

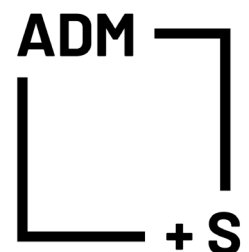
Smart TVs and local content prominence

A submission to the
Prominence Framework for Connected TV Devices
Proposals Paper

February 2023



A/Prof Ramon Lobato, Dr Alexa Scarlata and Dr Bruno Schivinski



About the authors

Ramon Lobato is Associate Professor (Australian Research Council Future Fellow) in the School of Media and Communication, RMIT University, and an Associate Investigator with the ADM+S Centre. A screen industries researcher with a special interest in digital distribution, Ramon has published widely on streaming services and the future of television in Australia and internationally. Ramon co-leads the Global Internet TV Research Consortium and is co-founder of MIT Press' Distribution Matters book series. His books include *Netflix Nations* and *Streaming Video: Storytelling across Borders* (NYU Press, 2019 & 2023).

Alexa Scarlata is a research fellow in the School of Media and Communication, RMIT University and an Affiliate member of the ADM+S Centre. With qualifications in law and global media communications, she studies the dynamics of online TV, the resulting impact on local production, the implications of the platform ecosystem enabled by smart TVs, and the subsequent development of media policy in these areas. In 2022 Alexa was selected for the ADM+S Consumer Advocacy Placement Program with Australia's leading consumer advocacy organisation, CHOICE. Alexa serves on the editorial board of the *Journal of Digital Media and Policy* and has published in *Continuum*, *Critical Studies in Television*, and *Media International Australia*.

Bruno Schivinski is a statistician, behavioural researcher, and Senior Lecturer in Advertising at RMIT University. He consults for online service providers, websites, and scientific institutions such as the Polish Ministry of Science and Higher Education (MNiSW) and the National Science Centre (NCN). Bruno specializes in problematic consumer behaviour, social-media engagement, online branding, and user-generated content. His research has received international coverage in *Forbes Magazine*. His latest work can be found in the *Journal of Business Research*, *Journal of Advertising Research*, *Journal of Marketing Communications*, and *Journal of Clinical Medicine*.

For enquiries contact A/Prof Ramon Lobato
ramon.lobato@rmit.edu.au | (03) 9925 3680

Suggested citation Lobato, R., Scarlata, A. and Schivinski, B. (2023) "Smart TVs and local content prominence", submission to the Prominence Framework for Connected TV Devices Proposals Paper, RMIT University and ADM+S, <https://doi.org/10.25916/ma06-3y46>

Licensed under a Creative Commons Attribution-Non-commercial-No Derivatives 4.0 International License (CC BY-NC-ND 4.0).

Report design: Christine Horn

Table of contents

Introduction	4
Executive summary	5
I: Connected TV in Australia	
Users and devices	6
Smart TV markets	8
Agency and inertia in smart TV use	10
Where is the free-to-air audience?	11
II: Evidence from device testing and user survey	
Linear FTA access on smart TV interfaces	12
BVOD access: availability and preinstallation	15
> <i>User views on BVOD preinstallation</i>	17
BVOD positioning	18
> <i>User views on BVOD shortcut buttons</i>	21
Discoverability of BVOD content	22
> <i>User views on smart TV advertising</i>	25
References	26
Appendices	
Testing results: smart TVs	27
Testing results: connected TV devices	28
Device testing methodology	29
Survey methodology	31

Introduction

In its recently released National Cultural Policy, the Australian federal government publicly committed to ‘take the necessary action so that Australians continue to be able to see and hear quality home-grown content, regardless of which platform they are using’ (Australian Government, 2023: 87). One aspect of this involves ‘legislating a prominence framework to ensure local TV services are easy for Australian audiences to find on connected TV devices’ (5).

Regulatory design of a prominence framework is complex, and requires detailed analysis of connected TV devices, their interfaces, and their operating systems. It also requires an understanding of how Australians use these devices in their everyday lives, and what this means for their access to local TV services.

To support policy development, this report presents detailed evidence about local content prominence in smart TVs. This research has been conducted as part of an Australian Research Council project (ARC FT190100144, Australian Television in the Smart TV Ecology). Our research is independent of any industry funding and is conducted in the public interest.

The research we have undertaken for this project includes:

- a nationally representative online survey (n=1069) about smart TV ownership and user behaviour, conducted in December 2022;
- lab testing of a representative sample of smart TVs and connected TV devices, conducted in January 2023;
- monitoring of business practices in TV software, hardware, and retailing, via trade press and industry sources;
- background interviews with consumer electronics retailers across Australia (n=10);
- analysis of international prominence rules and related policies.

This evidence forms part of a larger body of research on smart TVs, streaming services, and local content that we have undertaken since 2017. For further context, see our various submissions to the Streaming Services Revenue and Investment Scheme Discussion Paper, the ACCC Digital Platform Services Inquiry, the Media Reform Green Paper, the Supporting Australian Stories on Our Screens Options Paper, and the Australian Children’s and Screen Content Review Consultation Paper (Lobato and Scarlata, 2017, 2020; Lobato, Cunningham and Scarlata, 2021, 2022; Lobato, 2022).

Figure 1: RMIT TV testing lab



Executive summary

The TV remains central to the domestic media ecology of Australian households. Our research finds that two thirds of Australians use smart TVs (and/or other connected TV devices) to access video content, and that the vast majority of smart TV users are happy with the services and content available on their devices. All of this suggests widespread enthusiasm for connected TV culture in Australia.

However, we also find that **smart TV operating systems are evolving in ways that warrant policy intervention**. Throughout this report we present evidence of widespread self-preferencing, partner-preferencing, search and recommendation bias, poor integration of third-party apps, and prioritisation of advertiser content over relevant local content in smart TV interfaces. We also present evidence from a nationally representative user survey that establishes the scale of consumer confusion and misunderstanding.

Together, this evidence points to the need for regulation. In our view, the purpose of such regulation is threefold: to ensure a minimum level of visibility for Australian broadcasters, and especially for public-service broadcasters; to enhance consumer welfare for smart TV users; and to minimise misleading and deceptive practices by manufacturers and platforms. Regulation needs to achieve these objectives while respecting user autonomy and minimising market distortion.

To achieve these objectives, **a robust must-carry framework (Proposal 8.3) should be implemented in Australia**. This report offers detailed design recommendations for such a framework, informed by the empirical research we have undertaken. We also present survey evidence on smart TV user attitudes to prominence, shortcut buttons, and app preinstallation, that establishes majority support in Australia for a must-carry regime (see pages 17-20).

KEY RECOMMENDATIONS

1. Manufacturers should be required to preinstall broadcaster video-on-demand (BVOD) apps on all smart TVs and designated connected TV (CTV) devices sold in Australia.

2. An ABC iView shortcut button should be required to be installed on the remote controls of all smart TVs and CTV devices, where 2 or more shortcuts exist.

3. The scope of the prominence framework should be limited to free to air (FTA) broadcasters and their BVOD apps (*Proposal 5.2*), with prominence obligations applying only to devices where TV viewing is the primary use (*Proposal 6.2*). Compliance responsibility should rest with device manufacturers (*Proposal 7.1*).

4. An ad labelling system should be introduced so that consumers can distinguish between paid advertising and organic recommendations in smart TV devices (*Proposal 8.3*).

5. Government should work with the ACCC to introduce prohibitions on self-preferencing in smart TV recommendations and search results, ensuring a level playing field between in-house and third-party services.

6. Must-promote measures (*Proposal 8.4*) should not at this stage form part of the regulatory package, as they are liable to further distort the marketplace and degrade user experience.

I: Connected TV in Australia

Users and devices

To develop an effective prominence policy, it is important to understand the dynamics of connected TV (CTV) ownership and use in Australia.

In this report CTV is defined as streaming content on the TV screen via a smart TV's native interface or an external CTV device such as a Chromecast, Apple TV or games console.

We find that more than two thirds of Australian smart TV households are using connected TV services. The device configuration of these households varies as shown in Figure 2. Around 13% of Australian adults use a smart TV only, 11% use a 'dumb' TV connected to a CTV device, and a surprisingly high 43% use both a smart TV and a CTV device.

These findings are broadly consistent with research commissioned by the Department (Social Research Centre, 2022) and ACMA (2022), accounting for definitional differences. They suggest that users have found different ways to configure their homes for connected TV access.



Characteristics of smart TV users

- **72%** use their smart TV every day
- **46%** purchased their smart TV within the last 2 years
- **93%** feel they 'have all the apps [they] need'
- Average number of smart TVs at home = **1.6***



Source: RMIT survey, Australian smart TV users (n=1069), Q1 3, 5, 19

*Standard deviation = 0.84

Device type	% of households	
Smart TV only	13%	} 67% Connected TV users
Smart TV + Connected TV device*	43%	
'Dumb' TV + Connected TV device*	11%	
'Dumb' TV only	28%	} 33% Non-users
Don't use TV	1%	
No TV	4%	

Figure 2: TV households in Australia

Source: RMIT survey, all respondents (n=1895), S2, Q1, 7

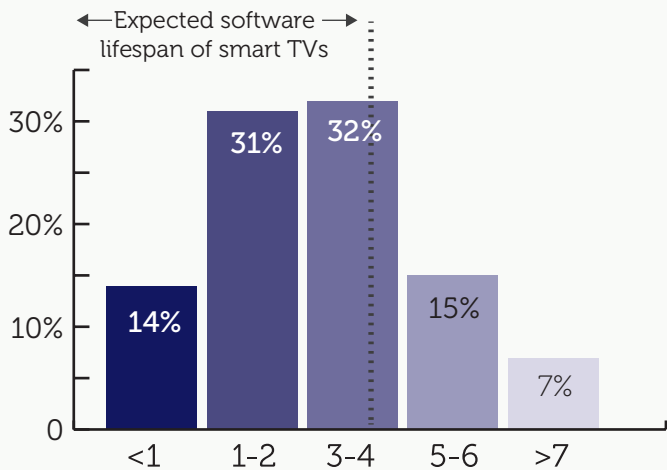


Figure 3: Ages of smart TVs in years

Sources: RMIT survey, Australian smart TV users (n=1069), Q5; Laughlin (2023)

However, our research also found evidence of **a digital divide** in CTV access, with a third of Australians not using connected TV services. This includes 28% of the population who have older, 'dumb' TVs incapable of streaming content, 4% who do not have a TV at home, and 1% who never or hardly ever use their TVs.

There are also resource constraints within connected TV households that must be taken into account. A key issue here is the age of the user's TV.

As per Figure 3, nearly a quarter of Australian smart TV users (22%) use smart TVs that are 5 or more years old. In contrast, the average software lifespan of a smart TV – based on guaranteed delivery of updates – is estimated to be 3.6 years (Laughlin, 2023). This means that many Australians are using older-model smart TVs likely to offer a compromised user experience, with reduced app availability, functionality, and processing speed (Scarлата and Lobato, 2023).

In summary, connected TV access in Australia is complex and variegated. While many Australians are early-adopters with good access to connected TV services, others face equipment and connectivity constraints, or may struggle to afford reliable internet access (Thomas et al, 2021). For policy purposes, CTV device ownership should not be equated with actual use and enjoyment of CTV services.

Policy recommendations:

1. The TV – whether older, 'dumb', smart, or augmented with external devices – remains central to the domestic media ecology of Australian households. Prominence policy is therefore justified in focusing on TVs as the primary objects of policy attention, even though a range of external devices are being connected to those TVs.
2. Government must continue to be alert to the dynamics of exclusion that shape access to connected TV in Australia. In this context of unevenly distributed access, the current emphasis on sustaining access to broadcast television is appropriate as an equity measure.
3. Australian broadcasters who benefit from prominence regulation should be required to support their BVOD apps through software updates for as long as possible, so that users are not cut off as their TVs 'age out'.
4. Other useful policy interventions that would increase digital inclusion and expand access to connected TV services include discouraging planned obsolescence of software and hardware and supporting right-to-repair.

Smart TV markets

To understand prominence on smart TVs, manufacturer market share must be taken into account. This is because manufacturers, and the smart TV operating systems they partner with, have different arrangements for free-to-air (FTA) prominence on their devices.

In our survey we asked consumers which brand of smart TV they have at home. Based on the results, we estimate that five brands – Samsung, LG, Sony, Hisense, TCL – account for around 86% of the market for smart TVs in Australia (see Figure 4). The rest of the market comprises a long tail of other brands, mostly with shares of less than 1%.

Samsung, LG and Hisense have their own smart TV operating systems (Tizen, webOS, VIDAA), while Sony and TCL license the Google TV OS. In each case, the operating system controls the interface, menus, search, recommendation engine, and other functions of the smart TV. Manufacturers can modify the interface by

placing pre-installed apps, shortcuts, and other forms of prioritisation throughout the interface. Based on our estimates, Tizen and Android/Google TV are the most widely used smart TV operating systems in Australia, followed by LG's webOS and Hisense's VIDAA. The Roku operating system, which is dominant in the US, constitutes a negligible share of the Australian market.

In summary, the smart TV market in Australia is relatively concentrated, with five brands and four operating systems accounting for the vast majority of use. This means that the number of stakeholders whose cooperation is needed to enforce an effective regulatory system for FTA prominence is small.

Using these data we can also calculate how many people are affected by different brands' prominence and discoverability arrangements for FTAs. This data can be shared with the Department if it is helpful for policy purposes.

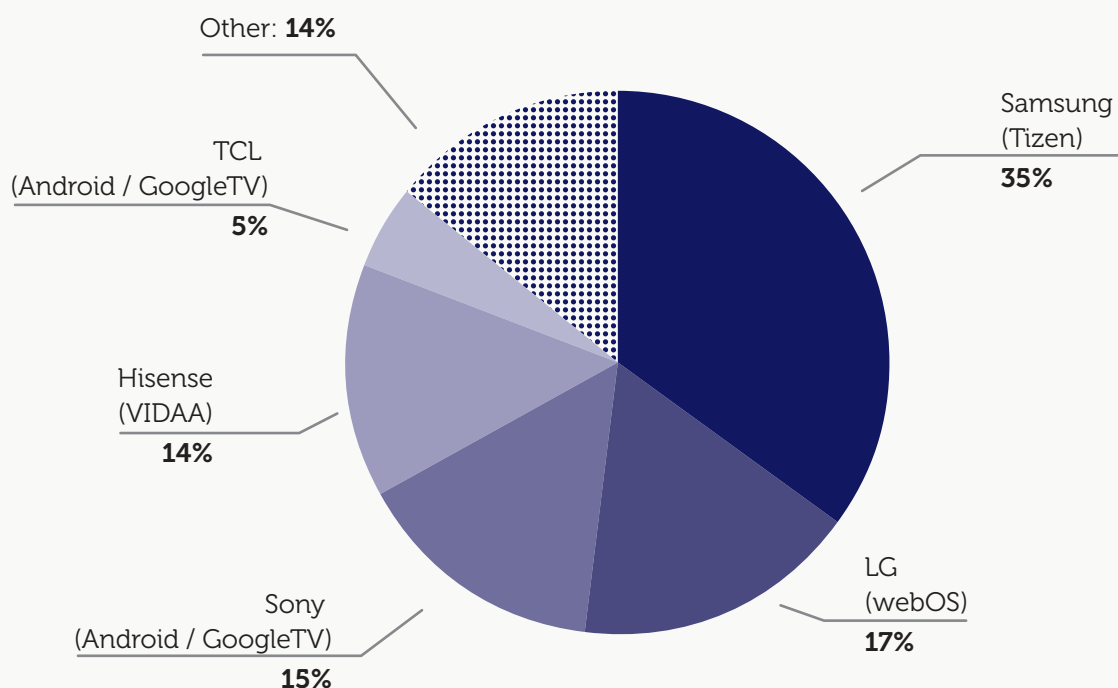


Figure 4: Smart TV brands and operating systems - Australian market share

Source: RMIT survey, Australian smart TV users (n=1069), Q2



Insights from smart TV retailers

To understand retail sales practices in Australia as well as common consumer questions and concerns about smart TVs, we interviewed retail floor staff and managers in consumer electronics stores about how they sell smart TVs.

We found that availability of FTA apps is rarely discussed at point of sale. Consumers tend to make their purchase decisions based on other factors including price and screen size. Retail staff observed that most customers generally are not interested in or aware of app availability problems on smart TVs.

“The market’s geared so much towards on demand viewing these days, the **free-to-airs are an afterthought for 95% of customers.**”

“(Customers) usually **know nothing**, apart from the fact that they just want the **Netflix app** on it.”

“It’s rare that they actually ask **what the operating system’s like.**”

Policy recommendations:

1. *Proposal 6.2* (the primary use definition) of the Proposals Paper offers the most appropriate and workable starting point for a regulatory definition of CTV devices. We recommend adding the following essential criterion: ‘A commercial market for video app pre-installation must already exist, or be emerging, for the device category to be included in the prominence regime’.
2. The device manufacturer should be the party responsible for upholding prominence obligations (*Proposal 7.1*). Manufacturers control the key elements of the interface relevant to the proposed prominence framework, including app pre-installations, app integration, app positioning, and remote shortcut buttons.
3. Platform operators such as Google decide positioning of services in search and recommendations. These practices should be regulated via more general transparency and fairness obligations (see Section II for more detail).
4. The concentrated nature of the smart TV market means government can proceed with confidence that the number of key entities to be regulated is relatively small – and therefore manageable.

This will help to ensure that prominence regulation is limited to those devices where diminished visibility of BVOD apps, in relation to competing apps, constitutes an unfair commercial challenge for broadcasters, and will not be extended to devices where there is no mature pre-installation market already in place for video services (such as phones, laptops, and general-purpose devices).

Agency and inertia in smart TV use

In our study we investigated how Australians use their smart TVs. In particular, we wanted to understand their level of *agency* – whether they know how to download apps, adjust their privacy settings, and customise the order of apps on their TV (see Figure 5).

In consumer research terms, agency can be contrasted with *inertia* – when users operate their TV with minimal user customisation, on the default settings, as it came ‘out of the box’.

Our research finds that **a third (33%) of Australian smart TV users are highly active, and have all skills listed in Figure 5.** We call these active users ‘customisers’.

Customisers tend to be relatively young, more tech-savvy, and more multilingual than the general population. They are more likely to be male. Most customisers (61%) believe that having a diverse range of apps on their smart TV is important (45% agree, 17% strongly agree). Half of all customisers (52%) have downloaded five or more apps. Customisers are also more likely than defaulters to search for content, and therefore less likely to rely on the recommendations shown on the smart TV home screen or in apps.

In contrast, **a quarter of Australian users (26%) are less active.** We call these users, who do not have any of the skills listed in Figure 5, ‘defaulters’.

Defaulters are more likely to be older and female. Defaulters rely more heavily on recommendations and prominently-placed content on the TV home screen. About 30% of defaulters state that they never search for content. Defaulters are also generally more ambivalent about issues like advertising, surveillance, and pre-installation of BVOD apps.

While defaulters are the group most impacted by a smart TV’s default settings, they are also the group least likely to care about this. More than three quarters of defaulters (78%) stated that having a diverse range of apps on their smart TV is not important to them.

In summary, agency and inertia are matters of policy significance (ACCC, 2021). Australian smart TV users vary widely in their competencies and confidence. Just as we found a spectrum of access in Australia, from disconnected users to multi-CTV-device users, there is also a spectrum of user agency.

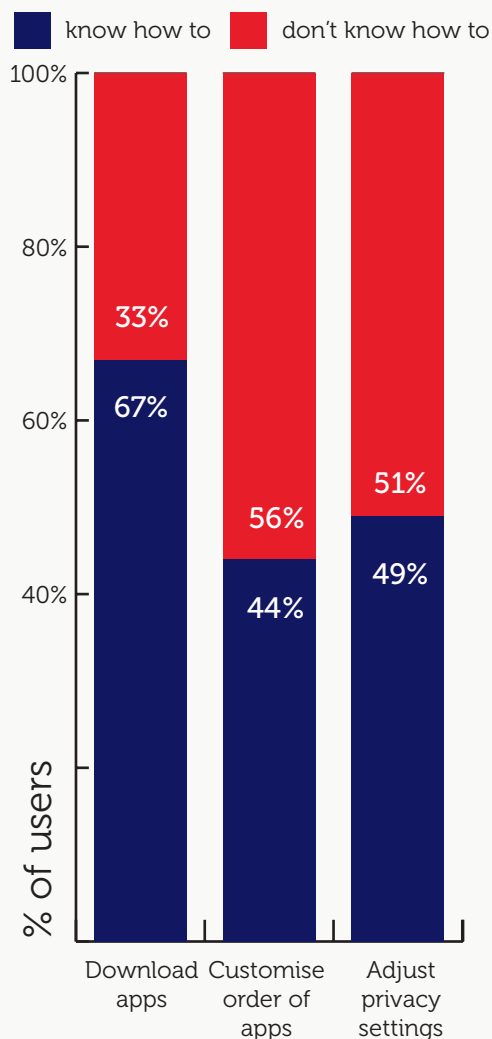


Figure 5: Smart TV user skills

Source: RMIT survey, Australian smart TV users (n=1069), Q20a, 20b, 20c

Where is the free-to-air audience?

Our survey found that FTA viewing remains common among Australian smart TV users. Around 61% of smart TV users watch linear FTA channels often or very often, while 33% of smart TV users use one or more BVODs (broadcaster video-on-demand services, such as ABC iView or 9Now) often or very often.

Figure 6 shows the overlap that exists across the two delivery models, with three quarters of the population using both FTA and BVOD services. This reveals that multi-platform engagement with broadcaster content is the norm in Australia.

Only a minority (17%) of users – older viewers, predominantly – watch free-to-air TV exclusively.

These results challenge common assumptions about how streaming is reconfiguring the Australian television market. Our findings suggest most Australians are not yet ready to abandon their terrestrial TV antennas; instead, they like to combine broadcast viewing with streaming. This means that effective prominence regulation needs to be multi-faceted, covering both linear channels and BVOD apps.

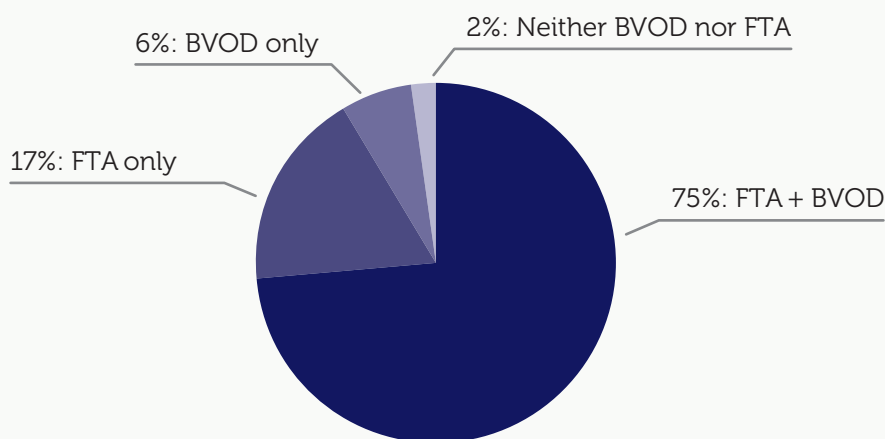


Figure 6: FTA and BVOD use

Source: RMIT survey, Australian smart TV users (n=1069), Q7, 8

Policy recommendations:

1. Australia is not a one-size-fits-all nation when it comes to user agency. The policy value of prominence reform therefore varies according to the populations under study. Highly-active customisers (a third of the population) will benefit the least from prominence reform as they are already skilled at finding their own content and customising their devices. The rest of the population (low-agency and medium-agency users) will benefit most from prominence regulation, as it will help these users to have easy access to content from Australian public-service and commercial broadcasters.
2. Australia's dual delivery model for broadcast content and the resulting mosaic of audience practices require a multi-dimensional approach to prominence regulation. FTA users need to be able to find linear channels easily in the inputs menu and electronic programme guide (EPG), while BVOD users need to find broadcast services easily on the home screen. The must-carry framework (*Proposal 8.3*) is the most effective way to guarantee access across all these audience segments.

II: Evidence from device testing and user survey

Linear FTA access on smart TV interfaces

Here we assess the availability and positioning of linear FTA channels (ABC, SBS, 7, 9, 10) on smart TVs.

Overall, we found that the accessibility of linear FTA channels is reasonable, but there is considerable variation between manufacturers when it comes to positioning and prominence.

All smart TVs offer to scan for linear channels during set-up. The primary availability and quality of linear channels is thus first determined by a connection to a terrestrial antenna and the user's location. If the user opts-out of scanning during set-up, they can do this at a later stage.

Once connected to an antenna, smart TVs provide various entry-points into linear FTA TV. These include:

- An FTA TV tile, or equivalent one-click-entry point, in the home screen
- A Freeview EPG, or other EPG that includes FTA programming
- One or more remote shortcut buttons (to FTA channels, EPG, or channel list)
- A number pad on the remote where users can input a channel number
- Defaulting to live TV after power-on.

Operating system (manufacturer)	Tizen (Samsung)	webOS (LG)	Google TV (Sony)	VIDAA (Hisense)	Google TV (TCL)
Persistent FTA tile/icon on home screen	✓	—*	✓	✗	—*
Remote shortcut button	✓	✓	✓	✓	✓
Number pad on remote	✗	✓	✓	✓	✗
FTA included in EPG?	✓ †	✓ †	✓	✓	✓
Default entry point	✗	✓	✓	✓	✓
	Home screen	Last watched**	Last watched	Last watched or FTA	Last watched
Market share	35%	17%	15%	14%	5%

Figure 7: Linear FTA on smart TVs - access and entry points at default set-up

Source: RMIT lab testing

* Non-persistent tile (usage based)

** Will be user-customisable in 2023 models

† EPG includes manufacturer's free ad-supported TV (FAST) channels below FTA channels.

We noticed the following trends in our TV testing research:

FTA home screen shortcuts vary in size and position.

Only Samsung and Sony TVs have a persistent linear FTA tile placed prominently on the home screen (see Figure 8a). Non-persistent tiles also appear on LG and TCL TVs based on the user's recent viewing (see Figure 8b). We found no direct access to linear FTA on the Hisense/VIDAA homescreen.

We note that linear FTA TV is accessible on all major smart TVs via Inputs menus (which are often available in Settings). LG TVs go further to include a "TV/Inputs" tile a little further down the home page. However, these shortcuts are less prominent than dedicated FTA tiles on the home screen.

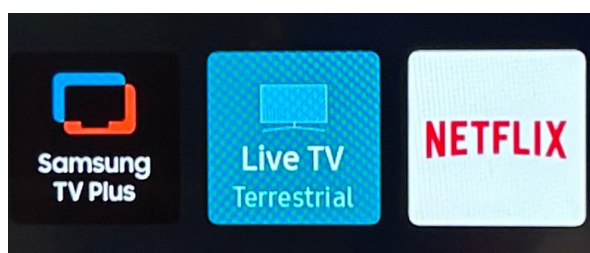


Figure 8a: Persistent FTA tile (Samsung)

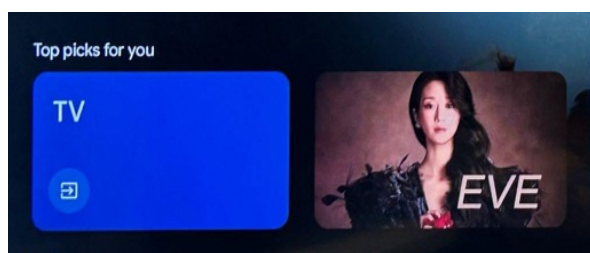


Figure 8b: Non-persistent usage-based FTA tile (TCL)

Number pads are no longer the norm

LG, Sony and Hisense remote controls retain a traditional number pad. Samsung and TCL TVs no longer feature a number pad. Samsung is unique among TV manufacturers for its minimalist remote design with a bare minimum of buttons – a design approach reminiscent of CTV devices such as Apple TV.



Figure 9: FTA shortcut buttons on 2022-model TV remote controls

All smart TVs offer one-click access to linear FTA via the remote control, but some make it hard to find the right button.

All smart TV manufacturers include some kind of remote shortcut button(s) for FTA, such as a TV, Guide or Channel List button (see Figure 9). The number of FTA shortcut buttons varies from one (Samsung, TCL) up to three (Hisense). FTA shortcuts are usually clearly labelled. An exception is the Samsung remote, which requires users to press a blank toggle switch to launch the Guide. We found the LG and Hisense remotes, in which the home button can be used to alternate between the home screen and the last-watched linear channel, particularly intuitive.

Some EPGs include FAST (free ad-supported TV) channels alongside FTA channels

EPG design has evolved in recent years. Two manufacturers, Samsung and LG, now include their own linear services in the FTA EPG (see Figure 10). This provides extra promotion for their own FAST channels. However, FTA channels remain at the top of the channel list in Samsung and LG TVs, giving the FTAs high visibility.

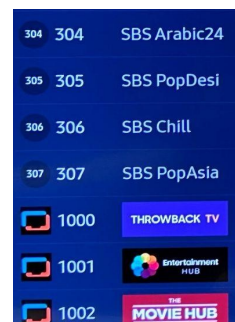


Figure 10: Samsung TV Plus FAST channels



Most smart TVs default to the last-watched channel or service.

TVs generally default back to the last-watched service after powering up. However Samsung TVs always default to the home screen, providing Samsung with an opportunity to generate advertising revenue and promote in-house content. Hisense TVs default to linear FTA except after viewing Netflix (indicating a commercial deal for prominence).

Combined, these interface design choices can lead to a varied experience of linear FTA on smart TVs, with the effect that some brands of TV feel more 'FTA-friendly' than others.

Consider the case of Hisense TVs, which make linear FTA very easy to find. Hisense remotes feature a home button that switches between the home screen and the last-watched FTA

channel; a number pad for entering FTA channel numbers; an EPG shortcut button; and an FTA channel list button. Hisense TVs also default to FTA after viewing all services except Netflix. While there is no persistent linear FTA tile on the Hisense home screen, the user-friendly remote design means that Hisense TV users are likely to have no trouble finding FTA channels.

In contrast, linear FTA television is less prominent on Samsung TVs, which always default to the home screen. Samsung remotes have no number pad for channel number input. The only way to access FTA channels from the remote is by pressing the Channel switch (see Figure 9); however, this switch is unlabelled and confusing to use. The EPG on Samsung TVs also intermingles FTA listings with Samsung's own FAST channel listings. We note however that Samsung TVs do include a prominent Live TV Terrestrial tile on the home screen, which will assist with FTA discovery

Policy recommendations

Our research finds that access to FTA on smart TVs is presently reasonable on smart TVs sold in Australia. However, we anticipate that with increasing adoption of FAST services by TV manufacturers in coming years, there will be a growing commercial imperative to 'crowd out' linear FTA services in favour of in-house FAST services. While manufacturers should be given freedom to pursue their own interface design goals, we believe that – from an audience access perspective – the minimum expectations for TVs sold in Australia should be:

1. One or more persistent linear FTA shortcuts on the home screen (e.g., a tile), visible without further scrolling required, when an aerial is connected. These shortcuts may be moveable or deletable by the user;
2. One or more clearly labelled remote shortcut(s) to FTA channels/EPG; and
3. Default entry point for the TV is the last-watched service. Alternatively, users can choose to select their preferred default entry point during or after setup.

BVOD access: availability and preinstallation

We investigated the availability of Australian BVOD apps – ABC iView, SBS On Demand, 7Plus, 9Now and 10Play – on current smart TV devices, to determine whether these apps are preinstalled, available, or unavailable on each TV.

We found that BVOD apps are widely available on most new smart TVs sold in Australia, but are not being preinstalled on the two most popular brands, Samsung and LG (see Figure 11). For other brands, BVOD installation is patchy.

Our testing was conducted on the 2022 model range of smart TVs. The findings therefore represent a ‘best case scenario’, as older smart TVs may have limited access to apps due to technical constraints or app or operating system obsolescence (see pages 6-7).

that the TV they were buying would allow them to access the BVODs. While some coverage gaps remain (for example, Hisense TVs cannot run 7Plus and 10Play), most consumers with up-to-date smart TVs who know how to download and install apps will likely encounter few problems accessing BVOD apps.

However, we identified some issues that complicate the installation of BVOD apps. In all brands except Hisense, users are required to create an account with the television manufacturer or platform operator before they can download any apps, including BVODs. In practice, this means that if Australians want to access any BVODs on most of the popular smart TV brands, they must first sign up to and provide extra personal information to the manufacturer.

Also, in Samsung, Sony and TCL TVs, downloaded apps are not automatically added to the home screen app list – the user needs to actively move them there while in the app store.

Finally, BVOD users also need to log into apps after download, due to personalisation policies currently used by the broadcasters, resulting in additional friction. Some of these (ABC iView, 9Now, 10Play) make it easier to sign in on your TV than others (SBS On Demand, 7Plus).



Four out of five top manufacturers carry the full range of BVOD apps in their app stores

BVOD apps are widely available on new smart TVs sold in Australia, with most of the leading manufacturers offering the full range of BVOD apps in their app stores. This situation has improved considerably from a few years ago, when the availability of BVOD apps was patchy and Australian consumers could not be confident

Manufacturer (platform)	Tizen (Samsung)	webOS (LG)	Google TV (Sony)	VIDAA (Hisense)	Google TV (TCL)
ABC iView	—	—	✓	✓	✓
SBS On Demand	—	—	✓	✓	—
7Plus	—	—	✓	✗	✓
9Now	—	—	✓	✓	✓
10Play	—	—	—	✗	—

Figure 11: Australian BVOD apps on smart TVs - preinstalled (✓), available in app store (—) or unavailable in app store (✗)

Source: RMIT lab testing



A minority of manufacturers actively preinstall BVOD apps on smart TVs.

Preinstallation entails a range of commercial benefits, including deep linking of search results and inclusion in recommendation rows (Ofcom/MTM, 2019). Therefore, services that are not preinstalled – even those that are otherwise available in the app store – may be disadvantaged in their visibility when compared to preinstalled services.

We found that the two leading smart TV brands representing 52% of the smart TV market in Australia, Samsung and LG, do not preinstall any BVOD apps. In contrast, all manufacturers in our sample pre-install Netflix, YouTube, Prime Video and Disney+.

Three manufacturers, Sony, Hisense and TCL, actively preinstall BVOD apps on their smart TVs. However, none of these manufacturers preinstall the full range of BVOD apps; at most, 4 of 5 apps are pre-installed.

In effect, this means that Australian users will need to download somewhere between 1 app (Sony TVs) and 5 apps (Samsung and LG TVs) for full access to streaming content from the broadcasters. If they have a Hisense, they can only access 3 of the 5 BVOD apps at this stage.

The end result of this situation is patchy visibility for BVOD services, compared to high visibility for major US services.



The most commonly preinstalled services are ABC iView and 9Now

ABC iView and 9Now are preinstalled on 3 of the 5 major smart TV brands. In contrast, 10Play is not preinstalled on any smart TVs. The preinstallation of ABC iView suggests that manufacturer preinstall decisions are driven by a combination of commercial deals and user expectations, as ABC does not pay for prominence.



BVOD preinstallation is more common on CTV streaming devices than on smart TVs.

The preinstall situation is improved on CTV streaming devices (see Appendix 2). Apple TV has every broadcaster app preinstalled – the only device in our sample to offer this. Chromecast with Google TV comes with three BVOD apps preinstalled. Amazon's Fire TV device does not preinstall any BVODs but does offer all BVOD apps in its app store.



User views on BVOD preinstallation

Our smart TV user survey examined public attitudes towards the preinstallation of BVOD apps.

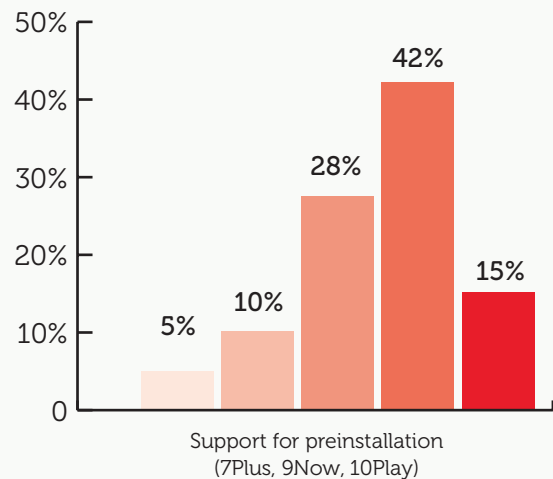
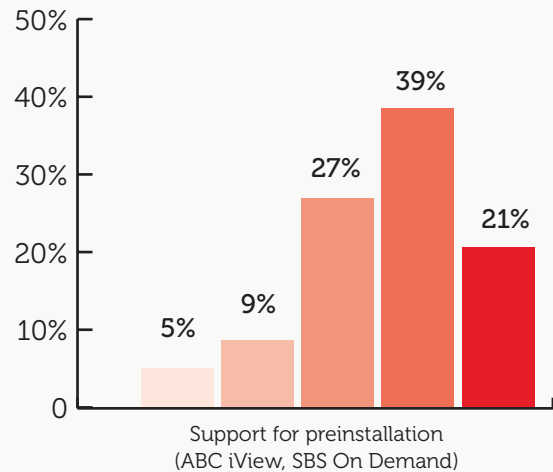
As Figure 12 shows, we found strong support for compulsory preinstallation of all BVOD apps.

- 59% of Australian STV users agree that SBS and ABC apps should be preinstalled on new smart TVs
- 57% of Australian STV users agree or strongly agree that commercial broadcaster apps should be preinstalled on new smart TVs

Support for preinstallation was broad and occurred across all ages, incomes, and levels of education. We found that a key factor determining support for preinstallation was use of BVOD services (i.e., people who already use BVOD services were more likely to support pre-installation). Viewers of linear FTA channels were also more likely to support preinstallation, although not as strongly as BVOD users.

Figure 12: Support for mandatory preinstallation of BVODs on smart TVs sold in Australia.

Source: RMIT survey, Australian smart TV users (n=1069), Q21c, d



■ Strongly disagree ■ Disagree
■ Neither agree nor disagree
■ Agree ■ Strongly agree

Policy recommendations

1. We support the introduction of a must-carry (i.e. must-preinstall) rule to ensure that all smart TVs sold in Australia come preinstalled with the full range of BVOD apps (where available). This is a matter of convenience for most Australians, and will help to smooth out competitive dis/advantages in smart TV markets.
2. Our research suggests that a BVOD preinstallation requirement would not represent a significant operational burden for device manufacturers, as many apps are already routinely pre-installed prior to purchase, and new apps can be pre-installed remotely via software updates.

There is a modest cost for manufacturers, as they will forego the possible revenue that could be generated by selling preinstall rights to Australian broadcasters. We regard this as a reasonable trade-off that is in the public interest.

3. The onus must be on broadcasters to develop and maintain their apps to the standards required by smart TV operating systems. In cases where broadcasters have not developed a BVOD app for a particular operating system, the manufacturers would be exempt from the must-carry requirement.

BVOD positioning

Further to the availability and preinstallation of BVOD apps, we now consider how these apps are positioned in smart TV interfaces relative to their competitors.

Our testing found that BVODs do not receive prime positioning on smart TV interfaces, with the most visible slots reserved for manufacturer-owned services (such as Samsung TV Plus and LG Channels) or global services like Netflix, YouTube and Prime Video.

In addition, BVOD shortcuts are almost entirely absent from smart TV remote controls.



App shortcuts on the home screen

The TVs that we tested – entry-level, 2022-model smart TVs – contain between 10 and 23 app shortcuts each on the home screen. We note that our testing does not cover all models, and larger smart TVs (with a greater screen size) may contain more app shortcuts.

Our analysis found that BVODs may appear in the app shortcut row if preinstalled or user-edited, but they are invariably less prominent than their key SVOD competitors. Figure 13 shows the configuration and order of these app shortcuts.



Figure 13: App shortcut rows on smart TV home screens

Importantly, not all installed apps actually appear on the home screen, as the number of slots available is often lower than the number of installed apps. Apps may therefore need to be added manually into the shortcut row. For example, SBS On Demand is preinstalled on Sony (Google TV) TVs but not visible in the home screen app list. Users need to manually move the app into the home screen shortcut row otherwise it will not be visible on the home screen.

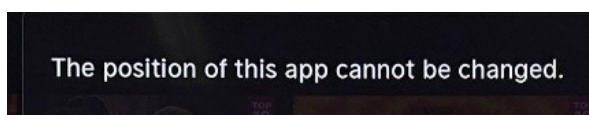


Figure 14: Error message on a Hisense TV (when attempting to edit Netflix app)

While the app shortcut row is generally reconfigurable by users (typically via a long-press on the Select/OK button), some TVs do not allow users to modify preinstalled app shortcuts. For example, the Netflix shortcut on Hisense TVs is positioned first and cannot be moved or deleted (Figure 14). Similarly, the LG Channels shortcut on LG TVs cannot be deleted but can be moved from its default first position.

What does this mean in practice? In our user survey we found that fewer than half of Australian smart TV users (44%) know how to

customise the app row (Figure 5). This means the majority of users rely on the preinstalled order of apps and shortcuts, unless another household member has customised the device already. This finding suggests the manufacturer has significant influence over which services are most visible and accessible to the user, and attests to the truth of the UI design principle that 'every click is sacred' (Ofcom/MTM, 2019: 61).

From a policy perspective, the appropriate response when it comes to positioning depends on the underlying policy goal. If the goal is availability of BVOD services, then compulsory preinstallation should be sufficient. If the policy goal is prominence of BVOD services, then further intervention is required.

In our view, a preinstallation requirement without a prominence requirement is ineffective for the government's stated policy goals of ensuring broadcaster content is prominent on smart TVs, because – as we have shown above – BVOD installation and positioning practices remain uneven across smart TV manufacturers.

Interestingly, BVOD apps tend to be more prominently positioned on CTV streaming devices than on smart TVs (Appendix 2). In particular, Apple TV makes all BVOD apps easily available from the home screen.

Policy recommendations

1. Rather than introducing rigid rules about positioning of BVOD apps, we suggest specifying within the must-carry framework a general principle that BVOD apps must not be unfairly disadvantaged relative to other preinstalled apps.
2. If needed, this stipulation could further specify that BVOD app shortcuts should not be smaller in size than those of pre-installed

apps, and that users should not have to click away from the home screen to find BVOD apps. In our view, scrolling is acceptable if the shortcut row or collection extends off-screen.

2. All app shortcuts should be moveable and deletable, except for those essential to the device's proper functioning.



Remote control shortcuts

Like the home screen, the remote control is a key strategic space in the TV economy. Remote control design varies according to the specifics of particular TV models and the needs of national markets, with buttons and functions customised according to local preferences, commercial deals, and regulatory requirements.

Our analysis of a representative sample of smart TV remote controls found that only one manufacturer currently includes a BVOD remote shortcut (Hisense/ABC iView) (see Figure 15).

Additional findings:

- The number of branded app shortcut buttons ranges from 4 (Samsung) to 12 (Hisense)
- All remote controls presently include shortcut buttons for Netflix and Prime Video, and most have a Disney+ button
- Several remote controls include a shortcut to FAST channels currently on offer (Samsung TV Plus, TCL Channel)
- Only one manufacturer, LG, gives the option to create your own remote button shortcut using the number pad
- No manufacturers allow the user to deactivate or re-program branded shortcut buttons

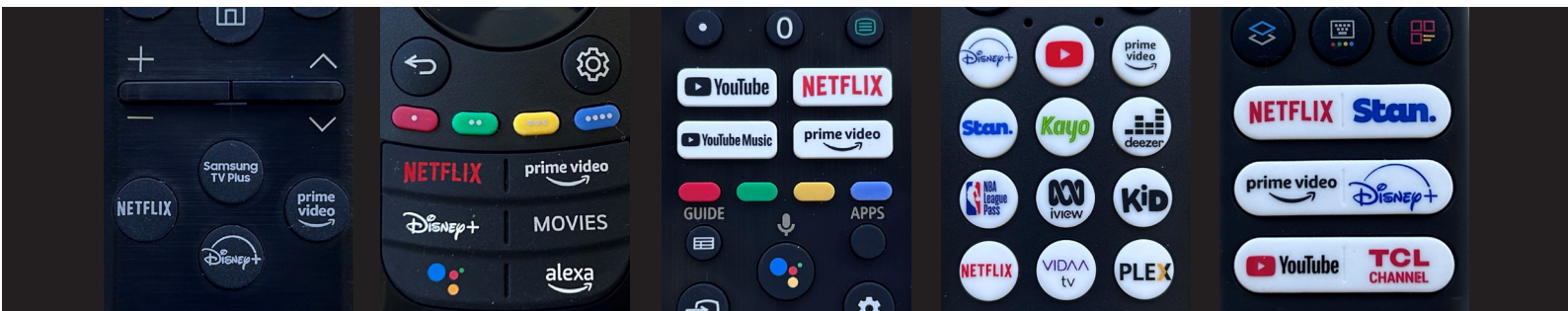


Figure 15: Shortcut buttons on Samsung, LG, Sony, Hisense and TCL remotes



User views on BVOD shortcut buttons

To understand consumer preferences regarding remote controls, we asked respondents which app shortcuts they would include if they were designing their own remote control. We asked them to select four options from a list of locally-available apps (or write their own choices, up to four). The results of the experiment are listed in Figure 16.

Netflix was the clear favourite, with 75% of respondents choosing to include a Netflix button, followed by YouTube (56%) and Disney+ (32%). ABC iView (28.4%) was the most-preferred Australian service, coming in fourth place slightly ahead of Prime Video (28.3%).

As noted in our testing data, Netflix, YouTube and Disney+ buttons are widely preinstalled on smart TV remote controls in Australia. However, an ABC iView button appears on only one of the five leading brands – Hisense (Figure 15).

We also asked some more general questions about how they use their remote controls. Two-thirds of smart TV users stated that their remote features app shortcut buttons. Most of these respondents said they use the app shortcut buttons (rarely [16%], sometimes [27%], often [21%], very often [19%]). Around 18% stated they never use the shortcuts, however this may be because the buttons point to undesired or unsubscribed services

Netflix	75%
YouTube	56%
Disney+	33%
ABC iView	28%
Prime Video	28%
SBS On Demand	26%
Stan	22%
7Plus	21%
9Now	19%
Kayo	15%
Foxtel Now/Go	13%
10Play	13%
Binge	10%
Apple TV+	10%
Paramount+	8%
Optus Sport	6%
Others	5%

Figure 16: Most preferred remote shortcut buttons in Australia – percentage of respondents who selected each app
Source: RMIT survey, Australian smart TV users (n=1069), Q15

Policy recommendations

1. We find that ABC iView is substantially under-installed as a remote shortcut compared to US services. More than a quarter of Australians told us they want a convenient entry point for ABC iView – yet only one manufacturer (Hisense) presently includes an ABC iView shortcut on its remote control.
2. Existing evidence about the power of defaults in software and hardware suggests an ABC iView shortcut button would make the service more accessible, visible and convenient to users. This should expand the audience for ABC content and improve return on our national investment in public-service broadcasting.
3. Therefore, our view is that **installation of an ABC iView remote shortcut button should be mandated as part of prominence reform** for all smart TV and streaming device remote controls featuring two or more branded app shortcuts. Remotes with fewer than two shortcuts should be exempt from this requirement.

Discoverability of BVOD content

Proposal 8.4 of the government's Prominence Proposals Paper describes a must-promote regime, which would require BVOD content to receive positive discrimination in recommendations and search results (search/recommendation 'bias'). Positive discrimination is a significantly more complex issue than pre-installation or positioning. As we have argued elsewhere (Lobato and Scarlata, 2022), policy interventions seeking to boost visibility of nationally significant content can be justified in certain circumstances, including prioritisation of trustworthy news. However, such prioritisation involves risks to the consumer and to the information ecosystem that must be carefully weighed. These risks include degradation of user experience, decreased relevancy of search results and recommendation, and potential misuse by governments (e.g., to promote nationalist content).

So, what is the evidence that smart TVs require positive discrimination for BVOD content, and is this evidence sufficiently compelling to outweigh other risks? Also, is there any evidence of negative discrimination against BVOD content?

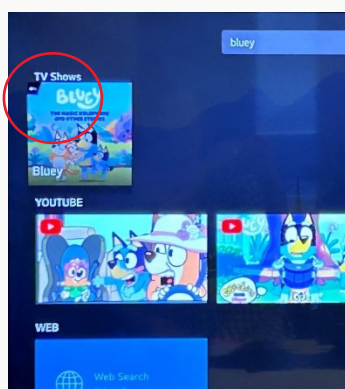
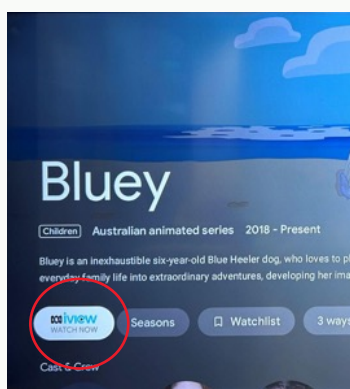
Our testing found that, in general, BVOD content is poorly integrated into smart TV search and recommendations, relative to preinstalled partner apps that receive greater visibility. The reasons

for this are complex, and it is not always clear who is at fault. For example, poor integration into search and recommendation can be the result of by missing or low-quality metadata feeds from BVOD apps, as well as intentional exclusion by smart TV manufacturers.

Importantly, while BVODs are poorly integrated compared to preinstalled partner apps, we found that BVODs are *not* generally disadvantaged compared to other user-installed apps. In other words, smart TV is best understood as a two-tiered system, in which a select few partner apps receive deep integration, and all other apps (including, in most cases, the BVODs) receive more limited integration.

Search integration

Let us begin with search. To assess visibility of BVOD content in search, we conducted search experiments as described in Appendix 3. Through these experiments we established that BVOD content is generally poorly integrated into search results on smart TVs, although performance varies by manufacturer. This presents an obvious discoverability challenge for Australian broadcasters as well as a usability problem for audiences.



Figures 17a and 17b: "Bluey" search results from smart TV home screen search bar on Sony/TCL (L) and LG (R) smart TVs. Sony and TCL direct the user correctly to ABC iView, while LG directs the user to purchase full episodes through AppleTV and does not include ABC iView in the results.

Performance varied by brand and operating system:

- Google TVs (Sony and TCL) give fair visibility to BVODs, intermingling BVOD results with relevant results from other services. These TVs were the most effective at directing to BVODs from title searches (Figure 17a). However, search accuracy was inconsistent. For example, a search for Nine's *The Block* directs the user to YouTube clips rather than to 9Now.
- Hisense TV search is not integrated with content from 7Plus, 9Now, 10Play or SBS On Demand. Hisense search does successfully find content on ABC iView, but priority is given to partner apps with less relevant

results. For example, a search for *Bluey* on a Hisense TV initially returns (inaccurate) results from Prime Video and paid episodes of *Bluey* on Apple TV+, ahead of iView, where the show can be viewed for free.

- Samsung and LG TVs did not include any BVODs in search results when using the TV's default search settings. Nor could these TVs title-match any BVOD content. In the case of LG, only pre-installed partner apps (Disney+, Netflix, Apple TV, Tubi) were integrated into the TV's search engine (see Figure 17b). In the case of Samsung, which has more limited search functionality, only YouTube was integrated.

Recommendation bias

Our testing also examined whether prioritization is occurring in home-screen recommendations (recommendation bias), and the implications for BVOD content. We found that major smart TV brands are either not including Australian BVODs and their content in recommendations, or are only featuring content from partnered apps. This exacerbates the visibility challenge for Australian FTA on BVODs.

- Again, Sony and TCL (Google TV) TVs performed best here due to what we assume to be a commercial agreement with Seven and Nine. 7Plus and 9Now titles feature in the genre category rows of Google TVs and current flagship programming is heavily promoted in the home-screen carousel, taking up many of the slots. Content from ABC iView was also regularly surfaced in the recommendation rows on these TVs.
- Hisense (VIDAA) smart TVs included some but not all BVODs in its recommendations. During our testing period, SBS On Demand featured heavily (as Hisense was a major sponsor of the event). Hisense also consistently included ABC iView and 9Now-specific category rows (e.g., "ABC Kids from ABC iView", "Roll on the Floor Laughing with these ABC iView comedies", "Trending



Self-preferencing

Self-preferencing refers to prioritization of in-house services in search results, recommendations, and other marketplace services. As the ACCC has noted, self-preferencing is a significant problem in platform markets because it 'risks disadvantaging individual sellers who compete directly against the online marketplaces' own products' (ACCC, 2022: 73).

Examples of self-preferencing that we found were:

- Sony and TCL TVs positioning YouTube and Google Play Movies and TV above other services in search results;
- Samsung TVs featuring Samsung TV Plus titles and channels in the first row of the home-screen recommendations.

Shows to Try on 9Now”). 7Plus and 10Play are not available on Hisense TVs and do not feature in its recommendations.

- Samsung TVs include a 7Plus recommendation row but do not recommend any other BVOD content on the home screen.
- LG TVs did not recommend any BVOD content. We observed some ABC-produced titles included in category rows, but these were always links to Apple TV episodes available for purchase.

Ad labelling

The lack of ad labelling in smart TV recommendations is another problem that needs to be addressed by government. At present, Australians are presented with a mix of paid advertising and organic recommendations on their smart TV home screens. The boundaries between these categories are rarely clear, and consumer confusion is being exploited for commercial gain. Unlike in older media where ad labelling standards have evolved over time, smart TV operating systems do not yet have an agreed-upon way of distinguishing prioritized content from organic content. Nor do smart TV operators respect the principle of separation between advertising and content in their system design. This is a policy issue not only for communications regulators but also for consumer protection agencies, and requires coordinated action from government.

Does limited BVOD visibility warrant positive discrimination?

In summary, we have found extensive evidence that smart TV manufacturers and operating systems are engaging in prioritisation of partner and in-house services. These practices are comparable to older forms of ‘payola’ and parallel forms of illicit product placement on social media (e.g., undeclared influencer deals with brands). These are all problems that need to be addressed holistically by the government, for example through industry standards and prohibitions on deceptive practices.

Nonetheless, we are not convinced that positive prioritisation of BVOD content is an appropriate or effective remedy. A must-promote rule as described in the Proposals Paper (Proposal 8.4) may be beneficial for broadcasters but is likely to dilute trust in algorithmic recommendation and search; degrade user experience for those users who prefer not to see broadcaster content on their smart TVs; and create significant implementation and enforcement challenges for the agencies charged with overseeing such a framework. While a positive discrimination (must-promote) approach may be needed in future, our view is that other regulatory approaches as described below are preferable at this stage.

Discoverability on CTV devices

Our testing of Chromecast with Google TV, Amazon Fire TV stick and Apple TV revealed that BVOD content and services are better integrated on these devices than on smart TVs. In particular, Apple TV includes all Australian BVODs in search results and recommendation rows – the only device we tested that offers this full integration (Appendix 2).





User views on smart TV advertising

To gauge public attitudes towards privacy and advertising on smart TVs, our survey asked users about their attitudes, concerns and awareness on these topics.

This revealed two findings: that most Australians are uncomfortable with the extent of personal data collection on smart TVs, and that they have trouble distinguishing between paid ads and recommendations on smart TVs.

First, we asked respondents if they are comfortable with the manufacturer of their smart TV electronically monitoring what they watch and sharing this data

with advertisers (a common industry practice known as Automated Content Recognition). **Only a quarter (26%) of respondents were comfortable with this practice.**

Second, to test understanding of how ads work on smart TVs, we showed respondents a home screen featuring a paid display advertisement for a new show in the form of a large banner ad positioned at the top of the home screen. **Only 45% of respondents were able to identify the banner as a paid advertisement.** The remaining respondents were unsure (26%) or interpreted the ad as a personalised recommendation (22%) or a random selection (7%).

Policy recommendations

1. Smart TV manufacturers and operating systems must refrain from deceptive practices such as unlabelled advertising and move instead towards establishing minimum standards of separation between advertising and organic content. Any paid or 'contra' advertising must be clearly labelled, and must be separated from organic search results (e.g., by a different colour, or located within a different section of the home page), as is currently the norm in web search.
2. A principle of search and recommendation neutrality should apply in all smart TV platforms. This means that relevance and user experience, rather than paid integration, should be the key variable determining inclusion or exclusion of content in recommendations and search results.
3. In our view, a 'must-promote' (Proposal 8.4) regime is not appropriate as it would increase the already significant problem of artificial prioritisation in smart TV search and recommendations. Instead, relevance should be the principle guiding how smart TVs coordinate discoverability.
4. Government should consider the following measures to ensure a fairer discoverability environment, including (1) a prohibition on unfair trade practices, as currently being considered by the ACCC in the Digital Platforms Services Inquiry; and (2) a prohibition on negative discrimination, so that broadcaster or other nationally significant content cannot be intentionally 'downranked' (receive negative discrimination) as a result of commercial deals with competitors.

References

ACCC (2021) '[Consumer views and use of web browsers and search engines final report](#)'.

ACCC (2022) '[Digital platform services Inquiry: Interim report No. 4 – General online retail marketplaces](#)'.

ACMA (2022) '[Communications and media in Australia: Trends and developments in viewing and listening 2020–21](#)'.

Australian Government (2023) '[Revive: Australia's cultural policy for the next five years](#)'.

Laughlin A (2023) '[Smart products abandoned by big brands after just two years](#)', *Which?*, 12 January.

Lobato R (2022) '[Competition and consumer issues in smart TV platforms](#)', Response to ACCC Digital Platform Services Inquiry Discussion Paper for Interim Report No. 5.

Lobato R, Cunningham S, Scarlata A (2021) '[Response to Media Reform Green Paper](#)'

Lobato R, Cunningham S, Scarlata A (2022) 'Response to Streaming Services Reporting and Investment Scheme Discussion Paper'.

Lobato R, Scarlata A (2017) '[Australian content in SVOD catalogs: availability and discoverability](#)', submission to the Australian and Children's Screen Content Review.

Lobato R, Scarlata A (2020) '[Response to ACMA/Screen Australia Options Paper](#)'.

Lobato R, Scarlata A (2022) '[Regulating discoverability in subscription video-on-demand services](#)', in *Digital Platform Regulation: Global Perspectives on Internet Governance*, edited by T Flew and F Martin, 209–227. Cham: Palgrave.

Ofcom/MTM (2019) '[Review of TV user interfaces in the UK market](#)'.

Sandvig C, Hamilton K, Karahalios K, Langbort C (2014) '[Auditing algorithms: Research methods for detecting discrimination on Internet platforms](#)', Paper presented to 'Data and Discrimination'

preconference at the 64th Annual Meeting of the International Communication Association, 22 May, Seattle.

Scarlata A, Lobato R (2023), '[Why your smart TV might not last as long as you'd hope](#)', CHOICE, 11 January.

Social Research Centre, 'Television Consumer Survey', reported to the Australian Government Department of Infrastructure, Regional Development, Communications and the Arts.

Thomas J, Barraket J, Parkinson J, Wilson C, Holcombe-James I, Kennedy J, Mannell K, Brydon A (2021) '[Australian digital inclusion index: 2021](#)'.

Appendix 1: Testing results - smart TVs

Operating system (manufacturer)	Tizen (Samsung)	webOS (LG)	Google TV (Sony)	VIDAA (Hisense)	Google TV (TCL)
Market share	35%	17%	15%	14%	5%

Linear FTA

Persistent FTA tile/ icon on home screen?	Live TV Terrestrial tile	Non-persistent tile; only appears if FTA recently viewed	TV tile	No tile	Non-persistent tile; only appears if FTA recently viewed
Remote shortcut button	CH BUTTON	HOME GUIDE/LIST	TV	HOME GUIDE CH.LIST	TV ICON
Number pad on remote	No	Yes	Yes	Yes	No
FTA included in EPG	FTAs listed above Samsung channels	FTAs listed above LG channels	FTA-only EPG	FTA-only EPG	FTA EPG-only
Default entry point	Home screen	Last watched	Last watched	Last watched or FTA	Last watched

BVOD access and positioning

ABC iView	Available	Available	Pre-installed	Pre-installed	Pre-installed
SBS On Demand	Available	Available	Pre-installed	Pre-installed	Available
7Plus	Available	Available	Pre-installed	Unavailable	Pre-installed
9Now	Available	Available	Pre-installed	Pre-installed	Pre-installed
10Play	Available	Available	Available	Unavailable	Available
Manufacturer account required to download apps	Yes	Yes	Yes	No	Yes

BVO discoverability

BVODs integrated in search	None	None	ABC iView 7Plus 9Now	ABC iView SBS On Demand 9Now	ABC iView 7Plus 9Now
BVODs integrated in recommendations	7Plus	None	ABC iView 7Plus 9Now	ABC iView SBS On Demand 9Now	ABC iView 7Plus 9Now
Organisational logic of recommendations	By app	By content type	By genre	By app	By genre

Note: Results are from January 2023 testing of 2022-model smart TVs sold in Australia

Appendix 2: Testing results - connected TV devices

CTV device	Chromecast with Google TV	Amazon Fire TV Stick	Apple TV
BVOD access and positioning			
ABC iView	Pre-installed	Available	Pre-installed
SBS On Demand	Available	Available	Pre-installed
7Plus	Pre-installed	Available	Pre-installed
9Now	Pre-installed	Available	Pre-installed
10Play	Available	Available	Pre-installed
Manufacturer account required to download apps	Yes	Yes	Yes
Order of app shortcuts on home screen	Netflix; YouTube; Stan; Prime Video; Disney+; 9Now; 7Plus; ABC iView; Apple TV; YouTube	Prime Video; Netflix; Amazon Music; YouTube	Apple TV+; Paramount+; AMC+; BritBox; AcornTV; MUBI; Shudder; Garage; The Great Courses; Tastemade; ErosNow; Carnegie Hall - ABC iView; SBS On Demand; 9Now; 10Play; Binge; Prime Video; Disney+; 7Plus
BVOD discoverability			
BVODs integrated in search	ABC iView 7Plus 9Now	ABC iView 7Plus 9Now	ABC iView SBS On Demand 7Plus 9Now 10Play
BVODs integrated in recommendations	ABC iView 7Plus 9Now	SBS On Demand	ABC iView SBS On Demand 7Plus 9Now 10Play
Organisational logic of recommendations	By genre	By genre, app and content type	By genre, app and content type

Note: Results are from January 2023 testing of 2022 CTV devices (standalone devices with app stores) sold in Australia

Appendix 3: Device testing methodology

In late 2022 we purchased a representative sample of smart TVs and connected TV devices for lab testing. For smart TVs, we chose one model for each major manufacturer (size 43" or closest match) to capture each of the major operating systems (Tizen, webOS, VIDAA) and major-manufacturer implementations of Google TV (Sony, TCL). Per our market research, these models represent the brands and operating systems currently used by 86% of Australian smart TV users. One of these TVs was provided by our research partner, Choice. While smart TVs were our focus in this study, we also tested for comparison the key CTV streaming devices with app stores - Chromecast, Fire TV, and Apple TV.

Each device was unboxed and installed in our research lab at RMIT University city campus. We then developed a structured rubric in a testing spreadsheet to capture key information on access, positioning and discoverability from each device (as per Appendix 1 and 2).

Linear FTA TV testing

Using a digital TV antenna, we allowed each smart TV to scan for linear channels during set-up. We then recorded the availability of and any observations about the following features:

- Linear FTA tile/entry point on primary interface
- Linear FTA remote shortcut button
- Number pad on remote
- Linear FTA included in EPG
- Default entry point

We could only assess the availability and positioning of linear FTA channels (ABC, SBS, 7, 9, 10) on smart TVs, as the connected TV devices we considered do not have a radiofrequency tuner capable of receiving terrestrial broadcast signals broadcast via radiofrequency spectrum.

Operating system	Brand	Model	Year
Smart TVs			
Tizen	Samsung	BU8000 43" Crystal LED UHD 4K Smart TV Model: UA43BU8000WXXY	2022
webOS	LG	UQ90 43" 4K Ultra HD LED Smart TV Model: 43UQ9000PSD	2022
Google TV	Sony	50" X75K BRAVIA LED 4K UHD HDR Google TV Model: KD50X75K	2022
VIDAA	Hisense	ULED 55" U7HAU 4K QLED Full Array Smart TV Model: 55U7HAU	2022
Google TV	TCL	TCL P735 43" 4K Ultra HD AI LED LCD Google TV Model: 43P735	2022
Connected TV devices			
Google TV	Google	Chromecast with Google TV Model: GA01919-AU	2022
Fire TV	Amazon	Amazon Fire TV Stick Model: B08MR37WXM	2022
TvOS	Apple	Apple TV 4K Wi-Fi 64GB Model: MN873X/A	2022

BVOD access and positioning testing

We tested the availability and positioning of BVOD apps (ABC iView, SBS On Demand, 7Plus, 9Now and 10Play) on smart TVs and connected TV devices. This was conducted by resetting each device to factory defaults and documenting each of the following elements to capture the device's 'out of the box' operation state:

- Apps preinstalled, available to be downloaded or unavailable to be downloaded
- App remote shortcut buttons
- Customisability of app shortcut buttons on remote
- Manufacturer account required to download apps
- Number and order of app shortcuts on home screen
- Customisability and deletability of apps on primary interface

BVOD discoverability testing

To assess the discoverability of local content and services in search results and recommendations, we used an algorithmic audit method to determine 'whether [platforms] are conducting harmful discrimination' (Sandvig et al, 2014: 6). Through this method we were able to clarify the integration logic that determines which services

are included in smart TV search results, and to assess whether BVOD content was being unfairly omitted. While this method does not provide access to proprietary 'black-boxed' algorithms, it can clarify some effects of those algorithms from the end-user perspective.

First, we reset all devices with default factory settings and installed BVOD apps as needed. We did not log into any of the BVOD apps, in an attempt to mimic a 'must-carry' framework where these would all be preinstalled. The impact of these installations on recommendation rows and search result output was noted. We then conducted a range of search experiments from the home screen search bar, including: targeted title searches (e.g., 'Bluey', 'Home and Away') using unique keywords for exclusive flagship content carried by each BVOD; and open-ended genre searches (e.g., 'reality TV') to determine which BVOD services are included in general search queries. The purpose of these experiments was to clarify the degree of integration between BVODs and the smart TV operating system, which determines how the relevant BVOD is treated in search results.

We then conducted recommendation experiments, scrolling through the entire home screen of each device to determine whether BVOD content (linking the user to the specific BVOD) featured in the banner ads, carousels or category rows. Finally, we logged into each of the installed BVOD apps and noted whether this impacted search and recommendation results (it did not).

Appendix 4: Survey methodology

To gain a general understanding of smart TV ownership and use across Australia we carried out a nationally representative online survey in December 2022. This was administered by a professional market research firm, The Online Research Unit. The structure of the sample was nationally representative according to age, gender, location and income.

The overall sample (including screened-out participants) was n=1895. Of these, n=1096 (57.8%) were smart TV owners and n=1069 (56.4%) were smart TV users whose responses are our focus in the current report. The responses of screened-out participants (n=826; 43.6%) were included in selected parts of this report (e.g., in Figure 2 to estimate the prevalence of non-connected TV households in Australia).

The survey included questions related to smart TV ownership and usage, viewers' attitudes toward smart TVs, and socio-demographics. Frequency and attitude questions were rated using a 5-point Likert scale. To avoid response bias, lists in questions were randomized.

The survey was prepared and pre-tested with 55 participants using a convenience sampling technique. We carried out minor amendments to the survey following feedback from the participants (e.g., refining instructions and clarity of statements).

In terms of socio-demographics, 49% of the sample were females. The highest level of education was an undergraduate degree or diploma (37%) followed by a postgraduate degree or diploma (21%). Most of the viewers (76%) reported that they use English as their primary language at home. About 4% of the viewers identified as having some disability or impairment that impacts their use of TV. The overall structure of the sample closely resembles the Australian population according to the latest Australian Bureau of Statistics (ABS) reports.

To assess viewers who were 'customisers' or 'defaulters' an index was calculated. To compute the customisers/defaulters index we used entries from Q20a, b, and c. Ratings ranging from strongly disagree (1) to neither agree nor disagree (3) were coded as zero (0). Agreement ratings – agree (4) and strongly agree (5) – were coded as one (1). The dichotomized scores were later summed and ranged from 0 to 3. To be deemed a customizer, a respondent would positively answer the three statements (Q20a, b, and c), hence scoring 3. Respondents whose summated scores were 0 were classified as defaulters.

For the purposes of this report, calculations were executed with IBM SPSS v28.

Percentages have been rounded up to the nearest whole and so may not equal 100% in some instances.

The full list of survey questions is available below.

RMIT Smart TV Survey - December 2022

SCREENING QUESTIONS

S1: Do you have any of the following devices at home?

- Games console (e.g., xBox, PlayStation)
- Smart doorbell (video doorbell with remote access)
- Smart speaker (internet-connected speaker with digital assistant)
- Smart TV (internet-connected TV with built-in apps) → **if not selected, S2 → screened out**
- Smartwatch (fitness tracking watch with smartphone features)
- Smartphone (e.g., iPhone, Android)
- None of the above

S2: You indicated that you do not have a smart TV. Please select the statement that best describes your situation.

- I do not have a TV
- I have an older model TV (i.e., not a smart TV)
- I use a TV streaming device (e.g. Apple TV, Fire TV, Chromecast, Google TV, set-top box)
- I am not sure what kind of TV I have at home

DEMOGRAPHIC QUESTIONS

D1: What year were you born? [Select year]

D2: Please select your gender identity

- Female
- Male
- Non-binary or gender diverse
- Gender identity is not listed here

CORE QUESTIONS

Q1: How many smart TVs do you have at home?

- 1
- 2
- 3
- 4
- 5 or more

We would now like to ask you some questions about your main smart TV.

If you use more than one smart TV, please consider the TV you use most often when answering.

Q2: What brand is your smart TV?

- | | | |
|------------------------------------|-----------------------------------|---|
| <input type="checkbox"/> Akai | <input type="checkbox"/> JVC | <input type="checkbox"/> Sharp |
| <input type="checkbox"/> Bauhn | <input type="checkbox"/> LG | <input type="checkbox"/> Sony |
| <input type="checkbox"/> Blaupunkt | <input type="checkbox"/> Linsar | <input type="checkbox"/> TCL |
| <input type="checkbox"/> Chiq | <input type="checkbox"/> Loewe | <input type="checkbox"/> Toshiba |
| <input type="checkbox"/> EKO | <input type="checkbox"/> Metz | <input type="checkbox"/> Other (please specify) |
| <input type="checkbox"/> FFalcon | <input type="checkbox"/> Philips | <input type="checkbox"/> I don't recall |
| <input type="checkbox"/> Hisense | <input type="checkbox"/> Polaroid | |
| <input type="checkbox"/> Hitachi | <input type="checkbox"/> Samsung | |

Q3: How often do you use your smart TV?

- Hardly ever or never → **Q4 → screened out**
- A few times each month
- About once a week
- Several days a week
- Every day

Q4. You told us you use your smart TV monthly or less often. What is the main reason for this?

- I don't like watching TV
- Lack of interesting content
- I don't have time to watch TV
- I have limited access to the TV (e.g., other household members are usually watching it)
- My TV is difficult to use

- o Other (Please specify)

Q5: How old is your smart TV? If you're unsure, please select your best guess.

- Less than 1 year old
- 1-2 years old
- 3-4 years old
- 5-6 years old
- 7-9 years old
- 10+ years old

Q6: Did you set up your smart TV (i.e., connect the TV to the internet)?

- No
- Yes
- I don't recall

Q7: How often do you use your smart TV to do the following? [Never (1)-Very Often (5)]

- Watch live free-to-air channels (e.g., ABC, SBS, 7, 9,10)
- Watch streaming apps (e.g., YouTube, Netflix, iView, 10Play) → if “Never” → screened out
- Use a connected streaming TV device (e.g., Google TV, Apple TV, Fire TV, Fetch)
- Watch pay-TV from a set-top box (e.g., Foxtel)
- Play games via an app or console
- Use the TV to watch content from your laptop, phone, or other device
- Watch DVDs, Blu-Rays, or other physical media
- Display photos, art, or relaxation scenes
- Listen to music or radio
- Exercise (e.g., workout videos/apps)
- Use your TV for video calls (e.g., Zoom, Skype)

Q8: How often do you use the following apps on your smart TV? [Never-Very Often]

- | | | |
|-----------------|----------------------|--------------|
| • ABC iView | • Netflix | • Binge |
| • SBS On Demand | • Stan | • Apple TV+ |
| • 7Plus | • Disney+ | • Kayo |
| • 9Now | • Amazon Prime Video | • Optus Spor |
| • 10Play | • Paramount+ | |
| • YouTube | • Foxtel Now/Go | |

Q9: Do you use any other apps on your smart TV that are not listed above? [OPEN TEXT]

Q10: When you watch your smart TV, are you most often watching:

- Alone
- With other adult/s
- With children
- With other adult/s and children

Q11: In your household, who is most often in charge of the remote control?

- | | |
|--|---|
| <input type="checkbox"/> Me | <input type="checkbox"/> My friend / housemate → Q12 |
| <input type="checkbox"/> My partner → Q12 | <input type="checkbox"/> Other (Please specify) → Q12 |
| <input type="checkbox"/> My child / children → Q12 | <input type="checkbox"/> Nobody in particular – we share the remote control |
| <input type="checkbox"/> My parent(s) → Q12 | <input type="checkbox"/> My TV does not have a remote control |

Q12: What is the gender identity of the person who is most often in charge of the remote control?

- o Female
- o Male
- o Non-binary or gender diverse
- o Gender identity is not listed here

Q13: Here is a picture of a remote control with app shortcut buttons. Does your smart TV have app shortcut buttons on its remote control?



- No
- Yes → Q14
- I don't recall

Q14: How often do you use the app shortcut buttons on your remote control? [Never-Very Often]

Q15: If you could design your own remote control, which app shortcut buttons would you include? Select FOUR from the list below.

- | | | |
|--|---|---|
| <input type="checkbox"/> ABC iView | <input type="checkbox"/> Stan | <input type="checkbox"/> Kayo |
| <input type="checkbox"/> SBS On Demand | <input type="checkbox"/> Disney+ | <input type="checkbox"/> Optus Sport |
| <input type="checkbox"/> 7Plus | <input type="checkbox"/> Amazon Prime Video | <input type="checkbox"/> Other (Please specify) |
| <input type="checkbox"/> 9Now | <input type="checkbox"/> Paramount+ | <input type="checkbox"/> Other (Please specify) |
| <input type="checkbox"/> 10Play | <input type="checkbox"/> Foxtel Now/Go | <input type="checkbox"/> Other (Please specify) |
| <input type="checkbox"/> YouTube | <input type="checkbox"/> Binge | <input type="checkbox"/> Other (Please specify) |
| <input type="checkbox"/> Netflix | <input type="checkbox"/> Apple TV+ | |

Q16: How often do you do the following? [Never-Very Often]

- a. Click on recommendations shown in apps (e.g., Netflix, iView)
- b. Click on recommendations shown on the TV home screen
- c. Search for content using the search bar within apps (e.g., Netflix search, iView search)
- d. Search for content using the search bar on your TV home screen
- e. Search for content using the voice button on your remote control

Q17: To the best of your recollection, how many apps have you downloaded from your smart TV's app store?

- 0
- 1-2 → Q18
- 3-4 → Q18
- 5-6 → Q18
- 7+ → Q18

Q18: Please name all the apps you have downloaded from your smart TV's app store. Please list as many as you can remember. Do not include apps that came pre-installed on the TV. Feel free to refer to your TV if it's nearby. [Open text]

Q19: Are there any apps that you currently do not have but would like to use on your smart TV?

- No - I already have all the apps I need
- Yes - due to cost (Please specify which app/s)
- Yes - due to unavailability in app store (Please specify which app/s)

Q20: I know how to... [Strongly disagree (1)-Strongly agree (5)]

- a. Download apps on my smart TV
- b. Customize the order of apps on my smart TV
- c. Adjust the privacy settings on my smart TV

Q21: Please tell us whether you agree or disagree with the following statements: [Strongly disagree-Strongly agree]

- a. I normally know what I want to watch before I turn on the TV
- b. Having a diverse range of apps on my smart TV is important to me
- c. ABC iView and SBS OnDemand should be pre-installed on all smart TVs sold in Australia
- d. 7Plus, 9Now and 10Play should be pre-installed on all smart TVs sold in Australia
- e. The user interface on my smart TV should be an ad-free environment
- f. I am comfortable with the manufacturer of my smart TV monitoring what I watch and using this data to suggest content to me (i.e., personalised recommendations)
- g. I am comfortable with the manufacturer of my smart TV monitoring what I watch and sharing this data with advertisers

Q22: Which operating system is installed on your smart TV?

- | | |
|-------------------------------------|---|
| <input type="checkbox"/> Android TV | <input type="checkbox"/> I don't know |
| <input type="checkbox"/> Google TV | <input type="checkbox"/> Other (Please specify) |
| <input type="checkbox"/> Tizen | |
| <input type="checkbox"/> VIDAA | |
| <input type="checkbox"/> WebOS | |

Q23: This image shows a smart TV home screen with information about a series called *The Boys*. Do you think that the smart TV is suggesting *The Boys* because...

- It thinks you might like this series
- This is a paid advertisement
- The series has been randomly selected
- I'm not sure

Q24: What do you like most about your smart TV? [Open text]

Q25: What is the most frustrating thing about your smart TV? [Open text]

Q26: How does having a smart TV change the way you watch TV, if at all? [Open text]

DEMOGRAPHIC QUESTIONS

D3: Do you have a disability or impairment that impacts your use of the TV?

- Yes → D4
- No

D4: Do you find your smart TV sufficiently accessible for your needs? Please explain in your own words. [Open text]

D5: What is the highest level of education you've reached so far?

- | | |
|---|--|
| <input type="checkbox"/> Primary school | <input type="checkbox"/> Undergraduate degree or diploma |
| <input type="checkbox"/> High school to year 10 or 11 | <input type="checkbox"/> Postgraduate degree or diploma |
| <input type="checkbox"/> High school to year 12 | <input type="checkbox"/> Prefer not to say |
| <input type="checkbox"/> TAFE | |

D6: Please indicate your current approximate personal annual income from all sources before tax.

- | | |
|---|--|
| <input type="checkbox"/> Less than \$35,000 | <input type="checkbox"/> \$100,001 - \$150,000 |
| <input type="checkbox"/> \$35,001 - \$50,000 | <input type="checkbox"/> \$150,001 - \$200,000 |
| <input type="checkbox"/> \$50,001 - \$70,000 | <input type="checkbox"/> Over \$200,000 |
| <input type="checkbox"/> \$70,001 - \$100,000 | <input type="checkbox"/> Prefer not to say |

D7: Please select the statement that best describes you.

- I do **not** feel confident using electronic devices and software
- I feel **somewhat** confident using electronic devices and software
- I feel **very** confident using electronic devices and software

D8: Please select the statement that best describes you.

- I am **not** concerned about online threats to my personal privacy
- I am **somewhat** concerned about online threats to my personal privacy
- I am **very** concerned about online threats to my personal privacy

D9: Do you speak a language other than English at home?

- Yes - I only speak a language other than English at home
- Yes - I speak both English and another language at home
- No - English only
- Prefer not to say

D10: Would you like to take part in further research about smart TVs by RMIT University? This will involve a paid interview conducted over the phone at a time of your choice. To register your interest please enter your email address here. [Open text]