Design guide for virtual farm demonstrations

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Inhoud

0. Introduction

The use of farmer-made videos is a great way to share innovative approaches used on-farm. Virtual demonstration allows to increase the access to demonstrations and to decrease the time constraints associated with traditional on-farm demonstration.

Videos are gaining bigger impact than written content or pictures. With a well-produced video, a farmer is able to capture much more information than from a written abstract. He does not only see a tractor on the field, but at the same time catches details about the soil conditions, technical capabilities, equipment adjustment and ease of machinery as well as working conditions.

Smartphone technology enables to record in slow motion and time lapse, easy editing and cutting, as well as fast upload to the internet. For farmers, it is easy to consume such content and to share it with peers. Therefore it enables farmers to disseminate their interests and learn from their peers near and far.

When videos are embedded in discussion forums, Twitter, Facebook, YouTube, LinkedIn, webpages or other social media channels, they also enable online learning and networking opportunities for farmers.

In this document, we defined 6 steps to organise virtual demonstrations, from defining the objective to the dissemination and evaluation of the impact. Throughout, this guide offers concrete tips and tricks and examples from practice (with QR codes to video links).

Figure 1. Filming during a drone demonstration at La Maremmana (Principa Terra, Toscane)

1. Defining the objective for virtual demonstrations

Making explicit the objectives of the virtual demonstration is key because they determine all the other decisions an organiser makes during the preparation and organisation of the virtual demo. Having a clear objective and key message aids to the success of the virtual demo.

The demo objective should specify what the organisers seek to achieve with the virtual demo. It should start by addressing the 'why' (why are you planning this virtual demo?), then the 'what' (what do we want to demonstrate?), and then the 'who' (Who is the target audience for the virtual demonstration?). These three aspects together then define the 'how' (how will the virtual demo be set-up?).

1.1. Why are you planning a virtual demo?

Videos can significantly increase the reach and multiply the impact of demonstration activities. For example, an on-farm demo event will only be attended by a limited number of farmers, but a video can go viral on the internet and reach a much bigger audience. Box 1 lists the most important reasons for producing agricultural videos by yourself.

The use of videos has some advantages. First, it can be used to advise on problems common to a large number of farmers. Second, it allows for repetition of information and advice, so it can be remembered easier by the audience. Information heard at a meeting or passed on by an extension agent can soon be forgotten. Third, the audience can be brought into contact with successful farmers or agricultural experts from all over the world

Why you should produce farm demo videos

Many agricultural activities are linked to the time of year, such as tillage or harvesting.

A video captures the current moment and the content becomes accessible to a wider audience.

Agricultural videos are popular with farmers. Many farmers even run their own YouTube channels.

Videos are an excellent way to show the experience of practitioners.

The reach of such demonstrations can be significantly extended with videos.

Farmers prefer videos over written resources to inform them about a specific topic or approach.

After Google, YouTube is the second largest search engine in the world.

Video equipment and editing software are now inexpensive and easy to use.

1.2. What do you want to achieve and demonstrate?

The contents of a virtual demo should be selected carefully according to what you want to achieve with it. For example, organizers of demo events, might want to use them to promote future event by giving a general overview of what will be demonstrated. Advisors might want to explain how to perform a specific practice on the farm.

Agriculture offers a wide range of topics suitable for videos, including (Figure 14):

1. ***Machine demonstrations***. These are among the most popular demonstration activities and achieve the highest number of views on YouTube.
2. ***Training Videos*** which are shot on site, i.e. in the field, in the stable or at a machine.
3. ***Tutorials*** on more complex topics are preferably realized in a simple studio in front of a so-called green screen (primarily filmed indoors vs. training videos which are out door based).
4. ***Practical innovations*** and individual solutions from farmers.
5. ***Event Videos*** to convey selected conference contributions or impressions of conferences.

6. ***Results of research*** communicated to various stakeholders. These are in less detail and often supplement written articles or papers.

7. ***Teaser videos*** can be used, for example, to announce a new handbook or events.

8. ***Short video clips*** on agricultural advisory websites are a valuable addition to online texts.

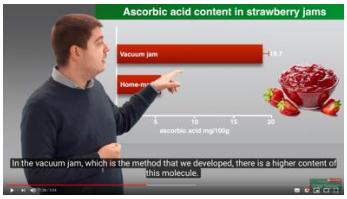
1. Machine demonstration

Scan me

2. Training videos

Scan me

3. Tutorials



Scan me

4. Practice innovations

Scan me

5. Events

Scan me

6. Research projects

Scan me

7. Teaser

Scan me

8. Addition to online-text

Scan me

Figure 2. Fields of application of videos in agriculture, with QR-codes to see video examples from the PLAID project. (source: Deliverable 4.3-PLAID)

Other popular formats in agriculture are **video blogs** (vlogs) in which farmers document and comment on their work on the farm. **Advertising films**, for example for a farm shop or **image films** for organizations, are other formats. We recommend hiring professional videographers to produce PR and commercial films.

Some recommendations on choosing a topic:

- Current content that is topical and sometimes seasonal will be the most appealing to viewers.
- Take into account variation in farm types (animal breeding, plant production, mixed, conventional, organic, etc.) and farm size (small, big, medium) when producing virtual demos (but depending on your target audience).
- Have a short 10 second introduction. It has been shown that people's attention is gained in the first 10 seconds. If the content does not catch their attention in this initial engagement, they often become disinterested.
- Demonstrate both whole farm approaches and approaches to specific areas of the farm.
- Use a simple topic to start with, e.g. a machine demonstration. Here, the storyline is linear, i.e. one machine just follows another

TIPS

Start with a simple, clearly defined topic.

Ask yourself: Is film really the appropriate medium for this topic?

Consider whether the topic provides enough visual material. Prevent that too much information that cannot be illustrated should be conveyed as text.

Avoid talking heads!

Find the story behind a topic. Telling stories and evoking emotions are the strengths of videos.

Know your own limits. Leave complex topics, concepts, PR and advertising films to the professionals.

1.3. Who do you target?

The contents of a video will differ depending on the target audience of the video. Visual content can be good for engaging at many different levels, for example, technical videos are good at explaining how new technologies can be used in different situations. So a video could include instructional content but also promotional content, for example, to point of selling. Videos of research data and results could be used to disseminate project results or they could show how research is translated to practical farming advice. Examples of audience type and their areas of interest are given below.

1.3.1. Peer-to-peer

For videos that target peer-to-peer learning, the videos are produced by farmers to inform farmers. These videos focus on material that engages fellow farmers. The video footage has generally been taken by farmers, or on occasion by advisors, to showcase new innovations or management techniques that would be interesting to their peers. The videos can be used to inform on a technical aspect of machinery or husbandry or management techniques and can be used to gather interest or encourage discussion and debate or as a tutorial to help others to use technology.

Peer-to-peer exchanges help to encourage communication within social groups and help the uptake of on-farm innovations. They encourage the development of sustainable agriculture by experimentation of new techniques in on-farm situations. The videos help to create debate and critical problem solving to further develop innovations and encourage the use of new technology for specific on-farm situations where tailored solutions are necessary. Often regional issues can be explored by viewing and following discussion on social media. Equally, cross regions and cross sectorial solutions can be exchanged where face-to-face discussion would have been unlikely to have taken place.

Videos aimed at other farmers need to illustrate and provide additional details to a specific farming approach or method as well as whole farm approaches and systems. Areas of interest for other farmers will include how the approach was implemented, how transferrable it is to their farm, the benefits, and barriers or challenges to implementing the approach.

Videos for farmers should focus on a strong visualization of the topic including machines in action, crops, animals etc. Farmers want to see practical solutions on other farms. Whenever possible use other farmers as testimonials. Let them speak about their experiences, about their success, but also about difficulties encountered. Different opinions on a topic increases the attractiveness and credibility of your video. However, statements should be very concise and clear.

1.3.2. Policy

Videos aimed at policy should highlight the transferability of an approach, how this farming approach/ trial can impact policy and how policy can be changed to further influence/ enhance farming practices across Europe. Videos aimed at policy makers can target wider topics, for example, the effect of a change in agricultural management and its impact on biodiversity. These videos can take a broader view on how a whole agricultural community may impact the wider community and may be a good basis to provoke a wider debate. Equally, policy targeted videos can highlight beneficial aspects of a change in agriculture practice and help encourage further changes that are beneficial to all.

1.3.3. Research

Videos are ideal to disseminate results of research. However, be aware that one minute of video corresponds to about 100 spoken words. Thus, a video about research will be in much less detail compared to a written article. But it is ideal to supplement articles and to tease the viewer to read a paper.

There are several approaches on how to use video on research results; either as a short and simple teaser video of 30 to 45 seconds, in which the researcher explains their main results. So called teaser videos can be used on social media and to link to the original paper.

Research can also be presented in a more extensive way (lecture-style). The easiest way would be to film a public lecture. However, the quality of these lecture videos is often not satisfying (dark room with projector), and they are often too long. Therefore, it is recommended to produce research videos separately: either on a location which fits the research topic, e.g., in a lab, a stable or a field,

or film indoors in a simple studio with a green screen. Both approaches have their advantages and disadvantages. The outdoor location might be more authentic, specifically if objects related to your research can be demonstrated. Indoor videos allows the environment to be controlled (sound, light) better, and with the green screen technique graphs can be inserted and explained as a tutorial.

If the target audience are other researchers, focus on the most important results. Simplify graphs and tables used in written articles or papers, as the viewer will not have the time to understand too complex graphs. The methods applied in the research might also be interesting to be shown in a video.

If research results have a strong practical relevance or have been carried out together with practitioners, videos are the ideal tool to showcase the multi-actor approach, and to get the interest of farmers and advisors. In this case, an outdoor location might be the better choice. Again, do not overload the video with information! If uploaded to YouTube, practitioners can ask under the comment section for further details.

1.3.4. General public

Farmers like to engage the general public to help them understand the importance of the farming community in producing the food that they purchase to feed their families. Videos that promote the sustainable production of healthy food are welcomed to encourage the general public to purchase and support food that is produced sustainably. Often sustainably produced farm products produced according to EC ethics have a higher premium and videos promoting these foods are used to encourage the public to support these foods. The general public may not be aware of specific approaches, techniques or farming terms so the language used in the video and footage shown needs to reflect this.

The areas of interest for the general public will be more general compared to other farming, policy and research audiences and can include, how a demonstrated approach will affect the environment and the availability of food.

1.3.5. Children

Some children are unaware of 'where their food comes from'. Therefore, videos can help them to understand the source of their food and how food is produced. These videos need to be targeted specifically to them as their understanding is at a different level and short effective videos will promote engagement and lead to higher acceptance of healthy options for food choices as they grow. The subjects they find interesting often are more diverse than older viewers although their attention level is high for a limited period of time.

2. Preparing a video for virtual demonstrations

2.1. Choose a production team

The video production team can constitute a diversity of actors, such as universities, scientific and research institutes, extension services, private companies, farmer organisations or public services. The collaboration between a diversity of actors, such as farmers, advisors and scientists can be challenging because of their different professional backgrounds, skills, knowledge bases, priorities, work routines, and motivations. To help this endeavour succeed; it is important to define clear terms of reference and a mutually agreed upon topic, content and division of labour.

Every demo video project is unique and having the right team in place is crucial to its success. With the right people on board you will make the most of your time, and get a better video in the end. It is important to know your own limits. Leave complex topics, concepts, PR and advertising films to the professionals.

When it comes to deciding on the size of your production film crew, what you're really deciding is how many experts you need to create a successful demo video. This will depend on the complexity of the project. At least the following roles should be covered in your team:

1. **Director and camera operation.** For almost all projects, a 2 man crew (1 director and 1 camera operator) is the best basic set-up. The camera operator can dedicate full attention to the picture and sound quality. The director can lead the shoot, guide the presenters, interviewees or actors, and make sure everything is going according to plan. It's also a good idea to have two sets of skilled eyes on the shoot. This makes it easier to decide which shots are needed for complementary images (see also B-roll in section 7.4). The images help to add style to the material and can bring simple videos to life.
2. **Presenters.** The presenter should be able to explain things clearly and concisely. This saves a lot of work in the subsequent post-production and is the best prerequisite for a successful video. Where possible use a range of stakeholders (researchers, advisors, farmers including young farmers and female farmers) who are asked relevant questions and add value to any written online text.

2.2. Structuring the content

Once the topic is selected, it should be narrowed down and further specified. For example, the main topic "Biodiversity in agriculture" can be transformed into "Creating areas to promote biodiversity on an arable farm" or even more specifically "Planting hedges" or "Maintaining hedges". As a general rule, only one topic should be dealt with per video. Further, the action-oriented elements that you want to include in your video should be defined.

It is important to write down the most important points you want to get across to the audience. First, as keywords and afterwards as formulated sentences. This gives a first indication of the duration of the video. As a rule of thumb: 100 words make 1 minute of film.

The formulated content must then be structured. The basic structure for all video formats include a beginning (intro), a main part and an ending (outro) (Figure 15):

- The **intro** introduces the theme and its relevance. During the first 30 seconds, the viewer must understand why it is worth watching this video. In addition to the topic, the main speaker and, if necessary, the location should also be introduced.
- The **main part** presents solutions or recommendations for action. It is often useful to divide the main part into short chapters.
- The **outro** draws a short conclusion and/or refers to further sources of information (call for action).

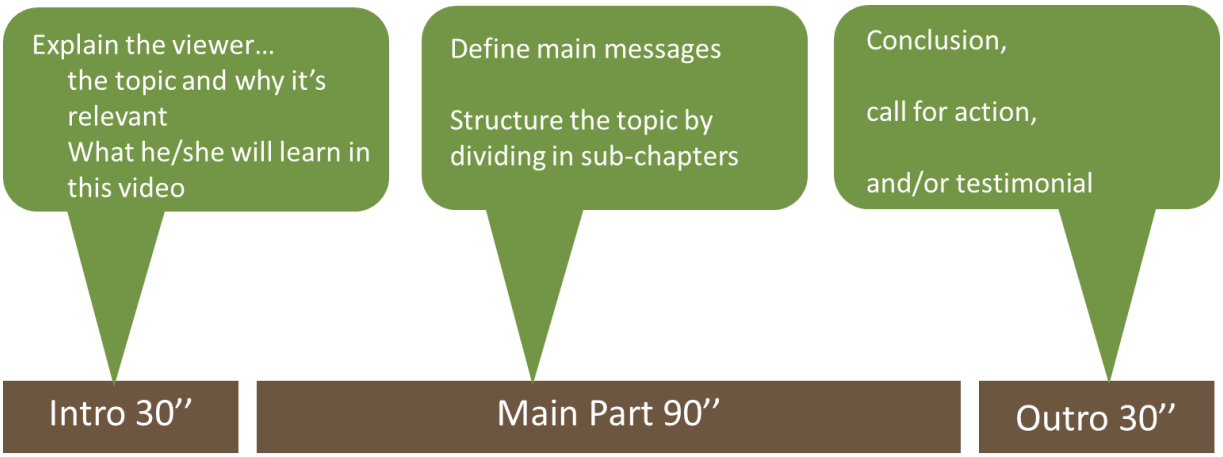


Figure 3. Basic structure of a short video of 2-3 minutes. Whether a further subdivision is needed in the main part depends on the complexity of the topic. (source: Deliverable 4.3-PLAID)

2.3. Speaker, presenter or text inserts

Once the content has been determined, a decision has to be made on who will tell the story. This could be one or several people. In the case of agricultural videos, for example, farmers, researchers or advisors can be considered. As experts, they can convey the content in an authentic and credible way.

An alternative is to have the main points written and then read by a speaker as voice-over. Both methods have advantages and disadvantages (Figure 16). But often are off-camera speakers and original voices of experts are combined.

In short videos, pictures can also be supplemented with short text insertions or subtitles. Specifically, on social media, videos are often viewed without sound which makes subtitles very advantageous.

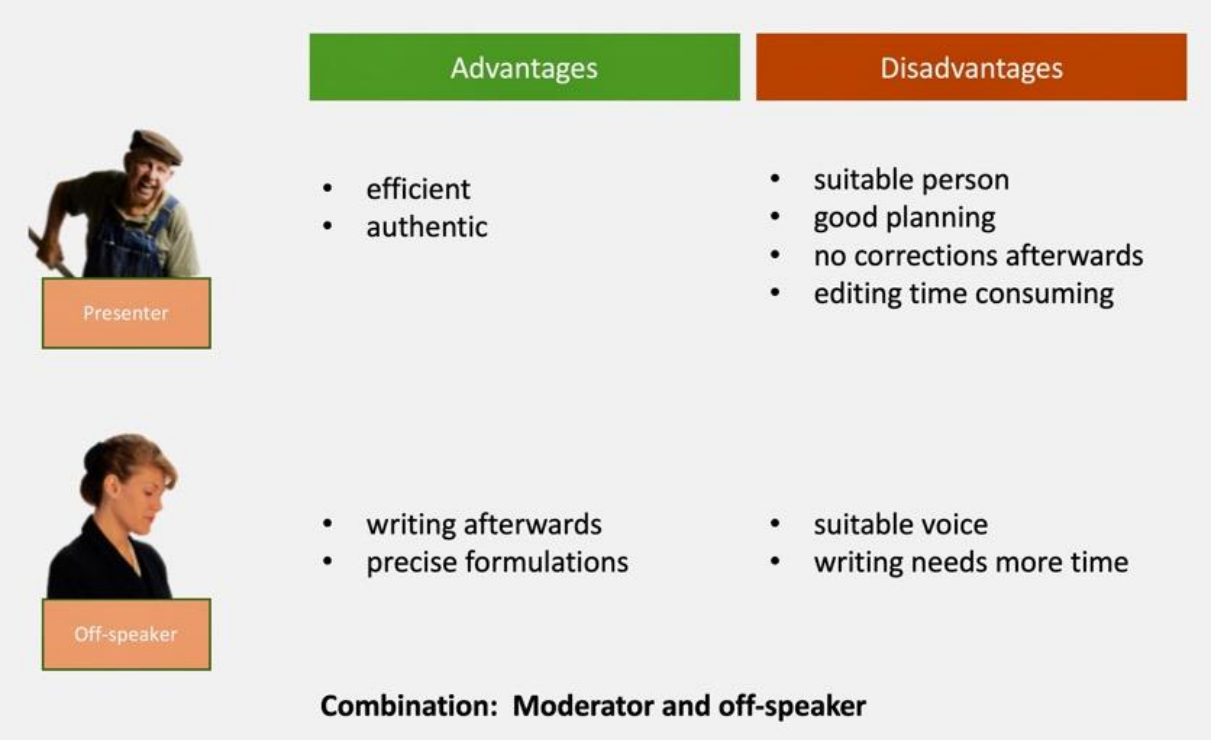


Figure 4. Advantages and disadvantages of presenter and off-speaker. (source: Deliverable 4.3-PLAID)

2.4. Planning A-Roll and B-Roll

It is important to plan the video both at a narrator and image level, regardless of whether the content is narrated by an interviewed person or by an off-video speaker. The narrator's level is also known as the A-Roll. The image level is referred to as B-roll or footage (Figure 17).

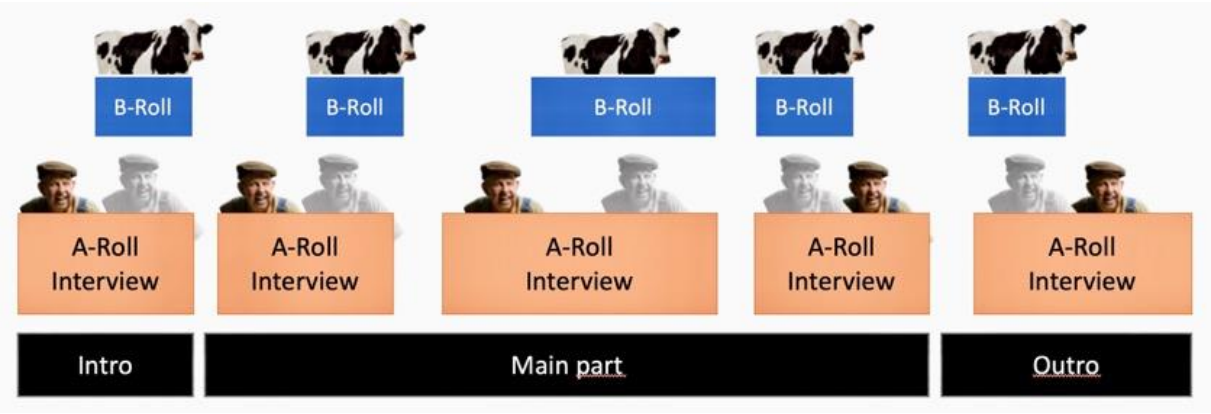


Figure 5. The backbone of a video is the A-Roll, i.e. the essential statements of an interviewee. With the B-Roll, what has been said is illustrated. (source: Deliverable 4.3-PLAID)

Once it is decided what the narrator will say, it is necessary to plan the appropriate images to compliment the narrator level. Having this well prepared, allows to film all required images on the same shooting day. If there are gaps in the planning, existing image material - photos or clips – might have to be used. It is important to list all the pictures you need so that you don't forget anything during the shooting. A template for an outline is shown in Figure 18.

Outline for Video (title): .....

Format: _presenter _narrator (voice-over) _only titles _other

Content 100 words=1 Minute	Picture level
Intro Explain the problem, say what will be shown in the Video Keywords: - - - - - - - Estimated time:	e.g. presenting farmer, crop
Main part: Explain your innovation step by step Keywords: - - - - - - - - - - - Estimated time:	e.g. machines in action, details, photos
Outro: recommendations, call for action, statements of farmers etc. Keywords: - - - - - - - Estimated time:	

Figure 6.Template for an outline to plan a video. (source: Deliverable 4.3-PLAID)

2.5. Equipment

2.5.1. Camera

You can choose between smartphones, camcorders or photo cameras with video function (Figure 19).

Smartphones today usually have an excellent camera built in. In bright sunlight, however, image control on the display is difficult. It is important to remember to always film in landscape with smartphones. For further information on how to turn your smartphone into the perfect video camera, click the following url: https://www.backstage.com/magazine/article/turn-smartphone-perfect-video-camera-19498/

Camcorders are fully designed for filming. They are easy to handle and require little practice. They offer an adjustable display, which is a big advantage in bright sunlight. Camcorders with viewfinders and eyecups offer even better image control. The zoom lens is another advantage compared to smartphones.

Cameras (reflex and compact cameras) with video function also offer excellent image quality. However, handling, and more specifically focusing, requires more practice than with camcorders. Important for all camera types is to make sure they can be connected to external microphones and a tripod.

Figure 7. Smartphone, video camera or photo camera: the image quality is good for all of them. The choice of the right device is determined by the application, budget and personal preference. (source: Deliverable 4.3-PLAID)

Considerations for buying a camera

First gain experience with existing equipment.

Rent cameras and see what suits your needs best.

Video camcorders with good image quality are available from €300.

Make sure you have inputs for an external microphone and headphones.

It depends on your budget whether you buy a camera with Full HD or 4K resolution. Editing video in 4K requires a more powerful computer and more storage space.

2.5.2. Additional types of cameras suited for agriculture

Here we present three types of cameras that are particularly suitable for the production of agricultural videos (Figure 20). However, they are not part of the basic equipment for beginners.

Figure 8. Popular in agriculture: Actioncams, drones and 360° cameras. (source: Deliverable 4.3-PLAID)

Actioncams deliver spectacular images when mounted on a tractor or machine in the dustproof and shock-resistant protective housing supplied. The picture quality is usually very good, but the sound quality is poor. You could decide to use separate audio recording equipment simultaneously to obtain a better sound quality.

Drones with good cameras and good flight characteristics are available from €600. The Mavic Air by DJI, for example, is light, small and easy to operate via smartphone. They are useful to shoot aerial photos of fields, machines, herds of animals or farm buildings that allow to enhance every video. The viewer obtains an excellent overview of the location of the event. However, drone recordings should only be used where it makes sense. Further, the drone pilot should ensure they use them

within flying laws/regulations. The legal basis for drones is country-specific and varies in its restrictiveness. It is essential to consult the official information office of the country in question prior to use. An overview on drone legislation in different European countries can be found here. However, in all countries it is forbidden to fly over groups of people with drones. For example, if you want to film on on-farm machine demonstrations with drones, you should do so before or after the visitors arrive. Another disadvantage of drones is that sound recordings are not possible. A tip might be to engage a hobby drone pilot from your friends instead of buying your own drone, or to ask children and adolescents who have more experience with joysticks than some adults.

Tips for using drones

The legal basis for drones is country-specific and varies in its restrictiveness.

This blog gives a good overview of the regulations in different European countries http://dronerules.eu/en/recreational/regulations

Consult the official information office of the country prior to the drone use.

360° cameras: A standard video is taken with a single lens and gives the viewer a 'flat' view of the object being viewed. 360° video is taken with a specialized camera that uses 2 fish eye lenses to take views in every direction simultaneously. This allows a viewer to move the viewing angle/position during the video. So in practice during the video the viewer can move their orientation to look at a different aspects, for example, up down and around, but it's not possible to zoom in or change the original video position. 360° cameras offer the viewer a comprehensive spatial experience, which is controlled by the viewer himself on the display or by means of VR glasses.

Figure 9. Ricoh Theta V 360° camera (source: Deliverable 4.3-PLAID)

There are several viewing options for 360° recordings. The videos are ideally suited to be viewed using a Virtual Reality headset or for a more readily available format using an Android phone and a cardboard (google) headset (Figure 22). This gives the viewer a virtual reality immersive experience and the video can be navigated using head movements. The viewer can move around the video to change the viewing position by moving the head. The videos can also be hosted on a YouTube channel and viewed using the chrome browser to allow the viewer to move within the video using a standard PC or Laptop and mouse control/navigation. There is significant potential in the area of virtual training courses and virtual tours. However, producing virtual reality videos requires both experience and good planning.

Figure 10. PLAID Cardboard headsets being demonstrated at DATagri, Spain. (source: Deliverable 4.3-PLAID)

2.5.3. Microphone

A good sound is as important as a good image. Specifically for interviews, the built-in microphones of video cameras and smartphones do not meet this requirement. As the distance between camera and sound source increases, the sound quality decreases rapidly. Moreover, ambient noise or wind often spoil such sound recordings. The solution here is to use an external microphone.

Microphones with cable connections and wireless microphones are available in various price classes (Figure 8). We also distinguish between lavalier (Lapel) microphones and handheld microphones. Wireless lavalier microphones are well suited for agricultural contexts. The filmed person can move freely and use their hands to show and demonstrate things. The RodeLink wireless microphone offers a very good price-performance ratio and costs around €300.

It is important to always control the sound via headphones. It can happen that there is noise, that the battery is empty or that you forgot to switch on a wireless microphone. When buying a video camera, make sure that there are inputs for the microphone and headphones (Figure 23, right). Unfortunately, these connections are only available for a few models in the consumer segment.

Another advantage of external microphones is the use of a synthetic fur windbreaker which helps to prevent rattling noises that make sound recordings unusable even in light winds. In addition to a lavalier microphone, we also recommend a handheld microphone. This is needed when interviews have to be conducted in situations with a lot of ambient noise.

Figure 11. Left: simple microphones with cables for smartphones are already available from €20. Middle: the RodeLink radio link offers a good price-performance ratio. Right: when buying a video camera, make sure that there are connections for microphone (red jack) and headphones (green jack). (source: Deliverable 4.3-PLAID)

2.5.4. Tripod

Shaky videos look unprofessional and exhaust the viewer. Therefore, a tripod should always be used. There are a variety of options which can be used, including (Figure 24):

- Simple rigs for smartphones are available from €20.
- Gimbals which produce specifically soft and dynamic movements ("steady cam")
- A shoulder tripod or a monopod are recommended for many changes of location when there is no time to set up.

The tripod is the ideal solution for many applications. Thanks to a special video head and with a bit of practice they allow for smooth pans.

Figure 12. Multiple tripod options. (source: Deliverable 4.3-PLAID)

3. Potential barriers

3.1. Budget

Video camcorders with good image quality are available from €300. Another €100-300 are needed for an external microphone and tripod. If you have a limited budget, you may want to buy used equipment. If your budget allows, a camera with Full HD or 4K resolution is preferred but requires a more powerful computer with more storage in order to edit 4K footage. This may constrain its use.

3.2. Editing Hardware

For a smooth editing process, your computer should have at least 8 GB, better 16 GB RAM. The minimum requirements are usually indicated if you buy an editing software. It is also recommended to use external storage space.

3.3. Editing Software

There are many editing software programs available on the market. Free programs such as iMovie on Apple devices, Movie Maker for PC or comprehensive programs such as Hitfilm or Shotcut, are available.

Nevertheless, we recommend to use payable programs in the price range between €50 and 100, such as Adobe Premiere Elements. With free programs you quickly reach your limits and the extensive free programs like Hitfilm are often too complex to use for beginners.

3.4. Licences

Suitable background music can enrich videos but music should be used sparsely. Only royalty-free music may be used. YouTube offers a large selection of royalty-free music in its audio library. Popular pieces of music appear again and again in YouTube videos and gradually wear out. For higher demands, music can be purchased from payment providers such as audiojungle.net or premiumbeat.com prices range from $20 to $50 per piece of music.

3.5. Language

We generally recommend to let the protagonists speak in their mother tongue. As consequence, translations are needed for transnational projects. This can be done either by a voice-over or by subtitles. For both, a transcript needs to be created of all what is said in the original language. The appropriate file extension for subtitles is .VVT or .SBV or T.XT. The transcript can then be translated to other languages and then be read by a speaker or be inserted as subtitles on YouTube.

The time required to transcribe a minute of video ranges between 0.5 to 1 hour depending on the complexity of the topic and of the experience of the transcribing person. For inserting subtitles on YouTube, about 10 minutes per minute of video are needed. It can be concluded, that, if translation is part of the project, videos should be as short as possible, as the time required for translation increases linearly.

Ensure language used both as a transcription and in the native language is not too complex or scientific which may not be understood by the target audience. Abbreviations should not be used unless they are well known and easily interpreted.

3.6. Time

Videos can take several hours if not days to produce, therefore creators of videos may be limited by how much time they have available to produce a video.

On average the planning of a video takes between 1-2 hours, the filming itself between 1 and several hours and editing takes the most time. As a rule of thumb, the time required to edit a 5-minute video is about 1 day. In the beginning, without practice, it may take more time.

3.7. Skills

Lack of knowledge or experience in creating videos may deter people from creating their own. It may also affect the overall quality and time taken to produce a video. It is therefore important to follow practice in creating videos, before producing any which will be shared with the target audience. Where possible training sessions provided by professionals should be followed to obtain the skills and confidence needed to produce videos.

3.8. File size

When you start shooting video footage you should remember to stop shooting from time to time to ensure files do not become too large. For example, a video file of 20 minutes from a good quality camera could easily reach 9 GB size. This file size is difficult to transfer and therefore process. If the laptop/computer has limited RAM/disk space it is possible the computer will either be extremely slow or will be unable to complete the task. Larger files are also harder to edit compared to small files with less footage.

For this reason, it is appropriate to stop recording after 5 minutes for some seconds before resuming to record again. Bear in mind that if the video files are too short (smaller than 2 minutes) this will make it difficult to process them and you will need more time and effort during the editing process to piece together the video footage.

3.9. Clip size

Clip size is very important to think about. Before starting to process footage check you have enough disk space on your computer/laptop. It means at least 2 GB free space for video making. You should take in mind that you will have several video clips before to finalize the last. One processed video clip with 2 minutes duration is about 200 MGB.

3.10. Ethics (consent)

Before filming, the EU obliges to obtain free and informed consent from those who ('s premises) will be filmed (e.g., EC Participant Portal H2020 online manual). Consent can be given orally, in writing or electronically. Where appropriate information sheets should be provided to participants, mentioning the purpose, method, risk and benefits of the research and planned use of the data to enable them to make a clear informed decision to give their consent. Consent can be given by completing a short targeted informed consent form ensuring that the participant has understood the use of the images, knows they can withdraw consent at any time and retains the right of the footage although they allow the project to use the data captured or processed (See the box below).

When dealing with mass attended events it is unrealistic to consider obtaining informed consent from all attending, therefore it is necessary to inform participants that filming is being undertaken and anyone that does not want to be captured in the footage should make themselves known to the management team. Common practice is to issue this person with a coloured badge to wear. This ensures that either footage is not taken if the badge is visible, or when editing any footage with someone displaying the badge is not used or edited out.

Photograph, video or audio recording consent form NEFERTITI

I, _____ (person's full name), do hereby consent to the use of my image or voice, or both, by members of the NEFERTITI consortium project. The image may have been captured by either video recording or still photography.

- I agree that all such pictures, video or audio recordings and any reproduction thereof shall remain the property of the author and that the NEFERTITI project may use the image as it sees fit.
- I understand that these images may appear publicly as part of NEFERTITI's website and/or other marketing materials related to the project.
- It is understood that this material will be used in a legitimate manner and is not intended to cause any harm or undue embarrassment to the parties involved.

Signature:_____ Date: _____ / _____ / _____

The project NEFERTITI has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°772705.

Figure 13. Example of an informed consent form (based on Deliverable 4.3-PLAID)

4. Producing a video for virtual demonstrations

4.1. Shooting the images

4.1.1. Shooting of A- and B-Roll

During the video shooting itself it is also helpful to think in both levels A- and B-roll respectively. Which part you shoot first depends on the situation. For example, for a machine demonstration one usually films the machines "in action" first, i.e., footage images or the B-roll. This includes details and long shots, hands examining the worked soil, people around the machines, etc.

It is usually not recommended to film the live commentary that the demonstrator makes for the participants of the on-farm demo as an A-Roll. This is because the sound quality is often too bad and the explanations are usually too long. Therefore, if possible, the explanatory commentary should be recorded in a separate step as an interview with a competent person (if possible, clarify who and what will be told during preparation).

Ideally, the commentator should be able to explain the individual machines directly in front of the machines. The expert describes the working methods, advantages and disadvantages of the machines just presented. The person must speak in the present tense and formulate the sentences as if they were commenting on the subject live. This then sounds like: "Here we see machine XY...", "As you can see, it works somewhat less deeply than machine XY...".

This will ensure comments fit exactly behind the pictures of the machines. To allow the speaker first to see the machine in operation under the current conditions, the commentary is usually recorded only after the demonstration.

In other situations, e.g., when a farmer explains a routine process, the explanatory comment ("A-roll") can be recorded first and the illustrative pictures ("B-roll") can then be filmed. If the commentator can show actions, speaking and acting are often ideal. In order to be able to edit such recordings well afterwards, the commentary should be recorded as a whole without action. Afterwards, the details of the action are filmed.

4.1.2. A-Roll: 10 tips for conducting interviews

An explanatory commentary is often recorded in the form of an interview. Here are some tips for conducting interviews.

1. **Relaxed atmosphere**. Always ensure a relaxed atmosphere between you and the person you are interviewing.

2. **Sitting or standing.** Normally the person to be interviewed should stand. Sitting is only recommended during long interviews as well as for people who move a lot.

3. **Image composition.** In the interview, the eye line must lie on the upper third line of the image (rule of thirds). If the eye line is lower, the person appears unnaturally small (Figure 25). Make sure that the person to be interviewed looks professional (hairstyle, clothing, etc.).

4. **Direction of sight.** The interviewee should not look directly into the camera, but slightly laterally past it, into the eyes of the interviewer. Only if the interviewee has a moderation role he or she should look directly into the camera.

5. **Fully automatic.** If the interview is conducted by only one person (simultaneous camera and interview conducting), it is advisable to mount the camera on a tripod and operated in fully

automatic mode. That is the only way you can fully concentrate on the person to be interviewed and the content of what is said.

6. **Do not turn off the camera.** We recommend that you let the camera run through the entire interview. Turning the camera on and off will distract you and can increase nervousness every time. In addition, there is a risk of forgetting to switch it on.

7. **Silent nodding.** During the shooting, the focus must be on the interviewee and the content. Communicate by eye contact and non-verbally, for example, by nodding your head. The interviewer must not make any intermediate remarks such as "Yes," while the person to be interviewed is speaking. They cannot be removed.

8. **Crisp statements.** Very few people can describe something concisely and precisely. Therefore, it is recommended to plan at least two rounds. The first serves to get an overview of the topic and to reduce nervousness. The second round focuses on the relevant aspects and formulates them as concisely as possible.

9. **Integrate the question into the answer.** In order to save time, the question is often cut out at post-production. In order for the viewer to understand the context, the interviewee must integrate the keyword of the question into their answer.

10. **Follow-up without insisting.** If questions are not answered in an optimal way, it is necessary to follow up. Individual shots should be repeated until the result meets expectations. Sometimes, however, it is helpful to skip a question and pick it up again at the end.

Figure 14. In the interview, the eye line must lie in the golden section, i.e., on the upper third line. If the eye line is lower, the person appears unnaturally small. Multiple tripod options. (source: Deliverable 4.3-PLAID)

4.1.3. B-Roll: Ensure varied image settings

The motifs for the B-roll should have been roughly defined in the outline beforehand. There are a variety of settings which can be used as B-roll (Figure 26). The individual clips should last at least 30 seconds without zoom and pans, so that they can be used afterwards in the editing without problems. B-Roll clips can include:

1. **Long shots as opening a scene:** At the beginning the viewer should get an overview of the place of the demo if appropriate (establishing shot). A long shot either from the ground or drone shot is suitable for this purpose.

2. **Medium long shot:** This setting is ideal for machine shots but can become boring if used frequently or for too long.

3. **Details, close-ups:** Long and medium shots should be supplemented with close-ups. These can be produced in different ways: By getting close with the camera or zooming in on details with the Tele lens. An action cam mounted on machines also provides exciting perspectives which live participants of on-farm demos do not have.

4. **Additional image material:** Additional material such as farmers in conversation, hands in the ground, plants, landscape shots are very helpful for editing and improve the quality of the video.

Figure 15. Varied camera settings of B-Roll motives are the basis for an interesting editing. (source: Deliverable 4.3-PLAID)

4.1.4. Recommendations

Approaches and tools

1. **Clearly state the contents of the video at the beginning**.

2. **Use transitions wisely**. Unwarranted transitions are off putting and viewers get distracted from the real content by bad formatting.

3. **Use short sections of interviews or people speaking**. Viewers engage with moving footage rather than with a static view. So as movement is important to engage the audience, only use short sections of interviews.

4. **Use voice overs to narrate a technical clip**.

5. **Provide subtitles to make content more widely accessible**.

6. **Think well about the framing of the video**. The framing of the video, including movement and momentum, is really important for a well-produced video as it can make any subject pop into life and increase the interest of audiences to the approach or technique demonstrated.

7. **Use alternative formats to present the content**. For example, you can use music or graphics on the screen, which are well paced – not too long and include the right amount of information. Ensure thumbnails are used effectively. Where appropriate humour can be used to draw in the viewer.

8. **Videos should be edited and shortened as much as possible**. This allows to provide the maximum amount of information in the minimum amount of time. Audio should be clear and concise.

Presenters

1. **The presenter should be able to explain things clearly and concisely**. This saves a lot of work in the subsequent post-production and is the best prerequisite for a successful video.

2. **Use a range of stakeholders where possible**. This can be researchers, advisors, farmers (including young farmers and female farmers) who are asked relevant questions and add value to any written online text.

Skills and knowledge

1. **Follow video training to become skilled**. Or share experiences with others (or other farmers) interested in producing videos.

2. **Start with short videos of maximum 2 minutes.** Editing is the biggest challenge for many beginners, so keep it short in the beginning. To do so, you have to narrow down the topic as much as possible. Short videos are also much less time-consuming for translations.

3. **Show your videos to an independent viewer before publishing**. The viewer can point out ambiguities and unnecessary length.

4. **Upload materials regularly**.

4.2. Editing the video

Editing is a challenging part for most participants, as it has some requirements on the performance of the computer. Efficient editing also requires practice and discipline. Editing of a video consists of the following steps:

1. **Rough cut of the A-Roll**. Start with editing the A-Roll, i.e., the commentary track. All clips are listened to and the best versions are selected. The commentary is structured according to the plans and shortened to the essentials. When shortening, it is advisable to make several runs and always ask the following questions: Is this sentence relevant for the understanding of the topic? Does the sentence drive the story forward? This step takes between 1 and 4 hours, depending on the amount of material filmed.

2. **Fine cut of the A-Roll.** Once the "scaffold" of the A-Roll is in place, cut out the misspells and "aahms".

3. **Insert the B-Roll**. In this step, select the image material from the B-Roll and place it over the appropriate position of the A-Roll. The cuts of the A-Roll will be covered by these clips and thus made invisible, but what has been said is clarified and emphasized with appropriate images.

4. **Provide rhythm.** This step is about providing the film with a rhythm. This means, for example, determining the duration of the A-roll sequences, deciding when B-roll images appear, adjusting B-roll cuts to the rhythm of the voice. After this music, intermediate titles and pauses should also be inserted so that the viewer has time to catch their breath. The film should flow and have no unnatural breaks.

5. **Show the video**. Show the (almost) finished version to an outside person. This person can indicate if the video is easy to follow and understand, if the length is right and if any parts which need to be amended. After these last corrections have been made, the video can be published publicly to the target audience.

Figure 16. Arrangement of A- and B-roll in the editing program. Images of the B-roll are used to cover cuts in the A-roll and to visually support what has been commented on in A-roll. (source: Deliverable 4.3-PLAID)

5. Dissemination of virtual demonstrations

There are multiple channels for disseminating the demo videos.

5.1. Social Media

Social media is a great way to share videos to a large number of people. It can be used to disseminate audio-visual materials to all audiences, but some forms of social media may suit a specific audience more. It is therefore important to know what forms of social media your target audience uses and to tailor dissemination to this.

Short 30 second to 1 minute videos can be used on platforms such as Twitter and Instagram to share a snapshot of a practice or innovation. If your video is on YouTube and too long for Twitter, you can just upload the intro and link to the full version on YouTube. It is important to use subtitles, as most people watch videos on Twitter and Facebook without sound. Short videos can also be used as a great promotional tool for a demonstration event or conferences. On Twitter videos can also be shared by followers, helping to increase the views and interactions with the post. Facebook can also be used to share audio-visual materials. These can be either similar to short clips used on Twitter and Instagram or longer more in depth videos similar to that of YouTube videos.

5.2. YouTube Channels

For agricultural videos, distribution via YouTube is recommended because it is the most popular platform in agricultural circles compared to Vimeo or other video platforms. In order to upload videos, you must have your own channel or open a new one. Every day, thousands of new channels are opened and millions of new videos are uploaded. Therefore, some efforts are needed to make the uploaded videos known and to ensure optimal distribution.

How to make your YouTube video easier to find

Choose a meaningful title with the most important key words.

Provide a brief description on the content of the video. Here you can also provide links to further information.

Specify keywords as tags and also translate the most important ones.

Do not use the thumbnails suggested by YouTube, but upload your own meaningful screenshot from the video. Video equipment and editing software are now inexpensive and easy to use.

Particularly with newly launched YouTube channels, it is difficult to generate many views at the beginning due to the small number of subscribers. In the beginning, a YouTube channel serves more as an online video archive. From here the videos should be embedded into existing websites and made known through social media networks. Depending on the topic, the quality of the videos produced, and the existing networks, it can take months, if not years, for a new YouTube channel to be accepted by the audience.

5.3. Networks

There are a variety of different network types which can be used to disseminate audio-visual materials to target audiences. These include local farming groups, national or regional demonstration farm networks, research or trial groups (such as Innovative Farmers in the UK), advisory groups and email/ communication networks and networks of project partners.

All these network types are great for sharing videos to people who share common interests and thus can help to increase the impact of the video. Some of the networks, such as demonstration networks, may also help to raise the profile of the video or topic area as these farmers are often highly regarded in the community/ farming industry and also come in contact with a variety of people across the industry who they can share a video with. Networks also provide opportunities to tap into new groups or stakeholders who might not currently be aware of a particular practice or approach. By sharing a video within the network ensures all will have access to the video and increases the chances of them watching the video compared to sharing it without using such networks.

Networks set up within H2020 projects are another way of disseminating videos outside of a project or research group, e.g., NEFERTITI. These networks allow videos to be disseminated more widely, across member countries, enhancing the knowledge exchange between farm clusters. Likewise, the European Network for Rural Development (ENRD) and respectively National Rural Networks (NRNs) serves as a hub for exchange of information on how Rural Development policy, programmes, projects and other initiatives are working in practice and provide another route for disseminating videos across Europe.

5.4. The virtual farm

The PLAID Virtual Farm proof of concept has been created by students at the Abertay University, Dundee, Scotland, whilst studying for a masters in Gaming Technology, in conjunction with staff at The James Hutton Institute.

During research for the farm demonstration Inventory it became apparent that access to demonstration can, in some cases, be limited. The project therefore investigated innovative methods of increasing access to on-farm demonstration, one way is by Virtual demonstrations. The students have developed a simulated environment (Figure 28) depicting a Farm platform, which is a virtual walk through the environment of a typical farm. This can be accessed both on the web or with a virtual reality (Cardboard) headsets and an Android phone. Within the virtual reality environment, it is possible to access videos of innovations filmed in both standard video and 360° video. These videos showcase farming innovations in use around the farm.

Figure 17. Simulated environment showing tractor.(source: Deliverable 4.3-PLAID)

The hosted videos can be accessed within the simulated environment (Figure 29) by clicking on the sphere when the indicator is centred on the video. This allows the video to be accessed and the viewer can move around within the video to get a full spherical view that is omni-directional. The video can be exited, and the viewer can continue to explore the simulated environment using head movement to find further videos.

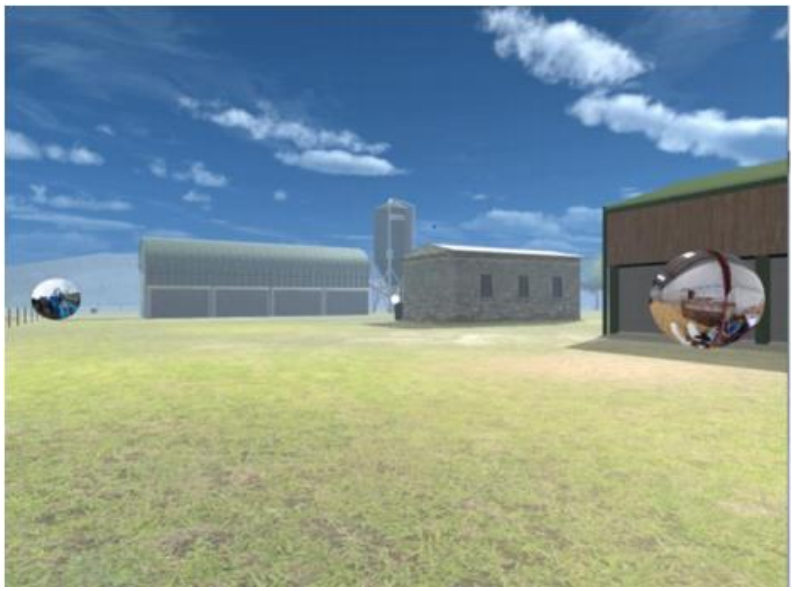


Figure 18. Simulated environment depicting hosted 3600 videos spheres. (source: Deliverable 4.3-PLAID)

The videos can be removed and replaced depending on the requirements of the situation. For example, when demonstrating to children the videos can display child friendly videos, but when engaging the farming community, technological videos appropriate to the audience can be hosted.

The virtual farm has been disseminated to various audiences both in the UK and at events across Europe. The visual nature of the technology has overcome language barriers often seen to halt/hinder communication to large crowds without a native speaker present to translate.

6. Evaluating the impact of virtual demonstrations

When you've launched a new video, you will probably want to evaluate the performance of your video. Evaluation refers to any feedback on the demo video that can be taken into account to improve following related demo videos, and to be aware of whether you reached the prior set objectives for your video. Video metrics can be useful to measure the success of your demo video. Ideally, you think about those before you start a new video project. This is arguably the most important part of the whole video process, as it is the only way to evaluate the success of your video.

Video metrics can sometimes be confusing or overwhelming, especially if you're new to video. The choice for specific video metrics is defined by the objectives of your virtual demonstration. What were you hoping to achieve ? From there you can tie specific metrics to your goals and begin measuring success. It is recommended to measure a few different video metrics to get a comprehensive view of the success of your video. However, if you track everything then you probably haven't narrowed down your objectives enough. Use your findings to learn, improve, and direct your future video projects towards greater successes.

This section presents 7 of the most important video metrics, and explains how to use them to find out how successfully your demo video achieved your demo goals (based on https://www.skeletonproductions.com/insights/video-metrics).

6.1. View count

The simplest but most deceptive metric of all. View count tells you the raw number of how many times your video has been viewed (as you might expect). Basically your views indicate the reach of your video content. If you want your video to be seen by millions of people in your target audience, then you'll want to track views. However, be aware that views are counted differently across the web – for example, on YouTube a view is counted once 30 seconds of a video have been watched, whereas on Facebook it's only 3 seconds. So if you've placed your video on various channels, keep this in mind when aggregating data.

If you're looking to boost your video view count, consider these tips:

- Share your video with your audience, through email and social media
- Share your video with relevant influencers
- Pay to promote your video on channels where your audience can be found

Don't take views as the be-all and end-all of your video content. It's nice to know how great your video reach is, but unless your only aim for your video was to spread awareness, it's really just the first step in measuring its success.

6.2. Play rate

Play rate is the percentage of page visitors who actually clicked play and began watching your video.

This metric is a good measure of how relevant your video content is to the location where it's placed, and how successful it is at enticing visitors to watch. If you want a certain percentage of your target audience to click play on your video, play rate is the number to keep an eye on.

If you want to increase your play rate, try the following:

- Increase the size of your video embed or move its position on the page.
- Pick a more engaging, vibrant, eye-catching and relevant thumbnail.

- Change the copy around the video to make sure it accurately communicates its content.
- Move your video to a different page – maybe it would be more appreciated elsewhere.

The play rate doesn't just depend on the attractiveness of the video, but also on its content. A video that appeals broadly to everyone in your target audience will likely have a higher play than a supplemental, specialized video.

6.3. Engagement

This metric is a measure of how effective your video is.

Engagement for each viewer shows you how much of your video they watched, and is expressed as a percentage.

Average engagement, also a percentage, tells you how much of your video all viewers watched on average. This metric is incredibly useful, especially if you see it expressed as an engagement graph which shows how your audience as a whole watched, re-watched and stopped watching you video. With this data you can start to gauge the quality and usefulness of your videos.

Are viewers watching all the way to the end, as they might do with a story-driven narrative? Or jumping around to view specific parts, as they might do with a Q&A video? If you have a Call-to-Action (CTA) at the end of your video you'll want your audience to reach it, but with and engagement graph you may realise that lots of your audience are dropping off before that point.

To improve your video engagement, here are some recommendations:

- Keep your video content short, concise and clear. If something is unnecessary, cut it.
- Fulfil your audience's expectations – this ties into accurate communication on the page around the video.
- Pay attention to your average engagement, and especially engagement graphs. If viewers are stopping watching at certain points, work out why and change your video.

Engagement is relevant to almost every type of video in every type of industry. After all, at the end of the day you want your video to be watched. Just keep in mind the purpose of your video and be aware that a low average engagement isn't always a terrible thing.

6.4. Social sharing

Social sharing shows how much people are sharing your video content, usually measured by numbers of shares across social channels.

Although it might not appear to mean much by itself, social sharing leads to more views for your video which generally leads to more sharing. It's also a good measure of how appealing your video is to your target audience (and others), and how willing they are to spread the word about it. This all leads to greater awareness of your demonstration project as well as an opportunity to tap into a larger portion of your target audience.

If your video objective is to reach the largest audience possible, you will probably focus on this metric along with view count. You can increase social sharing by following these tips:

- Ask your viewers to share your content – just asking can go a long way.
- Specifically create content to be shared.
- Kick-start the sharing of your video by passing it onto influencers relevant to your target audience.

But don't just pay attention to the number of retweets you get. Also keep track of the comments you receive about your video, and whether people are saying positive or negative things.

6.5. Click-through rate

Another metric that isn't unique to video, click-through rate (CTR) is the percentage of viewers that click on whatever CTA (= Call-To-Action) you include in your video content.

Your CTR will give you an indication of how successful your video is at encouraging viewers to take action. Of course, nobody will click on your CTA if they don't watch enough of the video to see it, so keep an eye on engagement too. The click-through rate metric is most important if you're looking to drive your audience on after watching your video.

To improve the CTRs in your video content, it is suggested that you :

- Alter your CTA. Try placing it at a different point in your video, or make it more visually appealing.
- Improve your average engagement first, especially if viewers are dropping off before reaching your CTA. The more of your video viewers watch, the more likely they are to click through.
- Make your CTA highly relevant to the content of your video.

Always make sure your CTA matches the video it's placed in, it should not only be relevant to the video topic, but should also fit the tone and look of the video.

6.6. Conversion rate

Conversion is the number of leads that you have gained thanks to a piece of video content. A lead is defined as an individual or organization with an interest in what you are showing. Depending on the conversion opportunities on your site, their interest is expressed by sharing contact information, like an email-ID, a phone number, or even a social media handle. This number can also be expressed as a percentage of all viewers that convert (your conversion rate).

This metric is a little trickier to track, and will probably involve some setting up through a separate analytics software to your video host, such as Google Analytics.

Conversion is a vital metric to measure if you're producing videos with a goal to increase your conversion rate, and therefore gaining more leads. You can improve conversion with these tips:

- Make your video relevant to what your target audience wants to know at that stage of the funnel
- Always provide valuable information; answer your audience's questions or allay their fears
- Place your video in the right area of your site to help drive conversions.

6.7. Feedback

The final key metric is feedback on your video, which we touched briefly on in social sharing. This is not a number but rather the qualitative data you can gain by tracking how viewers react to and comment on your video content.

To get a true feel for the reception of your video, you'll need to listen to your target audience and the communities they engage with. Keep a note of both the digital and in-person comments you hear. Try to judge the tone of these comments, and thereby the overall reaction to your video.

Because of the qualitative nature of feedback, it's hard to suggest ways to "improve" this metric. However, don't forget this more human side of the data and don't be afraid to use it as evidence to create video content more tailored to your target audience in the future.