



The Rise of Embedded Video Communications

Trends in Video-enabled Apps



webRTC.ventures



Vidyo®



Integrated Technology Makes Video More Accessible

Even in today's hyper-digital world, human-to-human interaction is still the best way to communicate. Whether it's to make new connections, solve difficult problems or provide a remote set of eyes, more and more, businesses of all sizes are differentiating their brand by embedding real-time video directly into business applications, workflows and devices. Video communication platforms providing Application Programming Interfaces (APIs), reference code and services to developers are emerging, making it easy to embed group video chat directly within their app or service.

From large enterprises to SMBs and early-stage startups, embedded video is used by organizations across many industries to enhance collaboration and engagement. In healthcare, embedded video facilitates better access to specialist services for patients in remote locations. For banks or credit unions, embedded video is used to recreate the in-branch experience remotely for customers or members in order to complete a complex transaction or offer consultative services. Embedded video is also used in a variety of other applications such as remote technical support, distance learning and training, see-what-I-see field maintenance and more. In reality, developers can use these platforms to video-enable virtually any concept or idea that they may have, in any industry.

Using APIs to embed real-time video communication into third party apps is not a new phenomenon. However, increasing availability of "low-code" platform-as-a-service (PaaS) offerings has made the technology more accessible to the average "citizen developer" who is not a video technology expert, thus accelerating adoption. This report highlights recent key trends in embedded video adoption, including how and why organizations are embedding video chat into their applications, and for what use cases.

The data was collected through an online survey of 166 respondents from 48 countries, conducted from June to July 2017.

Technical Complexity and Cost Are Barriers to Video Chat Integration

We polled 166 developers who have expressed interest in video chat. Of those, more than half have already implemented some form of video chat, leaving (47%) who have yet to add video chat to their app.

What is holding those that have yet to implement back? Unremarkably, the top two reasons are lack of use case and business priorities (see figure 1). That said, the next two reasons are concerns about technology limitations and cost.

If we take a deeper look at the specific technology concerns, far and away, the chief concern is guaranteeing a good quality video experience for users in a network constrained situation. We believe there is a relationship between cost and quality. Specifically, in order to provide reliable quality of experience for end users, organizations believe that they must make a heavy investment in data center infrastructure and provide regional connectivity so users connecting will be ensured a reliable quality of experience.

FIGURE 1 : CLEAR BUSINESS VALUE IS THE TOP BARRIER

What has prevented you from using embedded real-time video communication so far?

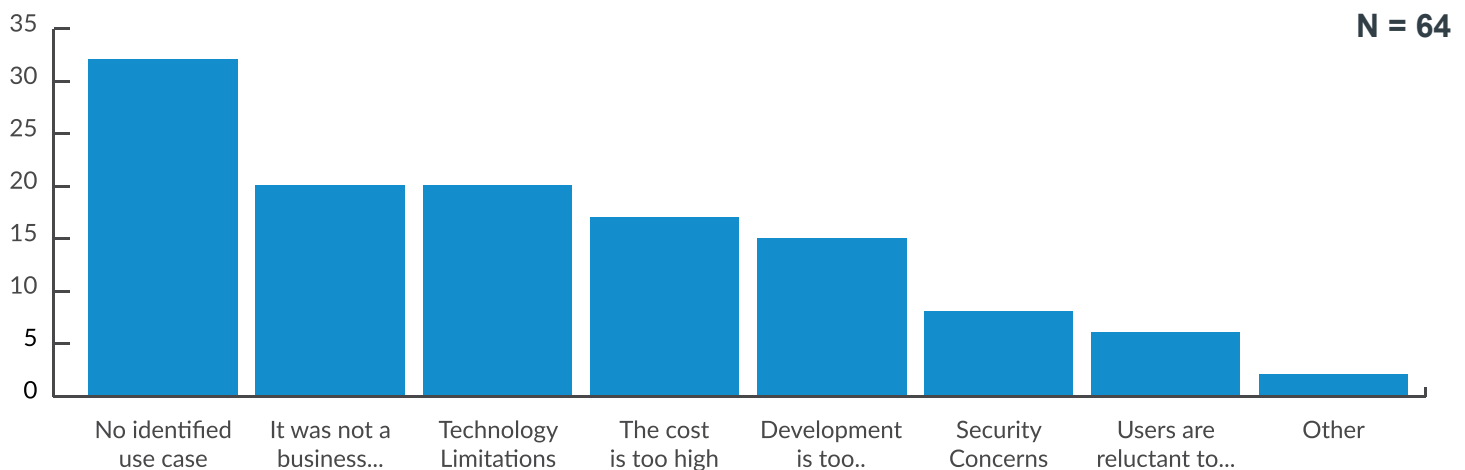
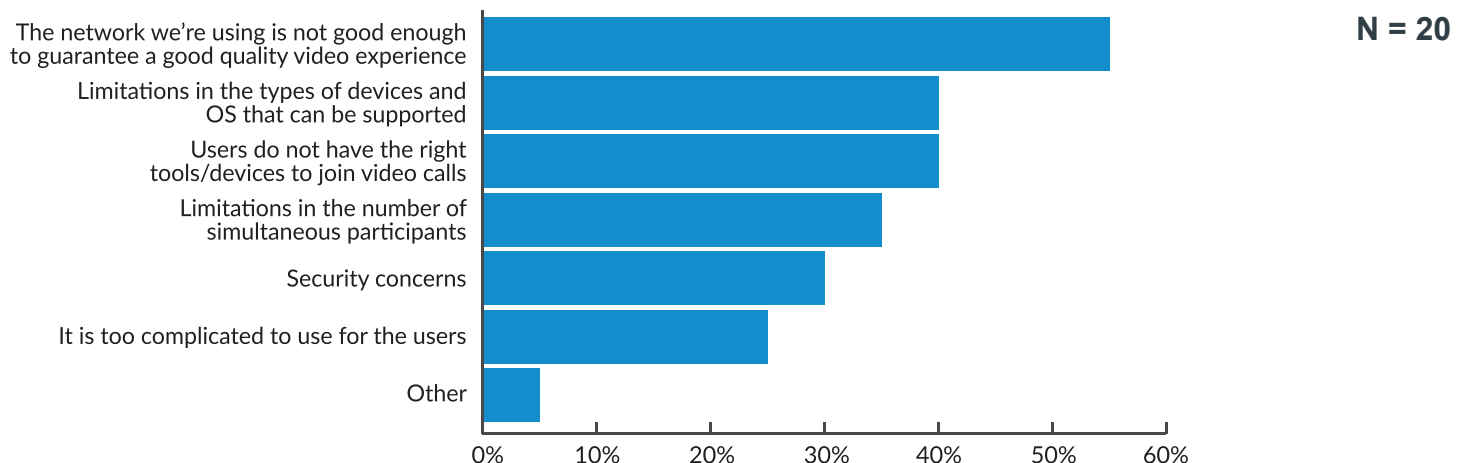


FIGURE 2 : NETWORK QUALITY IS TOP TECHNICAL CONCERN

What were the technology limitations that prevented you from using embedded video communication?



Weighing the Different Approaches to Embedded Video Chat

Concern about delivering high quality for a reasonable cost certainly makes sense. The good news is that choices are continuing to expand considerably. Developers must consider several factors when determining their approach to integrating video into their apps. More importantly, they must consider the pros and cons of the technology direction they choose. There are essentially four models that developers should consider (see figure 3):

- Build it
- Use commercially available software
- Open source it
- Leverage a communication platform-as-a-service (CPaaS)



FIGURE 3 : BUILD VS. BUY OPTIONS FOR EMBEDDED VIDEO

Approach	Pros	Cons	Upfront Cost
Full Internal Development With this approach the majority of the video technology is home grown.	• High degree of flexibility	• High cost of development and maintenance • Must host own global infrastructure	\$\$\$\$
Commercially Available Software This approach involves obtaining commercial software and integrating it as part of the project.	• Little to no development cost • Varying degree of customization • Support available	• Higher cost of acquisition and ongoing support • Must host own global infrastructure	\$\$\$
Open Source Software This approach uses available open source software that can be used as-is or customized if needed.	• Lower development cost • High degrees of customization	• Can be difficult to obtain support • Must host own global infrastructure	\$\$
Communication Platform-as-a-Service (CPaaS) This approach uses a CPaaS to deliver the embedded video capability through an API platform.	• Fully hosted service • Little to no video expertise required • Customizable • Usage based pricing lowers up front cost	• Less control over the hosting of video infrastructure	\$

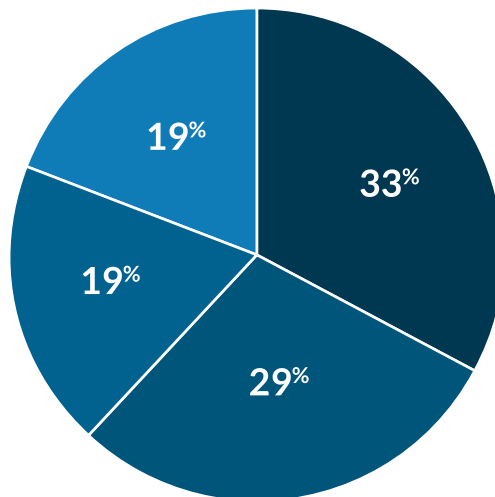


Getting up and running with embedded video can be expensive depending on the approach. Survey respondents are focused on cost savings by choosing the lower up front cost options of implementation, open source software and CPaaS.

FIGURE 4 : EARLY ADOPTERS FAVOR OPEN SOURCE AND CPAAS

How did you develop this embedded video component?

N = 88



- Leveraging Open Source Software
- Leveraging the video capability of CPaaS (Communication Platform as a Service)
- Full internal development
- Leveraging a commercially available on-premises video communication software

CPaaS Usage Expected to Grow

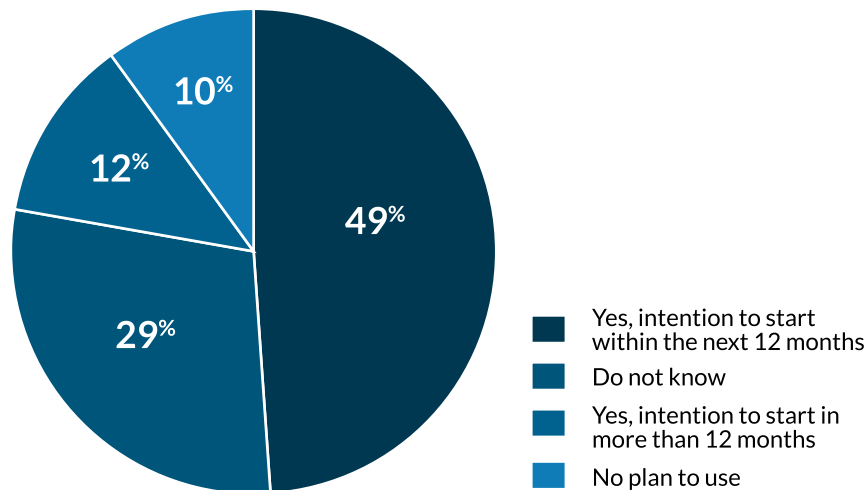
CPaaS, along with open source options, far outpaces adoption of other implementation choices (see figure 4) for video chat. CPaaS is a quick and easy way to rapidly add communication capabilities to third party apps. A CPaaS typically includes everything an app provider would need to deliver video communications, including the necessary software components and cloud hosted infrastructure. This allows the app developer to focus on building their app, rather than developing video expertise or standing up their own infrastructure.

The future of using CPaaS for video communications seems bright. When we asked respondents that have not yet embedded video about their future plans. A vast majority, 78%, of respondents plan to use CPaaS for embedded video with nearly half have plans to use a CPaaS in the next 12 months for embedded video. (see figure 5).

FIGURE 5 : CPAAS IS TOP CHOICE FOR THOSE PLANNING EMBEDDED VIDEO PROJECTS

Do you have plans to use video capabilities from a CPaaS in the future?

N = 84



What to Look for When Choosing a CPaaS Platform

Survey responses revealed an interesting correlation between the most important feature considerations when selecting a CPaaS provider and the implementation use cases.



The top two features considered important for selecting a CPaaS are WebRTC support and support for a variety of devices / platforms.

It's not surprising that WebRTC is a critical feature for customer engagement applications. It facilitates the ability for customers to join a video call without downloading software, thereby

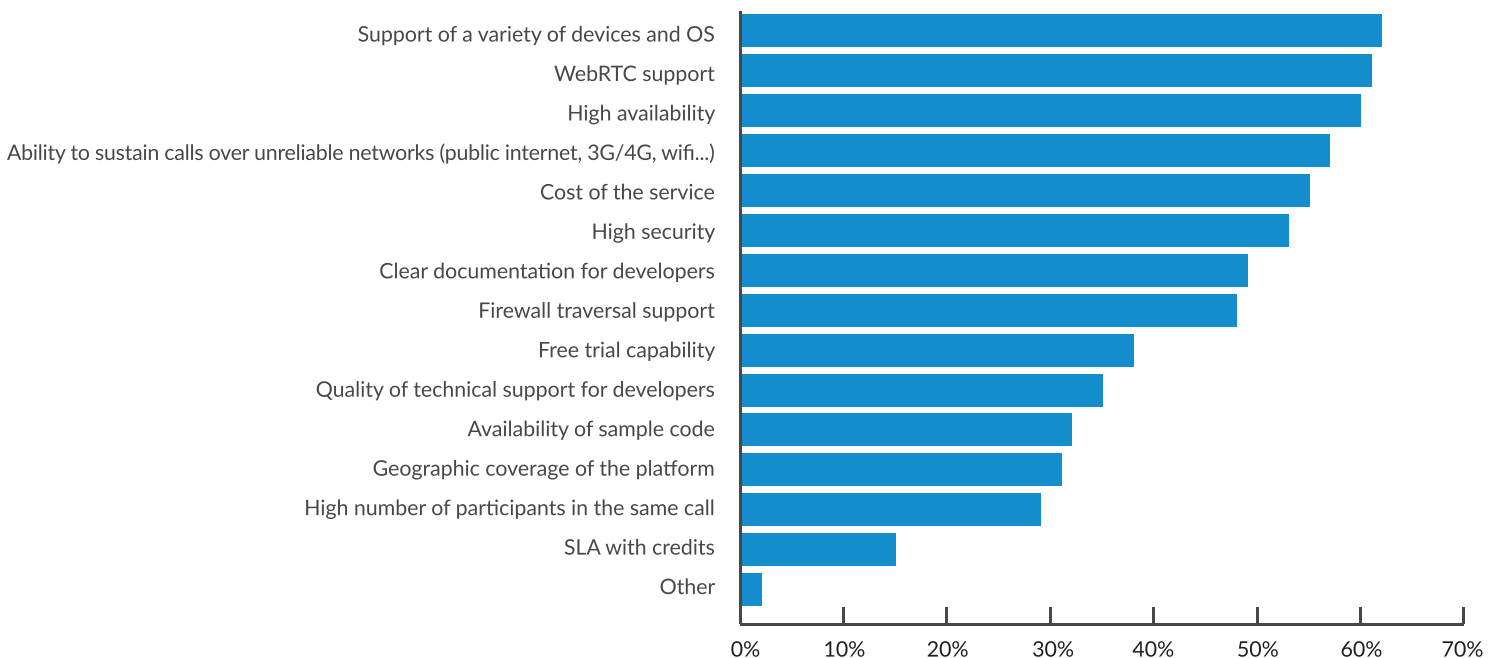
reducing the friction associated with connecting to an agent via video (see figure 6). For example, customers do not need to speak with an agent on a regular basis, and do not need the benefits of a native installed app.

Conversely, for online meetings and routine collaborative interactions within a networked group of users, there are many more benefits associated with having a native app installed, rather than using a web app for regular use. Therefore, collaboration and online meeting use cases need to be able to support a broad variety of devices and operating systems in order to facilitate collaboration between users on disparate devices.

FIGURE 6 : TOP SELECTION CONSIDERATIONS FOR CPAAS

What are the most important considerations when choosing a CPaaS to enable real-time video communication?

N = 166 , MULTIPLE SELECTION





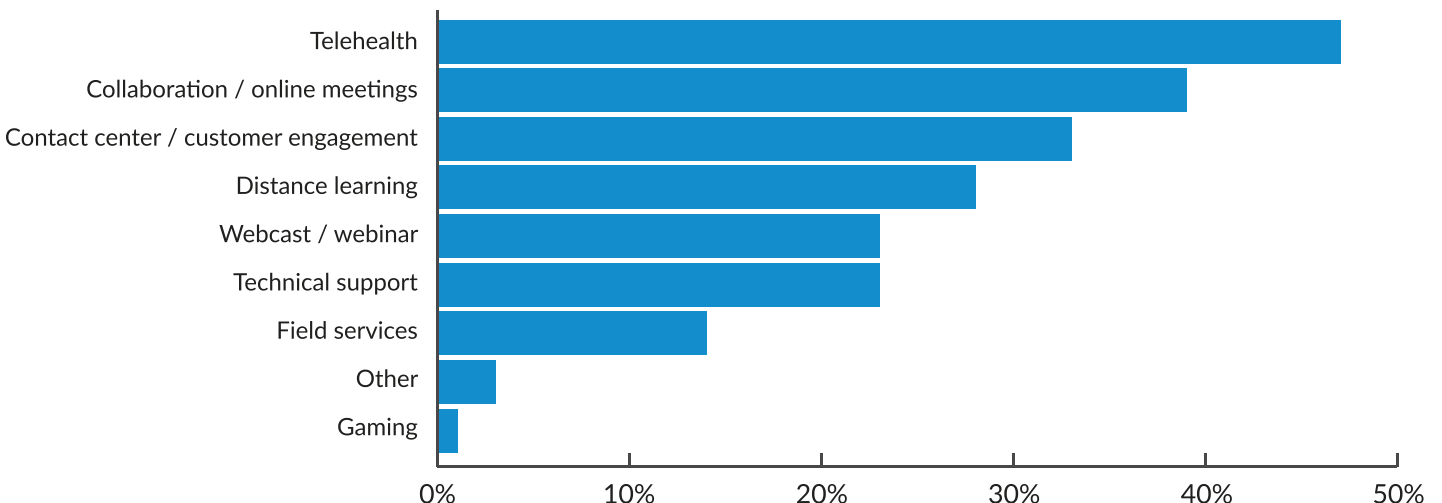
Telehealth, Team Collaboration, Customer Engagement and Distance Learning Are the Top Use Cases for Integrated Video Chat

Survey results clearly illustrate telehealth applications are the leading use case for embedded video (see figure 7). Why? The healthcare industry is plagued by political pressure and is aggressively seeking ways to lower the cost of care while increasing access and improving outcomes. Enter telehealth. However, telehealth is also a key example in which clear, reliable video communication is crucial. Not having clear communication between patient and doctor could result misdiagnosis, or worse.

FIGURE 7 : TELEHEALTH IS THE TOP USE CASE FOR EMBEDDED VIDEO

What is the use case for the embedded video capability that you built?

N = 102 , MULTIPLE SELECTION



Web Applications are the Predominant Delivery Platform

The application type describes the platforms users access the app from. These include:



Native Application

An application that is installed on a desktop or laptop computer that runs directly within the operating system of the computer.

Web Application

An application that is web based and is accessed via a web browser.

Mobile Application

An app that is installed directly on the mobile device such as a phone or tablet.

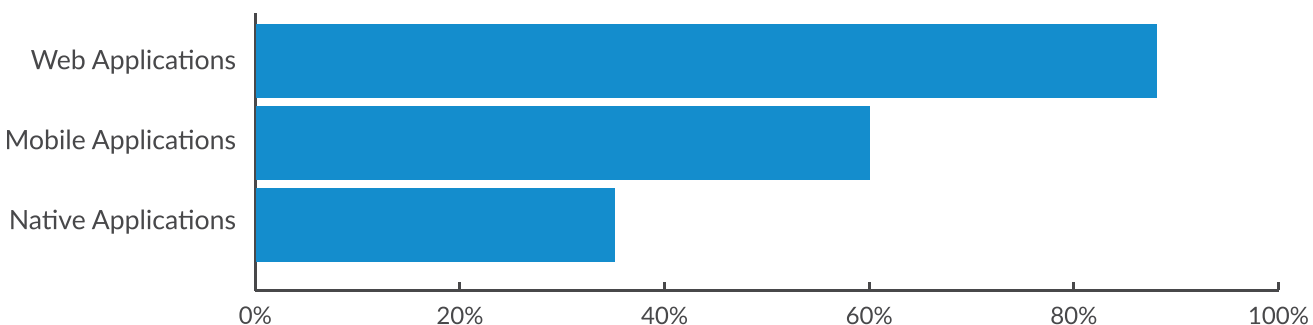
The leading target platform for respondents who have embedded video into their apps is a web application (see figure 8). Web applications provide the benefit of not requiring users to install software in order to use the application. In the context of video chat, this further explains why WebRTC is such an important feature. Because video chat can be accessed directly from the browser without any kind of software download, it offers the most convenience for many forms of interaction. Web apps using WebRTC are ideal for desktop or laptop users who only occasionally use a service.

It is also notable that mobile apps come in second at 60% while native desktop apps lag far behind at only 36%. Clearly most companies building embedded video apps are developing for multiple target devices in order to reach users on their preferred device. Apps that are natively installed on a device (mobile or desktop) have direct access to the underlying hardware resources, which can result in better performance and a better user experience vs. running within a web browser.

FIGURE 8 : WEB AND MOBILE APPS ARE THE MOST COMMON

In what type of application is the video service embedded?

N = 102

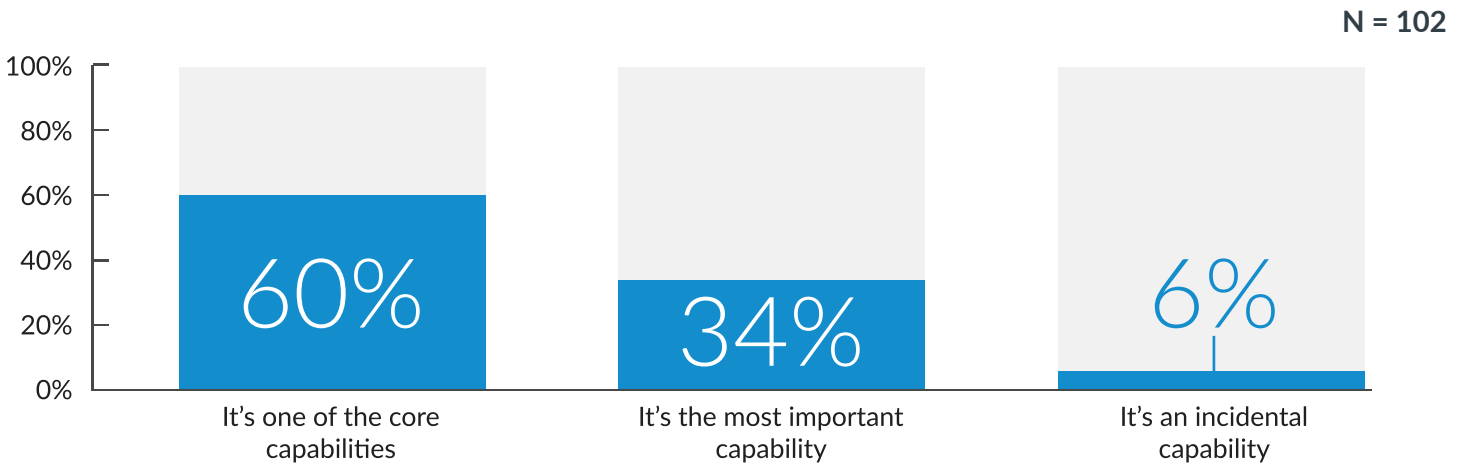


Video is a Critical Feature of Respondent Product and Services

We attempted to determine how crucial embedded video was for respondents who have video built into their application (see figure 9). Depending on the application workflow or use case, the video communication can be a small part of the workflow or it can be a vital component. For 60% of respondents, video is core to the product or service offering, and over one-third indicated that video is the most important capability. A mere 6% indicated the feature was incidental to the overall app or service being provided.

FIGURE 9 : VIDEO IS A CRITICAL COMPONENT OF MOST SERVICES

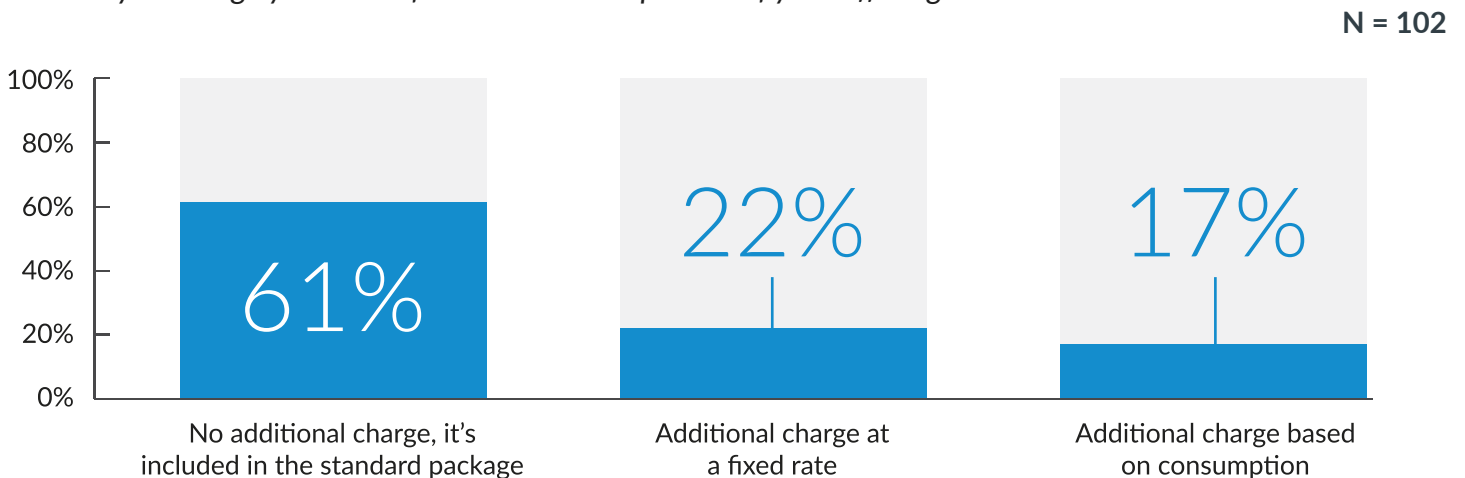
How important is the use of embedded video in your offering?



In line with the finding that most apps include video as a core part of the service, our survey also reveals that 61% of respondents include the video capability as part of their standard packaged offering rather than having a consumption or usage-based fee structure (see figure 10).

FIGURE 10 : VIDEO PRICING IS INCLUDED IN COST OF SERVICE

How do you charge your users for the video component of your offering?



Most Use Cases Target Personal Devices For Now

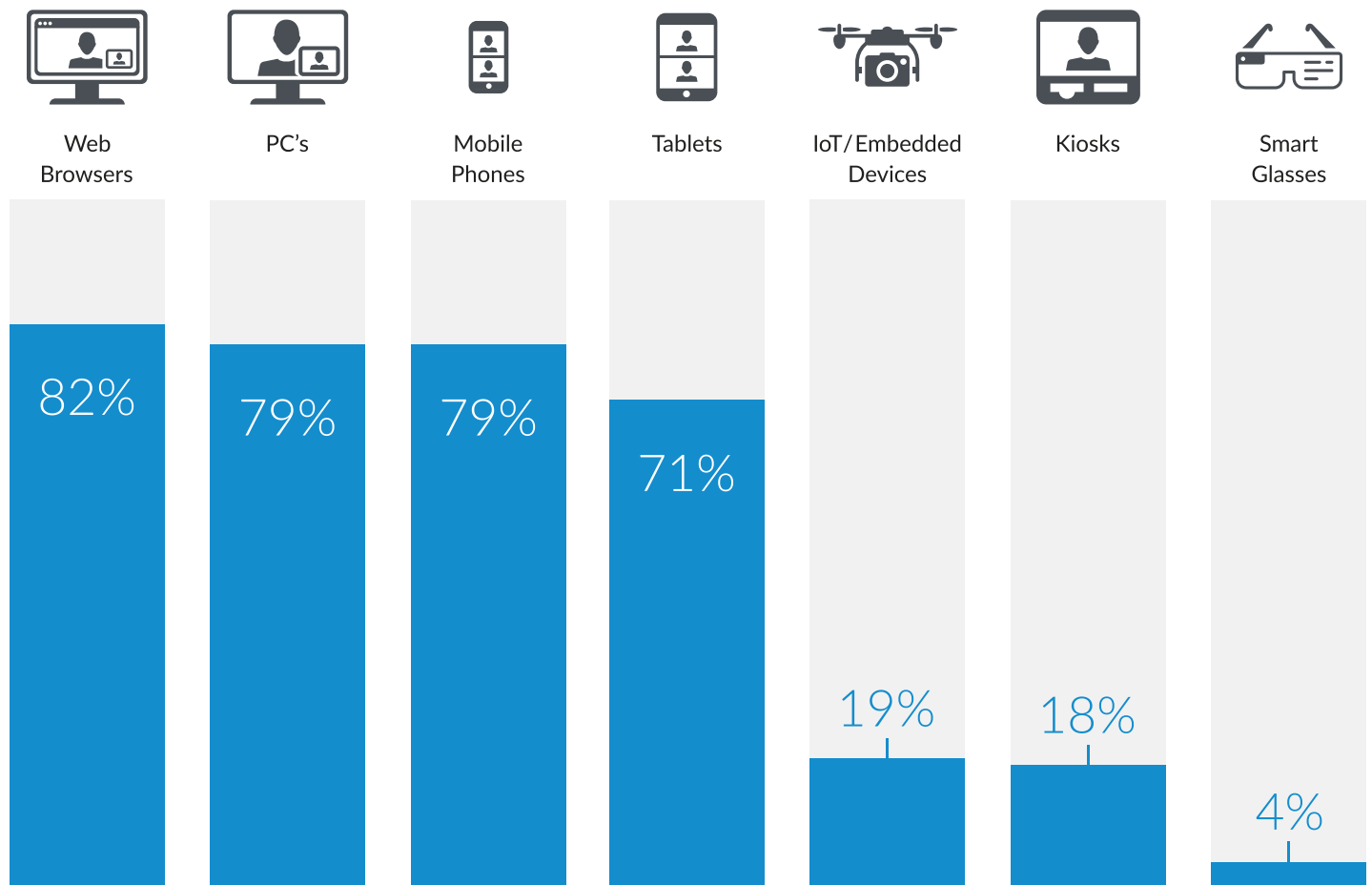
Embedded video is predominantly used in devices that people commonly have access to, such as a computer (web browser, PCs) or their mobile devices (smartphones, tablets). Our data confirms that the majority of use cases for embedded video are targeted at these personal devices (see figure 11). However, there are other devices that also used for embedded video. The top alternative device types to computer, smartphone, and tablets are:

- **IoT / Embedded Devices** (19%) - IoT / Embedded devices can be a variety of different devices that utilize video, such as hospital bed monitoring devices that allow nurses or doctors to view patients, doorbells that provide two-way voice with video for the home owner, etc.
- **Kiosks** (18%) - Kiosks can be used in physical locations, such as brick and mortar stores or bank branches, giving customers the ability to speak with subject matter experts that are not local.

FIGURE 11 : DEPLOYMENT THROUGH PERSONAL DEVICES IS MOST COMMON

What type of devices can the video service be used with?

N = 102, MULTIPLE SELECTION





Most Apps Go Beyond Basic One-to-One Video Chat

Group video chat extends the capability of embedded video systems by allowing more than two endpoints to connect and communicate simultaneously. Technically speaking, group video chat is considerably more complicated than just one-to-one video chat between two participants. The endpoints in a group video chat aren't always participants. For example, if an application needs to record two participants, some form of multiparty infrastructure is required to enable both participants - plus the device that is performing the recording - to be joined together in a call.

Some apps simply leverage basic one-to-one video without the need for complicated infrastructure, however the results (see figure 12) indicate more advanced video chat apps are being built. Nearly two-thirds of respondents have found a solution that supports multiparty video.

FIGURE 12 : MOST APPS SUPPORT GROUP CALLING

Do you support multiparty video calls or point-to-point only?

N = 102



63%

Multiparty



37%

Point-to-Point Only

Advanced features are capabilities provided in addition to video chat. These advanced features can be used in different applications or use cases.

- **Web conferencing** - This capability provides features necessary to support two or more participants to meet in an interactive video session.
- **Recording** - Recording capability records the audio and video from an embedded video session and saves it in a format that can be viewed later on demand.

- **Annotation / Whiteboarding** - This feature allows participants in a call to be able to draw on a virtual whiteboard or over shared content.
- **Streaming** - This feature converts the two-way interactive video into a composited one-way stream for viewers to watch as a live video stream rather than an interactive video. Generally, the one-way stream is not quite real-time and can be delayed.
- **Interactive Broadcast** - Interactive broadcast provides the features of web conferencing for a few participants with the ability to output a low latency one-way stream to a broader audience. This feature is typically used in scenarios where an audience member can be escalated to a participant such as an audience member asking a question from a panel of speakers.

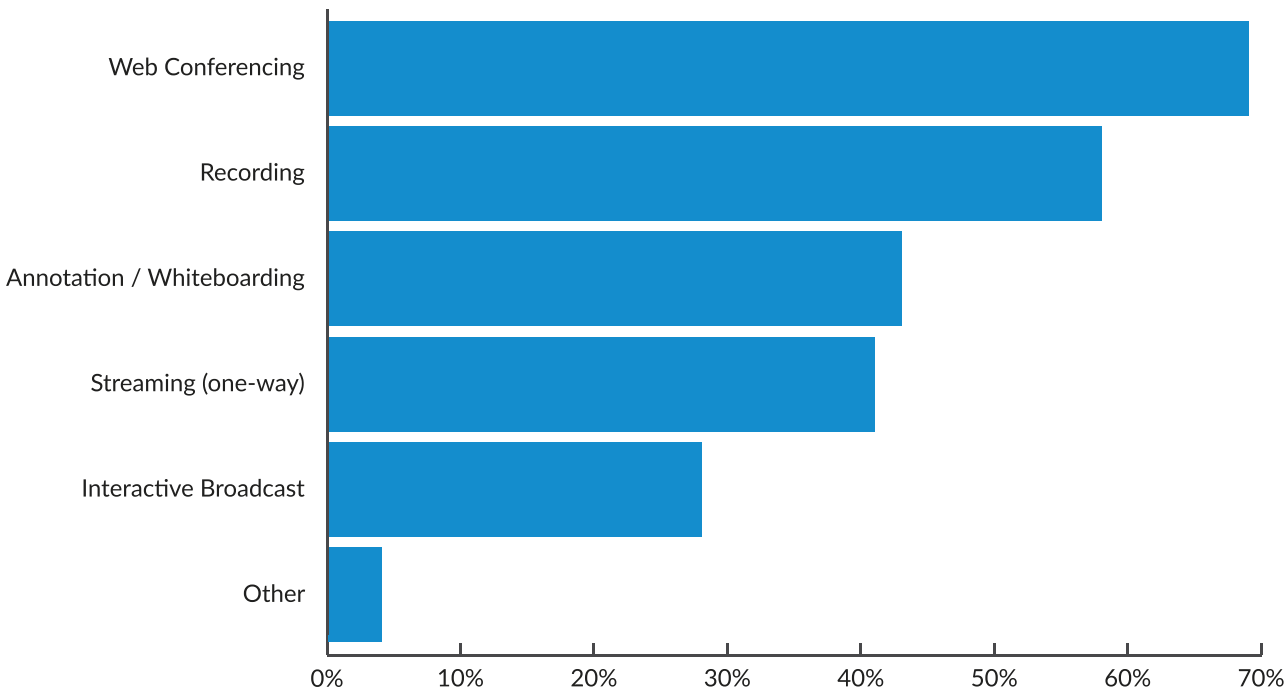
Survey respondents value using embedded video to facilitate group meetings, with 70% selecting web conferencing as the most common feature (see figure 13). Web conferencing is a common way to establish face-to-face meetings between groups of people who are in different locations.

Coming in at second is recording functionality, with 58% of respondents indicating they use this feature. Recording is useful for variety of use cases involving video chat. For example, recording customer service video chats are a way to further ensure quality service. Collaborative teams use recording to take meeting minutes and provide recordings to team members who are not able to attend in real-time. Education and training groups use recording to make on-demand training videos from actual live training sessions.

FIGURE 13 : TOP VIDEO CHAT FEATURES

Which of these advanced video features are you using?

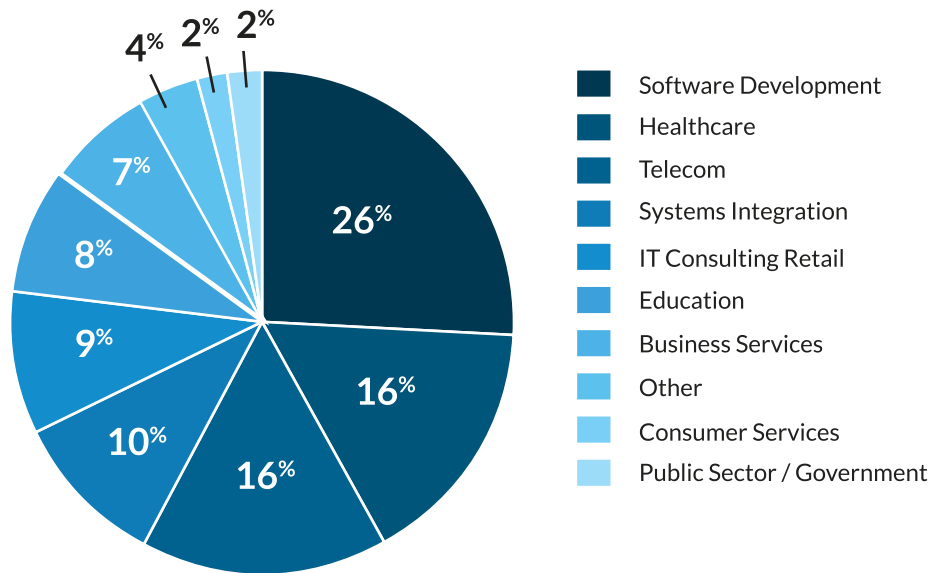
N = 99 , MULTIPLE SELECTION



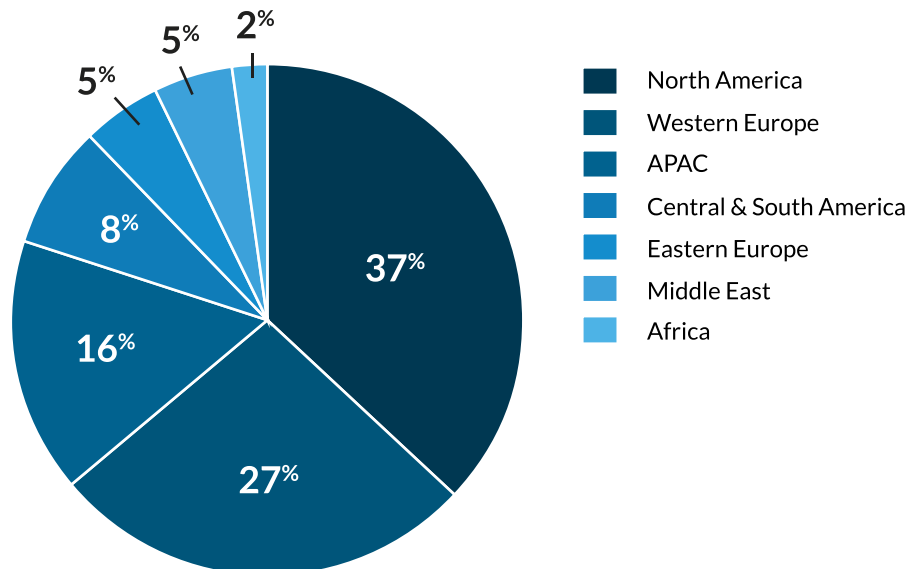
Profile of Respondents

Survey respondents hail from 48 countries with the largest segments, 37% and 27%, from North America and Western Europe respectively. While a broad mix of industries is represented, respondents overwhelmingly come from companies with less than 100 employees. Perhaps a reflection of company size, the lion's share of respondents also report that they are director-level or above with a full 50% reporting that they are general management, CIOs, or CTOs.

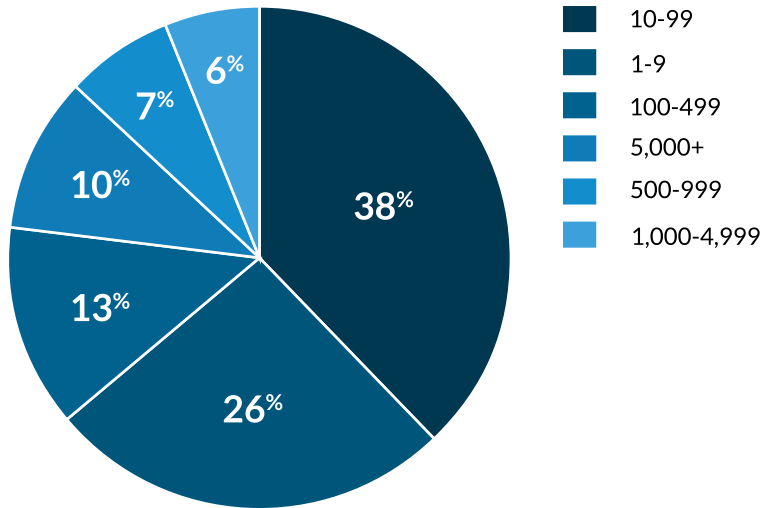
Respondents by Industry



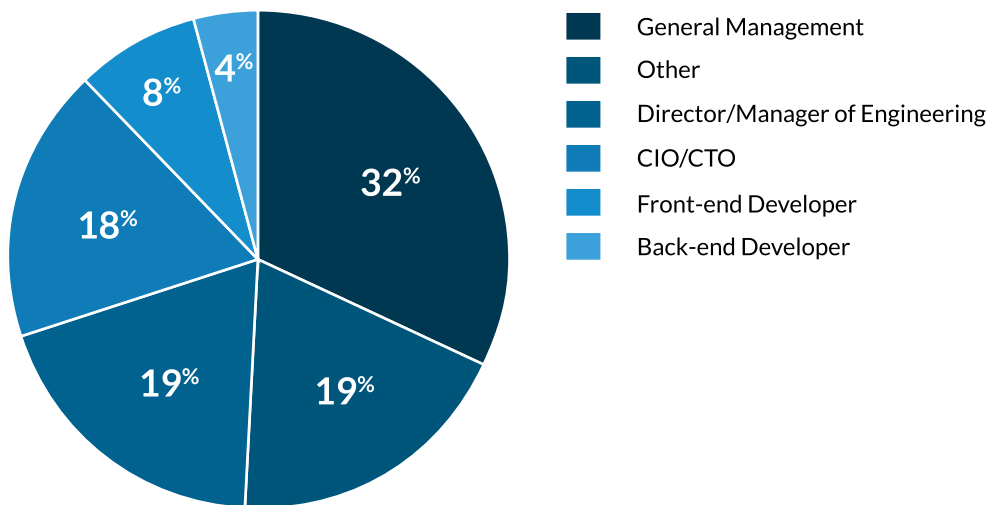
Respondents by Region



Respondents by Company Size



Respondents by Job Role



Vendor Highlight: Vidyo.io is the Developer Platform for Embedded Video Apps

Vidyo.io is a developer platform that makes it easy to embed high quality group video chat into any mobile, desktop, or web app. Vidyo.io is powered by Vidyo's patented technology that delivers the highest quality, enterprise-grade video communications.



Cross Platform SDKs

With SDKs available for all major platforms and consistent APIs, developers can rapidly build cross platform video chat apps powered by Vidyo.io. It is possible to have an embedded video app up and running in a matter of minutes.



Global Video Network

Vidyo.io is powered by a globally distributed, highly available cloud network. Geo-localization of traffic ensures users always connect to the nearest data center for highest quality of experience. Whether you're talking to someone across town or across the globe, we've got you covered.



High Quality And Reliable Performance

Good communication requires crystal clear video. Vidyo sustains high quality conferences over links with variable bandwidth, such as wireless and the public Internet. Using dynamic network adaptation, the video is continuously optimized to deliver the best quality possible at any given moment.



Secure Communication

With industry standard encryption and software that has been hardened inside and out, Vidyo.io is trusted by the most security-conscious industries, including financial services, major healthcare providers, and others.



Ability to Deliver High Quality on Mobile

Vidyo's patented technology delivers 20% error resilience and supports virtually all of the devices that customers may own: desktops and laptops (macOS, Windows), smartphones and tablets (iOS and Android).

Have your developer give vidyo.io a try!

Sign Up For a Free Account

<https://vidyo.io/signup>

Conclusion

It's clear the shift from unified communications to embedded video is well underway. People do not want to use a single monolithic app or solution that is separate from the workflow tool they are using in order to connect. Innovative companies recognize this trend and are moving to embed communications into their apps and services to take advantage of the many benefits it provides. Embedded video improves customer experience, user adoption, employee productivity, and much more.



WebRTC.ventures

WebRTC.ventures builds custom real-time applications with video, voice, and data exchange so you can stay ahead of your competition and your customers' needs. Our mission: Using the best talent possible, we build innovative solutions that enable the communication of the future. We enrich and facilitate people's lives with embedded communication apps that better connect them with the world around them, no matter where they live. Our team works with companies in healthcare, education, online broadcasting, and more!

For more information: <https://webrtc.ventures/>



Vidyo

Millions of users around the world visually connect every day with Vidyo's secure, scalable technology and cloud-based services. Vidyo offers video collaboration solutions for companies that require the highest quality video interaction available. Recognized with over 170 patents awarded, the company's software platform and APIs are used by enterprise customers, service providers, and ecosystem partners to create innovative HD quality video-enabled applications embedded into workflows and emerging IoT devices.

For more information: <https://www.vidyo.com>