shares a heritage with theatre and cinema. A traditional TV audience is a passive one who give themselves over to the medium, saying, "Tell me a story".

The internet PC, on the other hand, has quite a different heritage. Its ancestor is the reference library, a place for the active and deliberately seeking mind that says, "I want to find out".

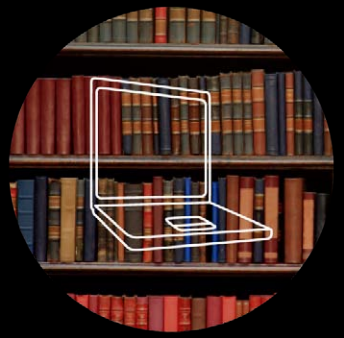
When we kick back and relax in our sitting rooms in front of our TVs, ready to be entertained, we probably don't want to feel like we are roaming the aisles of a library; that's the psychology of the couch.

The psychology of the couch says that most people, most of the time, want their TV viewing to be simple and not too much work. A good TV app designer recognises this, and designs apps mainly for passive consumption with allowance for short periods of activity and active consumption.

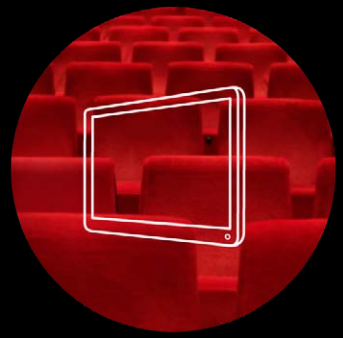
For example, between watching shows and videos the TV viewer may take simple actions like browsing for the next programme, rating a show with a 'thumbs up', sharing a short opinion ("OMG! LOL!"), or even placing a quick bet. Short active consumption can range from a quick weather check, to reading a Twitter feed, to playing a casual game.

As much as we love the experience of the internet on our PC, it's on a full-featured, complex device that was not designed for entertainment. The relatively simple TV remote control reveals that the television was designed, mainly, for getting you in touch with the story.

The goal of the TV app designer, then, should be to take content from the net and present it in a televisual way that fits the psychology of the couch: simple, relaxing, transporting, and emotionally immersive.



I want to find out



Tell me a story

Making it televisual

Principles for making TV apps simple, relaxing, and emotionally immersive

1. Strive for simplicity.

Keep the interactivity simple, the interface uncluttered, and remote control button presses down to a minimum.

This can be a real balancing act, especially for a complex app.

Sometimes splitting cluttered designs (that have too many planes of navigation, for example) into separate screens helps to simplify them, but also keep in mind that additional screens can add to the number of button presses.

2. Don't force the viewer to make decisions if they don't have to.

According to the psychology of the couch, we want to relax, not make decisions.

Editorialise the experience for the viewer, choosing content for them first. Then invite them to explore and make their own choices when they're ready.

3. Get to the story.

If the app has video, play it immediately, or consider making the video part of the overall application design. This will immerse the viewer in a narrative straight away.

4. Fill the background with movement.

Full screen designs using overlays are more immersive (and hence more like traditional TV) than L-split designs. Overlay layouts also cut down on viewer eye movement.

overlay interface

L-split interface

If a multi-screen layout is used (aka "video wall"), use a gently moving video background.

multi screen (video wall) interface

5. Keep text short.

Television is not a medium best suited for reading.

Glanceable blurbs are fine, but leave the news articles and e-books for web browsers and tablets.

Instructions and button labels should be as few words as possible, and text blocks should be no more than 100 words.

Consider using video and audio messages instead of text.

6. Minimise typing.

Typing with the remote control can be very slow compared to other devices, so don't force viewers to type if they don't have to.

Browsing should be presented before searching (in other words, give viewers the option to find content through images and text lists before asking for a keyword).

If part of an app requires a sign-in, try and offer guest access to the parts that don't require the sign-in.

7. Put video first.

Television is first and foremost a video device. An interactive TV viewer should have a more video-centric experience of the internet than a PC user.

On a PC images and text are consumed before the a user chooses a video.

On a TV the viewer watches a video before choosing to consume images and text.

Designing for the 10 foot interface

Designing an interactive application for TV is different from other devices like computers, mobiles, and tablets because of the 10 foot screen distance and the use of the remote control.

Both introduce restrictions.

Navigation with a remote control can be persnickety.

The free-range navigation we're used to on a touch screen, or with a pointing device like a mouse, is not possible with a remote control.

Moving focus around the screen with a remote must be carefully broken down into discreet steps of up, down, left, and right.

The single action of a mouse pointer going from one corner of the screen to the other can take many steps on a remote, and this is one incentive for not overloading any single TV screen with interactive elements.

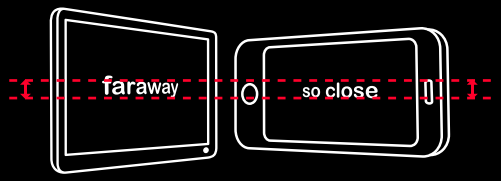
In order to make an app easy to use a careful balance must be struck between the amount of buttons on any screen and the amount of screens used to accommodate the buttons.

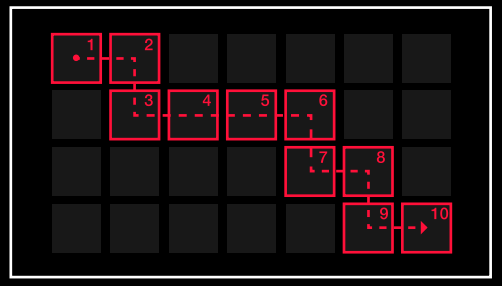
Multiple planes of navigation using menus and scrollable columns might be better if split up into different screens or pop-up windows, but with the caveat that viewers tend to feel lost after navigating three screens away from any starting point of a task.

A TV interface needs large text to be legible.

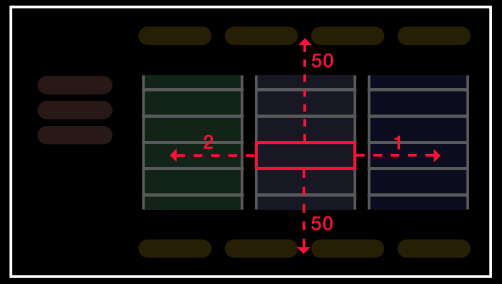
Although one might think the large television display gives the designer more real estate to play with, the distance shrinks the screen down in the viewer's field of view.

Often their won't be much more relative space for text on a TV than the average smart phone screen, so words need to be relatively large to stay legible.

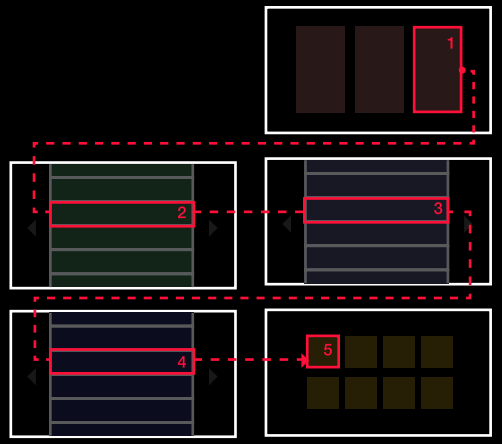




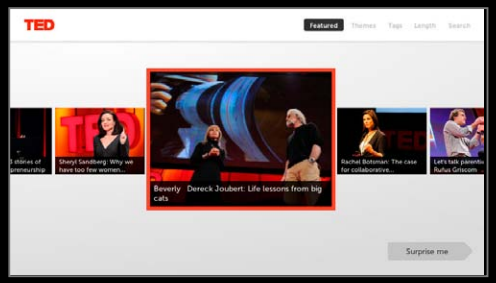
A layout of 28 buttons like this takes at least 10 steps to navigate from corner to corner

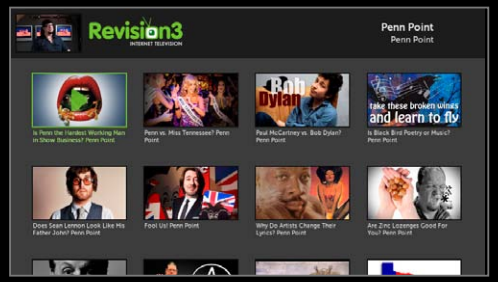


Menu buttons above and below a 50 item scrollable column would be very hard to access because those buttons could be 50 steps away



Steps may be reduced by splitting interactive elements across multiple screens





10 foot interface examples

Screen specifications

All apps for TiVo use a square pixel 16:9 720p HD screen size.

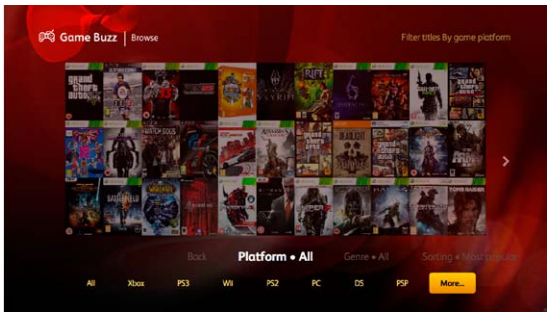
Overscan area

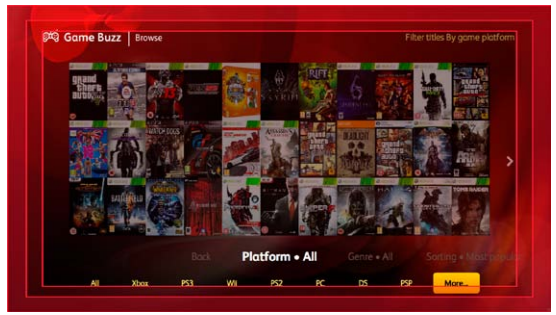
The Overscan area may or may not be visible, depending on the television and the television's current settings.

The app design must fill this area, but not with anything critical to the design.

Safe areas

All buttons and legible text must be placed within the Action safe area, and ideally within the Text safe area.





Fonts, colour, graphics, & animation

Specifications and best practice guidelines

Fonts

1. Fonts must be supplied in True Type format.
2. Body copy should be about 24 pt. Minimum size on screen is about 18pt.
3. There should be maximum 200 words per screen.
4. Small point serif or italic fonts should be avoided.
5. Light coloured text on a dark background is preferable to dark coloured text on a light background on TV.

Colour

1. A light foreground on a dark background is preferable on TV to dark foreground on a light background.

Light foreground Dark foreground

2. Large areas of cool desaturated colour are preferable to large areas of warm saturated colour.

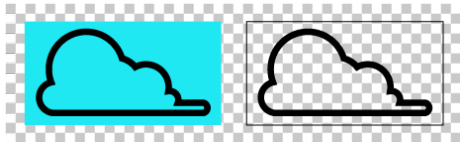
cool desaturated warm saturated

3. Use PAL broadcast safe colours:

black RGB 016 #101010 | R 16 G 16 B 16 | R 240 G 240 B 240 | white RGB 240 #F0F0F0

Graphics

1. Use 24 bit (no transparency) or 32 bit (with transparency) PNGs for interface graphics.



24 bit PNG 32 bit PNG

2. Use JPGs for content (eg. photographs, thumbnails).
3. Try to size all graphics to the display size. Flashlite using AS2 does not scale images smoothly (ie. it does not use any resampling interpolation).
4. Vector graphics may be used, but they should be simple with few colours and no gradients.
5. All strokes must be a minimum of 2 pixels thick.
6. Try to keep all file sizes small. Avoid complex vectors and avoid large bitmaps. If a full screen graphic is required, it may be better to render it as a video background.

Animation

1. Graphical animation generated by Flash is best avoided on the TiVo set top box, as it does not have a lot of memory and processing power for this task.

   Some simple tweening in Flash with simple flat graphics are doable.

2. Loading message animations should be avoided, as they sometimes stall. A static “Please Wait…” message should be used.

3. If animation is desired in the interface the best way to achieve it might be to follow the same model as traditional DVDs, which consist of a video track in the background and a subpicture track in the foreground.

subpicture video DVD interface

This will suit the capabilities of the TiVo set top box, which excels at playing video.

Common UI elements and groupings

3 common display elements

There are 3 common display elements- found in a TiVo application: progress bar, list number, and button hint.

4 common interactive elements

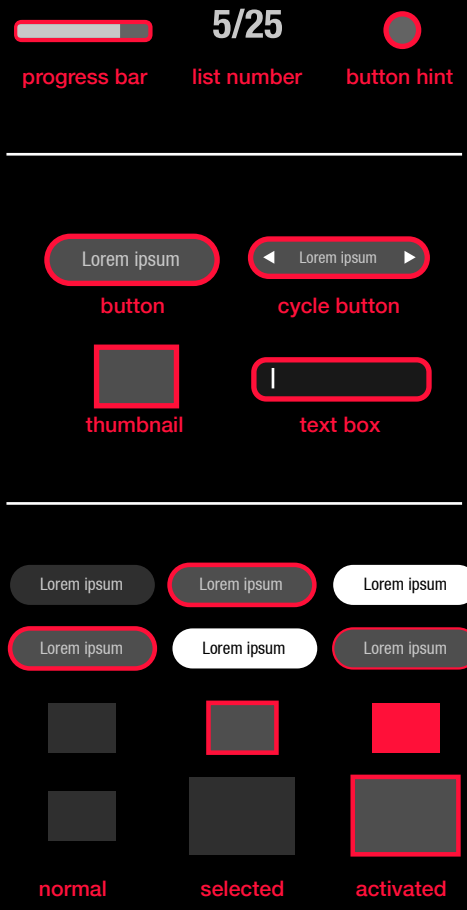
There are 4 common interactive elements: button, thumbnail, cycle button, and text box.

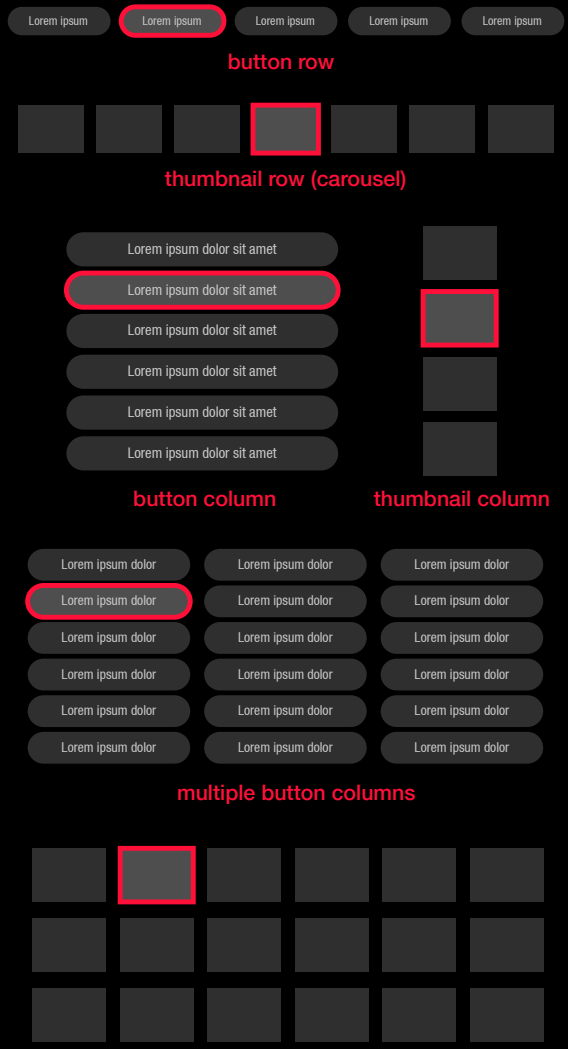
3 states of interactive elements

Each button must have 3 graphic states: normal, selected, and activated.

6 basic button layout groupings

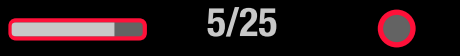
The most basic on screen button groupings, best suited the up, down, left, right arrow buttons on the remote, use button and thumbnail rows and columns: button row, thumbnail row, button column, thumbnail column, mutiple button columns, and thumbnail grid.





Progress bar, list number, and button hint

There are 3 common display elements- found in a TiVo application: progress bar, list number, and button hint.



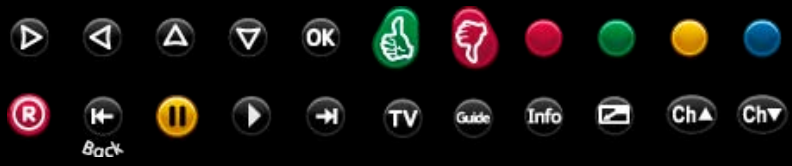
progress bar list number button hint

The progress bar is often used to indicate the current time on a video or audio asset.

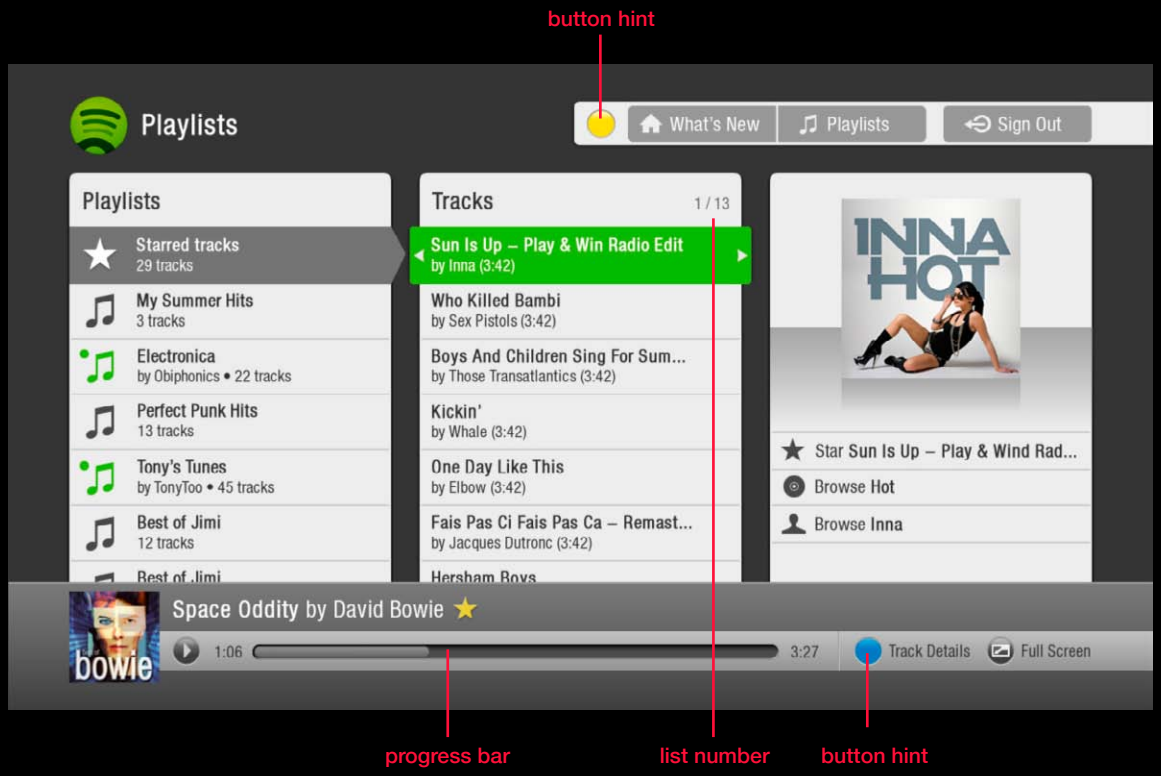
The list number indicates the current selection on a scrollable list (nb. this is preferable to a scroll bar). It can be written in the format “x/xx” or “x of xx”.

The button hint indicates what other buttons do in the app besides up, left, down, right, and OK. It should have a short descriptive text label next to it.

Ideally the button hint graphics should match the those shown at right, but they also may be altered slightly to fit the graphic style of an app if needed.

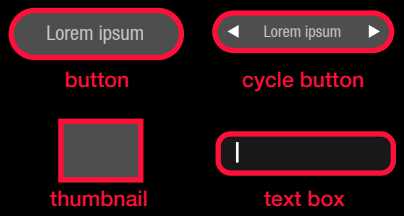


TiVo remote button hint graphics



Button, cycle button, thumbnail, and text box

There are 4 common interactive elements that are found in a TiVo app: button, cycle button, thumbnail, and text box.



A button has a text label and is pressed by hitting the OK button and/or RIGHT button (if the button is the right-most on the screen).

TiVo core UI convention

"Whispering Arrow" hints are found on buttons in the TiVo core UI to indicate the viewer can go left and right, and this convention may be used on buttons in TiVo apps.

A cycle button allows the viewer to pick from a series of options, usually by pressing LEFT and RIGHT. This is functionally equivalent to a checkbox or radio button on the web.

3 steps of a 3 option cycle button

TiVo core UI convention

Solid triangles are used in the selected state to indicate a cycle button. This convention should be used in all other TiVo apps.

Navigation Note

If LEFT and RIGHT are used for cycling through options, there can be no other buttons to the left or right on the screen. One can't cycle and navigate to another area of the screen at the same time.

typical column of cycle buttons

A thumbnail is a picture that is activated by hitting the OK button on the remote.

layout using a carousel of thumbnails

A text box is for typing and entering text. Typing is done using the multi-tap method using the number buttons on the remote, or by launching an on screen keyboard pop-up and using the D-pad.

Type with the number buttons in a text box or with the D-pad on an on screen keyboard

When using a text box only, the number buttons on the remote allow you to type letters, and pressing OK enters the text. When using an on screen keyboard the viewer navigates to the text box first and the first OK button press launches the on screen keyboard as a pop-up window.

Ideally an app should use both typing-methods.

When both methods are used together an OK press on the text box launches a pop-up keyboard and the viewer then chooses which method of typing they want to use.

Text box with pop-up on screen keyboard

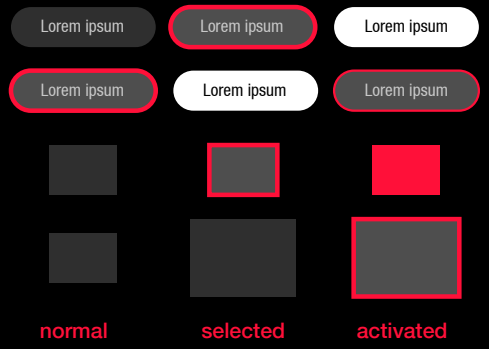
Each method has its own advantages. The onscreen keyboard is instantly understandable and the viewer can keep their eyes on the screen, but the multi-tap method is slightly faster once learned.

To speed up multi-tap typing, unneeded characters should be eliminated from the multi-tap cycles.

For example, if the password being asked for is not case sensitive, capital letters need not be part of the charater cycles on the number buttons. If only a number is being asked for by a particular text box, typing should simply be restricted to numbers.

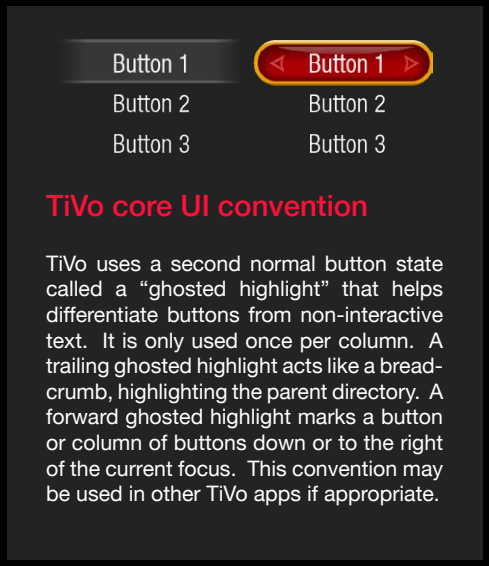
Normal, selected, and activated

Unlike a direct pointing device, selecting and activating on screen buttons are two separate steps when using a remote. This means 3 button states (normal, selected, and activated) must be represented graphically for all buttons.



Selected states are often differentiated from normal states by heavy strokes, different colour fills, or increases in size.

It is very important that the selected state stands out clearly on the screen, since this indicates to the viewer what they are interacting with. If the selected state graphic blends in too much, the viewer will easily loose their place on the screen.

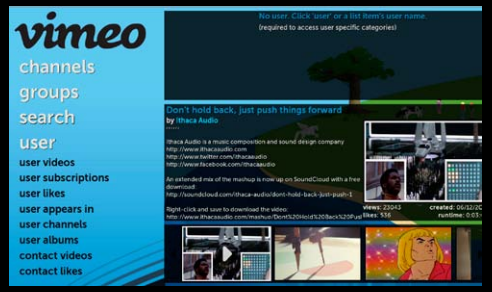


TiVo core UI convention

TiVo uses a second normal button state called a “ghosted highlight” that helps differentiate buttons from non-interactive text. It is only used once per column. A trailing ghosted highlight acts like a bread-crumb, highlighting the parent directory. A forward ghosted highlight marks a button or column of buttons down or to the right of the current focus. This convention may be used in other TiVo apps if appropriate.

Activated states are often shown by different colour fills. This graphic is valuable feedback to the viewer that the TV has received the remote control button press, and will usually only display for a second or less.

As a general rule, all buttons are activated by pressing the OK button and/or and arrow buttons on the remote.



Selected states should stand out clearly from the background. In the above examples the focus is not very strong or unique, and therefore the viewer isn’t sure what part of the screen they are interacting with.

Better. A thick border and an increase in scale help to to make the focus of this screen more obvious.

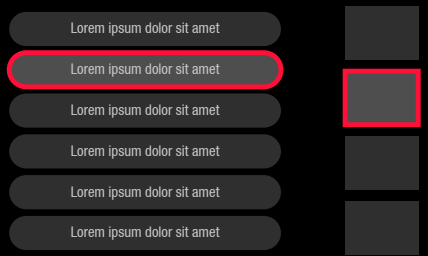
Very good. By using a fill colour that’s used sparingly elsewhere the selection is made clear.

Button and thumbnail rows and columns

Because the remote control is not a direct pointing device and a selection can only be moved in four directions, the designs easiest to use strictly adhere to a grid, using rows and columns.

button row

thumbnail row (carousel)



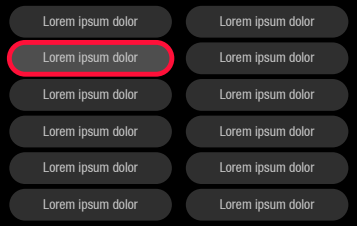
button column

thumbnail column

The most basic layout groups use button and thumbnail rows and columns.

The best practice is for all the items within a row or column to be exactly the same size, this way when the selected state changes from button to button it appears like the viewer is moving a single object across the screen, like moving a game piece across a checker board.

Other common layout groups include multiple columns of buttons the thumbnail grid.



double button columns

thumbnail grid

An additional layer of complexity is added when rows or columns are made scrollable. For all TiVo apps, hidden items in a scrollable element should be indicated by buttons, thumbnails, or text meeting and being cropped at one or more edges of the TV screen, ideally with a fade out effect.

scrolling thumbnails, buttons, and text

Starting from these basic UI layout groups, full layouts can be constructed. For example, drop-down and pull-up menus that combine multiple rows and columns have become commonplace in Blu-ray authoring.

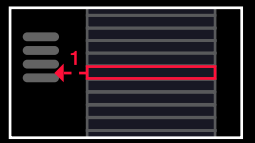
Pull-up thumbnail carousel menu

Pull-up list button menu

Be mindful when combining scrolling elements with other buttons on the screen. Scrolling will restrict navigation along a shared axis.

For example, if a vertical column scrolls and has 100 list items and there are menu buttons above or below it, it may take dozens of button presses to navigate to the menu. The TiVo set top box does not generally scroll quickly, so this can be a problem.

It's a long way up to the menu here



The menu is only one button press away here

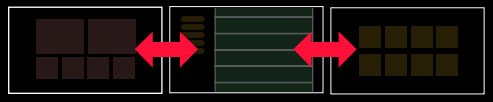
One solution to this might be a vertical menu next to the vertical scrolling column, that way the menu is always one left button press away no matter what item in the scrolling column was in focus.

Navigation

Specifications and best practice guidelines

TiVo's linear metaphor

All apps on TiVo should follow TiVo's linear metaphor where possible. All screens are imagined as being side by side in a row, not in columns or on different "levels" as some systems do.



In general, if the viewer presses LEFT or OK on the left most button on a screen, they will be returned to the previous screen. If the viewer presses RIGHT or OK on the right most button on a screen, they will forwarded to the next screen.

Pressing SKIP BACK anywhere on the screen returns the viewer to the previous screen (unless this button is being used to skip video tracks).

Left, right, OK, and skip back buttons

Thumb-operated control

All functions in an app must be accessible using the LEFT, RIGHT, UP, DOWN, and OK buttons.

Directional pad (D-pad)

Other remote control buttons may be used, such as the colour buttons, but only as shortcuts to those functions.

The advantage to this is that the viewer can control the entire app if they wish without ever looking down at the remote control and using only their thumb. Greater button presses on the D-pad can sometimes be faster than fewer button presses elsewhere on the remote control, because the viewer has to stop, move their hand (or use their other hand) and look for the button.

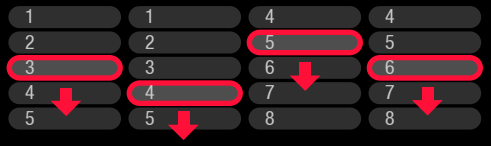
Use of the red button and the yellow button should be avoided if possible, since these buttons are associated with launching digital channels (or apps) and launching local news channels.

Scrolling

Scrollable rows advance one item at a time, while scrollable columns automatically paginate. This speeds up scrolling on long columns.

When the last item of a current page in a scrollable column is selected all slots jump up a page, minus one slot. The focus then jumps to the second from the top.

Keeping one slot from the previous page in view gives the scroll a sense of continuity and upward movement. The same pagination occurs in reverse when moving back up the column.



All scrollable button groups must employ the following quick keys: CHANNEL UP scrolls to the top of the screen, CHANNEL DOWN scrolls to the bottom of the screen, and SKIP FORWARD on the remote scrolls to the bottom of the list.

Channel and skip forward buttons

User control vs. fewer presses

The best interface practice is to always make the user feel like they are in control. If the device tries to do something automatically for the user and it guesses wrong about what the user wanted, the user does not feel in command of the device.

But sometimes due to the desire to minimise the number of button presses on a TV interface it may sometimes be prudent to try and anticipate the user's action and do it for them.

There of course is tension between these 2 strategies. What works best will depend on the design. It may be a bad idea, for example, if the selected state of a button doesn't stand out enough on the screen and the focus jumps across the screen without the user's button press. The viewer may loose sight of it and think the focus has entirely disappeared and the interface is broken.

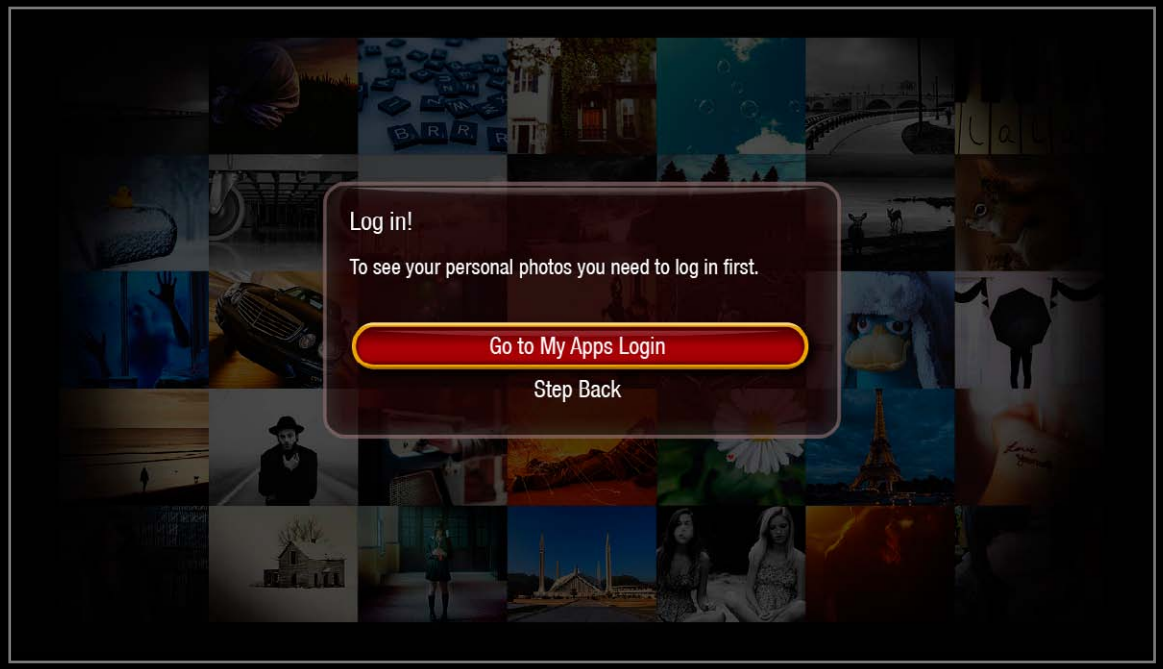
On the other hand, if the focus does stand out sufficiently, the viewer may be thankful for one less button press, especially if the next button press is obvious.

Using pop-up windows

1. Pop-up windows can be used if part of a task or message does not fit on the current screen but also does not warrant an entirely new screen.

2. Make sure the there is an obvious separation between the pop-up window and the background (for example, using the “lightbox” effect by darkening the background).

3. There should never be more than one pop-up window at a time. New pop-up windows replace old ones.



Pop-up window examples

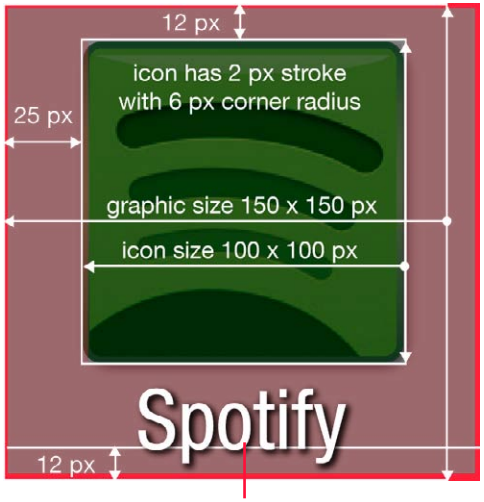
App packaging

Graphics package

All apps require an icon, Discovery Bar poster, and Discovery Bar flyout banner, all in 32 bit PNG format.

The app icon must follow this format: a graphic 100 pixel square with rounded corners (6 pixel radius) and a 2 pixel stroke, with an app name below in 26 point text (TiVo Helvetica Condensed Regular Extended) with a 90% opacity drop shadow. This must be centered in a 150 pixel square transparency.

The app name can be up to 15 characters long (using characters a-z, 0-9).



26 pt TiVo Helvetica Regular Ext.
90% opacity muliplied drop shadow
offset 2 px, blur 2 px

Application icon (150 x 150 pixels)

Discovery Bar poster (200 x 150 pxels)

Discovery Bar flyout banner (665 x 120 pixels)

Programming

Specifications and best practice guidelines

Programming Guidelines

1. Apps must be written in Action Script 2.0 and published to FlashLite or Flash 8 in a single SWF.
2. Separate the app content into an XML so that changes will not require a re-publish of the SWF.
3. Display the app at full screen using Fscommand2("FullScreen",true).
4. No css formatting is supported (such as p, br, sir, font, b).
5. Do not use mouse event handlers (on-Release, onMouseDown, onPress).
6. Be sure to turn off default focus manager rectangle.

Memory Usage

SWF file: up to 6 MB

XML file: up to 9 MB

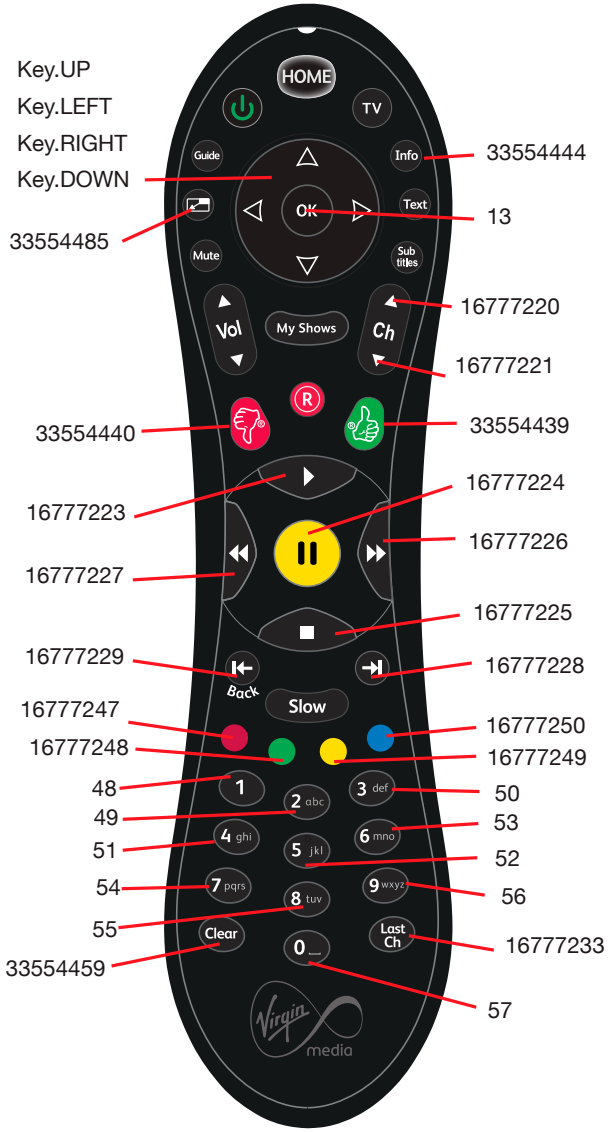
Locally Stored Objects: 4-450 kB

Key listener for capturing navigation events

```
var myListener:Object = new Object();
myListener.onKeyDown = function()
{
    if (Key.getCode() == 33554436) {
        trace("You pressed the OK key");
    }
}
```

Use of Local Shared Object

```
SharedObject.addListener("password_so",onSOLoaded);
password_so = SharedObject.getLocal("password_so");
function onSOLoaded(password_so:SharedObject):Void
{
    if (password_so.getSize() == 0)
    {
        password_so.data.usrPword = "";
    }else{
        debug.text = password_so.data.usrPword + newline + password_so.getSize() + " bytes";
    }
}
```



Remote control button codes
N.B. POWER, HOME, TV, GUIDE, MY SHOWS, VOL, and MUTE are not available to Flash on TiVo, as they are reserved for the core OS.

Ryan Gilmore
Interactive Design Lead (TiVo) at Virgin Media
ryan.gilmore@virginmedia.co.uk
245 Hammersmith Road, London, W6 8PW
Updated 10 Aug 2012