Review of TV user interfaces in the UK market

Current offerings and future developments

Final Report

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Ofcom commissioned MTM to conduct a review of the main user interfaces (UIs) for TV and TV-like content available in the UK, assessing their design, operation and underlying business models

Overview

- The UK TV market is experiencing a period of change and development as the penetration and quality of broadband has improved, providing a high-quality distribution platform for TV and video services alongside DTT, cable and satellite.
- Smart-TVs, internet-connected set-top boxes and various types of connected devices are increasingly popular, taking advantage of this high quality distribution platform to offer users access to a growing range of video services from both UK and international content providers.
- The proliferation of new TV and video offerings is contributing to a more complex environment of TV user experiences, aggregation and distribution, with a wide range of features and functionalities emerging (e.g. search, data-driven and/or curated recommendations, personalisation features and voice search).
- Although awareness of some new features is still relatively low, early indications suggest that UIs have the potential to change how consumers access and interact with TV and video content. New content discovery models including search, recommendation and personalisation may see viewers move away from traditional, linear EPG models and channel numbers.
- Ofcom recognise these developments as important considerations for setting future policy and regulation and engaged MTM to review the main TV and TV-like interfaces available in the market, to better understand their current state of development and how they might change in the future.

This review explores the design of and control over UIs, the business models of different types of UI provider and future trends in UIs

Project objectives

Design	1	Develop a detailed view of the UI design approaches taken by platform operators, device manufacturers and OTT video services, highlighting key features, user journeys and other important functionalities and characteristics.
	2	Analyse the availability of PSB streaming services on various platforms and explore the journeys taken to interact with certain programme properties and brands.
Control	3	Identify and explain who controls various parts of the UI, including the design of navigational journeys and ownership of consumption data, providing Ofcom with an understanding of how search and recommendations work within the UI, and whether the UI can be changed by the user.
Business models	4	Provide Ofcom with an explanation of the business models, strategies, priorities and motivations of different categories of UI provider, highlighting plans for significant future changes.
Future trends	5	Provide an assessment of the future of voice navigation and other trends in UIs, assessing their impact on the market and on the business models and strategies of TV platform operators and other categories of industry participant.

The review is based on UI testing, engagement with industry stakeholders, and a programme of synthesis research

Approach

User interface (UI) testing

Review of the features and functionality of some of the main TV UIs currently available in the UK[1]:

- Sky Q STB
- Sky+ STB
- Virgin V6 STB (TiVo)
- BT YouView STB
- Freeview T1 STB
- YouView integrated Sony Smart-TV
- Samsung 6 Series TV
- Sony Bravia 4K TV
- LG LED Smart 4K TV
- Fire TV Stick (2nd gen)
- Apple TV 4K STB
- Now TV STB
- Xbox One
- PlayStation 4

Industry engagement

Depth interviews (under the Chatham House Rule) with industry participants, including:

- BBC
- BT
- Channel 4
- Digital UK
- Google
- ITV
- Nagra
- Now TV
- Samsung
- Sky
- Sony
- STV
- TiVo
- UKTV
- Vewd
- Virgin
- YouView

Synthesis research

Review of publicly-available information about operator strategies, commercial partnerships and deal structures relating specifically to TV UIs (e.g. annual reports, announcements, trade press).

Notes: (1) Not exhaustive. Detail on the specific models tested is provided in the appendix

The findings contained in this review are subject to some caveats, reflecting the complexity of the UK TV ecosystem and that fact that details of commercial arrangements are rarely made public

Caveats

- The UI testing undertaken as part of this research was conducted on a specific set of devices, listed in the appendices. MTM has not considered legacy devices and has indicated new features and functionality available on more recent models than those tested, where aware of them.
- The term **"TV platform"** has been used in this report to refer to a wide range of products, services and devices that offer TV and TV-like services through their UIs, including pay-TV services, free-to-air platforms, Smart-TVs and connected devices (see diagram on following page).
- The illustrative TV value chain outlined in this report is a simplified representation of a highly complex and integrated TV ecosystem. In reality, industry participants may play multiple roles, such as TV platform and content provider (e.g. Sky) or tech provider and content provider (e.g. Google).
- The terms of deals struck between TV platforms and content providers are commercially sensitive and rarely available within the public domain. While MTM has endeavoured to provide insight into the forms these deals take and the negotiations that underpin them, we have not provided detail on specific outcomes unless they are publicly available.
- The industry participants interviewed as part of this research are predominantly UK executives who, in some cases, may have limited visibility of issues relating to long-term strategies and business models of international platforms and services.
- All research was completed during March and April 2019. The findings included in this report represent the state of the UK TV landscape at a specific point of time. All forward-looking comments are based on industry participants' current views and MTM's best professional judgement.

This report uses the term TV platform, tech provider and content provider to refer to specific industry participants involved in the TV value chain. In reality, many participants play multiple different roles

Industry participants (simplified) – for example:

TV platforms

Refers to a wide range of products, services and devices offering TV and TV-like services, including pay-TV platforms, free-to-air platforms, Smart-TVs and Connected devices.

Pay-TV

Sky Q

Sky+

Virgin V6

BT TV

TalkTalk

Smart-TVs

Samsung

Sony

LG

Free-to-air

Freeview

Freesat

YouView

Connected devices

Fire TV Stick

Apple TV

Now TV

Xbox One

PlayStation 4

Tech provider

Technology suppliers providing software or hardware, including open-source solutions, to TV platforms.

Android (Google)

TiVo

Vewd

Humax

etc.

Content provider

Broadcasters and streaming services, which operate their own channels and/or apps.

BBC

ITV

Channel 4

Channel 5

UKTV

Netflix

Prime Video

etc.

At a high level, TV platforms have tended to be either (relatively) open or closed – however, hybrids are becoming more common

Open versus closed TV platforms

Open	Closed
Open platforms generally allow third-parties to launch channels or apps on the platform, subject to capacity constraints and to conforming to certain technical (and other) specifications and regulatory requirements. For example: Any manufacturer can integrate a DVB-T compatible DTT receiver into a device to provide access to free-to-air channels, using Service Information (SI) to provide programme listings in an EPG.	Closed platforms, or 'walled gardens' tend to be pay platforms, controlled by a platform provider that manages the availability of channels and apps on the device, subject to certain technical and regulatory requirements. In some cases, these platforms also provide access to certain free-to-view channels distributed on the same TV platform.

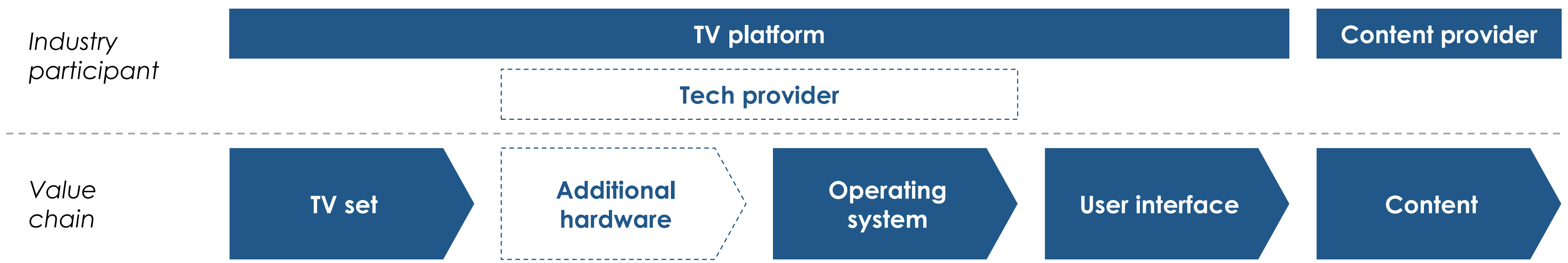
Hybrids

Increasingly, some TV platforms have adopted hybrid approaches, exercising different levels of control – for example:

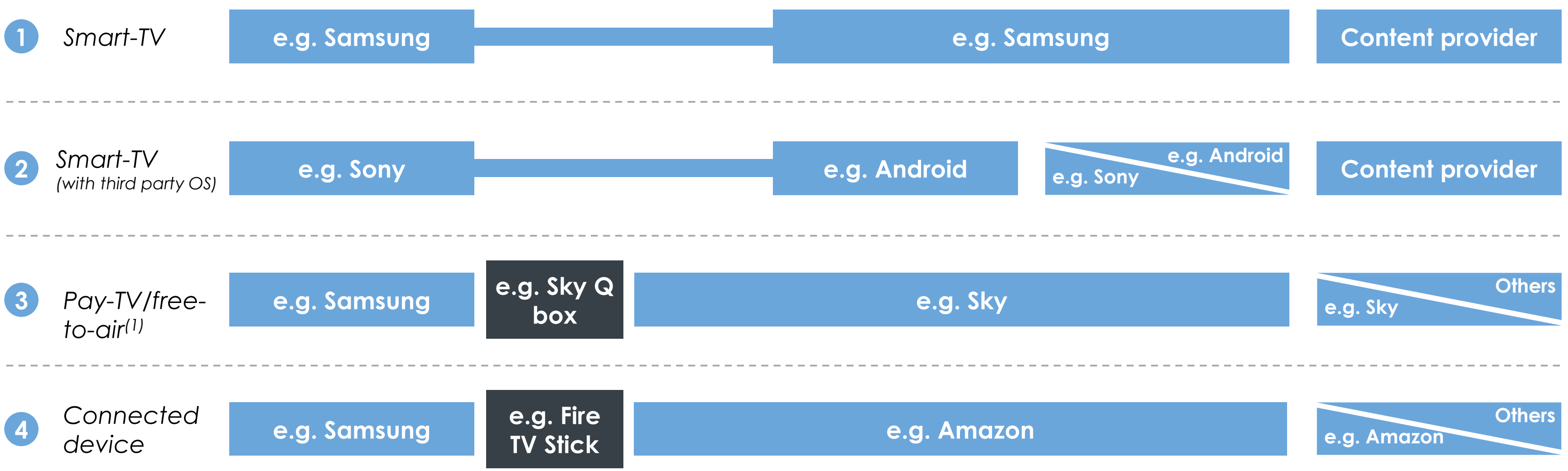
- Third-party app stores are often semi-open, allowing content providers to publish apps on a TV platform, subject to meeting the TV platforms guidelines, tech requirements and charging structures,
- Streaming media devices incorporating DTT receivers, built on third-party operating systems that support a range of pre-developed apps.

Users’ routes to content often involve multiple industry participants, operating at different stages of the value chain. A range of illustrative examples are used in this report to highlight key differences

Industry value chain (illustrative)



Influence over the user journey



Notes: (1) A household with access to a pay-TV platform, free-to-air platform or connected device will, in most cases, be able to bypass these by accessing the Smart-TV’s default UI

This report uses a consistent set of definitions to refer to different types of industry participant, UI features and functionality

Definitions

App menu
A list or tile-based menu of third party apps.

Backwards EPG
An EPG that also surfaces recently broadcast on-demand content.

Connected device
An internet connected device which offers access on third party streaming apps and content via the TV through a proprietary UI.

Content ingestion
The process by which a TV platform (e.g. Sky) ingests third party content (e.g. BBC's) into its servers. This removes the need to deep link to a third party app.

Content provider
Broadcasters and streaming services, which operate their own channels and/or apps.

Curated recommendations
Content selection generated either editorially (e.g. Sky's 'Top Picks') or using data that is not specific to the individual users (e.g. Most popular).

Deep linking
The process of linking from within a TV platform interface to in-app content.

Electronic programme guide (EPG)
An ordered list of linear channels.

Free-to-air platforms
Platforms which offer access to linear channels (and potentially third party streaming apps and content), without requiring ongoing payment.

Hardware shortcuts
Buttons on a remote control leading the user directly to a specific area of the UI or third party app.

Home page
The first screen visible to the user when they turn on (or restart) a TV platform.

Operating system
The back-end software underpinning the UI.

Pay-TV platforms
Platforms which offer access to linear channels (and potentially third party streaming apps and content), via a set-top box, on a subscription basis.

Personalised recommendations
Content selection generated based on a specific user profile (e.g. Netflix recommends), including previous viewing/browsing data and contextual information.

Search
The process by which users find content through either manual text entry or voice command.

Smart-TV
An internet connected TV set which offers access to free-to-air linear channels and third party streaming apps.

Tech provider
Technology suppliers providing software or hardware, including open-source solutions, to TV platforms (e.g. Android TV, Vewd, TiVo).

TV platform
Refers to a wide range of products, services and devices offering TV and TV-like services including ***pay-TV platforms***, ***free-to-air platforms***, ***Smart-TVs*** and ***Connected devices***.

User interface (UI)
The front-end of a TV platform, through which the user can search for and navigate channels, apps and content.

Report contents

TV UIs provide access to a range of channels, apps and content, allowing users to navigate and browse in a variety of different ways

Design

- UK consumers access TV and TV-like content through a wide range of UIs, including free-to-air and pay-TV platforms, Smart-TVs and connected devices. Each of these has a distinct layout and design, offering multiple ways to surface content.
- UIs often, but not always, include a linear EPG, streaming apps, recommendations sections (curated and personalised) and search functionality (text and voice).
- UIs will typically direct users to a home page, allowing them to browse a combination of channels, streaming apps and/or content, or navigate to other pages containing specific UI features (e.g. recommendations). There are two notable exceptions to this;
  - Hardware shortcuts may allow the user to bypass the home page and access a specific third party app directly;
  - The UI may default to the third party app that was in use when the user last ended their session.
- The design of home pages varies significantly – at a high level they tend to either be channel-led (e.g. an EPG), app-led (e.g. a third party app menu) or content-led (e.g. an aggregated content menu).
- Although the design of the UI varies significantly by platform, testing identified a number of consistent design features;
  - An EPG is available on all of the free-to-air, pay-TV and Smart-TV platforms tested – though the EPG is less prominent on newer pay-TV platforms (e.g. Sky Q);
  - Most UIs have a third party app menu on or close to the home page;
  - Most UIs offer text search for channels, apps and content, though the ability to surface content within third party apps tends to be limited and can vary across different apps.
- The four main PSB streaming apps (BBC iPlayer, ITV Hub, All4 and My5) are available within the majority of TV platforms. The relative prominence of PSB apps varies across platforms.

TV platforms generally control the UI and its various elements, striking deals with content providers on the inclusion and prominence of their content. In some cases, tech providers also exert influence

Control

- TV platforms – whether pay-TV or free-to-air platforms, Smart-TVs or connected devices – generally control the layout of the UI for their services and negotiate deals with content providers on the inclusion and prominence of their content.
- These deals can be highly complex with a wide range of variables being negotiated over e.g.: prominence within the UI (e.g. positioning of apps), content availability (e.g. on-demand libraries) and levels of integration (e.g. deep linking and data sharing). Other commercial considerations (e.g. advertising deals) may also factor into these negotiations.
- International device manufacturers (e.g. Samsung, LG) often strike global deals with international content providers (e.g. Netflix) alongside national deals with national content providers (e.g. UK PSBs).
- In some cases, tech providers may also influence the UI and the availability and functionality of certain features. For example, tech providers prefer consistency and may not tailor solutions to local markets and/or individual TV platforms.
- TV platforms have control over search results and recommendations, though some rely on tech providers to deliver these features. Content providers may exert some influence e.g. by negotiating over search rules and proposing content for inclusion in curated recommendations.
- Content providers need to share detailed content meta-data to enable their content to be surfaced in search results and personalised recommendations.
- Most UIs allow a degree of user customisation, for example changing the order of apps in an app menu or allowing users to highlight content that they like and that feeding into future recommendations.
- More broadly, user expectations and feedback influence the design and operation of UIs as TV platforms aim to create an engaging user experience that is aligned with users' preferences.

The business models and commercial incentives of different types of TV platform can vary widely, which may influence how they choose to present and promote content

Business models

- The business models of major TV platforms vary significantly, creating different incentives to provide access to content and exert influence on the ways viewers navigate through the UI. In general, platforms are more valuable to a greater number of users if they provide access to a broad range of content and a compelling user experience:
  - Pay-TV operators invest heavily to provide a broad, and in some cases exclusive, range of content and an engaging experience to attract and retain subscribers. In addition to subscriptions, they generate revenues from advertising and transactions (e.g. pay per view);
  - The main UK free-to-air platforms are jointly owned by a mix of PSBs, tech providers and/or pay-TV platforms, delivering the content of their owners and other broadcasters. They are investing in their user experience and on-demand features to attract and retain viewers;
  - Smart-TV manufacturers are improving the design and functionality of their UIs and providing access to third party apps to differentiate their products in an increasingly competitive market. Smart-TV platforms generate revenue primarily from hardware sales;
  - Connected devices and their associated ecosystems provide access to a range of third party apps and adopt a variety of business models: pure-play subscription (e.g. Now TV), encouraging subscriptions to associated services (e.g. Fire TV, Xbox and PlayStation), transactional sales and advertising/promotion within the UI itself;
  - Tech providers serving TV platforms leverage scale and experience to provide market leading solutions. These services may be part of a broader offering for media clients (e.g. Android TV is part of a suite of Google services including Search, YouTube, Google Play and the Google Cloud Platform).

In the future, industry participants expect UIs to become increasingly personalised and advanced features such as voice to change the ways users search for and discover content

Future trends

- Industry participants expect that the design of UIs will continue to evolve, with emerging features becoming more widespread and UIs becoming increasingly personalised. Some specific predictions include;
  – Growing numbers of users accessing content through home assistants and other smart devices, and casting content to TV screens, bypassing existing TV UIs;
  – The most prominent areas of UIs shifting from the presentation of channels and apps to the presentation of aggregated content, with increasingly sophisticated search and recommendation algorithms identifying content relevant for users.
- While the uptake of voice navigation and search features has been relatively limited within TV UIs to date, many industry participants are bullish about the future of voice search and navigation, anticipating increasingly sophisticated use cases such as intelligent, two-way conversations with viewers.
- Industry participants also expect new entrants and changing dynamics in the relationships between TV platforms, content providers and tech providers to influence the evolution of TV UIs going forward. Some specific predictions include;
  – International content providers entering the UK market and/or expanding their existing offerings (e.g. Disney, Warner, Apple and Amazon), creating new apps that will compete for prominence;
  – Increased aggregation of content within TV platforms, requiring greater levels of integration and data sharing between TV platforms and the third party apps available within them;
  – Growing reliance on international tech providers to support advanced features, which have high development costs and benefit from economies of scale.

Report contents

This section summarises the findings of UI testing for some of the most widely used TV interfaces in the UK

A. Which TV UIs were reviewed as part of this research?

Pay-TV
- *Sky Q*
- *Sky+*
- *Virgin V6*
- *BT TV*

Free-to-air
- *Freeview*
- *YouView*

Smart-TVs
- *Samsung*
- *Sony*
- *LG*

Connected devices
- *Fire TV Stick*
- *Apple TV*
- *Now TV*
- *Xbox One*
- *PlayStation 4*

B. What are the key features and functionality that make up the UI and influence its overall design?

Access	Home page	Hardware shortcuts	
Channels and apps	EPG	Backwards EPG	App menus
Content	Curated recommendations	Personalised recommendations	Search

C. How are TV user interfaces changing over time?

Shift towards aggregated content sections

All of the UIs tested allow users to access content in a variety ways, catering to a wide range of preferences and behaviours

A. Major TV interfaces and key design features

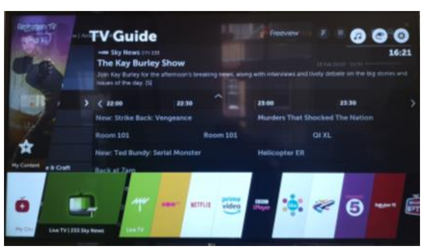
		Sky Q	Sky+	Virgin V6	BT TV	Freeview	YouView[1]	Samsung	Sony	LG	Fire TV Stick	Apple TV	Now TV	Xbox One	PlayStation 4
Channels and apps	Linear EPG	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✓	✗	✗
	Backwards EPG	✗	✗	✓	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗
	Third party app menu	✓	✗ (2)	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓
Content	Curated recommendations	✓	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓	✓	✗	✓
	Most popular section	✓	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓ (3)	✓	✓	✓
	Personalised recommendations	✓	✓	✓	✗	✗	✗	✓	✗	✗	✓	✓ (3)	✓	✗	✗
	Text search	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗
	Voice search	✓	✗	✗	✗	✗	✗	✓ (4)	✓ (4)	✓ (4)	✓	✓	✓ (4)	✗	✗

Sources: MTM product testing, March 2019; Additional information on product features and detail on products tested is provided in appendix
Notes: (1) YouView has been tested using a combination of the BT YouView set-top box and a YouView enabled Sony Smart-TV; (2) Sky+ hosts third party content from PSB streaming libraries, but does not host the apps themselves; (3) Features available only within iTunes sections; (4) Later models are voice enabled

All of the UIs tested provide a home page featuring a mix of channels, apps and/or aggregated content. Some Smart TV remotes offer shortcuts that bypass the home page to open third party apps

B. Access

Home page	Hardware shortcuts
The home page is the first screen visible to the viewer when they access the UI. The home page can include an EPG, links to third party apps and/or on-demand programming from one or more content providers. EPGs feature on or near the home page of most free-to-air, pay-TV and Smart-TV UIs, though the EPG is increasingly complemented by links to third party apps and content.	Hardware shortcuts link directly to third party apps, allowing users to bypass the default home page. Most Smart-TVs carry one or more buttons to launch third party streaming apps (e.g. LG, Sony and Panasonic models carry Netflix buttons on the remote). Other examples of hardware shortcuts include YouTube, Amazon Prime Video and Freeview Play buttons, though these are less common. With the exception of Apple TV, each device tested that provided access to linear channels has a TV Guide button on the remote.



LG smart TV landing page[1]

Fire TV Stick landing page

Netflix and Amazon buttons on an LG remote

Sources: MTM product testing, March 2019; Additional information on product features and detail on products tested is provided in appendix

Notes: (1) Screenshots and product images taken during MTM testing

All of the UIs tested feature an EPG and/or an app menu – these appear on or close to the home page

B. Channels and apps

EPG

The EPG is an ordered list of linear channels, with current and upcoming programming available for users to browse.

All free-to-air, pay-TV and Smart-TV platforms carry an EPG, but it is is less prominent within newer pay-TV platforms, such as Sky Q.

Connected devices, which rarely carry linear channels, do not feature EPGs.

Freeview EPG[1]

Backwards EPG

Backwards EPGs permit users to access recently broadcast, on-demand content through a backwards-scrolling EPG.

The ability to present on-demand content via a backwards EPG will depend on whether the TV platform carries the relevant third party streaming apps and/or has ingested the content onto their own servers.

Only a small number of platforms tested have this functionality[2].

Virgin TiVo V6 backwards EPG

App menus

Most UIs feature a tile-based menu of third party apps (e.g. Netflix, BBC iPlayer, YouTube).

Accessing third party apps within the interface allows the user to enter and browse within different content providers' streaming services.

App menus feature on or close to the home pages of most Smart-TVs and connected devices, but are frequently less prominent on pay-TV platforms.

Samsung TV app menu

Sources: MTM product testing, March 2019; Additional information on product features and detail on products tested is provided in appendix
Notes: (1) Screenshots taken during MTM testing; (2) Virgin V6, BT and YouView

More than half of the UIs tested provide content recommendations. It is not always made clear to users how these recommendations are generated

B. Content

Curated recommendations

Curated recommendations are either editorially selected or generated using non-personal data.

Recommendations often include third party content, presented on an aggregated basis or separately.

The selection of content is often updated throughout the day as new content becomes available and audience viewing patterns change.

Personalised recommendations

Personalised recommendations are generated using personal data, including past viewing and contextual information.

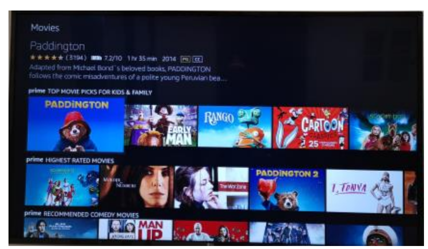
As with other recommendations, these are often drawn from a variety of apps available within the UI, but presented in an aggregated menu.

Search (text and voice)

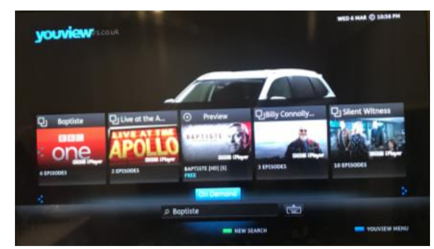
Search allows the user to surface content based on programme detail and features (e.g. titles, genres, cast members etc.).

Search functions return content made available within the UI itself, and may also be able to surface content from within third party apps, provided they are sufficiently integrated.

Sky Q 'Top Picks'(1)



Amazon Fire TV 'Recommended'



YouView text search

Recommendations sections often draw on a combination of editorial and algorithmic decisioning – meaning the difference between curated and personalised recommendations is not always obvious from the context of the UI(2).

Sources: MTM product testing, March 2019; Additional information on product features and detail on products tested is provided in appendix

Notes: (1) Screenshots taken during MTM testing; (2) Additional detail on the presentation of recommendations, and the commercial/technical agreements that underpin them, is provided in the Control section

The main PSB streaming services are available across most major TV platforms. The STV and S4C services are less widely available

B. Availability of third party PSB apps[1]

	Sky Q	Sky+	Virgin V6	BT TV	Freeview	Freesat	YouView	Samsung	Sony	LG	Fire TV Stick	Apple TV	Now TV	Xbox One	PlayStation 4
BBC iPlayer	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ITV Hub	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗
All4	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓
My5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
STV Player	✓(2)	✓(2)	✓(3)	✗	✓(3)	✓	✓	✓	✓(4)	✗	✓	✗	✓	✗	✗
S4C Clic	✗	✗	✗	✗	✗	✗	✓	✓	✓(4)	✗	✓	✗	✗	✗	✗

*PSB apps enjoy **varying levels of prominence**, especially when there are limited numbers of tiles on the home screen and/or app menu. My5 (and occasionally All4) feature less prominently than BBC iPlayer and ITV Hub on some platforms.*

*The major PSB apps are **pre-installed on the majority of platforms** (excluding games consoles). Although available on some Smart-TVs and connected devices through app stores, STV player and S4C Clic are rarely pre-installed.*

Notes: (1) Table reflects availability of PSB apps. These are often pre-installed, but may have to be installed by the user prior to use in some cases; (2) Launch announced in January 2019; (3) Only available in Scotland; (4) YouView model

More advanced UIs aggregate content from third party apps, which requires greater levels of integration between the TV platform and content provider

B. Surfacing in-app content

Overview

Most recent TV platforms provide third party content from within streaming services, enabled by shared meta-data and deep links which deliver content directly from within third party apps.

These features are often subject to negotiation between the TV platform and individual content providers, explored in more detail in the Control section of this report.

Most TV platforms provide some level of integration with at least some of the apps within their UIs.

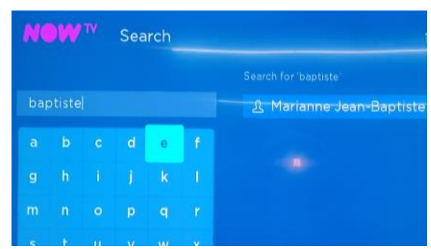
Impact on user journey

Although most TV platforms allow users to surface content from within the third party apps they carry, this coverage is often incomplete, and can lead to inconsistent results.

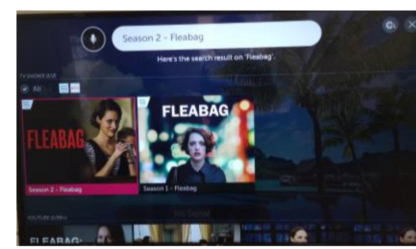
For example, at present, some connected devices and Smart-TVs that carry PSB streaming services cannot surface content from within them. This may change over time, subject to commercial and technical arrangements.

BT TV / YouView offers multiple results (including purchase) when searching for 'Baptiste'[(1)]

Virgin TiVo surfaces content across a variety of third party PSB streaming apps



Now TV search for 'Baptiste' does not return iPlayer content



LG Smart-TV only searches within Amazon Prime, Netflix and YouTube for 'Fleabag'

Sources: MTM product testing, March 2019; Additional information on product features and detail on products tested is provided in appendix

Notes: (1) Screenshots taken during MTM testing

There is a strong consensus across the TV industry that certain areas and positions within UIs are more desirable than others

B. Overview of arrangements between different parties

A presence on the homepage is highly valuable

Having a presence on the home page is critically important to content providers…

"Navigation begins on the home screen, so it's important to be there", Content provider

… as is position within the home screen

"Every [content provider] wants their content to be at the top of the homepage", TV platform

The most desirable position on the home screen can vary between platforms

"It's impossible to have fixed rules, I'd have to see exactly how the platform works and is set out", Content provider

Each 'click' away from the home screen is seen as a barrier to discovery

"When we are designing the UI, we operate under the principle that every click is sacred", TV platform

The EPG is still the core discovery method

The linear EPG remains very important, and is often used to discover on-demand content that recently aired

"Linear is still the largest proportion of our viewing, and even on-demand content is frequently surfaced from the backwards EPG", TV platform

This is particularly true of older audiences who are most likely to follow the linear schedule

"The EPG remains valuable, particularly for older audiences", Content provider

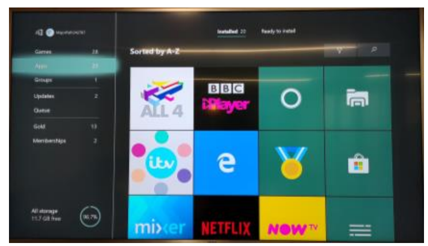
Sources: Off-the-record interviews with industry participants

Industry participants believe that aggregated content sections will become more common within UIs in future

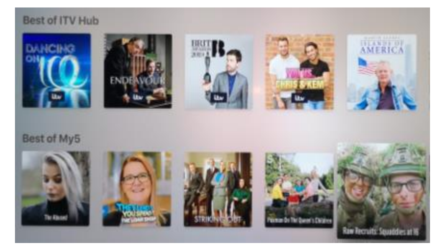
C. Shift towards aggregated content sections

EPGs → **Third party app menus** → **Aggregated content sections**

Sky+[1]



Xbox



Apple TV

"What we're currently seeing is a shift from a wall of channels and apps towards an integrated content experience. You're not clicking on something that takes you to another menu, you're being taken to the content itself", Tech provider

"Increasingly, TV platforms are trying to be super-aggregators, bringing everything into one place. It's not efficient for viewers to browse app by app for 20 minutes before they find what they want to watch", Content provider

Sources: Off-the-record interviews with industry participants
Notes: (1) Screenshots taken during MTM testing

Report contents

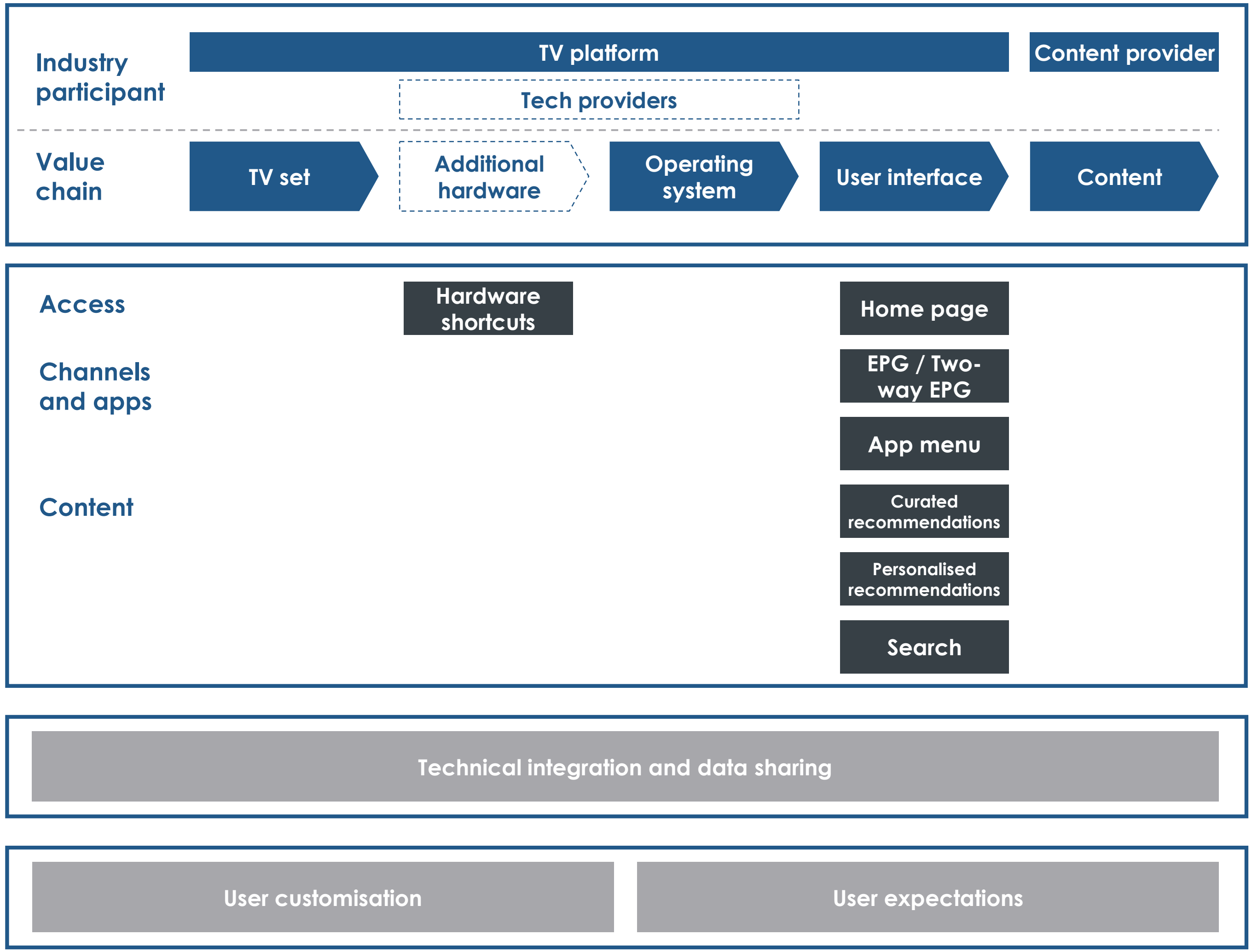
The following section explores which parties control and influence UI design

A. The parties involved in the TV value chain

B. The arrangements between these parties, and what control and influence they exert on different elements of the UI

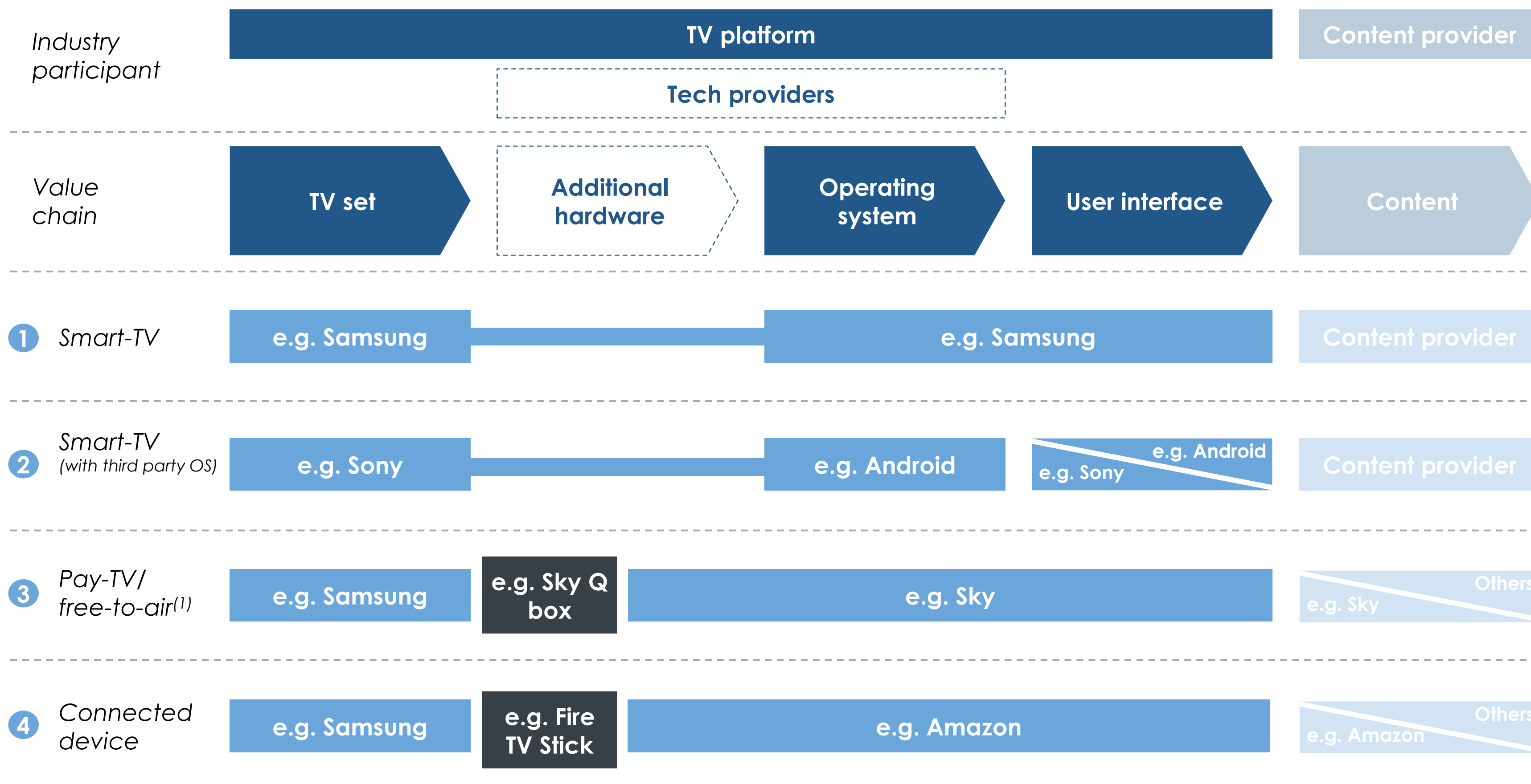
C. The nature of integration and data sharing behind the UI

D. The ability of viewers to influence UI design



UK consumers have various UI options for accessing TV and TV-like content – through TV platforms, devices and/or applications

A. UI access options (examples)



Notes: (1) A household with access to a pay-TV platform, free-to-air platform or connected device will, in most cases, be able to bypass these by accessing the Smart-TV's default UI

TV platforms generally control their service UIs, striking deals with content providers on the inclusion and prominence of their content. In some cases, tech providers also exert influence

B. Arrangements between different parties

Nature of arrangements between TV platforms and content providers	Complex trade offs between key aspects of prominence and content availability	*"Typically there are lots of variables being traded off in negotiations"*, Tech provider
	Content providers may have general principles, but UI variations mean that demands are tailored case by case	*"Every UI is different… how is content curated? Promoted? How many tiles are there on-screen? … You have to look at each platform and deal separately"*, Content provider
	Scale and popularity are seen as important to the outcome	*"What it boils down to is scale and negotiating leverage. How essential is that content to the platform and vice-versa? We see the race to scale everywhere"*, Tech provider
	Major international content providers entering the market seen as weakening the negotiating position of existing players	*"The market is moving to a position where the PSBs are going to be marginalised [with] more deep-pocketed global content offers doing deals with Smart-TV manufacturers"*, Content provider
	Challenges are usually commercial rather than technical	*"In 90% of cases any issues with a deal are commercial rather than anything technical"*, TV platform
Influence of tech providers	Tech providers prefer consistency and may not tailor solutions to meet the needs of smaller markets or platforms	*"We have to have standard policies … [e.g.] we can't provide a different search UI to different providers, it is just impossible for us… We have to think what is most intuitive and best for the user and go from that"*, Tech provider
	Smaller TV platforms can be limited by their tech providers' roadmaps	*"Some platforms are stuck with the roadmap of their hardware vendor"*, Content provider

Sources: Off-the-record interviews with industry participants

Deals between TV platforms and content providers can be highly complex, involving various deal terms and negotiating points

B. Variables traded off between TV platforms and content providers

Prominence within UI

- Installation of hardware shortcuts.
- Presence of content and/or apps on home screen.
- Location and integration of on-demand content.
- Position amongst available third party apps.
- Inclusion and input into curated and personalised recommendation sections.
- Inclusion and position within search results.

Content availability and integration

- Level of integration (content ingestion, deep links and/or third party app availability).
- Control of onward journey.
- Data sharing[1]:
  - Content meta-data and in-app viewing (from content provider to TV platform);
  - Platform navigation/user data (from TV platform to content provider).
- Provision of additional content for platforms' on-demand libraries.

Additional commercial considerations

- Advertising deals (e.g. the platform owner may advertise on the content provider's channels and/or services).
- Joint promotions (e.g. the platform provider and/or content provider may agree to feature the other in advertising campaigns and promotional activity).

Some deals may involve payment but others are based on trading off non-monetary benefits

Sources: Off-the-record interviews with industry participants
Notes: (1) Additional detail on data sharing under different arrangements is provided later in this section

Some international OTT providers have struck multi-territory prominence deals with Smart-TV platforms, which will also generally localise their UIs to include popular national services

B. Prominence negotiations with international TV platforms

	International content providers (e.g. Netflix and Amazon Video)	***National content providers (e.g. BBC, ITV, C4, C5)***
International TV platforms (e.g. Samsung)	• Deals typically struck at an international level. • Stand-out elements of historic deals include; – Hardware shortcuts (e.g. Netflix/Amazon buttons); – Joint promotion (e.g. 'Netflix recommended' TVs); – Pre-installed apps. • TV platforms want to make popular content services available – increasingly a consumer expectation. • Content providers seek to maximise distribution and encourage consumption of services. • Historically, Netflix and Amazon spent considerable, undisclosed fees for hardware shortcuts on major Smart-TV platforms, but these payments are understood to be in decline as their popularity grows.	• Deals between international TV platforms and national content providers take similar forms to those struck internationally, but there are additional barriers; – International platforms may be reluctant to make country-specific changes to hardware design; – The most valuable screen positions may already have been allocated as part of international content deals. • Nevertheless, the popularity of national content services like Freeview Play, BBC iPlayer etc. mean that most international TV platforms still seek some level of pre-installation and integration.

Despite local popularity, some industry participants believe national content providers may have less bargaining power than international services, who negotiate global deals for some of the most prominent positions on remotes, home screens and app menus

Sources: Off-the-record interviews with industry participants

National TV platforms are increasingly striking deals with international content providers, allowing them to add utility to their platform and attract/retain greater numbers of users and subscribers

B. Prominence negotiations with national TV platforms

	International content providers (e.g. Netflix and Amazon Video)	***National content providers (e.g. BBC, ITV, C4, C5)***
National TV platforms (e.g. Sky Q)	• Deals between national TV platforms and international content providers take a variety of forms; – Integrated apps (e.g. Virgin Media and Netflix); – Integrated content (e.g. Sky Q and Netflix); – Joint promotion. • National TV platforms look to integrate content from international services to improve product perceptions and, in pay-TV platforms' case, discourage churn to lower cost OTT services by offering a fully integrated content experience. • International content providers enter deals to increase consumption and acquire new customers – but their willingness to allow their content to be aggregated within the UI varies by platform.	• Deals between national TV platforms and content providers take similar forms, as national platforms seek to integrate additional content to extend their content libraries and user experience. • National TV platforms integrate national content given its popularity on linear channels, and the audience expectation that it will be similarly available and easily accessible on-demand. • For national content providers, integration with national TV platforms helps increase the use of their streaming services, whether this be through making their app available within the platform, or allowing the platform to offer direct access to specific content through deep links.

Some industry participants believe the relative strength of national services, and their ability to negotiate prominence within national platforms, may be declining as the popularity of international services increases

Sources: Off-the-record interviews with industry participants

In some cases, tech providers also play an ongoing role in the design and operation of TV UIs

B. Role of tech providers

Operating systems

- There are two main variants of Google's TV operating system, Android TV, in widespread use, offering platforms different levels of control over the UI.
- **Android TV Operator Tier** places a number of requirements on the operator. TV platforms running this version of Google's OS have to;
  - Meet some prominence requirements around Google's core apps, but are otherwise free to customise the home page and layout of the UI;
  - Use Google's search technology, but can prioritise and/or highlight particular content within results;
  - Use the Google Play Store to access third party apps;
  - Install regular updates as Google releases new versions.
- **Android Open Source Project (AOSP)** provides greater flexibility, with no ongoing input from Google. TV platforms running this version (including Amazon Fire TV);
  - Have complete control of the contents and design of the UI;
  - Are not required to use the Google Play Store or Google's search technology;
  - Are not required to install ongoing updates published by Google.
- Google recently announced it had secured 140 pay-TV partnerships, alongside a smaller number of Smart-TV manufacturers (including Sony) who use Android OS.

Individual UI features

- TV platforms (especially pay-TV and free-to-air platforms) work extensively with tech providers to produce hardware and, in some cases, provide features and functionality.
- TV platforms often outsource production to a set-top box manufacturer – many of which are international – but the platform enjoys substantial flexibility over the UI design in this case.
- Search and recommendation engines, which require the development of complex algorithms and access to substantial volumes of data, may also be produced by a tech provider.
- For example, Virgin's flagship set top box (V6) is powered by TiVo, and uses TiVo's search and recommendation technology.

Sources: Google public announcement (March 28th 2019)

TV platforms control the design of their home page and negotiate with content providers over the relative position of channels, apps and content

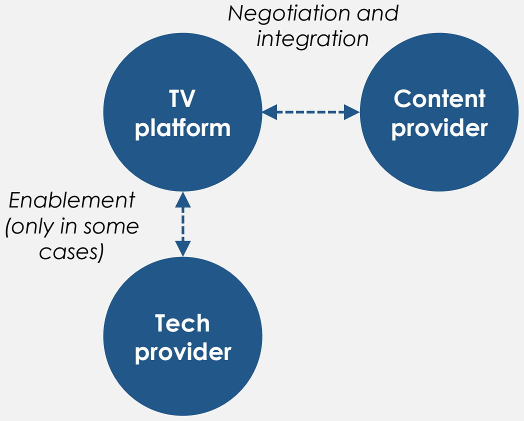
B. Home page

Elements to consider

Components of home page (e.g. promotional slots, app menu, aggregated content, search, EPG shortcut)

Position of different channels, apps and content within different components on the home page

Key parties involved



How this works in practice

- **TV platforms** control the design of the home page, from the components it includes to the position of different channels, apps and content;
  - Some exceptions – e.g. a **tech provider** like Android requiring inclusion of YouTube app.
- **TV platforms** are conscious of meeting user expectations on what should be available on the home page.
- **Content providers** negotiate with **TV platforms** for relative position of channels, apps and/or content.
- **TV platforms** using **tech providers** (e.g. Android) may face some restrictions on how the UI can be laid out (e.g. the positioning of certain apps).

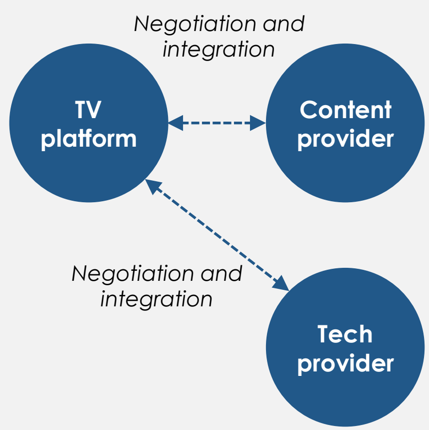
The inclusion of hardware shortcuts on TV remotes is determined by TV platforms themselves, negotiating with content providers and, in some cases, tech providers

B. Hardware shortcuts

Elements to consider

Shortcut to content provider app on TV remote

Key parties involved



How this works in practice

- **TV platforms** control the inclusion of hardware shortcuts (e.g. buttons on a Smart-TV remote).
- **Content providers** negotiate with **TV platforms** to secure these hardware shortcuts.
- As a **tech provider**, Google may also negotiate with **TV platforms** to include a YouTube button on the remote.

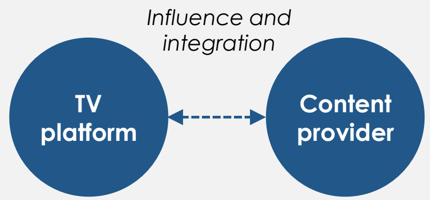
TV platforms determine the location of EPGs within the UI, conscious of user expectations

B. EPG and Backwards EPG

Elements to consider

- User journey to the EPG
- Availability of on-demand content within the backwards EPG

Key parties involved

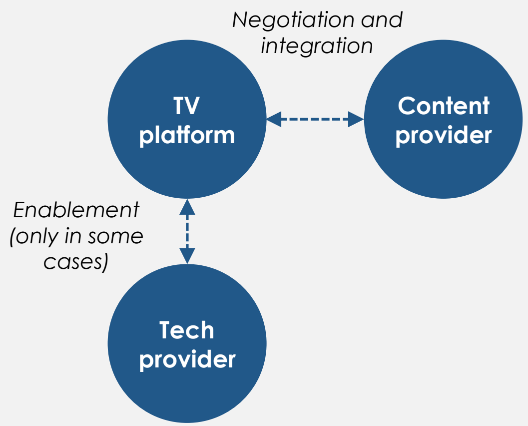
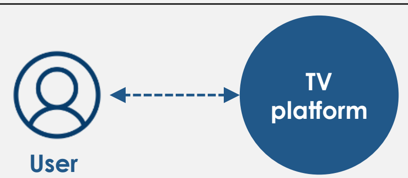


How this works in practice

- **TV platforms** control the design of the user journey to the EPG.
- **TV platforms** are conscious of meeting user expectations and there are instances where platforms have made EPGs easier to find in response to user feedback.
- **Content provider** apps must be deep linked, or their content ingested by the **TV platform**, in order to support the backwards EPG functionality.

The availability and prominence of apps within the UI is determined by each TV platform, with content providers negotiating for positions

B. Third party app menu

Elements to consider	Key parties involved	How this works in practice
App availability Pre-installation of apps Order of apps within menu App auto-restart Control of onward user journey		• In most cases **TV platforms** have ultimate control over app availability and prominence (pre-installation, order, auto-refresh); – Some exceptions – e.g. a **tech provider** like Android requiring inclusion of YouTube app. • **Content providers** negotiate with **TV platforms** for app availability and prominence. • Some **TV platforms** order apps according to most used/most recently used – in which case negotiations are over default positions. • **Content providers**' apps also need to meet technical requirements from the **TV platform**; – **Content providers** may set their own requirements (e.g. on streaming quality). • **TV platforms** using **tech providers** (e.g. Android) may rely on the **tech provider** to offer certain features which may/may not be supported.
User customisation of app menu		• A high proportion of **TV platforms** allow **users** to customise the order of the app menu.

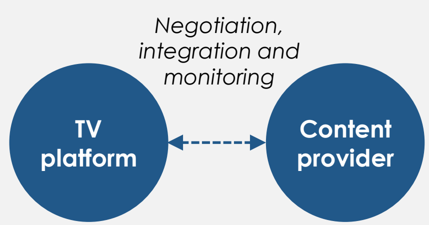
TV platforms determine curated recommendations, negotiating with content providers who wish to include their content in prominent positions and at high-traffic times of the day

B. Curated recommendations and 'most popular' lists

Elements to consider

- **Content provider's inclusion and share of recommendations.**
- **Relative prominence of recommendations** (e.g. top of list, during prime time)
- **Inclusion of dedicated area for content** (e.g. "best of"-style row)
- **Ability of content providers to influence which titles are selected**

Key parties involved



How this works in practice

- **TV platforms** control curated recommendations.
- **Content providers** negotiate with **TV platforms** for prominence of content in curated recommendations.
- To enable these recommendations **content providers** share data and/or content with **TV platforms**. They;
  - Share meta-data;
  - Share visual/video assets (e.g. images/trailers);
  - Share proposed recommendations (e.g. list of content to choose recommendations from and/or for a dedicated area of content).
- **Content providers** may regularly monitor curated recommendations to ensure **TV platforms** are complying with their arrangement.

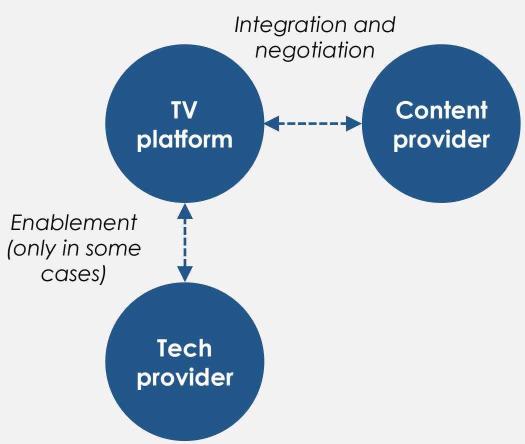
TV platforms generally set the underlying principles that determine how personalised recommendations are presented, influenced in some cases by content providers

B. Personalised recommendations

Elements to consider

- Content provider's inclusion within personalised recommendations
- How relevancy is determined
- Relative prominence of personalised recommendations for different content providers

Key parties involved



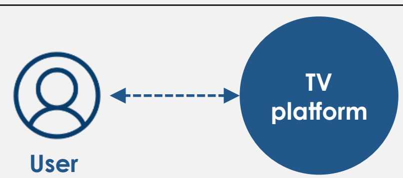
How this works in practice

- **TV platforms** generally control personalised recommendations;
  - Exceptions include using a **tech provider** (e.g. TiVo) to support recommendations.
- **TV platforms** are conscious of providing a good user experience and useful recommendations.
- **Content providers** may negotiate with **TV platforms** to influence recommendations;
  - Closely related to negotiation on relative prominence of curated recommendations;
  - Algorithms can be opaque, making it hard to set and monitor agreements.
- **Content providers** integrate with **TV platforms,** allowing their content to be ingested or deep linked and sharing meta-data;
  - Ability to surface relevant content depends on granularity of meta-data provided.
- Generally **content providers** and **TV platforms** do not share usage data so personalisation is based on partial picture of user behaviour.

Elements to consider

- User customisation of recommendations

Key parties involved



How this works in practice

- Some **TV platforms** allow **users** to customise recommendations (e.g. identifying if a recommendation is not relevant).

TV platforms generally set the underlying principles behind search results, though content providers may negotiate for certain rules to be applied

B. Search: Text and voice

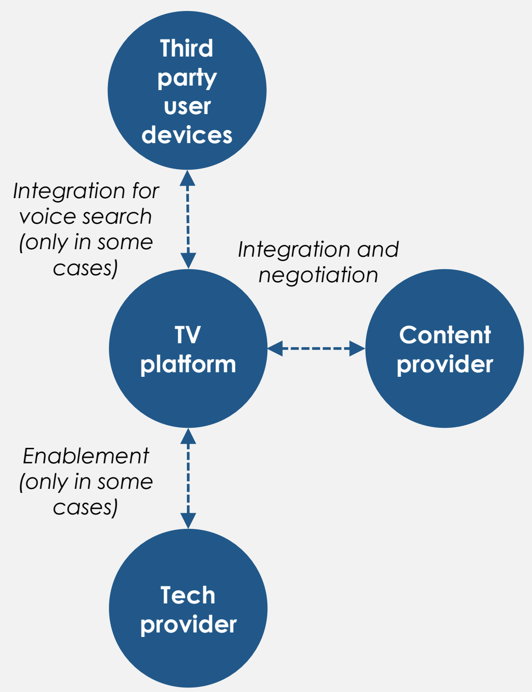
Elements to consider

Inclusion within search across text and voice

Ordering in search rankings for dedicated titles (e.g. "Dr Who")

Ordering in search rankings for broader, thematic queries (e.g. "drama")

Key parties involved



How this works in practice

- **TV platforms** generally control search functions and how results appear;
  - Exceptions include using a **tech provider** (e.g. Android) to run search and integrating with **third party user devices** (e.g. home assistants) to enable voice search.
- **TV platforms** are conscious of providing a good user experience with helpful search results.
- **Content providers** integrate with **TV platforms,** allowing their content to be ingested or deep linked and sharing meta-data;
  - Ability to surface relevant content depends on granularity of meta-data provided.
- **Content providers** may negotiate with **TV platforms** to influence search results;
  - Some **content providers** impose conditions to resolve duplicate results (e.g. free content appears ahead of paid, more recent content appears higher);
  - Search algorithms can be opaque, particularly for broader, thematic queries (e.g. "drama") making it harder to set and monitor conditions.

Recommendations and search results are surfaced in a variety of different ways, based on the features of the TV platform and the willingness of different content providers to share meta-data

B. Recommendation and search features

	Recommendation		Search	
	Curation	**Personalisation**	**Programme title**	**Programme features**
Description	Selection of promoted content, editorially curated or determined using non-personal data.	Tailored selection of content, based on user viewing history and contextual information[1].	Relevant content based on programme title, drawn from multiple content providers' apps.	Relevant content based on general term (e.g. genre, actor), drawn from multiple content providers' apps.
How it works in practice	• The **TV platform** provides a changing selection of content, drawn from its own library and third party apps. These may be aggregated (e.g. Sky Q), or presented separately for each content provider (e.g. Apple TV). • **Content providers** negotiate for the inclusion of their content, a specific share, or the ability to select which of their programmes are recommended.	• The **TV platform** provides a personalised selection of content, drawn from its own library and third party apps (e.g. Fire TV). • **Content providers** allow their content to be included – but the mechanism behind recommendations is not always transparent.	• The **TV platform** allows the user to perform a universal search and creates general rules that determine the order of results when relevant content is available within multiple apps. • **Content providers** allow their content to be included – potentially on the condition certain ordering rules are used.	• The **TV platform** allows the user to perform a universal search based on content features. • **Content providers** allow their content to be included – the ability to surface relevant content will depend on the granularity of the meta-data provided.

*Personalised recommendations and search require **content providers** to create and share detailed content meta-data to enable the **TV platform** to surface relevant results.*

Notes: (1) The variables considered within personalised recommendations are rarely made clear. For example, Netflix claims to tailor preferences based on previous interactions (viewing and ratings given), similar members' tastes, genres, category (film, series, documentary etc.), actors, release year, the time of day, device, and an audience member's typical viewing duration. Netflix states it doesn't consider age or gender in the process of creating recommendations

Recommendations and search results can be influenced by commercial considerations, and subject to negotiation between the TV platform and content providers

B. Recommendation and search features

	Recommendation		Search	
	Curation	**Personalisation**	**Programme title**	**Programme features**
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Example	Sky Q '*Top Picks*' section; Apple TV '*Best of…*'	Fire TV's '*Recommended for you*'	'*Line of Duty*' results on Apple TV	'*Drama*' results on Freeview Play
Aspects of control (subject to negotiation)	• Inclusion in recommendations. • Content provider's share of recommendations. • Ability to select recommendations. • Position within the recommendation menu. • Time of day featured.	• Inclusion in recommendations. • Position within the recommendation menu. • How relevancy is determined.	• Inclusion in universal search results. • Ordering of results from multiple sources; – preference for free vs. paid content; – preference for recency (e.g. last broadcast, newest or oldest season). • How relevancy is determined (for generic search terms).	

Notes: (1) The variables considered within personalised recommendations are rarely made clear. For example, Netflix claims to tailor preferences based on previous interactions (viewing and ratings given), similar members' tastes, genres, category (film, series, documentary etc.), actors, release year, the time of day, device, and an audience member's typical viewing duration. Netflix states it doesn't consider age or gender in the process of creating recommendations

The extent of data sharing between TV platforms and content providers depends on both commercial arrangements and how third party content is made available on the TV platform

C. Data sharing

Third party app availability

Most TV UIs provide links to content providers' apps (e.g. Netflix, iPlayer, All4).

Limited data is shared between the TV platform and the content provider;

- The **TV platform** receives no information once a user enters a third party app, other than the time they spend within it;
- **Content providers** have no visibility of navigation outside the app itself, but may have information on the identity of the incoming user from login data.

Virgin V6 app menu[1]

Content deep links

Aggregated content is most commonly provided through deep links which access content within third party apps.

Some types of data must pass between the TV platform and content provider to support this feature;

- The **TV platform** must receive content meta-data from the app's owner to identify and surface relevant content, show content thumbnails etc.;
- Once a user is within the app, the **TV platform** has no visibility of their consumption or any onward journey they make;
- **Content providers** may receive detail of incoming traffic, such as the area of the platform UI that drove them there, sign-in data etc. but whether this data is shared is subject to negotiation with the **TV platform** owner.

Content ingestion

In some cases, TV platforms will ingest third party content, in order to provide a more fully integrated experience[2].

Data sharing is more limited in this situation, and subject to negotiation;

- The **TV platform** must ingest the content and associated meta-data into its own servers and can collect data on consumption taking place;
- **Content providers** receive less insight than through deep links, but may agree to share content on the condition of receiving consumption data from the **TV platform** – though this is often limited.

Sources: Off-the-record interviews with industry participants
Notes: (1) Screenshots taken during MTM testing; (2) For example, PSB on-demand content available on Sky+ and Sky Q is delivered from Sky's servers, rather than the PSB streaming apps

The ability of users to customise the UI is often limited, but most platforms that carry third party apps do allow users to change their order within app menus

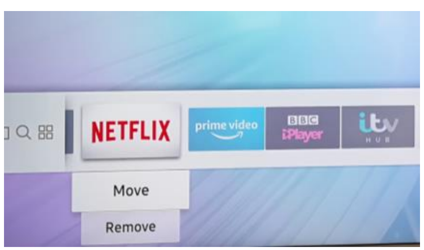
D. User customisation

Location of app tiles

- Many TV platforms allow users to change the position of third party apps, or adjust automatically to their behaviour and preferences;
  - Each of the Smart-TV platforms tested, as well as Apple TV and Fire TV, allow users to customise the location of app tiles through relatively simple ‘drag and drop’ commands;
  - Now TV and Xbox automatically customise the location of app tiles based on those most frequently accessed and/or recently used;
  - In contrast, the location of apps is fixed on Sky and Virgin’s TV platforms.

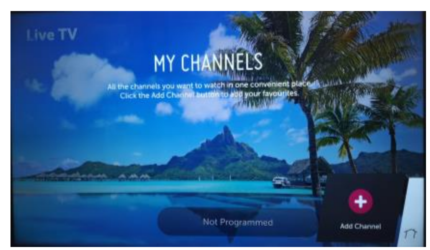
Preferences for specific content

- A number of platforms allow users to express preferences which influence future recommendations, but these features do not appear to be widespread;
  - Some Smart-TV platforms allow users to input their favourite programmes and populate an area of the interface with episodes that have recently aired, or are available on-demand;
  - Virgin V6 allows users to manually ‘like’ or ‘dislike’ (via voting buttons) any programme being viewed, influencing future recommendations[2].



Samsung Smart-TV app menu[1]

Now TV app menu



LG Smart-TV favourites section

Virgin TiVo V6 voting buttons

Notes: (1) Screenshots and product images taken during MTM testing; (2) Virgin’s search functionality is provided by TiVo

TV platforms and content providers are influenced by user preferences and expectations around the layout of the UI, content availability and prominence

D. Role of user preferences and expectations

Location of EPG

The extent of linear viewing leads many TV platforms to ensure that the EPG is easily accessible

"The live TV experience is still important and people expect the EPG to be prominent in any interface where it's available", TV platform

Prominence of streaming services

Established linear channel orderings, and the popularity of PSB content, mean that audiences expect PSB streaming services to be prominent and easily accessible

"We know that our users expect to have quick and easy access to the PSB apps, especially iPlayer", TV platform

This also applies to the leading international streaming services

"We have to welcome Netflix and Amazon because of their popularity – consumers expect to be able to access them easily", TV platform

Search and recommendation

TV platforms recognise that influencing search results to favour particular types of content will frustrate users who have a clear view of what they are seeking…

"If you start to make things more prominent within search you are undermining what it is", TV platform

… but TV platforms have greater scope to influence recommendations and general search results (e.g. 'drama') without damaging user perceptions

"There's more subjectivity in recommendations and more scope to promote content when the viewer doesn't have a clear idea of what they're looking for ", Content provider

Sources: Off-the-record interviews with industry participants

Report contents

The following section explores the variety of business models that underpin the UK's leading TV platforms

A. How does each TV platform monetise their UI?

- **Hardware sales** – Revenues generated on a one-off basis through the sale of equipment
- **Subscriptions** – Subscription revenues paid by users for ongoing access to the TV platform
- **Transactions** – One-off payment made by users to purchase or rent content
- **Advertising** – Payments made to the TV platform for promotion alongside content, or within the UI itself
- **Platform fees** – Payments made to platforms by content providers in return for carrying their apps and content

B. How is content made available to audiences?

- **Free-to-air channels** – Content broadcast on free-to-air channels
- **Acquisition** – Content acquired by the platform for its on-demand library or proprietary channels
- **Revenue sharing** – Content sold to users within the TV platform, with revenues shared between the TV platform and content provider
- **Links to third party apps** – Content accessible on the TV platform within third party apps, or through deep links
- **App store** – Content (and apps) published on the platform by third parties, subject to guidelines and technical requirements

C. How do some TV platforms fit into their operator's wider business activities?

- **International digital media companies' business models**

The owners of TV platforms generate revenues through a variety of sales, subscriptions, transactions, advertising and platform fees

A. Monetisation approaches(1)

	Pay-TV					Free-to-air			Smart-TVs			Connected devices					OSs
	Sky Q	Sky+	Virgin V6	BT TV	TalkTalk	Freeview	Freesat	YouView	Samsung	Sony	LG	Fire TV	Apple TV	Now TV	Xbox One	PlayStation 4	Android TV
Hardware sales	✗ (2)	✗ (2)	✗ (2)	✗ (2)	✗ (2)	✗	✗	✓	✓	✓	✓	✓ (3)	✓	✓ (3)	✓	✓	✗
Subscriptions	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗ (4)	✗	✓ (5)	✗	✗	✗
Transactions	✓	✓	✓	✓	✓	✗	✗	✗	✗	✓ (6)	✗	✓	✓	✓	✓	✓	✗
Advertising	✓	✓	✓	✓	✗ (7)	✗	✗	✗	✗	✗	✗	✓ (8)	✓ (8)	✗	✓ (8)	✓ (8)	✗ (9)
Platform fees	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗

Sources: Desk research of platform owners' websites and industry press

Notes: (1) This exhibit is illustrative of the main revenue streams as they relate to content provision, but it is not exhaustive. Many of the TV platforms displayed have wider business interests beyond the TV market; (2) Pay-TV platforms may charge 'set up fees' to new subscribers but these are often discounted; (3) The prices of Fire TV and Now TV Sticks are significantly lower than other connected devices; (4) Does not include Amazon Prime Video subscription; (5) Although a Now TV Stick would provide access to third party apps without a subscription, its function would be limited; (6) Some Sony Smart-TVs provide access to the PlayStation Video Store; (7) Unlike other pay-TV operators, TalkTalk does not carry exclusive channels that generate advertising revenue; (8) Connected devices sell most advertising within the UI itself, as opposed to within content; (9) Although Google has an extensive advertising business, it does not directly monetise the Android TV UI

Most TV platforms make content available in a variety of ways, each involving different commercial relationships with content providers

B. Means of providing content

	Pay-TV					Free-to-air			Smart-TVs			Connected devices					OSs
	Sky Q	Sky+	Virgin V6	BT TV	TalkTalk	Freeview	Freesat	YouView	Samsung	Sony	LG	Fire TV	Apple TV	Now TV	Xbox One	PlayStation 4	Android TV
Free-to-air channels	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	~
Acquisition	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗ (1)	✗	✓	✗	✗	✗
Revenue sharing	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✗
Links to third party apps	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
App store	✗	✗	✗	✗	✗	✗	✗	✗	✓ (2)	✓ (2)	✓ (2)	✓	✓	✗	✓	✓	✓

Sources: Desk research of platform owners' websites and industry press
Notes: (1) User may have access to content that Amazon has acquired via Fire TV if they are an Amazon Prime Video subscriber; (2) Smart-TV app stores have significantly less apps than those of the major connected devices

Pay-TV operators source content from multiple providers. The most advanced now aggregate content from national and international services

A+B. Pay-TV business models

Pay-TV

Platform	Monetisation	Content provision
Sky Q Sky+	Subscriptions Transactions Advertising	Free-to-air channels Acquisition Revenue sharing Third party apps
Virgin V6	Subscriptions Transactions Advertising	Free-to-air channels Acquisition Revenue sharing Third party apps
BT TV	Subscriptions Transactions Advertising	Free-to-air channels Acquisition Revenue sharing Third party apps
TalkTalk	Subscriptions Transactions	Free-to-air channels Acquisition Revenue sharing Third party apps

- Pay-TV operators **generate revenues from subscriptions**, and may also have **large advertising operations** (e.g. Sky), helping to further monetise their audiences.
- To retain customers, and maximise the time they spend on the platform, pay-TV operators **invest heavily to provide a broad range of content and an engaging user experience**. There may also be an incentive for pay-TV operators to highlight exclusive content, unavailable elsewhere, to demonstrate their value.
- In the UK, pay-TV operators acquire the rights to a range of programming from domestic and international content providers. The leading platforms also **provide access to most major streaming services**, including the main PSB players and Netflix.
- To exert more control over elements of the user experience, pay-TV platforms are **increasingly aggregating and/or ingesting content from within third party apps**. For example, Sky Q released an 'ultimate on demand' package in 2018 which includes Netflix content surfaced within Sky Q interface alongside other third party content.
- Pay-TV platforms tend to be closed, meaning the **user has limited ability to install additional third party apps**.

The major free-to-air platforms are providing increasing volumes of on-demand content, alongside linear channels

A+B. Free-to-air business models

Free-to-air

Platform	Monetisation	Content provision
Freeview	Platform fees	Free-to-air channels Third party apps
Freesat	Platform fees	Free-to-air channels Third party apps
YouView	Hardware sales Platform fees	Free-to-air channels Third party apps

- The major UK **free-to-air platforms are each jointly-owned by a variety of industry participants**, including the PSBs, tech providers (Arqiva) and pay-TV platforms (Sky, BT and TalkTalk) (1). Each has a different principal activity;
  - **Freeview** manages the EPG license and allocates channel numbers. The development of Freeview and Freeview Play is overseen by Digital UK;
  - **Freesat** provides a universally available free-to-air satellite platform;
  - **YouView** develops the YouView platform for its own service, and those of BT and TalkTalk.
- Each platform **generates revenue from hardware sales and/or platform fees** levied on broadcasters (including their shareholders).
- To attract viewers, **free-to-air platforms are investing in their user experience and content offering**. To meet audience expectations, this means that **more recent versions of each platform provide access to the major PSB streaming services**(2) and, in some cases, aggregated content from within them.
- Freesat and YouView also provide access to the Netflix app.

Notes: (1) Digital UK, which oversees the development of Freeview and Freeview Play is owned by BBC, ITV, C4 and Arqiva; Freeview itself is owned by DTV Services, a joint-venture between BBC, ITV, C4, Arqiva and Sky; Freesat is owned by BBC and ITV; YouView is owned by BBC, ITV, C4, C5, Arqiva, BT and TalkTalk; (2) The exception to this is Freesat, which does not provide access to All4

Smart-TV manufacturers operate in a highly competitive market, and are seeking to develop increasingly sophisticated UIs as a means of product differentiation

A+B. Smart-TV business models

Smart-TVs

Platform	Monetisation	Content provision
Samsung	Hardware sales	Free-to-air channels Third party apps App store
Sony	Hardware sales Transactions	Free-to-air channels Third party apps App store
LG	Hardware sales	Free-to-air channels Third party apps App store

- Smart-TV manufacturers **generate revenues from hardware sales** and, in some cases, the sale of content through their store (e.g. Sony/PlayStation). Some may also receive fees for the installation of hardware shortcuts to specific services (outlined in the Control section).
- As the TV market becomes more competitive, manufacturers are **increasingly attempting to differentiate themselves on their user experience and content selection**.
- As a result, most Smart-TVs arrive with **major international and domestic streaming services pre-installed**, including Netflix, Amazon Prime Video and the PSB services. This is largely driven by consumer expectations and preferences.
- Most of the major Smart-TV manufacturers (e.g. Samsung, LG) have **developed their own proprietary TV operating systems and app stores**.
- Others, including Sony, have opted **to deploy the Android operating system** and, as a result, use the Google Play Store.

Connected device manufacturers monetise their UIs in a variety of different ways, including subscriptions, transactions and advertising

A+B. Connected device business models

Connected devices

Platform	Monetisation	Content provision
Fire TV[1]	Hardware sales Transactions Advertising	Revenue sharing Third party apps App store
Apple TV	Hardware sales Transactions Advertising	Revenue sharing Third party apps App store
Now TV	Hardware sales Subscriptions Transactions	Acquisition Revenue sharing third party apps
Xbox One	Hardware sales Transactions Advertising	Revenue sharing Third party apps App store
PlayStation 4	Hardware sales Transactions Advertising	Revenue sharing Third party apps App store

- Connected device manufacturers generate some revenues from hardware sales, though their **focus tends to be on monetising ongoing use of their platform** through subscriptions, transactions and advertising.
- Connected devices **adopt a variety of business models**, including;
  - Pure-play subscription (Now TV);
  - Complementary subscription services (Fire TV);
  - Transactional sales (most major devices);
  - Advertising/promotion (Fire TV, Apple TV, Xbox, PlayStation).
- Most connected devices **allow users to download additional third party apps from large app stores**. The selection can extend beyond streaming services, into gaming and other media[2]. Nevertheless, **major streaming services are often pre-installed** – including Netflix and, in some cases, PSB services.
- Like Smart-TVs and pay-TV platforms, connected **devices have an interest in meeting consumer expectations** around the availability and accessibility of popular content and services.

Notes: (1) Amazon generates subscription revenues from Fire TV users when they are an Amazon Prime Video subscriber; (2) Xbox and PlayStation offer a range of subscription gaming services

Google, Amazon and Apple are each investing in a portfolio of TV products and services, allowing them to offer proprietary content via their own global TV platforms

C. International TV platforms

	Google	Amazon	Apple
TV products and services	• **Chromecast:** Low price streaming device that links laptop/mobile to TV. • **YouTube Premium:** Ad-free, subscription service including YouTube original content and music. • **Android TV:** TV operating system used by Smart-TVs and pay-TV platforms.	• **Prime Video:** Subscription service including Amazon original content. • **Amazon Channels:** Content packages available for an additional fee via Prime Video. • **Fire TV:** TV operating system (running on Fire TV hardware), increasingly integrated with Alexa voice control.	• **Apple TV:** TV platform, providing third party apps and content. • **Apple TV App:** Streaming app (available on Apple devices), offering aggregated content from third party apps. • **Apple TV+:** Streaming service with additional content packages, launching in late '19.
Recent developments	• **Android TV** is rapidly gaining market share, with 140 pay-TV partners, plus a smaller number of Smart-TV manufacturers[(1)]. • YouTube Original content, currently available within **YouTube Premium**, will be made available to all YouTube viewers (ad-supported) by 2020.	• Amazon recently launched the **Fire TV Cube** in the US, a home hub with integrated **Fire TV** capabilities.	• Once launched later this year, **Apple TV+** will include original content, much like Netflix and Prime Video. • Apple has also announced that its **Apple TV App** will introduce third party subscription packages, to be called **Apple TV Channels**. • **Netflix** has announced it will not be part of the expanded **Apple TV** services.

Sources: Public announcements; Trade press
Notes: (1) According to recent Google announcements (March 2019)

Report contents

Industry participants expect a trend towards increasingly personalised UI design, and the emergence of new types of UI based on emerging technologies

Predictions on the design of future TV UIs

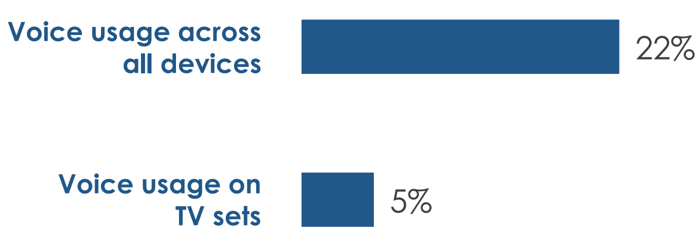
New UIs and adoption of smart devices	Home assistants become hubs for users to access and control a range of entertainment (including TV) and other services	*"You will have a Google home app [or equivalent from Amazon, Apple] that will bring together lots of different services all controlled from the same place"*, Content provider
	Casting of content from mobiles, tablets and other smart devices to TV screens bypasses TV user interfaces	*"Casting [VOD services] from mobiles to screens is a much bigger issue to prominence than anything on TV"*, TV platform
	Penetration of Smart-TVs and other connected devices increases	Smart-TVs were expected to reach 70% of all TV shipments globally in 2018
Presentation of services and content	UIs shift from presentation of services to presentation of aggregated content	*"What we're currently seeing is a shift from a wall of channels and apps [to] an integrated content experience"*, Tech provider
	Algorithms running recommendations and search become increasingly sophisticated	*"The technology and algorithms supporting search and recommendations are evolving incredibly quickly. They're not perfect but they're getting better and better"*, TV platform
	Linear/VOD crossover, with linear streaming channels users can personalise (e.g. restart, pause, skip)	*"There's a whole range of possibilities in-between live and VOD like the ability to modify a 'live' schedule"*, Content provider

Sources: Based on predictions from off-the-record interviews with industry participants; IHS Markit (July 2018)

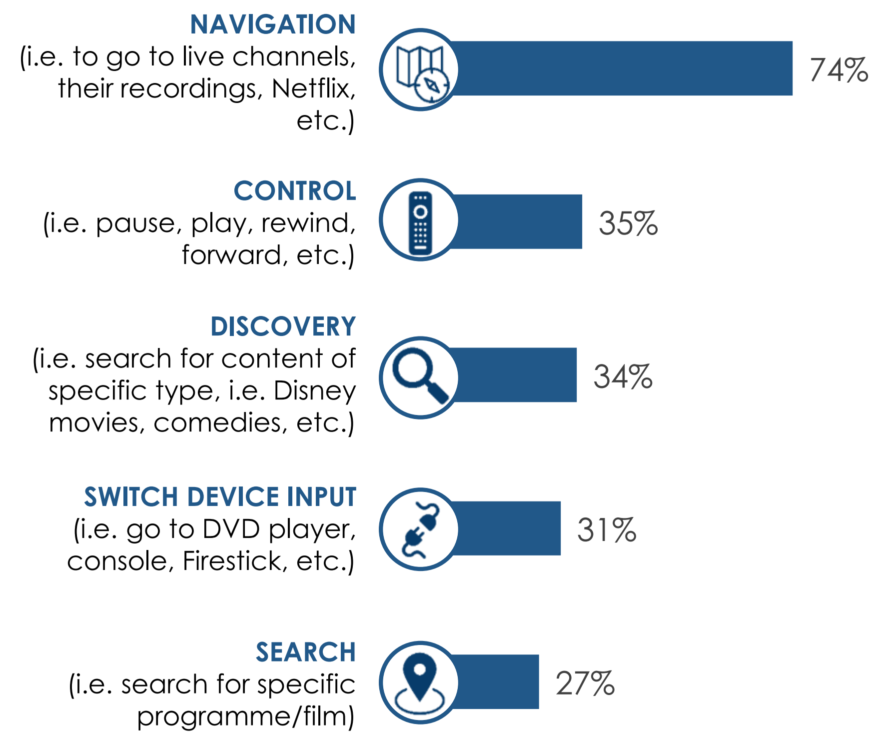
Uptake of voice is relatively limited at present and its primary use is for simple navigation

Current usage of voice navigation

Voice usage on TV is relatively limited



Voice is most often used for navigation



Although, there are indications voice is growing quickly on some platforms

> *"Voice is a huge enabler - we have seen that. The uptake of voice has been really, really positive, and continues to grow month on month"*, TV platform

Sources: Mobile Marketing Magazine, Jan 2019; MTM ScreenThink (n=3,006)

Industry opinion varies, but many are bullish about voice uptake in future and anticipate increasingly sophisticated use cases

Predictions on the future of voice navigation

Many are bullish about voice uptake

"Voice is increasingly going to be a hygiene factor for TV platforms ", Tech provider

"Usage [of voice] on our platform is growing exponentially… it will become mainstream ", TV platform

Although some point to significant barriers

"We are in the foothills when it comes to voice integration, it's very messy … there are a whole bunch of technical and commercial issues to getting these recommendations to accurately work", TV platform

Increasingly sophisticated use cases are expected e.g.:

Two-way conversations

"Right now voice is only incremental to text search… where it really comes into its own is when users can have a two-way conversation with their devices as they find what to watch", TV platform

Voice biometrics

"Voice biometrics mean you will be able to tell if someone is old or young, male or female and use that for personalisation", Tech provider

Sources: Based on predictions from off-the-record interviews with industry participants

Market dynamics, such as the rising influence of international services and tech providers, will continue to influence how UIs evolve

Predictions impacting the control of future TV UIs

Market participants

New international content providers enter the UK market and/or expand their offering e.g. Disney, Warner

"There are going to be more deep-pocketed global content providers – that trend is only going in one direction", Content provider

International tech companies expand their TV platform offerings e.g. Apple, Amazon

Apple recently announced Apple TV+ a new TV and film streaming service that will sit alongside the existing Apple TV connected device offering

Dynamics between content providers, TV platforms and tech providers

Increased aggregation of content on TV platforms and increasing integration

- At minimum sharing meta-data
- Potentially sharing of usage data and content ingestion

"I think we'll see a move towards universal search and recommendations … there are barriers though – content providers don't want to put their destiny in someone else's hands, they're concerned about how the algorithms work, brand safety is an issue, they'll want to see user data", Tech provider

More TV platforms rely on global tech providers for operating systems and role of tech providers increases

"The emergence of Android TV as a platform is significant, that's the biggest change I see on the horizon", TV platform

Sources: Based on predictions from off-the-record interviews with industry participants

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The following models were evaluated for this project during the design testing

Models tested

TV platform	Model tested	Model year
Sky Q	Sky Q set-top box	2016
Sky+	Sky+ set-top box	2001
Virgin V6	V6 set-top box (TiVo)	2016
BT TV	BT YouView set-top box (Humax)	2014
Freeview	Freeview set-top box (Manhattan T1)	2018
YouView	YouView integrated Sony Smart-TV & BT YouView set-top box (Humax)	2016 / 2014
Samsung	6 Series LED Smart-TV	2017
Sony	Sony Bravia 4K TV	2016
LG	LED Smart-TV 4K Ultra HD	2017
Fire TV Stick	Fire TV Stick 4K (2nd Generation)	2015
Apple TV	Apple TV 4K 32GB	2017
Now TV	Now TV set-top box	2016
Xbox One	Xbox One	2013
PlayStation 4	PlayStation 4	2013

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