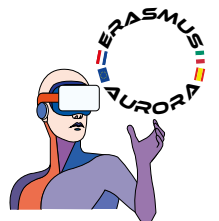


# Creating Augmented Reality Installations

Handbook



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# About this Handbook

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Augmented reality is at the center of the AURORA project (Augmented Reality OERs for Regional Attractiveness), a ground-breaking effort that responds to the demand for digital transformation and career education and training in the tourism and cultural sectors. The project intends to connect students with local businesses, provide them with fundamental technical skills for new careers in the industry, and contribute to the preservation of regional and European cultural heritage.

As part of AURORA's implementation process, a survey was carried out in the participant countries of Italy, Spain and the Netherlands, as well as shared to participants throughout Europe. The survey provided questionnaires to students, teachers and companies of each country, with the aim to draw observations on the participants' experience with new technologies such as Augmented and Virtual Reality, the current state of the institutions they're a part of and what their opinions are on the integration of digital education for these technologies into their everyday life and work. Overall, the final questionnaire report showed a gap between students' and teachers' desire to learn about the new Augmented and Virtual Reality technologies and the availability of educational and material resources of their institutions.

Along with the handbook of good practices, which presents some of the best examples of technology application in cultural heritage in the partner countries and in Europe, here we aim to teach the basics of Augmented Reality. For the teacher, it serves as useful knowledge to provide a hands-on learning experience that will add entertainment to the teaching process. For the student, it aims to familiarize them with basic Augmented Reality elements, in order to create their very own Augmented Reality installation.

# A Quick Guide to Definitions and Keywords

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## **What is Augmented Reality, Mixed Reality, Virtual Reality?**

- Augmented reality (AR) devices overlay digital information or objects with a person's current view of reality. As such, the user is able to see his or her surroundings while also seeing the AR content. Augmented reality is enhanced by computer-generated perceptual information across multiple sensory, visual or auditory modalities. The user experience is closely interwoven with the physical world and is perceived as an immersive aspect of the real environment.
- Although Augmented and Mixed Reality are very similar, they are not the same. Mixed reality (MR) is an extension of augmented reality that allows real and virtual elements to interact with one another and the user to interact with virtual elements like they would in the real world.
- In contrast, Virtual Reality (VR) devices place end users into a completely new reality, obscuring the view of their existing reality and recreating the real world into a virtual environment with 3D objects.
- The umbrella term for all these virtual realities intended to combine or mirror the physical world with a "digital twin world" able to interact with it is Extended Reality (XR).
- A VR headset is a head-mounted device that includes a display screen, stereo sound, sensors, and compatible controllers to deliver an immersive and interactive audiovisual experience. When a user puts on a VR headset, they can no longer see the world around them, but instead only see VR content projected on the display screen such as 360-degree videos and VR games, workspaces, or meeting rooms for other activities. Unlike augmented reality (AR) headsets or mixed reality (MR) headsets, VR headsets do not allow users to see any element of the external physical world.

## **Keywords**

- **Trigger or Target:** The element bound to be recognized by the software in order to activate the AR experience. It can be a marker, an image, a face, a flat surface or the GPS coordinates of a location.
- **Marker:** An augmented reality marker is a coded image that can be recognized by an AR-enabled mobile app and is used to trigger augmented reality features. For the AR to be activated, the user's phone's camera needs to properly identify this image among its surroundings. Examples of markers include QR codes, Hero-codes, Zap Codes. Recently, the augmented reality platform Zappar has introduced accessible codes for people with impaired vision.
- **Overlay:** Augmented Reality Overlay refers to the digital data that overlays the real-world environment shown through the phone's camera. Simply put, it is the content shown after the experience has been triggered. Anything that is in the physical world can have a virtual element designed to interact with it.

# Getting Started with Pictarize

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For the purposes of this handbook, we will be using the Pictarize Studio online service. Pictarize is a web-based drag-and-drop editor that lets anyone build and publish interactive web AR apps showcasing 3D models, videos, audios and texts. It is an easy-to-use option that requires no downloads or subscriptions.

The platform supports content such as 3D models, embed videos (Youtube or Vimeo), chroma videos (i.e. transparent green screen), images, audios, texts. The user can empower their experience using custom scripts easily too, but they are not necessary to release a fully working product.

A quick note on the subscription options: Pictarize offers a free version, providing the full online editor plus unlimited views and storage. The paid subscription includes —on top of all those tools— also usage statistics, a permanent app URL and removal of the Pictarize banner from the content. The process is very simple:

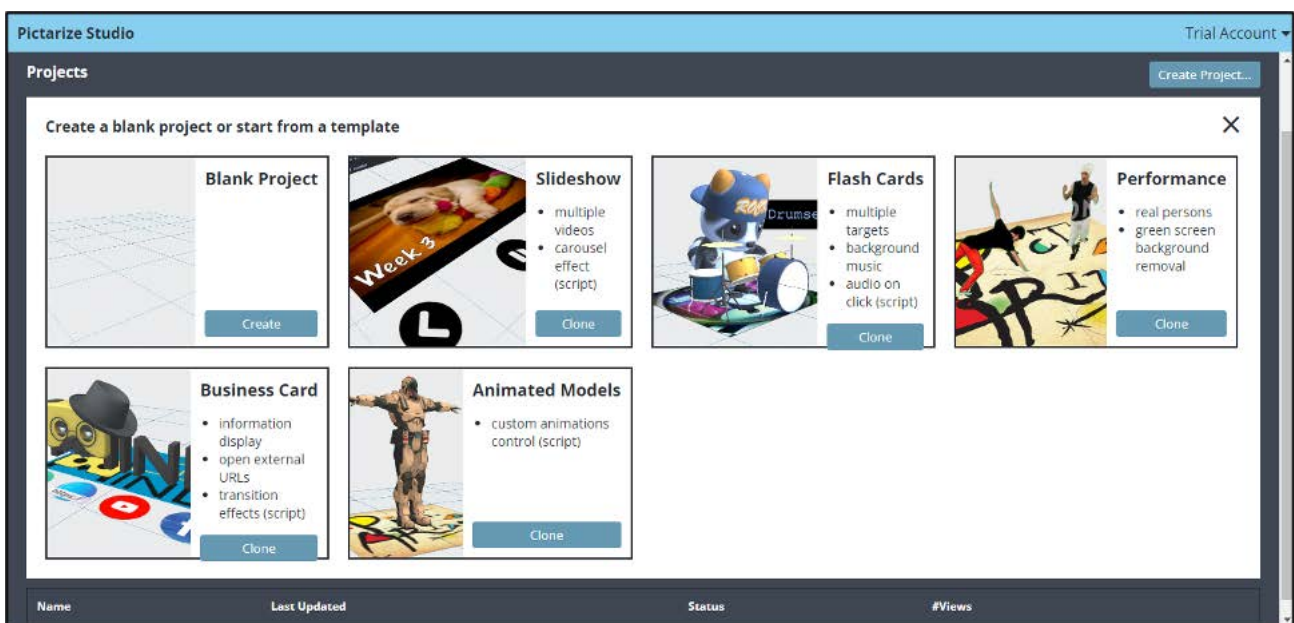
1. The user uploads any images of their choice, that will function as the target for the AR content.
2. The online editor is used to build the AR content on a drag and drop basis.
3. The app is published directly in the editor, generating a unique web URL.

Let's walk you through your first AR installation.

# Step 1: Create a Project

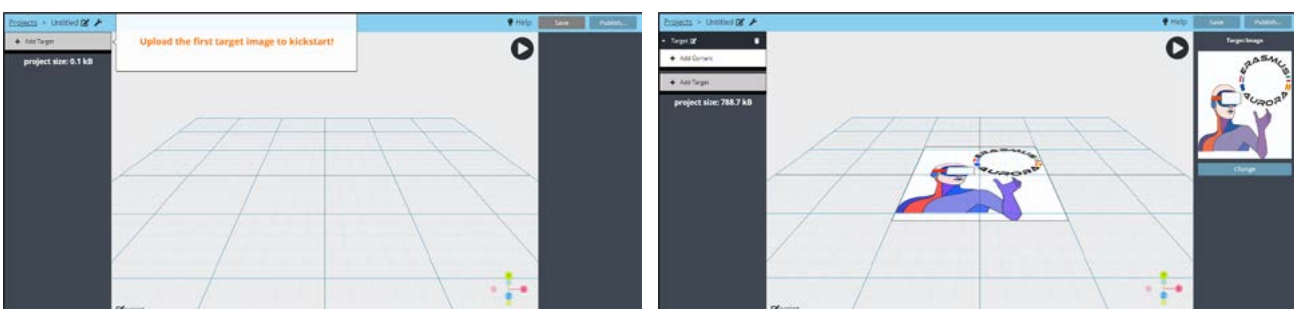
On the starting page, click on “Launch Studio”. The [website of the studio](#) that pops up includes a sign-in window, but you can choose to “try out first” with no registration required. Note that any work you make in this mode will disappear after 24 hours. For this example, we will be working on the free version of Pictarize.

Click on “Create Project”. Pictarize offers many possibilities ranging from slideshows to green screen performances, but for this walk-through, we will select a Blank Project.



# Step 2: Add a target image

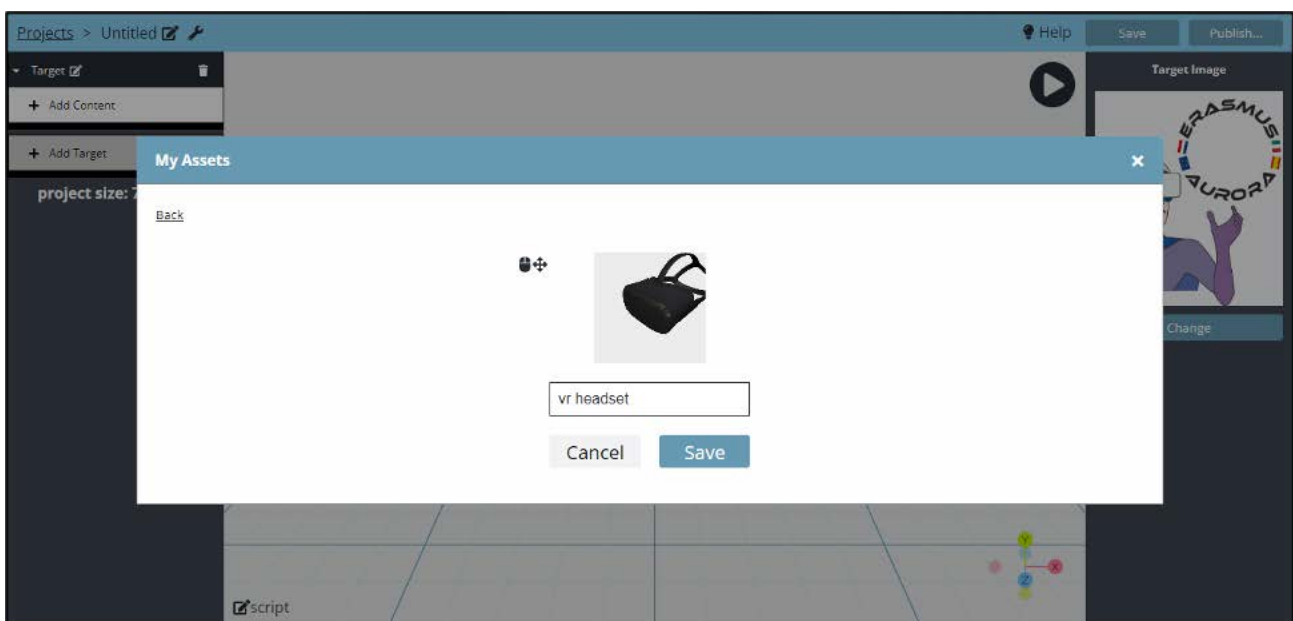
Next, you have to add an image that will trigger the AR content. Click on “Add Target” and upload an image of your choice. We will be adding our project logo.



## Step 3: Add the AR content

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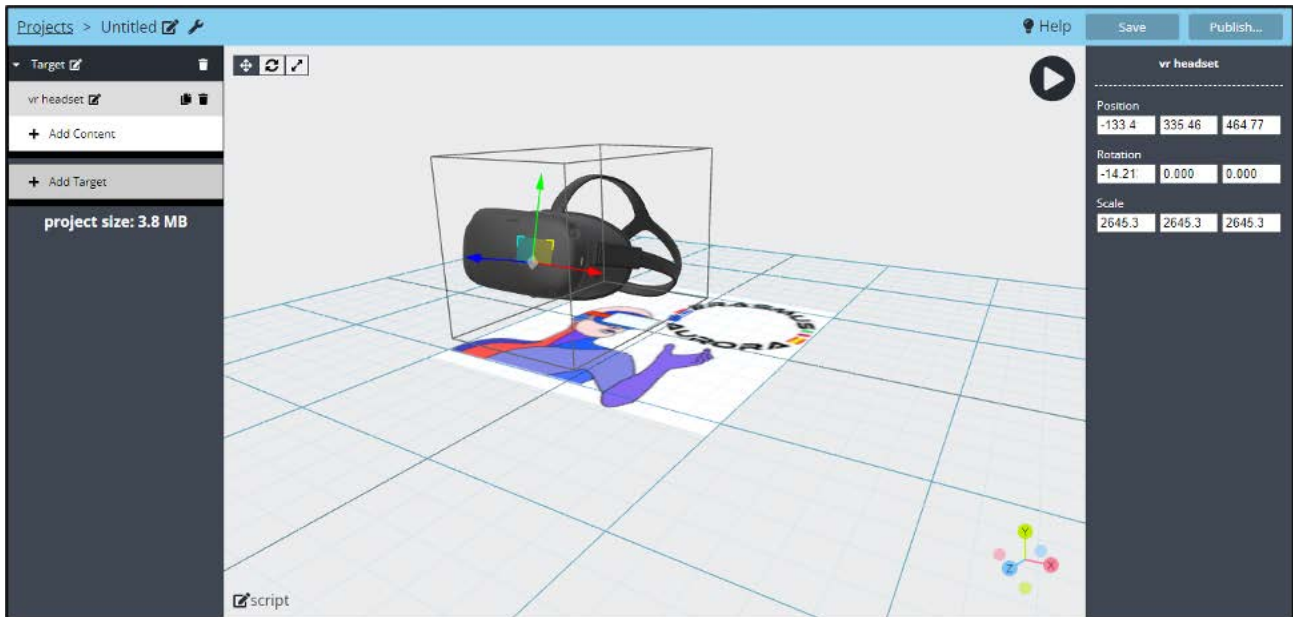
Now that we have a target, the image appears in the center of the scene. Then, we need to add contents on it. There are many types of content that you can add, including 3D models, videos, audios, images and texts. Here we will try a 3D model from SketchFab, a popular marketplace for 3D models. SketchFab will ask you to log in or sign up. Once you find one you want to add, download the model as “glTF” format and unzip it. Click on “Add Content” to upload your material. Then, click on “Upload Assets” and upload the entire unzipped folder. In this example, we will add a free 3D [model of a VR headset](#). Click on “Save” and then select your content.



## Step 4: Adjust your AR content

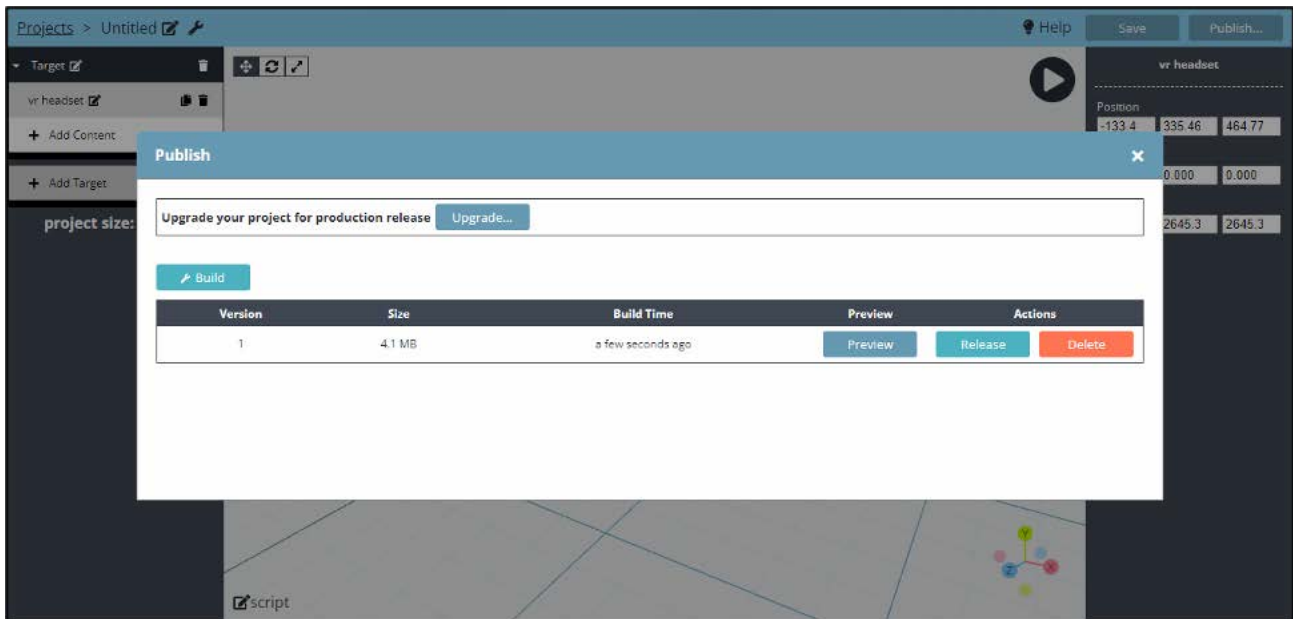
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Once you add your content, it might not be positioned properly. It might appear below the target image, but you can select it and move it up through the buttons on the top left. You can also rotate and resize your item as you wish. Feel free to add more contents to make your AR experience unique.



# Step 5: Publish your AR installation

Once you have finalized your content, click on “Publish...”, then click “Build” and wait for a few seconds until the content is ready. Here you can view a preview of your content or click on “Release” to publish it.



At this point, if you are using the free version of Pictarize, you can use the Preview to obtain a web address and view your experience in action with your phone browser. But attention! If you modify your work, the web address will change. With a paid subscription, your web address will remain always the same, no matter your modifications.



## Step 6: Preview your AR experience

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If you have done everything correctly, your Preview should show something like this. Congratulations! You have created your first AR installation.



## Resources

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<https://pictarize.com/>

<https://www.mindar.org/webar-for-beginners/>

[https://www.youtube.com/watch?v=J6\\_oi-pFKpg](https://www.youtube.com/watch?v=J6_oi-pFKpg)

## Other tools

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Although it makes for a nice, beginner-friendly platform, Pictarize isn't the only tool where you can make an AR installation. Let's explore some other platforms and resources that can help you make your installations stand out.

### **Zapworks**

This is an alternative platform to Pictarize. Zapworks is a tool where the user can build, manage and publish Augmented Reality experiences using a suite of creative tools, SDKs (Software Development Kits), custom branding & hosting solutions and powerful CMS (Content Management System). The Zapworks Creative Suite offers no-code, low-code or custom code options to cater to designers, developers and marketers to create immersive WebAR experiences, no matter their skill set or business objectives.

Although Zapworks contains multiple possibilities for agencies and enterprises, Zapworks Designer is its simplest software which makes it easy to create immersive web-based augmented reality (WebAR) experiences – no apps, no downloads and no coding.

This platform offers a 14-day free trial, followed by a paid subscription.

### **Mozilla Hubs**

If you want to create a Virtual Reality experience rather than an Augmented Reality one, Mozilla Hubs is the tool more suitable to this work. This platform creates virtual spaces to share information and interact with your online community, whether that is through hosting a conference, a lecture or an event, creating a virtual gallery or building a hobby space. Users can create a unique Hub by choosing environments and avatars that represent their community, and decorate using the world-building tool Spoke. 3D artists can build their own world from scratch using Blender.

There is a free starter subscription which provides a 10-guest capacity and 500MB Asset storage for avatars and scenes, followed by personal, professional and business subscription plans.

### **Webspaces**

Being another VR alternative to Mozilla Hubs, Webspaces uses HTML to create 3D worlds in addition to 2D pages. Webspaces can be created as files on a local computer and are deployed like a normal website, but can also be fully collaborative, multiplayer, and live-editable on the web.

The big difference is that a Webpace is delivered entirely through HTML.

### **SketchFab**

We already mentioned SketchFab while making our AR installation. SketchFab is a great source of 3D objects to add to your AR content. There are several categories to search from, including different licenses and paid as well as free models.

## Blender

If SketchFab objects don't quite suit your purposes, Blender is a free open-source 3D computer graphics software tool where you can create your own 3D graphics or animations. Blender's features include 3D modelling, UV mapping, texturing, digital drawing, raster graphics editing, rigging and skinning, fluid and smoke simulation, particle simulation, soft body simulation, sculpting, animation, match moving, rendering, motion graphics, video editing, and compositing.

Blender is used for creating animated films, visual effects, art, 3D-printed models, motion graphics, interactive 3D applications, virtual reality, and, formerly, video games.

## Resources

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<https://zap.works/designer/>

<https://hubs.mozilla.com/>

<https://webspaces.space/introduction.html>

<https://sketchfab.com/feed>

<https://www.blender.org/features/>

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