TV interfaces & vulnerable users

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Research Annex

By Projects by IF, for Ofcom

if

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0. Introduction

Introduction

Ofcom commissioned Projects by IF to:

1. **Define what vulnerable means and how it manifests when thinking about TV interfaces.**

2. **Understand:**
   a. **which elements of traditional TV services vulnerable viewers particularly value;**
   b. **and which elements of internet delivered services might meet their needs more fully.**

3. **Create initial design principles for developing future TV interfaces that are inclusive and accessible to all customers**

This is an annex to the Executive Summary of the report.

All content in this annex was provided with an appropriate level of consent and protects the confidentiality of research participants.

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Research objectives

1. To understand the role TV plays in a vulnerable customer's life.

2. To understand the needs and requirements of vulnerable users when using TV interfaces, including accessibility and ease of use.

3. To identify potential barriers and challenges for vulnerable users when using current TV interfaces.

4. To assess the potential benefits and drawbacks of different interface patterns currently used by vulnerable people.

5. To determine what, if any, emerging technologies, like voice or gesture control, currently play in the watching behaviours of vulnerable people.

6. To explore how current TV interfaces could be improved.

Methodology

Twelve user-led, semi-structured, contextual interviews conducted in participants' homes focusing on key journeys: browsing, searching, watching and use of subtitles.

Moderator probed for:

▸ **Use of access features / issues caused by other vulnerabilities**

▸ **Navigational devices**

▸ **Comprehension of different design patterns**

▸ **Unused features or alternatives routes that a participant could have used**

▸ **Expectations of functionality that exist across multiple services**

Sample

Based on IF's experience with researching with people with vulnerabilities we hypothesised that the primary indicator of vulnerability in TV consumers would be people who were not working. We expected this indicator to find people both of working age and above working age, but refined this through welfare-based screening questions. Secondary criteria were designed to broadly capture a range of people that may have different vulnerabilities.

Primary criteria:

▸ **12 adults who were not working**
  ▹ **6 people receiving universal credit**
  ▹ **6 people receiving pension credit**
▸ **TV usage:**
  ▹ **4 x Digital Terrestrial Television (DTT) only**
  ▹ **4 x DTT users plus one streaming service**
  ▹ **4 x DTT users plus multiple streaming services**

Secondary criteria:

▸ **Equal mix of men and women**
▸ **At least four people of colour**
▸ **Geographic spread of cities, towns, rural areas across SE, SW and NE England**
▸ **Key exclusions:**
  ▹ **Low usage TV users**
  ▹ **Homes with children**

Expert interviews

As well as conducting primary research, we also spoke to six experts to understand, in more details, the issues in this space:

▸ Four people from commercial TV companies, two of whom had specific responsibility for accessibility.

▸ Two external experts in accessibility and vulnerable customers.

Limitations of research

▸ **This research is based on deep observational research of a small number of participants.**

▸ **This research was not designed to quantify different types of vulnerability.**

▸ **We attempted to recruit more customers who were dependent on Digital Terrestrial Television (DTT), but found them hard to recruit. If we found it difficult it is likely that TV interface design teams will also find recruitment of these customers, for example for participation in research and testing, difficult.**

▸ **We used a recruitment agency to find user research participants. This may have missed some groups of people that are not visible to recruitment agencies. A follow-on study could explore non-traditional forms of recruitment, for example through specialist charities and community groups.**

▸ **We recruited industry expert interviewees from UK-based television service providers. A more future-looking view may be discovered through expert interviews with non-traditional video content service providers.**

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Vulnerability framework

▸ **One of the primary objectives of the research was to understand how vulnerability might manifest in the specific context of TV use.**

▸ **The research discovered a framework with three key areas of vulnerability, each with subareas:**
  ▹ **Demographic: age, poverty and loneliness**
  ▹ **Impairments: cognitive and dexterity issues**
  ▹ **Literacy: reading, digital and cultural**

▸ **The following section describes each of these sub-areas and for each provides:**
  ▹ **A short description**
  ▹ **A headline statistic to understand the potential size of each sub-area**
  ▹ **Observed behaviours and quotes from user interviews**

▸ **This research did not consider sight and hearing impairments as this is already subject to research by Ofcom and others.**

Vulnerability framework

An individual or household may combine multiple characteristics from this framework.

DEMOGRAPHICS	IMPAIRMENTS	LITERACY
Age People's age is a predictor of multiple other types of vulnerability.	**Sight / hearing** People who have sensory impairments that affect how they can access television. Covered by other Ofcom research.	**Reading** People with low reading skills that affect how they can read text content in television interfaces.
Poverty People who are not working or struggle to afford television and other basic services.	**Cognitive** People who have cognitive impairments that affect how they can access, use and understand television interfaces.	**Digital** People with low digital skills that affect how they can access and use television interfaces.
Loneliness People who want more social contact and use television as a way of generating it.	**Dexterity** People who have physical impairments that affect how they can use television devices.	**Cultural** People whose needs are less well met by the dominant culture within UK television services.

Indicators of extent of vulnerability in the UK population

DEMOGRAPHICS	IMPAIRMENTS	LITERACY
Age: 11.9m (at pension age, ONS)	**Sight / hearing: not quantified** (covered by other Ofcom research)	**Reading: 8.1m** (very low literacy, OECD 2016)
Poverty: 11m (before housing costs, DWP)	**Cognitive: 2.1m** (learning, DWP)	**Digital: 14m** (very low/low digital capabilities, Lloyds)
Loneliness: 4.2m (often/always feel lonely, ONS)	**Dexterity: 4m** (dexterity, DWP)	**Cultural: not quantified** (no statistics found)

	CATEGORY	OVERVIEW	OBSERVED BEHAVIORS		
DEMOGRAPHICS	**Age** People's biological age is a predictor of multiple other types of vulnerability.	Older people were more likely to be lonely, to have age-related impairments and to have digital literacy issues. When combined these issues often meant they were fearful of new technology and resistant to change.			
	Poverty People who are not working or struggle to afford television and other basic services.	People in poverty are more likely to have difficulty accessing digitally delivered TV because of the costs involved in buying compatible hardware, paying for broadband and subscription costs to paid for streaming services.	Cannot afford to pay for the internet, or choose a slower package because it is cheaper.	Use jailbroken technology to watch pirated material because it is cheaper.	Unable to pay for subscription services / share passwords with friends and family.
	Loneliness People who want more social contact and use television as a way of generating it	Almost half the respondents in this study used the TV to reduce their loneliness and increase contact. Participants liked the 'feeling of company.'	TVs were often turned on and left on from morning until bedtime even if they were not being actively watched.		

Quotes from users with a demographic vulnerability

" I'm 80, I know I should get involved with it all [the internet] but I'm 80. I'm always worried about pressing the wrong button. I'd press the wrong button on a bank and all my money would all get wiped off."

— **White British Man, Bristol, 80**

" Whole point of coming away from Sky was to save money. Used to spend £50 a month on Sky, then found streaming and it was cheaper. Bought a smart TV and it made my life easier."

— **Black British Woman, Bristol, 32**

" It might sound stupid, but I like the TV on when I'm home, it's a bit of movement, so you don't feel by yourself. I sometimes don't even have the sound on."

— **White British Woman, Hull, 72**

" I'm from Yorkshire, I wouldn't buy a new TV 'til this one conked out."

— **White British Man, Hull, 52**

	CATEGORY	OVERVIEW	OBSERVED BEHAVIORS		
IMPAIRMENTS	**Sight/hearing** People who have sensory impairments that affect how they can access television.	Not applicable.	Couldn't read on-screen text.	Unaware they could use subtitles.	
	Cognitive People who have cognitive impairments that affect how they can access, use and understand television interfaces.	As people get older they are more likely experience cognitive issues, but age is not the only cause. In this study we saw evidence of both age-related cognitive decline and memory issues caused by long-covid.	Found the cognitive load of 'busy' interfaces (typically paid for streaming services) taxing to navigate.	Difficulties tracking what they were watching on which platform.	Struggled to use multiple remotes.
	Dexterity People who have physical impairments that affect how they can use television devices.	Users with arthritis, tremors and amputated fingers found it difficult to use remote controls easily.	Could not accurately press the button they wanted / accidentally pressed the wrong button.	Had to focus on the remote when using it, often missing on-screen prompts.	Struggled to grip smaller, narrower remotes.

Quotes from users with an impairment vulnerability

" I wish the buttons were bigger and had more space between them, like on the phone my daughter bought me... I've got the shakes, it's hard to hit the right button."

— **White British Woman, Hull, 87**

" It's [Firestick interface] information overload–like picking a take away, spend too long looking at Deliveroo and you end up not knowing what you want. I sometimes switch the TV on and turn it off again twenty minutes later without watching anything."

— **Black British Woman, Bristol, 32**

CATEGORY	OVERVIEW	OBSERVED BEHAVIORS		
COGNITIVE				
Reading People with low literacy skills that affect how they can read text content in television interfaces.	People with lower literacy levels and/or English as a second language had difficulties navigating text based EPGs and using search functions.	Older EPGs often entirely text based, making it difficult to understand key information.	Users with lower literacy tended to prefer the more visual cues in other design patterns (recommendation rails / video previews / half page ads etc)	Often misspelled words when typing into search reducing the likelihood of finding what they wanted.
Digital People with low digital skills that affect how they can access and use television interfaces.	People have difficulties in accessing, navigating and paying for digital TV. Low digital literacy often compounded by a fear of 'pressing the wrong button' and causing irreparable damage.	Unable to use a d(directional)-pad to navigate on-screen UI.	Unused to browsing large content repositories and find them overwhelming	When things go wrong, freeze and do not know how to rectify problem themselves. Reliance on others.
Cultural People whose needs are less well met by the dominant culture within UK television services.	EPGs often provide very little contextual information about individual programmes, while cultural assumptions can be encoded into navigational mechanisms like genres. Some people, particularly from non-British backgrounds, can find this disenfranchising.	Watch a few minutes of a programme to assess its suitability because the title / information provided isn't sufficient.	Default to streaming services with richer / more visual ways of providing information: title tiles, video snippets, genre markers, ratings, recommendations etc.	Rely on people with more cultural knowledge to navigate.

Quotes from users with a cognitive vulnerability

" I don't use search.
My spelling's rubbish."

— **Arabic British Woman,
London, 52**

" [To use Netflix]
you've got to prat
about with passwords
and things like that.
So for a novice, like
me, it would be very
difficult. I can't be
bothered. There's fifty
odd channels now, I
mean we only used to
have four. You've got
a lot more choice."

— **White British Man,
Hull, 78**

" Because the content
isn't familiar, I don't
know what I'm getting
into. Sometimes I can
be twenty minutes
into a programme, and
I say, 'I don't want to
watch this rubbish'."

— **British Asian Woman,
Hull, 53**

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User types

▸ From the research three user types were created to demonstrate how specific issues combine to produce common sets of needs, barriers and opportunities.

▸ These user types have been constructed from observations made in field and are composites of multiple respondents.

▸ They are designed to help contextualise the research findings and provide a springboard for people designing services that contain TV interfaces or for user-centered policy design.

▸ With each user type is provided a:
  ▹ persona
  ▹ predominant navigational pattern
  ▹ case study
  ▹ set of barriers

Persona 01: Schedule Bound

PERSONA 01

Schedule bound

Overview

Older users who structure their day using TV schedule. TV very important for combating loneliness.

Watching habits

Watch DTT exclusively. Narrow range of sources, prefer 'classic' channels: BBC, ITV, Ch 4. Focus on entertainment and news.

Digital literacy

Very low digital literacy.

Hardware

Use an unconnected TV that they have had for a long time. Controlled with a 'bar' remote. May have a VHS or DVD player that they no longer use.

Vulnerabilities

Multiple age related impairments, sight issues, hearing loss, dexterity issues, memory loss, some cognitive decline.

Schedule bound users most likely to navigate using channel numbers and information overlay panels (see next page)

Behaviors

Have a highly habituated schedule of TV watching; they know which programmes they want to watch throughout the day.

Mostly navigate using channels numbers to go directly to programmes.

Occasionally use the programme +/- buttons to browse channels.

Do not use the EPG.

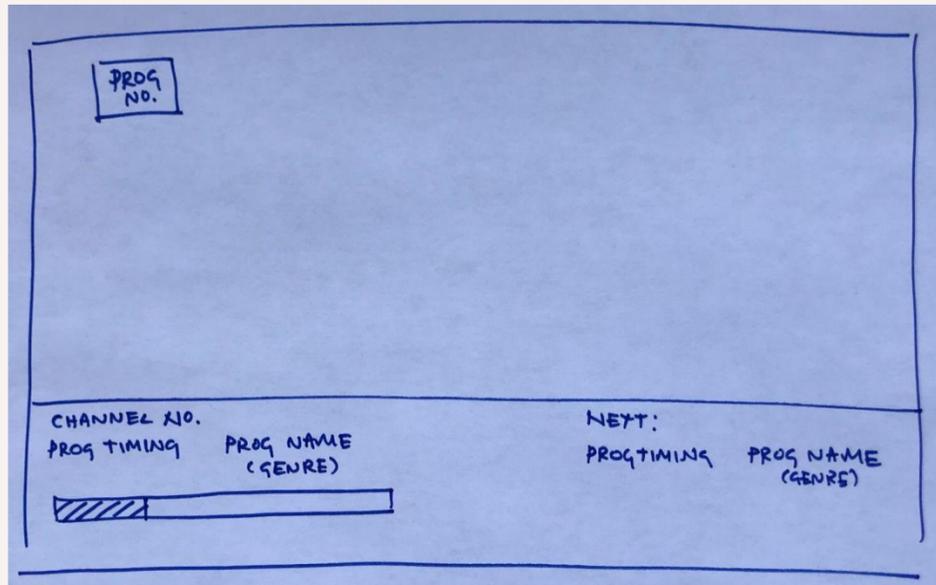TV always on for company.

Needs

Companionship. Often housebound and lonely and do not see many people from day to day.

TV schedule provides a way of structuring their day.

Familiar programmes that are not too demanding, can find highly plotted multi-episode dramas too difficult to engage with.
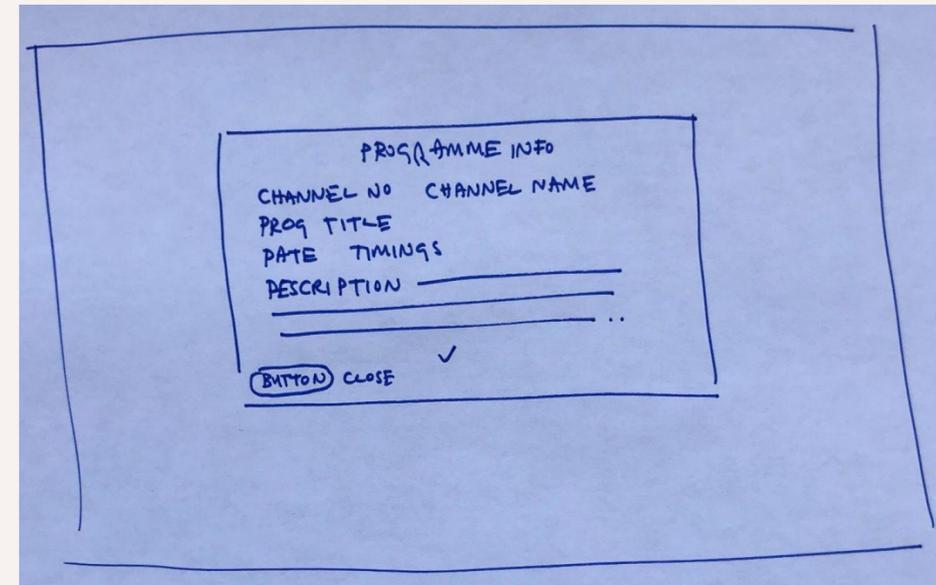
Channel numbers and info overlays
Predominant navigational pattern

Channel number shown in top left of screen

Programme name, timing and elapsed time shown at bottom of screen for a few seconds after launch

Pressing an info button brings up more programme details if needed: channel number, programme name, timings, elapsed time, textual description.

Overview

Simplest way of navigating a TV. Users type the number of the channel using the numerical keypad on the remote. When the channel loads it displays an info overlay at the bottom of the screen for a few seconds.

Interface metaphor

Manual TV controls, channel buttons and volume knobs.

UI elements

Channel number dialogue box on top right of the screen.

Info overlay at the bottom of the screen with channel number, channel name, timings, elapsed time bar and what's up next.

Common issues

Info overlay often doesn't have enough information for users to assess suitability of the programme forcing them to click into an info dialogue box
Users, who navigate exclusively with channel numbers / programme +/- buttons lack an overview of what is currently showing

"Margaret"

- ▸ White British woman, 84
- ▸ Lives alone
- ▸ Unconnected TV
- ▸ Never been online

" I'm happy with what I've got, I don't want to have to faff with more remotes or what-not."

"Margaret" lives alone in small seaside town on the East Coast of Yorkshire. She has mobility issues, so she doesn't get out as much as she used to.

Her neighbours pop in most days to see how she is, and her daughter lives nearby, but she still spends a lot of time on her own and can feel lonely. She likes to have the TV on 'for the company', even if she's not actively watching it.

She watches the same things everyday on the PSB: morning, lunchtime and afternoon news; quizzes in the late afternoon and then soaps in the early evening.

She doesn't watch flagship drama programme anymore as she finds it hard to follow complex plots.

She wishes her remote had the big buttons like the land-line phone her daughter bought for her. Her arthritis and tremors makes it hard to hit the buttons accurately and she often ends up on the wrong channel.

She isn't aware that her TV has subtitles even though she is hard of hearing.

She's seen Disney+ and Netflix at her daughter's house but isn't interested in them. The programmes on streaming services don't appeal to her and the choice feels overwhelming.

Key Findings:

- ▸ TV is a lifeline for disabled people providing access to news, information and companionship.

- ▸ Never been online and fearful of new technology.

- ▸ Very low digital literacy, doesn't know how to use a d-pad to navigate an EPG.

- ▸ Doesn't know that there are access services on her TV.

Barriers

▸ **Does not have internet**

▸ **Has not learned essential digital skills that would be essential to watching digital TV**
  ▹ **Never navigated a user interface**
  ▹ **Never made an online payment**
  ▹ **Never downloaded an app**
  ▹ **Never set up a user profile**

▸ **Fearful of technology and resistant to change**

▸ **Finds it hard to read text on-screen**

▸ **Finds it hard to use buttons on remote control**

▸ **Do not use, nor know, about access services that may help**

▸ **Struggles to afford broadband, new hardware or subscription services**

Persona 02:
DTT as library

PERSONA 02

DTT as library

Overview

Older users who treat DTT like a library of familiar content.

Watching habits

Watch a broad range of DTT channels, mostly those showing drama, documentaries and films.

Digital literacy

Medium level of digital literacy. Have a smartphone and used to surfing the web.

Hardware

Use an unconnected TV that they have had for a long time. May have a PVR and DVD. Controlled with multiple remote.

Vulnerabilities

Multiple age related impairments, sight issues, hearing loss, dexterity issues, memory loss, some cognitive decline.

Majority of users who watch DTT use programme numbers and EPGs to browse programmes

Behaviors

Primarily watch drama, films and documentaries on channels like Legend, GREAT! Movies, GREAT! Action.

Less scheduled watching. Only browse for content when they want to watch something. May buy a listings magazine.

Navigate using the EPG to find something to watch in the moment or to search for something to record.

Needs

Like the previous persona, uses the TV for companionship.

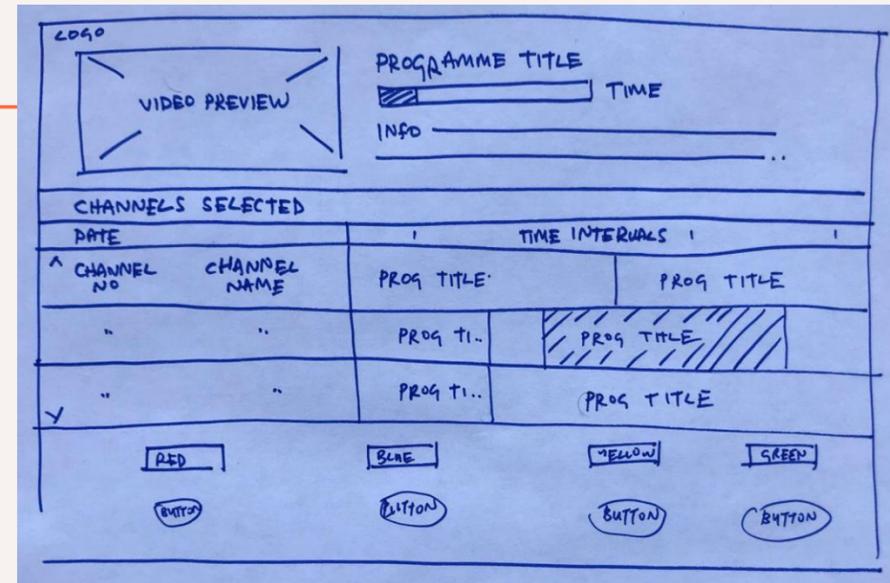To find films, documentaries and drama series that are interesting and engaging.

EPGs
Predominant navigational pattern

Info panel

More modern EPGs may have a video preview panel, but the majority in this study did not.

Programme title, timings, elapsed time indicator and short description of selected programme.

Programme grid

List of channel numbers, channel names. Grid of programmes by time.

Shortcut reference panel

Guide to hardware shortcuts

Overview

Majority of users who watch DTT use a combination of channel numbers and EPGs. EPGs are navigated using the d-pad and select button on the remote control. Quality varies hugely by device and age.

Interface metaphor

Newspaper listings / listings magazine.

UI elements

Info panel with programme name, timings, brief description and, sometimes,

a video preview.
Programme grid sorted by channel date and time.
Shortcut references panel, mostly ignored by participants.

Common issues

Information panel often doesn't not have sufficient detail.
Text on older EPGs sometimes too small or too low contrast to easily read.
Some users with lower digital literacy do not understand how to use the select button. These people find the channel they want to watch, dismiss the EPG and then type in the channel number.
Can be laborious to return to 'now' if you scroll into the future.
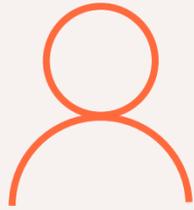
"Bill"

▸ White British man, 78
▸ Lives alone
▸ Unconnected TV / PVR
▸ Access the internet on his phone and laptop

" To get Netflix, you've got to prat about with passwords and things like that. So for the novice it would be very difficult."

"Bill" lives on his own on a council estate in Hull. Since his wife died a few years ago, and his son died last year, he struggles to keep himself busy. He recently started to volunteering for his local fishing group.

He can't afford to upgrade his TV or PVR even though they're both over fifteen years old. He believes things should be repaired whenever possible and not replaced.

He uses two EPGs, Freeview through his TV and Freesat through his PVR. Mostly uses the TV EPG, but will use the PVR if he wants to watch something in HD (sport or documentaries for instance). He finds it annoying that the channel numbers are different on the EPGs.

He doesn't have a set schedule for watching TV. He buys a TV listings magazine to find and record dramas, documentaries and films that he is interested in.

HIs friend recently gave his a chromecast dongle and downloaded the House of Dragons onto his laptop. He got it working a couple of times and enjoyed the series, but it seems to have stopped working and he doesn't know how to fix it.

He sometimes watches other streaming services at his friend's house, but isn't interested in getting them for himself: thinks he has enough choice already, doesn't know how he could access them on his hardware and is put off by the idea of having to set up a user profile.

Key Findings:

▸ Uses DTT as a repository of content

▸ Cannot afford to upgrade his hardware

▸ As more devices are plugged into a TV usability becomes exponentially more complex

▸ Although he is interested in content shown on streaming services, doesn't want to deal with signing up or logging in

Barriers

▸ **Cannot afford new hardware or subscription services.**

▸ **Issues navigating multiple piece of hardware with multiple UIs using multiple remotes.**

▸ **Often 'panic' and 'freeze' when they reach a screen they don't understand, worry about the consequences of doing something wrong and ask for advice from others.**

▸ **Find multiple streaming devices, remotes and interfaces overwhelming, would prefer a simpler setup to get to the content they want.**

▸ **Not used to setting up profiles and signing into services and find this very off-putting.**

Persona 03:
Streaming explorer

PERSONA 03

Streaming explorer

Overview

Users who watch PSB apps to 'catch-up' on TV they have missed and have treated themselves to a 'paid for' streaming service.

Watching habits

Mixture of DTT scheduled TV, catch up and streaming services.

Watching TV has to fit around other commitments (multiple PT jobs or caring responsibilities, for instance).
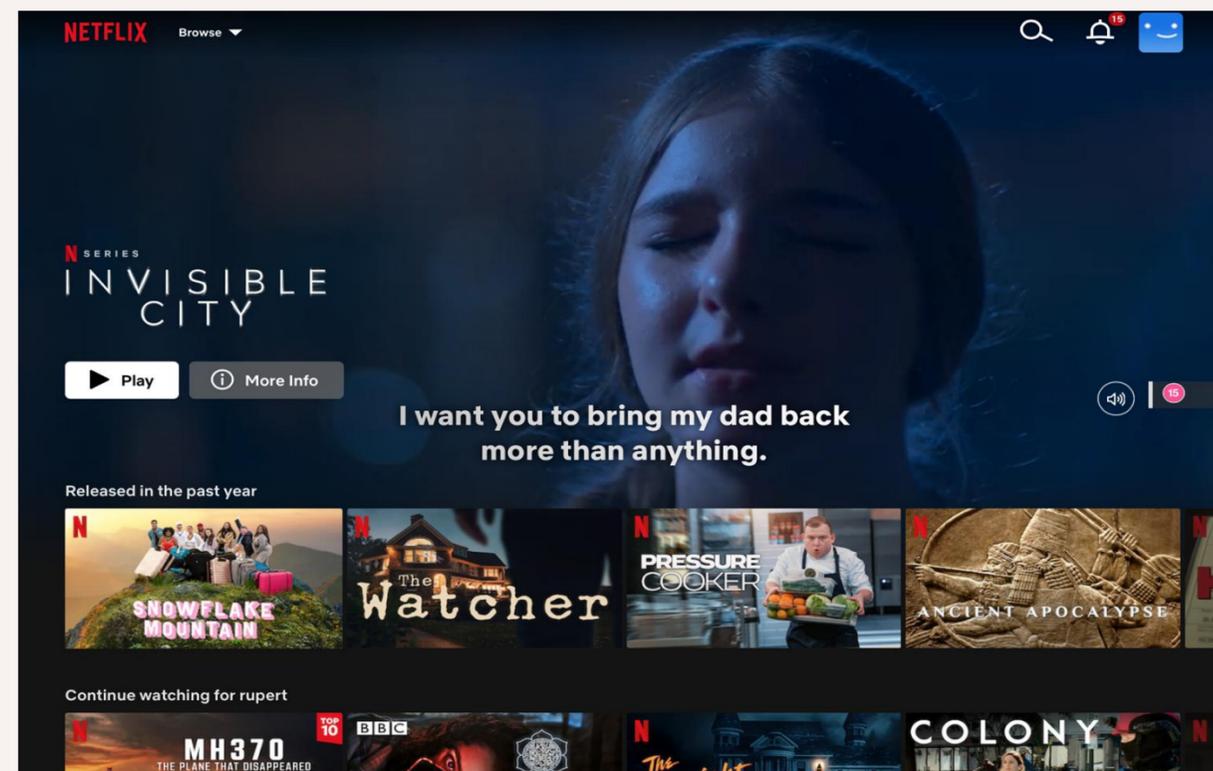
Digital literacy

Good. Likely to be using voice control on a smart speaker or their phone but not their TV.

Hardware

Either an unconnected TV with a stick, or an older Smart TV.

Vulnerabilities

Low income. Can be time poor and struggle to watch 'live' TV hence exploring streaming.

Comfortable using a mixture of design patterns to navigate their TV, channel numbers, EPGs and recommendation rails

Behaviors

Use sticks or boxes to turn their unconnected TV into a smart TV.

Browse for something to watch on multiple services, using multiple interfaces (FreeSat, All4, Disney+)

Use curated and personal recommendation features to help them navigate large content repositories.

May search for content on a phone / tablet and add to a favourites list to watch later.

Needs

Ability to watch TV when they want.

Reduced cognitive load from less fragmented hardware setup and an easier way to navigate between services.

Stable internet connection.
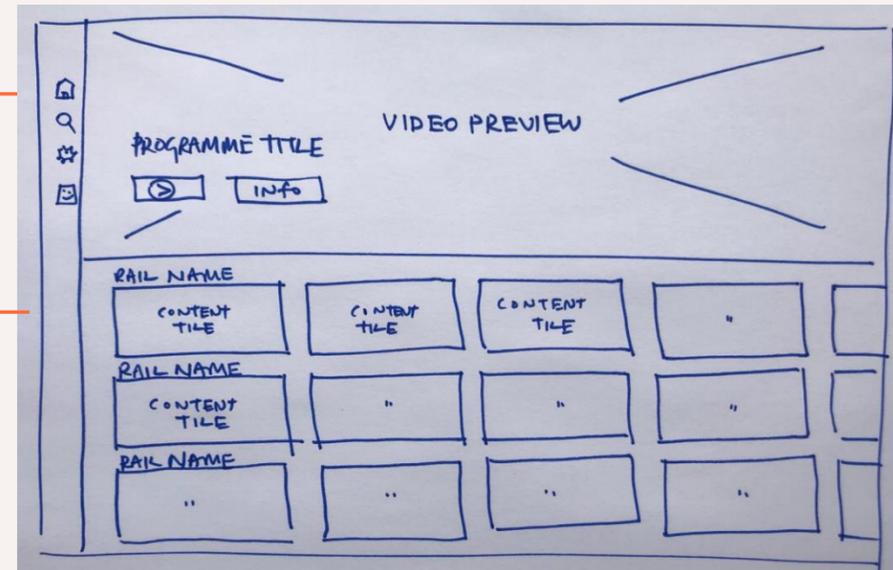
Recommendation rails
Predominant navigational pattern

Settings sidebar

Access to search, settings and profile

Recommendation rails

Each rail groups a specific type of content, for instance: continue watching, Top 10, recommended for you, or a specific genre

Programme info panel

Full bleed image or video preview snippet to show currently selected programme. Buttons to play or access more info.

Title tile

Tile for each programme or series image with the title incorporated.

Overview

Recommendation rails have become well established over the last decade as the primary way of navigating streaming services.

Interface metaphor

Video store, titles displayed on shelves.

UI elements

Rails, with programmes grouped by a common characteristic, for instance genre or recently released.

Title tiles with illustrative images.

Programme info panel to show more information about selected title.

Common issues

Interfaces have a high cognitive load and can feel busy and overwhelming.
Can be hard to read the title of a piece of content as it is embedded in the image on a tile.
Can take a long time to find watchable content, making it hard to find TV they want.
Increasingly need to set up an account and user profile to access the service..

"Rob"

- White British man, 52
- Lives with partner
- Smart TV / Firestick
- Has broadband at home

> " I only go to Firestick when I can't find anything on terrestrial. It's too busy with the apps. For me it's information overload. I have to go trawling through the apps."

"Rob" lives with his partner in a tower block in Hull. He used to be a postman but can no longer work as he has long covid.

They have two TVs in the living room, one in the corner for watching TV and one by "Rob's" chair that he uses for gaming. Neither TV is connected, but they were given a Firestick which is plugged into the main TV.

Although they have bought subscriptions to a couple of services (Netflix and Disney +) they prefer to watch freeview. They find it less demanding for two reasons: the interface is easier to navigate and the programmes are more familiar.

During the week they use TV to 'chill out', preferring to watch re-runs of old shows or light entertainment programmes that aren't too taxing and can be turned off easily. At the weekend they might watch more engaging drama on one of the streaming services they pay for.

"Rob's" partner is from the Philippines and likes to have the subtitles on, as that was how she grew up watching TV. She also finds it helps her understand some english accents more easily.

Key Findings:

- Cognitive issues due to long covid make it harder to engage with highly plotted programmes.

- Although they have subscribed to some streaming services their preference is for DTT.

- People with english as a second language find subtitles a useful comprehension aid.

Barriers

▸ **Fragmentation of services can make it harder for users to keep track of what they're watching.**

▸ **Combination of different hardware / different interfaces can make navigation very hard.**

▸ **Old technology means they cannot access some services they want, for example ITVX.**

▸ **Cost of paid for streaming service may mean they watch pirated material or share passwords.**

▸ **Broadband stability can affect ability to watch TV.**

▸ **Do not have time to watch 'live' TV when it's on.**

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TV interfaces

This section looks at the specific challenges associated with three key areas:

▸ **Connected TV interfaces**
▸ **Connected devices**
▸ **Remotes**

The challenges were identified through a combination of the user research, expert interviews and the team's expertise.

Connected TV interfaces

The native interfaces of connected TVs which bring together the three predominant navigational patterns.

Connected devices

Other connected devices, typically plugged into a TV's HDMI ports.

Remotes

Physical and smartphone remotes used to operate connected TVs and connected hardware.

TV interfaces

This section combines evidence from qualitative research with TV customers, research with industry experts, and IF's own expertise.

The following key is used to indicate the source of evidence for each slide.

C   **TV customers**

E   **Research with industry experts**

I   **IF's own expertise**

Connected TV interfaces

The native interfaces of connected TVs which bring together the three navigational patterns.

Connected TV interfaces

Over the last decade connected TVs have become the norm, bringing together the DTT signal with IP delivered services in the same interface.

Each manufacturer has designed their service in different ways leading to a huge variety of design patterns, functionality, quality of output, and access - or not - to third party services.

Controlling the interface through which customers watch TV has several commercial advantages: data mining, third party deals, and direct sales or rentals of content to customers.

EXAMPLE

Connected TV with DTT receiver

Like the majority of connected TV interfaces, this homescreen has kept the distinction between 'live' and on demand content with separate areas of the interface dedicated to each type of content.
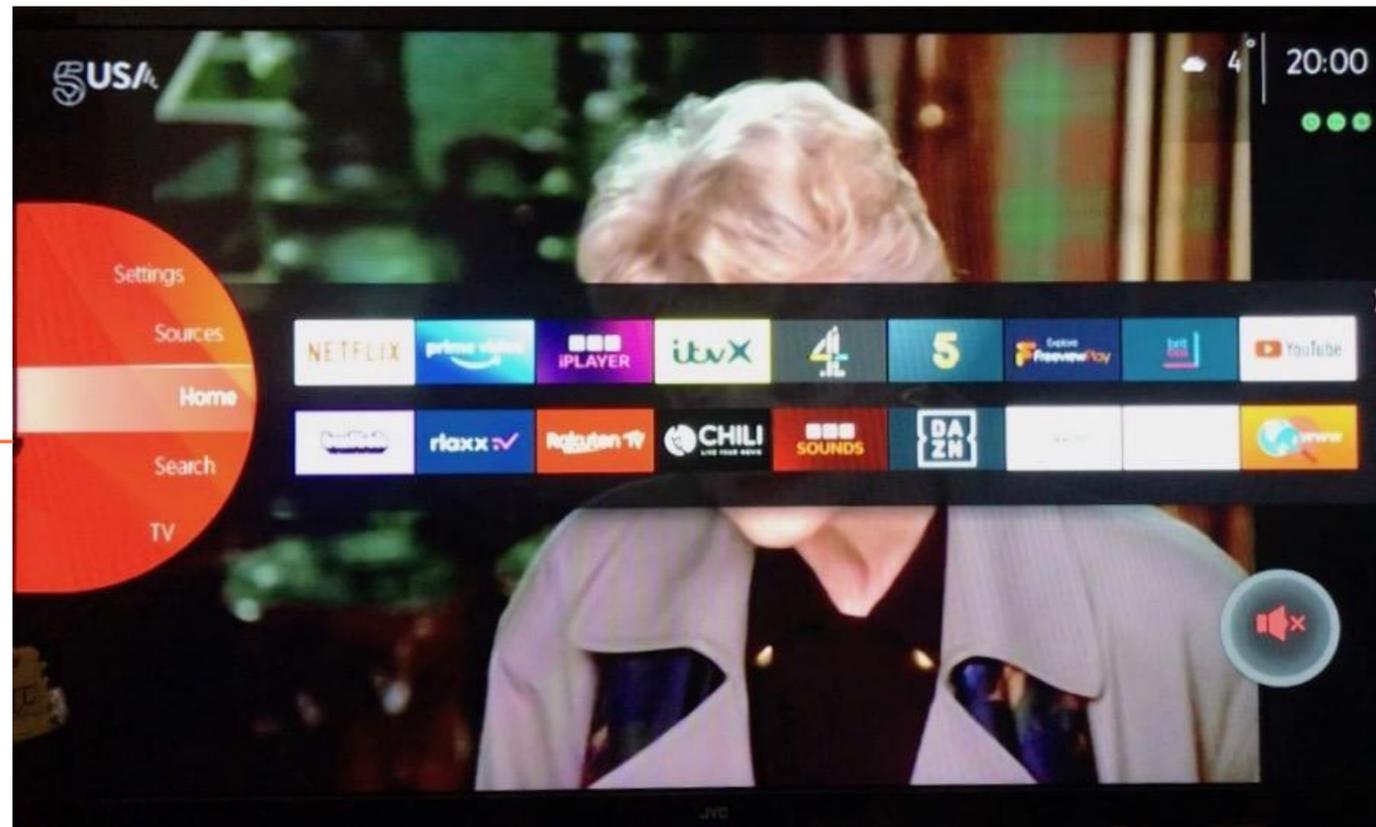
Interface splits out streaming apps, which are shown at the centre of this screenshot, from live TV, which can be seen lower down on the left-hand menu

Live TV playing in the background. This can be very distracting for people with cognitive impairments and some forms of neurodiversity

Interface is 'busy' live TV overlaid with streaming apps and navigation menu. It is hard to visually focus.

Live vs on demand, a false dichotomy?

We saw some interfaces that bring together live linear channels, catch up and on demand TV functions

▶ **Backward EPGs, that let a user scroll back in time to a programme aired earlier in the day and play it through a catch up app.**

▶ **Start-from-the-beginning feature. If a programme has already started user is asked if they want to watch the live stream or start from the beginning.**

▶ **Live rails. Rails of live content shown amongst VOD content. Seen on Sky and Amazon, for instance.**

As more content moves towards streaming it is likely that in the future only certain categories of content will be considered truly 'live', for example news programmes, sports events, or New Year's Eve celebrations.

How would you like to watch the live streaming?

Watch Live

Watch From the Beginning

Continue From Where I Left

Cancel

Nested Interfaces

Users have to open multiple services to search for the content they want to watch.

As well as providing some core services modern connected TVs also act as a platform for third party apps.

Customers have to browse multiple service to find the content they want to watch.

A customer may find it hard to locate specific content if they do not know which service it is being shown on.

Customer find it hard to keep track of what they are watching when it is split across multiple services with no overarching viewing history.
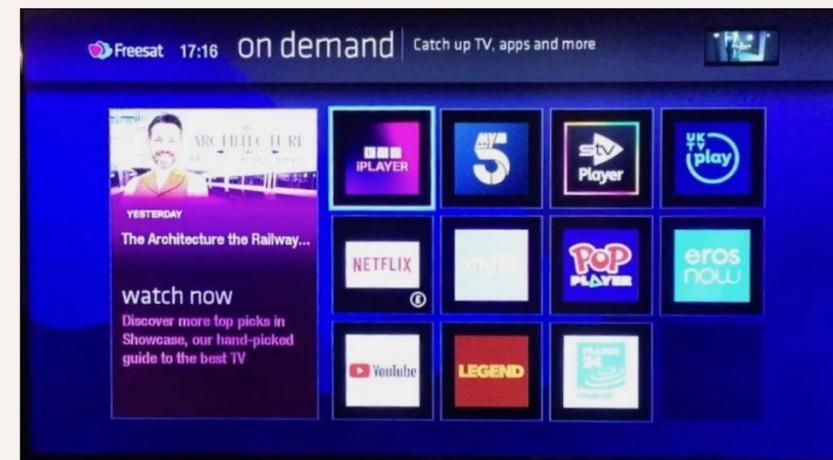
"Kate", prefers to watch VOD as she works part-time and finds it easier to fit around her schedule.

When she switches her TV on she spends a few minutes opening iPlayer, Channel 5 and Netflix apps to browse for something she wants to watch, but can't find anything.

She is frustrated that she has to open and close different apps to try and find the content she wants.

She checks live TV, but, as usual, can't find anything she wants to watch there either.

Finally she opens the recorded programmes on her PVR.

Common Components

Third party apps implement the same feature in different ways, forcing the customer to learn several design patterns to achieve the same goal

The functionality and design patterns of every third party app differ from each other and those of the connected TV.

Common tasks, like turning subtitles on and off, have been implemented in different ways across different services forcing users to learn multiple ways of achieving the same goal.

" On the same device, there are a number of ways of turning subtitles on. The iPlayer has one way of switching them on, which is not particularly obvious unless you know what you're doing. The Paramount Plus app has a very different way of doing it, and the Disney app has yet another way of doing it. The same task on the same device but lots of different ways of doing it."

— Guido Gybels
Accessibility expert

I   E

Connected devices

Other connected devices, typically plugged into a TV's HDMI ports.

Connected devices

For cost-conscious customers who do not want, or cannot afford to buy a new connected TV, connected devices offers the promise of a quick-fix.

Relatively cheap sticks and/or boxes can be plugged into an existing HDMI port to transform a unconnected TV into a connected TV.

There are a wide range of manufacturers of connected devices. As with connected TV manufacturers each device manufacturer has designed their service in different ways leading to a huge variety of interfaces.

Several connected device manufacturers are also content providers. Their interfaces will include their content, but may also provide the ability to install apps from other content providers.

Connected devices can themselves become obsolete with new streaming services only supporting newer TVs or devices. This can lead to a multitude of connected devices.

Hardware Hacking

Sticks and boxes often have very complex interfaces that are difficult to use.

Vulnerable, poorer people often try to make older hardware last longer by adding connected devices. They are, however, often frustrated by the experience and find the interface difficult to navigate.

Common interface issues include:

▸ Busy homescreens with a mixture of menus, video previews, adverts for apps, adverts for programmes and content.
▸ Lower consensus on design patterns than in connected TVs and no obvious hierarchy or next action when moving between content.
▸ Free, subscription and paid for content are combined making it hard to understand what is available to the customer within their current payment plan.
▸ Content rails containing a confusing mixture of apps, games and content.
▸ 'Live' tab containing PSB apps with 'live' streams, without making this evident.

I E C

OFCOM X PROJECTS BY IF

EXAMPLE

TV using a connected device

Connected devices can be a cost-effective way of converting an unconnected TV to a connected TV.
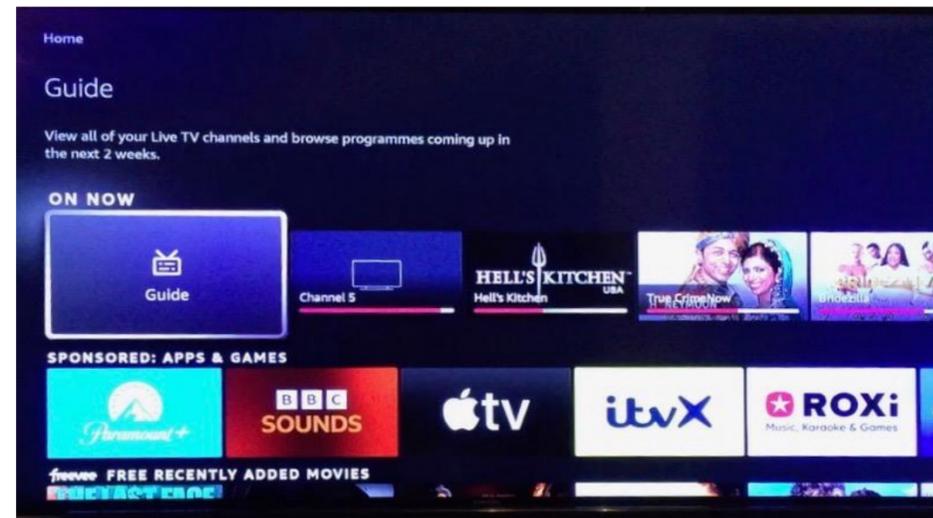
Advert for content

Primary navigation bar that includes: profile, search, home, live TV, settings and downloaded apps

Apps that can be downloaded

Paid for content is displayed alongside free content

Live does not load an EPG but a list of apps that contain live content

Live content currently playing in apps with a live feed

Recommendation rails with a mix of games, services and streaming apps

More devices, more problems

Multiple connected devices plugged into the same TV exponentially decrease the usability of the overall system.

People told us they wanted simplicity but it is common to see multiple connected devices plugged into the same TV.

Features found on the connected TV are often replicated on the connected devices that are plugged into it:

- ▸ **EPG on the TV and also on a PVR.**
- ▸ **Streaming apps on TV and also on a piece of connected hardware.**
- ▸ **It is possible to access the same services and content in multiple ways. iPlayer may, for example be found on the connected TV and connected device.**
- ▸ **Browsing for content happens across multiple devices and multiple services using multiple remotes.**
- ▸ **A customer wanting to watch a piece of content with multiple episodes is likely to find that different content sources will track which episodes the customer has viewed separately. This adds to the users cognitive load**

"Sarah"

- White British woman, 58
- Lives with husband
- Smart TV / PVR / Firestick
- Has broadband at home

> " I want it all on one screen. I don't want to have to go to another screen to have to do something."

C

Key Findings:

- Circumstances mean that she prefers VOD to live TV

- Has three different pieces of smart hardware with overlapping features

- Possible to watch Netflix on the TV in three different ways (TV OS, PVR and Firestick)

- Although she can comfortably navigate individual service once she has opened them, navigating between services is difficult

"Sarah" lives with her husband on a council estate in Bristol. She is a carer for her mother and works part time supporting a local community group. She often doesn't have time to watch 'live' TV so she catches up on PSB apps or sets the PVR to record programmes.

She has a Samsung TV with a Humax PVR and an Amazon Firestick plugged into it. The TV was disconnected from the wifi when they switched broadband provider and she hasn't got round to re-connecting it. She uses the EPG and apps on the PVR to watch the majority of her programmes, but recently had to buy a Firestick to watch ITVX as neither her TV nor her PVR can run the new app.

Her husband browses Netflix on his phone and adds interesting programmes to a list to watch later.

She finds it easy to navigate the EPG and downloaded apps on the PVR, but struggles with the Firestick, as she finds the interface very confusing.

She wishes that she could access all the channels and services she uses on the same platform without having to switch sources.

Sometimes she gets confused about where to find Netflix. She sees the logo on the FIrestick, but hasn't logged into it there. And sometimes she uses the Netflix button on the TV remote, forgetting that it is no longer online.

Participant setup: Multiple connected TV and devices

Research participant with connected TV, multiple connected devices and streaming apps - each with their own interface, features, and overlapping repositories of content.
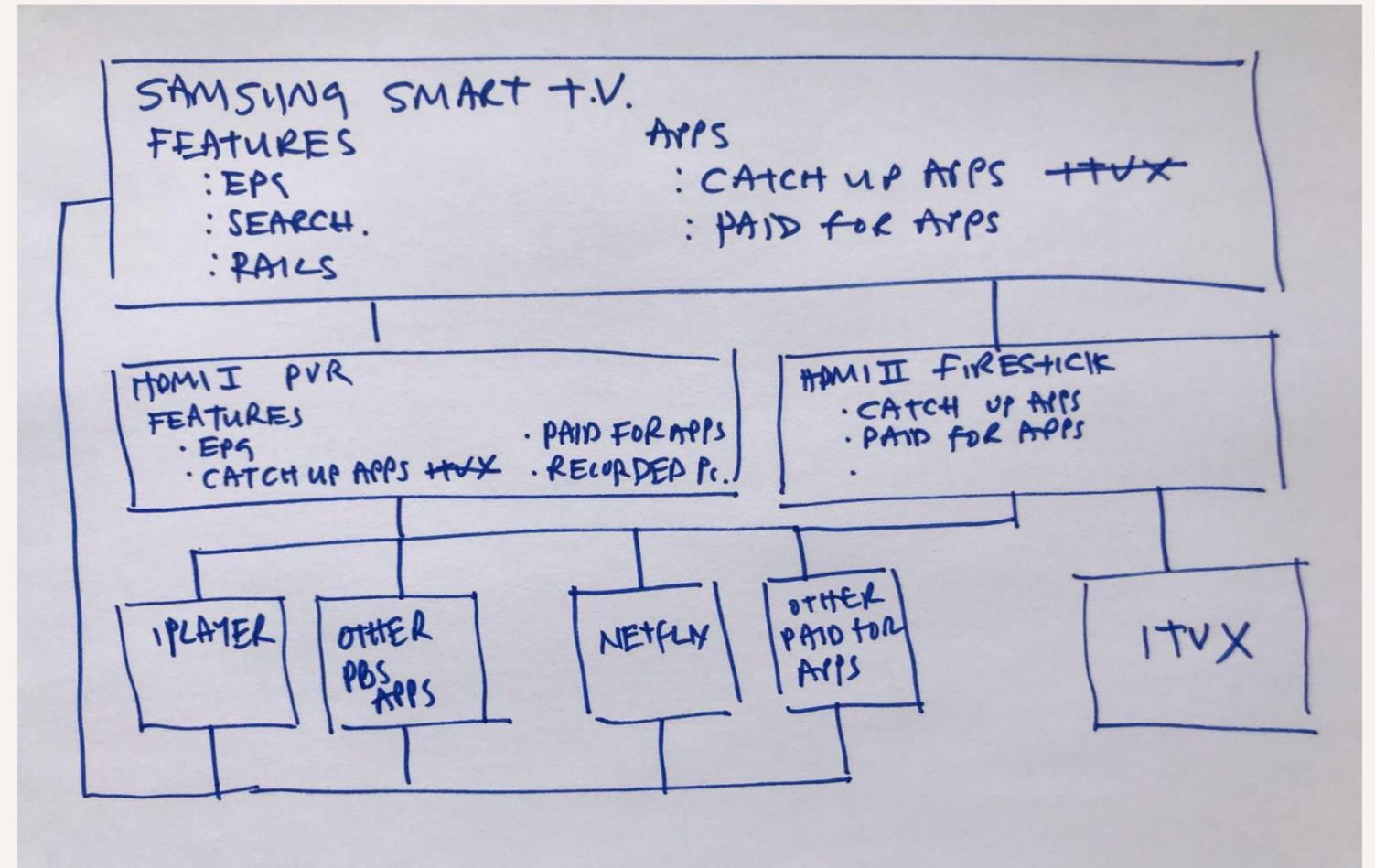
Remotes

Remotes used to operate connected TVs and connected devices.

Remotes

Remotes divide into three main categories:

▸ traditional 'bar' remotes primarily used to navigate live TV
▸ more modern 'puck' remotes primarily used to navigate VOD services
▸ smartphone remote apps

Common accessibility issues associated with remotes include, button size and target area, visibility of text, crowding of unnecessary buttons.

The need to use several remotes to manage the TV and connected devices can cause frustration.

EXAMPLE

Traditional vs VOD remotes

Primarily designed for navigating live TV

Design assumes that users will access most of the TV's services directly through buttons rather than on-screen menus

Most users only use and know a small subset of the buttons on the remote, typically (numbers, d-pad, volume, programme buttons, on/off and home)

Settings and video control buttons are rarely used.

Primarily designed for navigating VOD

Assume that users will access most of the TV's services through on-screen interfaces

Buttons reduced to core essentials. This remote is unusual for still having shortcut buttons to key streaming services: Netflix, Disney etc.

Dexterity Issues

Users with dexterity issues find it difficult to hold remotes and hit the right button

Users with dexterity issues, like amputated fingers or age-related tremors, find it difficult to accurately press the right button. Some users can also find it hard to grip remotes securely.

The target size of buttons is often too small making it easy to press adjacent buttons by mistake, This is particularly true of the smaller buttons used to navigate TV settings.
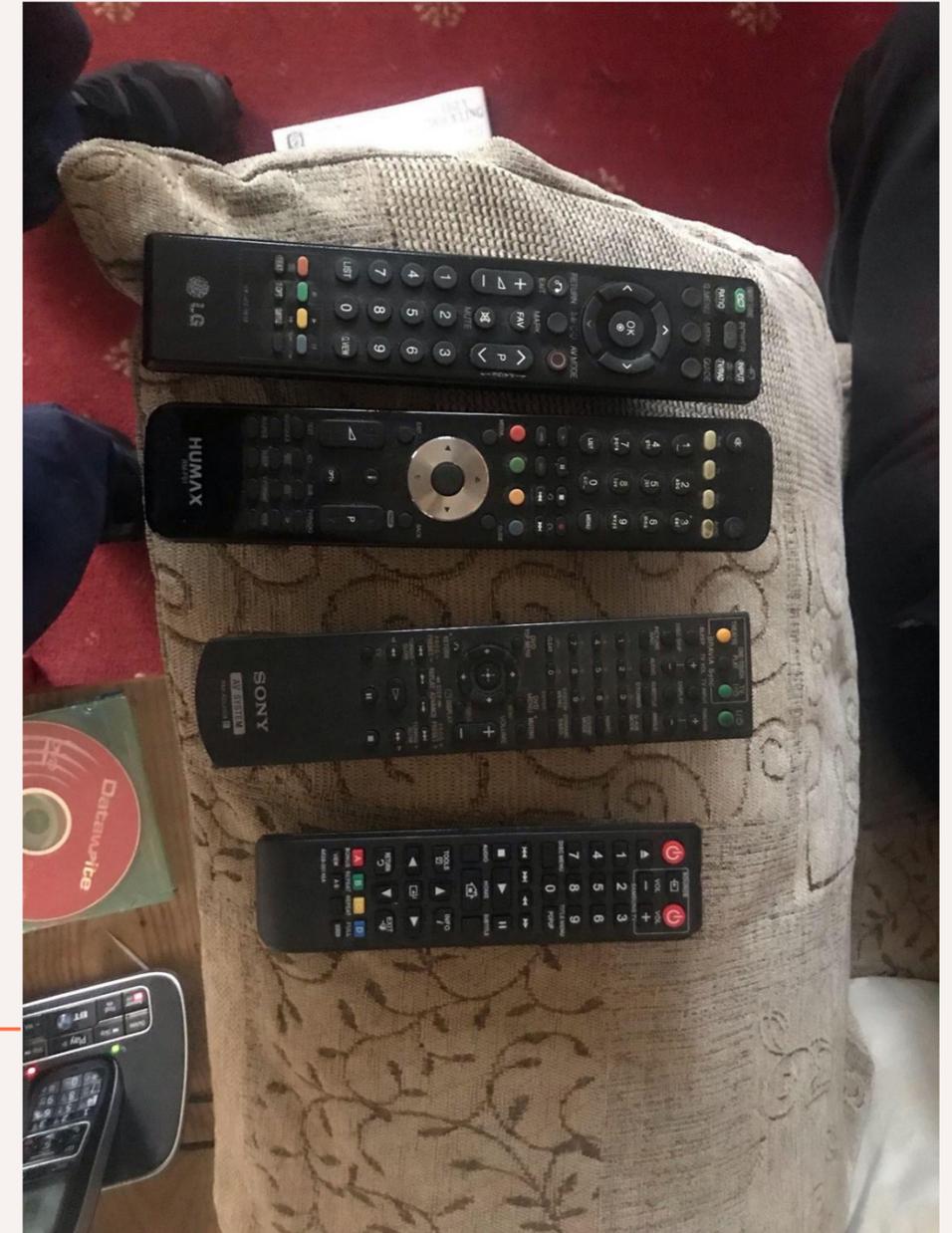
Multiple Remotes

Need for multiple remotes is confusing

It is common for users to need to use multiple remotes to use the TV and the hardware that is plugged into it.

Remembering which remote controls which device and which buttons on that remote is needed to complete a task can be hard and confusing.

TV remote
PVR remote
DVD remote
Bluray remote

Participant Desired Interface: Remote Control

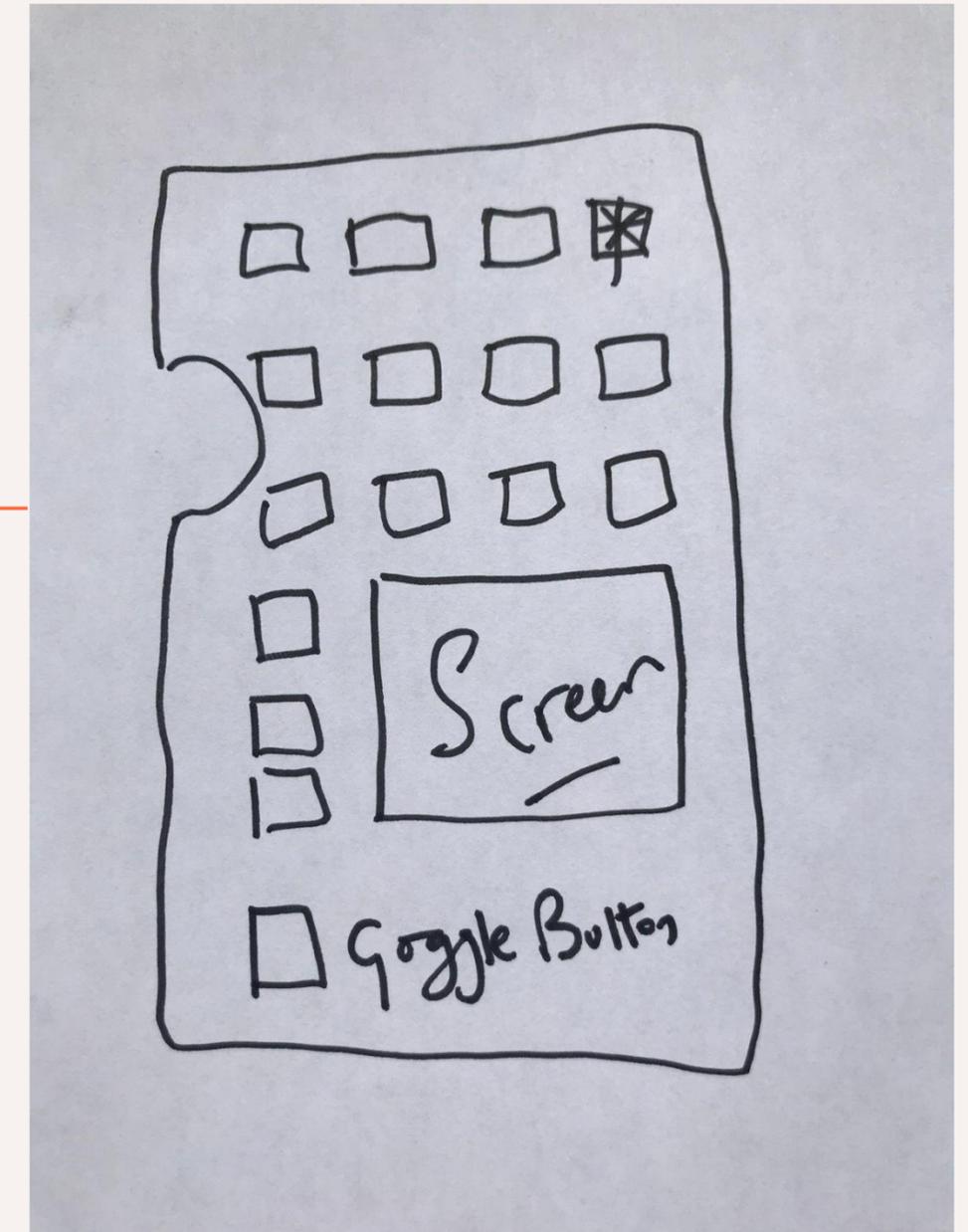**The idea of voice control intrigues people but has not, to date, been widely adopted. They do want better remote controls**

Usage of voice tended to be relatively limited and, often considered a novelty rather than fulfilling a core need.

Some participants in the study were using voice control for smart speakers and to search on their smartphones, but no-one was using it to control their TV.

One participant drew their ideal remote control.

Drawing of an ideal remote by a participant with dexterity issues

Includes a Google Button so they can give voice commands to the TV and a screen so they do not have to look at the TV whilst focusing on the remote

CONTENTS

Challenges, trends and opportunities

This section sets out a summary of the challenges and opportunities in making better connected TV interfaces for vulnerable people.

These were uncovered through primary research with vulnerable users, interviews with industry experts, and our own expertise.
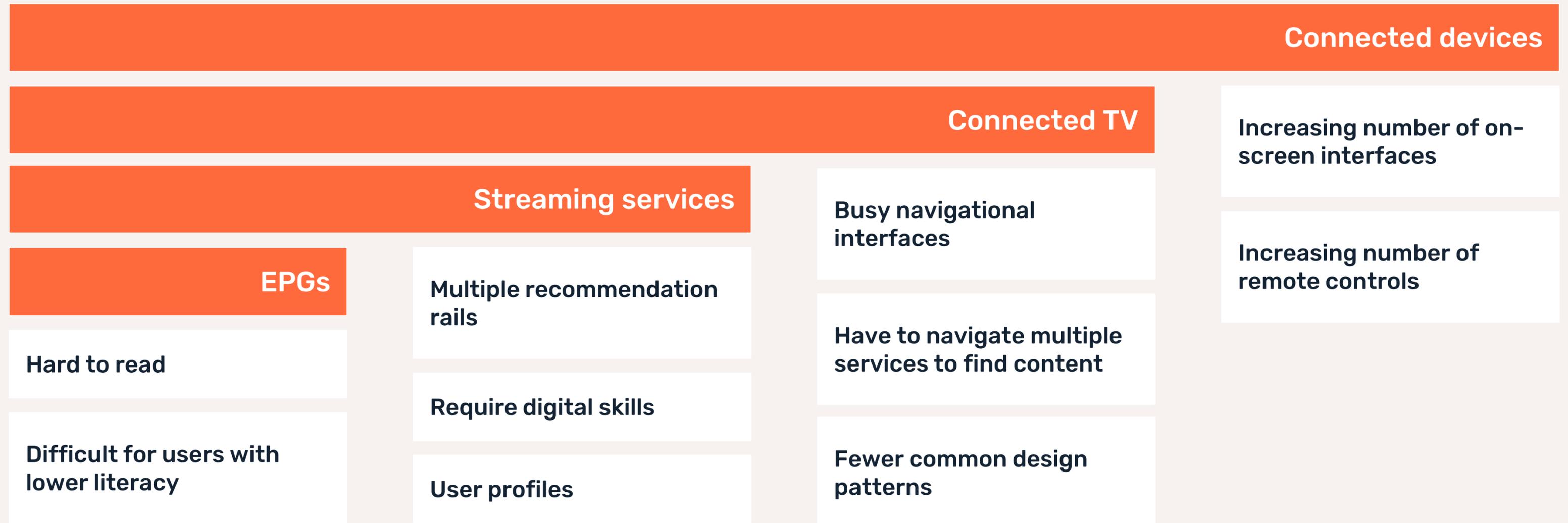
Challenges, trends and opportunities

This section sets out a summary of the challenges and opportunities in making better connected TV interfaces for vulnerable people.

These were uncovered through primary research with vulnerable users, interviews with industry experts, and our own expertise.

Challenges

The research found a number of cumulative challenges in current TV interfaces.

Connected devices

Connected TV

Increasing number of on-screen interfaces

Streaming services

Busy navigational interfaces

Increasing number of remote controls

EPGs

Multiple recommendation rails

Have to navigate multiple services to find content

Hard to read

Require digital skills

Difficult for users with lower literacy

User profiles

Fewer common design patterns

Challenges

EPGs

Hard to read

Older interfaces are often hard to read with small font sizes and low contrast.

Difficult for users with lower literacy

Lower literacy users can find EPGs hard to navigate as they are almost entirely text based. They prefer the contextual information provided by streaming services (ratings, genre markers, images, video snippets etc).

Challenges

Streaming services

Multiple recommendation rails

Multiple recommendation rails in streaming services, can feel overwhelming. The interface is highly visual, contains lots of content, and often has video snippets of content playing in the background.

Require digital skills

Least digitally literate users lack the digital skills to navigate on screen user interfaces. They may not understand how to use a directional pad, or be reliant on hardware shortcuts on their remotes to do key tasks.

User profiles

The need to set up user profiles and log into services is off-putting because the effort is higher for many vulnerable customers.

Challenges

Connected TV

Busy navigational interfaces

The integration of live and on demand content in the same service has led to busy interfaces that can be hard to navigate. Although common patterns are starting to evolve, they have not, as yet become established.

Have to navigate multiple services to find content

Users have to open multiple services to search for the content they want to watch.

Fewer common design patterns

Third party apps implement the same features in different ways, forcing the customer to learn several design patterns to achieve the same goal.

Challenges

Connected devices

Increasing number of on-screen interfaces

Increasing number of remote controls

Plug in sticks and boxes can have very complex interfaces that are difficult to use. Multiple connected devices plugged into the same TV exponentially decrease the usability of the overall system.

Need for multiple remotes is confusing. Users with dexterity issues find it difficult to hold the remote and hit the right button. This barrier increases as the number of remote controls increase.

Immediate opportunities

The research identified elements of traditional TV services that vulnerable viewers value. As more vulnerable customers move to connected TVs, connected hardware devices, and streaming services IF believes there are a number of opportunities to improve the service they will receive.

Transfer from DTT	
EPG	EPG could be the default navigational pattern.
No user profile	All content could be accessible without having to set up or log on to a user profile
Single remote	Service could be accessed through a single remote.
Free access	It could be possible to access a free DTT-like service.

Addition from DTT	
Catch up	Catch up could be designed into the EPG using a 'backwards EPG' pattern.
Discoverable access services	Access services could be more easily discoverable and use common interface elements.
Simple remote	Remotes could be designed to be easier to use and with the minimum number of buttons.
Richer programme info	Images, longer text descriptions, genre markers, recommended titles.

Immediate opportunities

Four key elements that could be transferred from DTT:

01 EPG

The EPG could be the default navigational pattern to help people transition with the least friction. Customers who are comfortable with more advanced navigational patterns should be able to change to those patterns.

02 No user profile

All content could be accessible without having to set up or log on to a user profile. User profiles could only be used for customers that want more advanced personalisation features such as recommendations based on historic viewing behaviour.

03 Single remote

It is possible to design TV services so that they could be accessed through a single remote.

04 Free access to linear channels

A free service could be provided that offers a DTT-like experience - including linear channels - within a streaming environment.

Immediate opportunities

Four key elements to consider adding:

01 Catch up

Integrate catch up into the EPG using a 'backwards EPG' pattern.

02 Access services to be more discoverable and useable

Most common access issues can be easily addressed (bigger fonts, higher contrast text, subtitles more easily found), but access services could also be easily discoverable using common interface elements.

03 Richer programme info

Supporting contextual information for programmes including images, longer text descriptions, genre markers, recommended titles.

04 Simple remote

Provide a remote which is easier to use, with the minimum number of buttons required for vulnerable customers to access the content they want.

Trends

The current TV interface market is highly fragmented and increasingly componentised. It is not clear how this market will evolve and whether existing or new third party entrants will (re)consolidate the market.

Based on IF's experience and learnings during this research over a 5-10 year period 5 key trends can be expected to affect vulnerable customers and TV interfaces. These are trends that are likely to be driven by society and multiple industry sectors, rather than solely by the television sector and/or telecoms regulation.

Digital literacy

The absolute numbers will decrease, but millions of people will still be reluctant to use modern technology or unable to afford the costs.

Some currently digitally literate people will have reduced literacy, for example due to technological change or cognitive decline.

Converged content

The lines between commissioned TV content, user- generated content, and AI-generated content will be increasingly blurred within interfaces.

Users with some impairment and literacy characteristics will face new navigational challenges as a result.

Multifunctional TVs

Televisions will become another internet-connected device with a large screen that is used for a multitude of functions and controllable by other devices - eg smartphones.

This will create new challenges and opportunities for vulnerable customers with impairments and literacy characteristics.

Simplification

Standard interface elements and patterns will be adopted for widely used features, perhaps from smartphone/tablet services..

User interfaces will become more personalised and responsive to individual user/household needs. This could help interfaces meet more needs.

New capabilities

New navigational paradigms for interfaces will emerge, for example digital services are becoming more relational and supporting interactions between groups of people.

Voice interfaces will benefit from the growth of AI to both become more useable by customers - eg conversational interfaces - and more capable of controlling other pieces of software - eg apps.

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