



Your video. Your way. Your time.

A bold prediction for video over the next decade.

Introduction

The television industry has undergone, and continues to undergo, monumental change. Video delivery to consumers' screens, devices, and into their homes is growing. The consumer experience of television today is giving viewers the ability to access television and video content on an array of devices, in and out of the home—a freedom once thought not possible ten years ago when the first Apple iPhone was launched.

Even though consumer technology and the infrastructure underpinning it has developed and improved, the consumer experience in the past has often been a clunky and fragmented one. Content has been spread across different devices—available on some and not others. On top of that, consumers have often had to wait for their favorite shows to become available. Yet recent technological innovation, together with the fact that the TV industry has increasingly embraced innovation and experimentation with new content formats, is inaugurating a more ambitious, daring, and ultimately more exciting future.

From the perspective of the consumer and wider participants in the value chain, TV's "broadcast" heritage is being left behind quickly. Velocix believes that a new and more ambitious vision is emerging for content consumption—one that allows players across the industry value chain to think bolder and bigger.

To 2025

By 2025, the consumer content experience will be unrecognizable. Screens will be everywhere. Pay TV operators will offer consumers unrestricted and unlimited access to every program on demand. In addition, the lines between content that is live, on-demand, curated, time-shifted or created virtually, will blur to the point of invisibility. Innovation in new content formats and technologies will provide users with an increasingly rich, immersive, and personalized content experience. Consumers will even be able to delay their social media services to align with their TV consumption.

Within this environment, any brand with video, be it amateur or professional, will be a potential broadcaster. Reduced barriers to entry will allow these brands to achieve unprecedented scale and reach across operators' services in minutes and hours rather than the weeks and months typical today. The consumer experience will be seamless.

And from the wider industry perspective, today's "old" broadcast behaviors—where consumers are restricted by screens, linear distribution, and the schedule, in addition to being granted an impersonal experience—will have mostly disappeared. Moreover, today's "old" broadcast characteristics, including operators' use of traditional broadcast technologies, such as Digital Terrestrial Television (DTT) and digital satellite, will be replaced by an ecosystem of newly scaled operators that deliver content to consumers' screens and devices, in and out of the home, entirely over IP.

Introducing Any Vision

As consumers increasingly seek access across their multitude of screens and devices to all of their content (be it live and on-demand) while continuously demanding the latest and most engaging content from old and new brands, Velocix believes that the status quo cannot and will not hold much longer.

A shift is taking place from a world of television to Any Vision. The Any Vision paradigm is rooted not only in what will be technically possible by 2025 in content markets around the world; it also seeks to paint an inclusive picture of what will become the mainstream consumption experience for users.

This paper examines this vision and its three primary strands:

- **Any surface:** Display surfaces and devices will be everywhere, underpinned by new and enhanced network intelligence.
- **Any show:** Curation will drive consumption, inspiring the development of new and immersive content formats.
- **Any one:** New brands will emerge/scale—the "channels" that flourish will become wider content entry points for brands.

Any surface

In recent years, broadcasters, pay TV operators, content owners and aggregators—set against the growing range and penetration of connected consumer devices—have sought to make their live and on-demand content quickly available across each and every device that reaches the market. The depth and breadth of available consumer content has never been greater, nor the range of devices on which to watch it. As the shift takes place toward the Any Vision world, new and enhanced display technologies—three of which are discussed below—will enable any surface to be a potential display. As the screens on which consumers watch favorite content continue to grow in number, any given moment can be an opportunity for consumption. Video, from professional and amateur content brands alike, will be available not only across and between more surfaces than ever, but will also be consumed in an array of form factors. This will have the effect of challenging users to experiment with favorite content formats and types in new and unexplored settings.

- **Pervasive displays:** Consumers will no longer be tethered to a piece of glass. A screen will not have to be bolted to wall, as any surface will render video. This will assure improved fluidity and portability in accessing content—both inside and outside the home.
- **Responsive control:** Content navigation will no longer be limited by the constraints of tactile interaction with screens, remote controls, and devices. Voice, gesture, and eye movement control features will be a feature of users' everyday consumption experience. To suit different screen, content, and location types, consumers will be able to seamlessly change their means of control.
- **Ubiquitous connectivity:** And where content is accessed—at home, at work, at school—will no longer matter. Screens and devices will remain permanently connected, allowing full, uninhibited, and fluid access to all of the content delivered by and through the consumer's operator.

Pervasive displays

Enhanced screen technologies

By 2025, continued innovation in screen technologies will enable screens to change size, shape, and location seamlessly. They will be adaptable to whatever location a consumer chooses to watch from, and accommodate whatever content is being consumed.

Carbon-based Organic Light-Emitting Device (OLED) technologies, without the need for backlights and filters (as with LCD displays), have already laid the foundations for more efficient, simpler, and thinner displays. This technology has become so flexible that some manufacturers have developed “rollable” displays. These PLED—plastic OLED—technologies will bring the potential for even more efficiency and flexibility in consumers' use of screens—both inside and outside the home. They will have the ability to blend in with their surroundings, taking the shape of a table, a mirror, or window. Among the screen manufacturers, the battle to and beyond 2025, will be for the clearest, crispest, and most true-to-life picture while also providing the smallest, least intrusive, and most flexible surface on which to view.

Head-mounted displays

Potentially, the greatest disruption in the enjoyment of ubiquitous content will emerge with new generations of near-eye displays. These will enable immersive viewing of content with head-mounted displays comparable to the size and shape of today's eyeglasses or sunglasses. This innovation will also assure wide acceptance and usage of virtual reality (VR) and augmented reality (AR) content.

Mobile device projection

In the last few years, a number of manufacturers have sought to incorporate—with varying degrees of success—built-in projectors in handheld consumer devices, predominantly in smartphones and tablets.

By 2025, however, a wide range of smartphones and tablets will be fitted with these small projectors capable of, and building upon the color, resolution, contrast and performance offered by today's high-end projection technology. As a result, consumers will be able to transform any flat, shiny surface into a potential screen. This will enable consumers—on the move—to stream live and on-demand content through their devices, displaying and consuming it in real-time on a surface that isn't, or doesn't need a screen.

And it won't just be screens that consumers will use to project their chosen video content. Projection paint, which has seen significant advances in research and production in recent years, will be applied to surfaces and used as a substitute for a physical projection screen. Even today, improved contrast, definition, and color fidelity—together with a continuous reduction in consumer cost—are making such options increasingly attractive and accessible for domestic as well as commercial purposes. This trend will continue to grow in both popularity and use.

Holographic projection

In the years to and beyond 2025, a similar competition will emerge among manufacturers of holographic projection technology. Increased numbers of smartphones and tablets will have this technology built in as standard. This will give consumers the

capability to display 3D holograms in any location at their convenience.

Much as the screen manufacturers, projector technology manufacturers—holographic or not—will compete on quality of display, continuously striving for the truest and most realistic picture to offer consumers.

Competing, but complementary

These technologies, though competing, will also be complementary. There will be different use cases for each, and there may even be occasions when consumers use them in combination. Combined, these technologies will liberate content—such that any surface could become a potential display. This, in turn, will drive consumers (even more so than today) to consume video wherever they are—in the home or on the move. This will also reinforce the operator’s importance as aggregator, curating live and on-demand content attuned to users’ needs, tastes, and behaviors across all their devices. The same will be true across all of their screens. Furthermore, these technologies will inspire content brands and providers, together with operators themselves, to innovate and invest in new content formats and technologies, including virtual reality, augmented reality, and 360-degree video.

Of most importance, the question for consumers viewing content up to 2025 will no longer be “which screen is possible?” but increasingly “which screen is best?” An amateur documentary maker will be able to adjust the screen size to show friends and family her latest creative efforts in the comfort of her own home. She will be able to do this before transporting the same screen to her studio where she can expand the screen’s size in order to play her latest creations to a wider public audience of fellow documentary makers. On top of that a young viewer will be able to begin watching their favorite animated show on their mobile, before sending the content to a nearby television screen, and then increasing the screen’s size so that a handful of friends can share in the content too. Screens will be adaptable to circumstances, use cases, and location. They will have become so flexible that they will be able to meet a whole range of consumption states—from public to private, small to large, alone or together. As such, they will be capable of delivering not only wider and shared public moments, but also smaller, more intimate private ones.

Responsive control

The industry should no longer confine its thinking to the devices carried around in our hands, our pockets and our bags today. Up to and beyond 2025, consumers watching content on a surface—rendered using a device’s built-in projector—could have the picture follow them as they move around a room. As a result, television services need not be confined to consumers’ homes or screens. Smartphone or other devices could even be connected to a screen on an airplane, enabling the consumption of pay TV content—live and on-demand—all from the comfort of the passenger’s own seat.

Whereas today much of media consumption is geared towards and centered on tactile interaction with devices and screens, in the future we will see video consumption that is genuinely “hands free”. While some viewers will still want physical interaction using remote controls or similar mechanisms, consumers will increasingly navigate using voice, gesture, and eye movement as opposed to being limited by touches and swipes on devices and remotes.

In recent years, operators have already begun to embrace voice control as a feature of mainstream consumer propositions both in relation to content and wider connected home services albeit using remote controls. This trend is extending beyond mere remote controls and set-top boxes and is embracing devices in the wider connected home. This points to a more converged, fluid, and exciting way forward. Such technologies will only continue to grow in their penetration and sophistication, and will increasingly be supported by intelligence around both choice and context.

In Any Vision, a family watching an episode of a drama series they have seen already will be prompted to move to a later episode. Similarly, a group of five friends growing increasingly bored as they watch a film will be not only prompted by their chosen operator to stop playback, but also with recommendations for alternative content. This content will not only be tailored to the users as individuals, but will take into account the emotional and cognitive dynamics at work within the group. Such intelligence will not only be applied to content-related services provided by a particular operator, but to all of the connected home services they will increasingly embrace.

As Any Vision takes hold, consumer interaction with content—on whatever screen, whatever device, and in whatever location—will become more immersive, personalized, and responsive, no longer limited as it is today by the constraints of devices and location.

Ubiquitous connectivity

Alongside the changing consumer face of screen technology, a great rationalization and reversal of a much-witnessed, former process will take place. As consumer media technology has developed, multiple pieces of customer premises equipment (CPE) have arrived in our homes, each performing a specific enabling function (be it the router facilitating broadband, or the set-top box delivering pay TV services).

Improved network delivery and coverage (connectivity) mean this will soon no longer be the case. In the years up to 2025,

most content-related services and functions will shift from CPE to the network. At the same time, operators who have invested substantially in network capacity and capability will achieve operational savings on CPE. For the consumer, less CPE will be required in the home, removing the need for set-top boxes, routers, and other such equipment.

In recent years, operators around the world have taken an intermediate step in this regard by offering “hybrid” devices that perform multiple functions at once. Yet the lifespan of such devices will be both short and limited. As the logic and intelligence in these devices moves increasingly back into the network, operators will be able to drive change and innovation faster. This will be done across myriad business activities from testing, through to measurement and UI adjustments on their services. Users will no longer need to wait for a new device in the home in order to experience the operator’s latest content and services.

Whether one is a user in the home or outside of it will no longer matter. Users’ screens, cameras, and devices will remain permanently connected. They will always be able to stream content whether this content is offered by the operator, or other sources. The move towards the network will provide greater visibility and control over the devices inside and out of the home, providing not only expanded choice but also an improved and enhanced user experience. Screens, not set-top boxes, will have primacy at the core of user consumption. Powered by enhanced network intelligence, the consumer experience will be seamless. Whether in the home or on the move, the question for users will no longer be, “is it possible to access my favorite content from here?” Instead, the question will be, “on which of these screens should I watch my favorite content?”

Any show

If the screens and devices on which consumers watch video will have an entirely different complexion by 2025, so too will the way consumers organize, discover, and navigate the myriad content brands and options open to them. Accelerated by a move towards open standards, shared and transparent APIs will provide new ways for developers to work with and plug into operators and platforms.

- **Curated content experiences:** Content will be curated for consumers in a very personal way using multiple inputs. Personalization will shape consumption based on time, our diary, our mood, and the people with whom we are watching.
- **Consumption unbound:** Pay TV operators will offer consumers unrestricted and unlimited access to every on-demand program across all consumer devices, inside and outside the home.
- **Live redefined:** For the consumer, the lines between content delivered live or on-demand will blur to the point of disappearing almost entirely and such distinctions will no longer matter. The nature of “live” content will also evolve.

Curated content experiences

Today the live schedule is an influential force in consumer discovery and navigation of content. However, by 2025 curation by and for the viewer will be the chief organizing force. Operator-level recommendations will become responsive to whomever is watching. This will be true for individual viewers or groups of viewers. A person’s or group’s very presence in a living room will determine what is offered by operators (through continuous and ongoing analysis of consumers’ speech, tone of voice, gesture and movement). Recommendations for “people like you” will finally mean exactly that—whether an individual is consuming alone or as part of a group. Moreover, these recommendations will take into account past, current, and projected future content preferences with an accuracy operators have never been able to offer consumers before.

In the world of Any Vision, content curation will include:

- Algorithmic recommendations based on the operators’ data and third-party datasets, as well as temporal data from within the content itself. For example, content could be recommended based on actors in movies you have watched or specific sports highlight reels based on your favorite athlete.
- Editorial recommendations at the operator and content brand level. For example: a breaking story about a celebrity you like could be recommended.
- Real-time behavioral curation based on topics trending in social media. For example: TV programs your friends are watching on Facebook could be recommended, or the ones receiving the most comments on Twitter.
- Dynamic, responsive cognitive curation based on consumer mood and tone of voice, exploiting machine learning and artificial intelligence technologies and their underlying datasets. For example, kids’ cartoons could be recommended if a child is crying in the room.
- Live, “real-time” scheduling, letting channels deliver “new” programming to their own schedule, which is in itself a form of curation. New customized channels will also be automatically generated for each individual user. For example, a live sports event or last weekend’s goals in a particular league could be recommended.
- Release schedules driven by studio marketing agendas for time-sensitive, on-demand content. For example, the latest blockbuster release on video on demand (VoD) or the most recent TV show on replay could be recommended.

Operators will no longer rely solely on algorithms or editorial intelligence alone in order to provide recommendations to shape their users' content consumption. Rather, they will draw on a myriad of datasets to curate content suggestions based on individual (and group) characteristics and attributes. Among other things, operators will make much greater use of machine learning technologies such that they will become instrumental in shaping the curation of users' content consumption.

Recommendations for “people like you” will no longer be a static notion, as they are today. Making use of their own data, third-party sources (professional, social media-based, and otherwise), together with artificial intelligence and machine learning technologies, operators will be able to curate content for individuals or groups of users dynamically and in real time. The resulting content choices will make themselves visible and accessible on user interfaces across each and every consumer device. The interface will differ not only from day to day, but hour to hour, and also reflect changes in the physical viewing environment. Adjustments will be made as a group of two viewers is joined by a third, tailoring curation based not only on voice recognition but also on tone of voice, as well as individual users' and the wider collective group's moods. Operators' content curation will be personalized to the individual viewer, collectivized and sensitized for groups of watching viewers, yet all the while adjusting to nuances in the content and viewing environment. Through the power and intuition of their curation, operators will have the chance to surprise, delight, and resonate with individual viewers and groups of viewers as never before. As a result, consumers will feel better understood by their operators as content consumers, and so better relate to the services their operators provide. This combination of intelligence and insight will also enable operators to provide targeted, tailored, personalized ad insertion.

The breadth and availability of metadata available to refine and hone these personalized experiences will also increase exponentially. Personalization will move from being based merely on editorial and usage related data sets, to extensively leveraging the temporal metadata available in the actual content itself. News and current events will be deeply indexed to enable topic search and creation of personal news channels, while viewers will compile individualized highlight reels based on criteria such as goals, penalties, or specific athletes. Customized channels will be generated based on indicators of high audience engagement from sources, such as Twitter hashtags. “Power Search” algorithms will be driven by descriptive temporal, allowing viewers to quickly find specific actors, scenes, or key words in a single asset or an entire content library.

While more content- and consumption-related data will inevitably be required as a result of this shift, the challenge for operators will be not only to make use of this data, but to make more intelligent use of it. This need for better insight will cut across content recommendations, advertising, and the video that gets to viewers' screens. In this new content environment, operators will be able to understand—in curating live and on-demand content for viewers to watch—the amount of time, as well as the mood and need states of the viewers in front of a screen. Not only will the content curated for viewers be adapted to suit these changing circumstances, but so, too, will the form and format of the content provided. Knowing that a married couple are accessing content in the early evening after a long day at the office, an operator will be able to gauge their combined mood, their need state (and related content genres), as well as the approximate length of time for which they're willing to view. Furthermore, the operator will be able to segment, shorten, and lengthen content as appropriate, but with an editorial intelligence that means that viewers begin and end their viewing at suitable moments within their chosen content. Not only this, but should any of these conditions change as the married couple is viewing, the operator's curation choices will respond dynamically and accordingly.

Consumption unbound

Ever since the mid-2000s, some pay TV operators have enabled subscribers to record TV programs in the cloud and/or access on-demand content. This feature has been known as cloud DVR. While offering the promise of access to a wider selection of cloud-delivered, on-demand content to consumers across more connected devices than previously ever possible, such propositions—despite the consumer benefits realized—have been constrained by commercial, legal, functional and device limitations. Progress in even the most advanced pay TV markets has been slow. That is because the industry has failed to deliver on universal and unlimited cloud access to all content, across all devices, and at any time of the user's choosing.

In this respect, the industry can be bigger and bolder in its thinking. By 2025, Velocix anticipates that all operators will offer consumers unrestricted and unlimited access to every program on demand across all consumer devices. In the process, the lines between what content is live, recorded, on-demand, curated, time-shifted or virtual will blur to the point of invisibility—and consumers won't mind. Instead, all they will want is universal access to content, on every screen, for any show, and from as many different content brands as possible.

- Such unrestricted access to content will bring with it benefits for operators and consumers:
- For operators, content ubiquity will allow them to compete on areas of strength, such as functionality and connectivity.
- For consumers, it will further entrench the central role of curation in the consumption experience.

Not only will consumers increasingly self-curate their own viewing schedules, operators, too—based on the enhanced, multi-faceted data, and insight at their disposal—will curate and time-shift subscribers' favorite content on their behalf. Content rights will become increasingly time-based in their focus. And consumers will be able to time-shift or delay their social media services to line up with their curated consumption. This will allow them to avoid plot spoilers or find out which sports team won a particular game.

To the consumer, the importance of who aggregates this content, and how it is aggregated and can be accessed, will far outweigh the significance of its manner of delivery (live or on-demand) or the territory from which it initially originated. The importance of the operator, as aggregator of this content and deliverer of functionality around it, will be reinforced.

Live redefined

Led by changes in consumer behavior, but cemented by both the increasing significance of curation as the organizing force for consumption (and the universal content access provided by operators), on-demand viewing will, by 2025, have become the dominant form of consumption. It will have grown to well over two-thirds of total viewing.

Yet within this predominantly curated and on-demand environment, elements of live content will continue to play an important role as live ‘events’ such as sporting and news continue to happen. Consumers globally will always want and enjoy the sense of synchrony that live content offers—knowing as a viewer that, though they may be consuming a piece of content alone in the home on a single device—in reality they are part of a wider community of thousands (perhaps millions) all experiencing and enjoying the same piece of content at exactly the same time. For many countries, the concept of a national audience around certain shows or events with live content playing a significant social and cultural role will remain very important. What will change with “live” content is how we define it.

Defining “live”

By 2025, the nature of what we know as “live” content will have changed from how we understand it today. We envisage there being at least three different types of live content:

- **“Real-time” live content** – live sport and breaking news.
- **“Time sensitive” content** – where a consumer has a specific window of time in which to watch. Examples include news programming and shows that involve consumer voting.
- **“Time popular” content** – content released at a particular time to the wider market on a curated, on-demand basis. Examples include the weekly release of episodes of popular and premium drama and comedy series, or the daily release of short-form current affairs and documentary shows.

As the definition of “live” widens, the value and shared timing of consumption once only attributed to live, linear television, will lead to the reinvention of synchronicity. The excitement among friends around the release of the latest episode of a major new drama series will in itself generate a new social currency (in person, and across social media), as well as drive and inspire their collective consumption of it. This will result in a new and more dynamic form of “appointment to view”. Viewers will still be keen to watch live to see whether their favorite contestant on a talent show has made it through to the next round, maintaining the social conversation with friends and family in the online and offline worlds between episodes. And at times of topical or sporting importance, users will be keen to blend real-time live consumption of breaking news and live sport with related, and reinforcing, curated on-demand content.

In the years up to and beyond 2025, this blurring of live and curated content—personalized to a consumer’s wants—will reinforce and increase the importance of unicast delivery for operators. This will necessitate the need for, and allow them to provide a personalized stream for each user. Across the content they consume, no two users will behave in exactly the same way.

Any one

It is not just about ‘when’ and ‘how’ consumers watch that will have changed radically by 2025. Compared to today, it will be hard to recognize ‘who’ and ‘what’ is watched. Though in recent years the depth and breadth of live and on-demand content from broadcasters, operators, and content owners has been continuously expanding and available across connected devices, the TV industry has only recently begun to embrace innovation and experimentation with new content formats. The barriers to entry, though now falling, have historically been high for new formats and new content brands seeking to achieve scale and reach. This has restricted content innovation in the process.

Fortunately, the future is looking brighter. By 2025, we expect a two-pronged process of democratization will become pervasive:

- Democratization of access for consumers with all content being available through all platforms
- Democratization in the distribution of content with all platforms offering content producers of all types the ability to deliver content to their platforms if consumers want it.

Furthermore, by 2025 we will see:

- **A wider choice of brands:** This will allow big content brands more flexibility in their production and distribution, but also enable a smoother journey for content start-ups to establish themselves and become major channels. Short term or ‘pop-up’ content brands will be created on the fly around major events and non-media brands will create and distribute content under their own brands instead of relying on advertising.

- **New content, faster:** With barriers to entry reduced and reducing, content brands old and new, amateur and professional will be able to achieve scale and reach across operators' services within seconds and minutes.
- **Deeper into the action:** Operators will not only innovate in the volume of live and on-demand content provided to consumers, but also experiment with new content types and formats. Consumers will be able to explore from richer, personalized, and more immersive perspectives. The breadth of content available will never have been greater. Similarly, the content will have been created and delivered to users in the most dynamic way.

A wider choice of brands

Any content creator or brand with video to share will be a potential broadcaster by 2025. IP distribution (and production) will have lowered barriers to entry to such an extent that new content brands will achieve scale and reach faster than ever before, while being carried as standard on operators' services and displayed with prominence as part of their user interfaces (UIs).

By 2025, social media services will be an integral feature of operators' content brand line-ups. They will have transitioned to become content distribution brands in their own right, offering video and other media to their members as a destination on operators' UIs. In recent years, several of the major social media services have already begun the steps in this evolution. They are becoming distribution platforms for streamed live and on-demand content in their own right and will continue further in this direction.

Moreover, the move towards open standards, with shared and transparent application program interfaces (APIs) providing new ways for service developers, (including those from social media), to work with and plug into operators and platforms, will enhance the dynamism and fluidity of this environment. Content onboarding will also be faster and smoother. Operators will become the super aggregators that possess the ability to make new content available to consumers in seconds and minutes rather than the hours and days typical today. At the same time, the open-source API environment will allow content creators themselves to take charge and self-publish content using operators' services (with the content's popularity driving its promotion on user interfaces across all consumer devices).

New content, faster

By 2025, the definition of "channel" will have also radically changed. There will be a huge reduction in the number of live channels that are linear and scheduled. But there will also be an increase in the number of content brands available to consumers using operators' services. This increase, in turn, will lead to a democratization in the provision of, and access to content brands that are new and old, amateur and professional.

Content brands will become curated "meeting places". They will become entry points—on a single platform—from which consumers can access all the live and on-demand content a particular content brand has to offer. Though the content brands offered through operators' services will become more global and international, a significant proportion of consumption—live and on-demand—will be directed towards local or niche content of cultural, social, and linguistic significance to a particular market or audience.

What's more, there will be a rise and flourishing of virtual content brands. In recent years, more and more "virtual" channels have appeared. Created in the cloud by operators at speed and short notice in reaction to topical events, these virtual channels will be offered to consumers across all their connected devices. Up to 2025, there will be a move beyond these mere virtual channels to virtual content brands. These will be live or on-demand streams created entirely in the cloud. These virtual content brands will be driven by and based on real-time data and insight (for example, in reaction to events, shifts in consumer behavior, and what may be trending at a particular moment on social media), as well as being operated and managed entirely virtually. Cloud-created content, based on real-time behavioral and machine learning data, will achieve a new dynamic resonance with individual users and wider audiences—in turn, inspiring and driving further consumption.

As barriers to entry are reduced, there will be more creative risk-taking and experimentation from content brands and operators alike on an unprecedented scale and pace. Content brands, be they amateur or professional, or that provide live or on-demand content, will achieve reach in minutes and hours rather than weeks and months typical today.

Deeper into the action

Until recently, innovation in the television industry has focused on commercial and distribution models. At its heart television content has remained familiar with 30- or 60-minute programs grouped into channels or apps. However, in the last few years, with the arrival and growth of new content formats, the tide has begun to turn. By 2025, it will look radically different.

The new and dynamic technological environment underpinning Any Vision in the years to and beyond 2025 will enable, and indeed encourage, innovation in existing and new content formats—even some that can't be conceived of yet. Through these formats, viewer interaction will become increasingly immersive as viewers are exposed to an ever richer and wider field of view.

Consumers will be able to exploit two fundamental benefits:

- By 2025, the cost and size of equipment enabling consumption of 360-degree video and virtual reality formats will have been reduced substantially, with comfort, resolution, and isolation issues vastly improved. These will drive consumer adoption and penetration of these devices into the mainstream. Augmented reality applications will become even more widespread and enable new content experiences that effectively merge physical reality and digital content. This will allow users to remain in continuous contact with their environment as they consume customized content on smartphones and other connected devices, and allow for full social interaction.
- From a content perspective, virtual reality will become increasingly personalized—allowing users to become their own producers, and curate their own experiences. This trend will be firmly established in the music, adult and sports genres. Each of these genres will have its own trajectory towards exploitation of these new formats; there will be commonalities, but it will not be a case of one-size-fits-all. Even so, it is instructive to speculate on the possibilities this could offer the consumer.

In sport, for example, it is not unrealistic to expect that, by 2025, cameras placed throughout stadiums and efficient, real-time, post-processing and delivery will allow for free viewpoint video experiences. These would transport the viewer to any location on the field. This would represent a new and immersive way to consume sport, and to “become, in fact, the player.” There would be ubiquitous camera coverage with a full 360-degree experience using VR and AR displays. This could be the core of a live sports stream or, more likely, a supplementary or premium offering for fans. Such new content formats and types may be offered as whole and as complete propositions to consumers. At the same time, operators could virtually stitch together smaller pieces of content from different content brands and providers in order to create a more dynamic, immersive, and larger whole. For example, an operator, knowing that a user supports a particular tennis player, will be able to aggregate and virtually combine short-form highlights of their favorite moments—supercharging what is today a manual process. Operators will become conduits not only for provisioning and distributing new content formats, but will also play an active role in creating these formats themselves.

Innovation in capture, processing, delivery and new experiences will extend beyond 360-degree video and VR and generate growing consumption. Other technologies, increasingly consumed in the mainstream and offered as part of operators’ services, will include:

- Holo-video, whereby using a dedicated headset and through specially designed content, a viewer can see one specific object from all the possible viewpoints.
- Curated gaming formats that exploit and build upon the technologies and formats mentioned above will be offered alongside video content on operators’ user interfaces.

In the future, consumers will be able to move seamlessly from watching their favorite football team live to being immersed in a multiplayer, cloud-delivered, competitive, virtual reality, e-sports tournament. Collaborative, interactive VR delivered through operators’ services, will allow amateur and professional users to co-create content through open-source APIs. Operators will not just be content distributors, but conduits for fresh creation of content, too.

Though fresh operator investment in the network will be required to meet the increased demand from these new content formats and technologies, the prize will be worth it. Operators will have the opportunity to become the gateway to consumers’ most individualized, personalized, and immersive experiences. This will drive a significant increase in pay-per-view revenue.

Any Vision in summary

A transformation is underway from the world of television—confined by linear distribution using traditional technologies, the rigidity of the live schedule, and providing consumers with a fragmented experience—to the Any Vision world. In this world, the possibilities around content consumption and delivery will be limitless.

As connected devices and screens have grown in their penetration and sophistication in recent years, there has been a parallel explosion in video consumption—a growth expected to continue apace. In 2025, display surfaces and devices will surround us wherever we are and wherever we wish to view them. They will also be powered by a new and enhanced network intelligence. This will result in a radically transformed consumer experience that will be:

- **Pervasive**, with new screen and display technologies, allowing any surface to be a potential display while providing new and unexplored opportunities for consuming content.
- **Responsive**, as operators harness the power of voice, gesture, and machine learning technologies to deliver consumers tailored, dynamic, and responsive navigational experiences and user journeys.
- **Seamless**, with users having universal and fluid access to content everywhere and without restriction on any device, and in any location powered by greater network intelligence.

Though more content will be available at our fingertips and on our screens than the industry has ever known, it will be easier for us to find and consume our favorite content. Curation will drive consumption, inspiring the development of new and immersive content formats, and the consumer's everyday interaction with content will be:

- **Curated**, as operators exploit the use of more granular, intricate, and intelligent recommendation techniques, as well as the use of a myriad of first- and third-party datasets to shape the user's content consumption in a tailored, personalized and increasingly dynamic way.
- **Unbound**, as operators offer consumers unrestricted and unlimited access to every program on demand, and across all consumer devices.
- **Liberated**, as the lines between how content is delivered—be it live, on-demand, curated or virtual—fade to the point of invisibility (and consumers will no longer mind).

And as new brands emerge and scale, the redefined “channels” of today will flourish to become wider content entry points. This will enable consumers to enjoy a content environment that is at once:

- **Broad**, with a substantial increase in the number of content brands available to consumers using operators' services that will lead to a democratization in access to content from brands new and old, amateur and professional.
- **Dynamic**, as barriers to entry fall and creative risk-taking on the part of content brands and operators alike allow scale and reach of content distribution to be achieved in minutes and hours, rather than weeks and months.
- **Deep**, as the pace and momentum of technological and creative innovation sees richer, more personalized and more immersive content formats grow in sophistication and mainstream adoption.

By 2025, the industry will have embarked upon a path from a world of television to a world of Any Vision. International pay TV operators, newly scaled, will have embraced the unbridled capability of IP distribution to transform and newly enrich the mainstream consumer content experience. The ecosystem will be filled with a rich range of new and existing providers, each daring to make the ultimate consumer experience more personalized, more immersive, and ultimately more enjoyable.

Consumers will demand and expect from their chosen operator not only the most competitive content propositions and aggregations, but increasingly the most attractive services and products that extend to and beyond the wider connected home. As such, the opportunity, challenge, and reward for operators in the coming years will be to become the most important, valued, and trusted aggregators in consumers' lives.

Acronyms

API	Application Program Interfaces
AR	Augmented Reality
CPE	Customer Premises Equipment
DTT	Digital Terrestrial Television
M&A	Merger and Alliance
OLED	Organic Light-Emitting Device
OTA	Over The Air
OTT	Over The Top
PLED	Plastic Organic Light-Emitting Device
PSB	Public Service Broadcaster
SD	Standard Definition
UI	User Interface
VoD	Video on Demand
VR	Virtual Reality