3D Wed Gallery for Game

Title: 3D Web Gallery for Game
By: Ali Akbary

Chapter 5 MODELLING PROCESS

THE PROCESS OF 3D MODELLING AND ANIMATION

The process of a 3D animation pipeline is complex and can be a lot more complicated than any other forms of animation.

Depending on what project and which 3D animation studio is involved, the number of steps may vary.
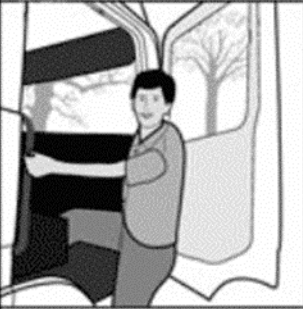
In this lens, I've identified and illustrated the 11 most common steps involved in producing a 3D animation project.

They are namely: -

1. Concept and Storyboards
2. 3D Modelling
3. Texturing
4. Rigging
5. Animation
6. Lighting
7. Camera Setting
8. Rendering
9. Compositing and Special VFX
10. Music and Foley
11. Editing and Final Output

Storyboard

When you make a video for your business, be it a demo video, a sales video, a training video, or any short online business video, planning is extremely important. One of the most important stages of planning out your video is creating a storyboard.

Figure 1 Storyboard drawing example

What is a storyboard?

A storyboard is a graphic representation of how your video will unfold, shot by shot.

It's made up of a number of squares with illustrations or pictures representing each shot, with notes about what's going on in the scene and what's being said in the script during that shot. Think of it as sort of a comic book version of your script.

A storyboard is a sequence of illustrations that showcase your digital story in two dimensions.

➢ The first dimension is **time**: what happens first, next, and last.
➢ The second is of **interaction**: how does the voiceover (your story) interact with the images, how do visual transitions and effects help tie together the images, how does the voice overs interact with the musical soundtrack? Any element can interact with any other one, and the storyboard is the place to plan out the impact you intend to make on the audience.

Why You Need a Storyboard?

Creating a storyboard might just sound like an extra step in the process of making a video for your business but trust us — it's a step you won't want to ignore.

Here are three reasons why you need a storyboard: -

➢ Best way to share your vision

- ➢ Makes production much easier
- ➢ Saves you time

Best way to share your vision

A visual aid makes it much easier for you to share and explain your vision for your video with others.

We've all had experiences where we were trying to explain something and the other person just can't see your vision. The core of this issue is that most stakeholders don't have the experience of visualizing something off of a text deliverable, such as a script.

When you have a storyboard, you can show people exactly how your video is going to be mapped out and what it will look like. This makes it infinitely easier for other people to understand your idea.

Makes production much easier

When you storyboard a video, you're setting up a plan for production, including all the shots you'll need, the order that they'll be laid out, and how the visuals will interact with the script.

The storyboard is a starting point or suggested thorough line around which you can plan your coverage (all the angles you will shoot of a scene). This really comes in handy when you're making your video, as it ensures you won't forget any scenes and helps you piece together the video according to your vision.

Saves you time

While it may take you a little while to put your storyboard together, in the long run it will save you time in revisions later.

Not only will it help you explain your vision to your team, it will also make the creation process go more smoothly.

Now how do you go about creating a storyboard for your video: -

1) Create blank slides
The first step in creating a storyboard is to draw a series of squares on a piece of paper (you can also find tons of printable storyboard templates on Google).

Think of these squares as the video frame. In each square a different shot or scene will take place. You can sketch the scenes by hand, create them on a computer or even take photographs. Make sure to leave space to write notes and lines from the script beneath or next to each frame.

2) Add your script
Beneath each picture, write the lines from the script that will be spoken in that scene and jot down some notes about what is happening.

Your storyboard should read like a comic book, so readers (coworkers, clients, etc.) can get a sense of exactly what will happen in your video.
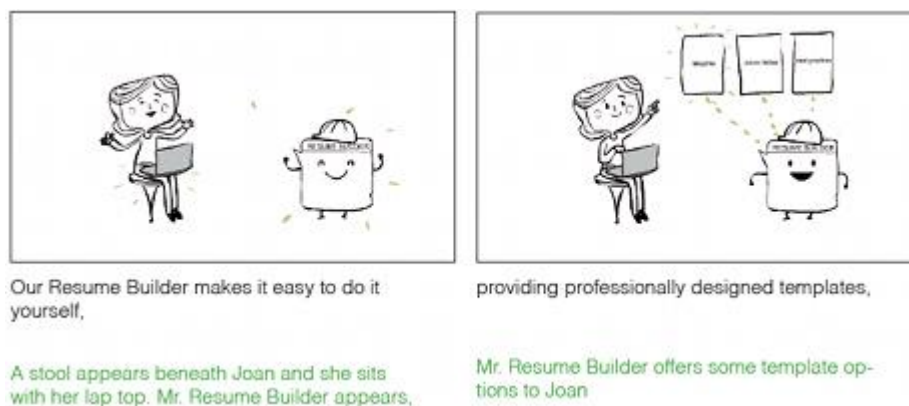
Figure 2 Storyboard sample

Next, you should sketch how each scene will look visually. Note that your storyboard doesn't have to be incredibly detailed — you don't have to draw in all of the props or even use color. (Hint: You don't have to be great at drawing either. Bad drawings are far better than no drawings at all.)

Just provide enough visual detail to give an impression of what is happening, which characters are in the scene and what the general framing will look like. The script and notes will help fill in the rest of the details.

You can also make notes about camera angles and movement, transitions between shots and other details that will come in handy during production and post production.

Here are some tips that can help you as you storyboard your video: -

➢ Show, don't tell. Use the storyboard as a litmus test to determine if your story is truly being visualized.
➢ Be cinematic. Does your video do things that movies do? Do people, places and things move or stand still? Does the camera move? Keep these factors in mind and bring them all together to create a cinematic video.
➢ Make sure it's logical and coherent. You're creating a story, so the video should look visually consistent from beginning to end
➢ Pick a theme. If you want to create a video infographic, add relevant charts and graphs. Want to highlight a customer pain point, show a character on screen and take them through a journey.
➢ Include all relevant details. Break up your script into smaller chunks and make note of important information:
  ❖ What is the setting or background for the scene?
  ❖ Is there a character on screen? If so, what action is the character performing?
  ❖ What props are in the scene? This should fit in with the context of the background / setting you're using
  ❖ Will any text appear on screen? What is the size, color, and position of the text?
  ❖ What message are you trying to deliver?

3D Modelling

Any representation of an object in digital space, is called a **3D model**. 3D modelling is a technique in computer graphics for producing a 3D digital representation of any object or surface.

An artist uses special software to manipulate points in virtual space (called vertices) to form a mesh and collection of vertices that form an object.

The software does the math: Luckily for artists, 3D software deals with most of the difficult mathematics. Within the graphical user interface of a 3D software package like Autodesk 3ds Max, Maya, or Blender 3D models are automatically interpreted and visually represented as geometric objects made up of vertices, edges, and faces. Most software environments have built in real-time render engines capable of displaying 3D models with realistic lighting, shadows, and textures.

For the modelling we are going to use Blender software to create model. Before we start modelling, we need to learn about software and tools of the Blender. For this purpose, we need to know keyboard shortcuts. For modelling we need to get comfortable with basics of software and how to use it. First of all, keyboard shortcuts are important.

Here are the Blender shortcuts: -

Blender 2.x Keyboard Shortcuts Cheat Sheet for Windows: -

Shortcut	Action	
Basics		
Shift + A	Add object/node	
X OR Delete	Delete	
F3	Search for function	
G	Move	
S	Scale	
R	Rotate	
R + X/Y/Z	Rotate along global axis	
R + XX/YY/ZZ	Rotate along local axis	
Double press R	Free rotate with trackball	
Shift (hold)	Precise movement	
Ctrl (hold)	Incremental movement	
Shift + D	Duplicate	
Alt + D	Duplicate linked	
H	Hide	
Alt + H	Unhide all	
Shift + H	Hide all except selected	
D (hold) + [1]LMB (drag)	Annotate	
D (hold) + [1]RMB (drag)	Erase annotation	
Q	Quick favorites	
Window Shortcuts		
T	Toolbar	
N	Properties bar	
Ctrl + Space	Maximize area (but keep toolbar)	
Ctrl + Alt + Space	Fullscreen area	
Ctrl + Alt + Q	Quad view	
Alt + Z	Toggle X-Ray view	
NumPad 7	Top view	
NumPad 1	Front view	
NumPad 3	Right view	
Ctrl + NumPad 3	Left view	
NumPad ,	Center selected	
Shift + ^	Walk navigation	
Change Windows		
Shift + F2	Movie Clip	
Shift + F3	Nodes	
Shift + F4	Python Console	
Shift + F5	3D Viewport	
Shift + F6	Graph	
Shift + F7	Properties	
Shift + F8	Video Sequencer	
Shift + F9	Outliner	
Shift + F10	UV/Image	
Shift + F11	Text	

Shift + F12	Dope Sheet
General Selections	
¹LMB	Select
A	Select all
Alt + A OR Double press A	Deselect all
B OR ¹LMB (drag)	Marquee box select
C	Circle select
Ctrl + ¹RMB	Lasso select
Ctrl + i	Invert selection
Shift + L	Select linked
Shift + G	Select similar
Alt + ¹LMB	Select from many
Navigation	
¹MMB	Orbit
Shift + ¹MMB	Pan
Scroll OR Ctrl + ¹MMB	Zoom in/out
Shift + ~	Fly
Object Mode	
Ctrl + Tab	Open pie menu
Tab	Edit OR Object mode toggle
Ctrl + M then X/Y/Z (OR ¹MMB (drag)	Mirror
Ctrl + P	Set parent (last selected)
Alt + P	Clear parent
Shift + Tab	Toggle snapping
Alt + G	Reset position
Alt + R	Reset rotation
Alt + S	Reset scale
Ctrl + A	Apply location / scale / rotation
Ctrl + J	Join selected objects
Ctrl + L	Copy attributes to new objects
Ctrl + 0/1/2/3/4/5	Add subdivision level
Alt + B	Mask view to region OR Clear mask
Shift + C	Center 3D cursor
M	Move active object to collection
Ctrl + Alt + NumPad 0	Move active camera to view
Ctrl + NumPad 0	Set as active camera
Selection in Edit Mode	
Ctrl + L	Select connected mesh
L	Select connected mesh under cursor
Alt + ¹LMB	Select edge loop
Ctrl + Alt + ¹RMB	Select edge ring
1	Vertex select mode
2	Edge select mode
3	Face select mode
Ctrl + Shift + M	Mirror current selection

Ctrl +/-	Grow/Shrink image
Ctrl + E	Edge crease
Curve Editing	
E OR Ctrl + ¹RMB	Add new handle
V	Change handle type
Ctrl + X	Delete but maintain connection
Alt + C	Close curve
Ctrl + T	Tilt
Alt + T	Clear tilt
Modeling	
E	Extrude
i	Inset
Ctrl + B	Bevel
Ctrl + Shift + B	Bevel vertices
Ctrl + R	Loopcut
G, G	Vertex/Edge Slide
K	Knife
F	Fill face
Ctrl + Shift + Alt + S	Shear
Shift + W	Bend
Y	Split
V	Rip
Alt + V	Rip fill
Alt + M	Merge
Shift + N	Recalculate normals
Ctrl + Shift + N	Invert normals
O	Proportional editing on/off
Shift + O	Proportional falloff type
P	Separate to new object
Texturing	
U	Unwrap
Ctrl + E	Mark seam
UV Editor	
L (under cursor) OR Ctrl + L	Select island
V	Stitch
Shift + W	Weld
P	Pin
Alt + P	Unpin
Shift + P	Select pinned
Image Editor	
N	Properties, Scopes, Slots and Metadata
1 (NumPad)	View at 100%
Shift + Home	View to fit
J	Next render slot
Alt + J	Previous render slot

1-8	Select render slot
Alt + S	Save image
Shift + S	Save image as
Image Editor (Paint)	
Alt + N	Create new blank image
Alt + O	Open image
N	Brush properties
F	Brush size
Shift + F	Brush strength
S	Sample color
X	Flip brush colors
Nodes	
Ctrl + [1]RMB (drag)	Cut connection
F	Connect selected
N	Properties
Ctrl + X	Delete selected but maintain connection
Ctrl + Shift + D	Duplicate selected and maintain connection
M	Mute selected
Ctrl + G	Group selected
Ctrl + Alt + G	Ungroup selected
Tab	Enter/Exit group (Toggle)
Ctrl + J	Frame selected nodes
Ctrl + H	Show/Hide inactive nodes
Compositor	
Alt + [1]MMB	Move backdrop
V / Alt + V	Zoom backdrop
N	Properties and performance
Sculpting	
Shift + Space	Brush image
F	Brush size
Shift + F	Brush strength
Ctrl + F	Brush angle
R	Angle control
E	Stroke control
B	Mask (box)
M	Mask (brush)
Alt + M	Clear mask
Ctrl + i	Invert mask
H	Hide (box)
Rendering	
F12	Render
Ctrl + F12	Render animation
Ctrl + F11	Playback rendered animation
Ctrl + B	Set render region
Ctrl + Alt + B	Reset render region

Animation (General)	
Space	Play/Pause playback
Ctrl + Shift + Space	Reverse play
Alt + Scroll	Scroll through frames
Left/Right Arrow	Next/Previous frame
Shift + Left/Right Arrow	First/Last frame
Up/Down Arrow	Jump to keyframe
I	Add keyframe
Alt + i	Delete keyframe
Animation (Dopesheet)	
Ctrl + Tab	Toggle Dopesheet
Ctrl + T	Toggle frames/seconds
Home OR NumPad .	Zoom to fit active keyframes
T	Set keyframe interpolation
V	Set keyframe handle type
Shift + E	Set keyframe extrapolation
Ctrl + M	Mirror keyframes
P then [1]LMB (drag)	Set preview range
Ctrl + Alt + P	Auto set preview range
Alt + P	Clear preview
M	Marker
Ctrl + M	Rename marker
Ctrl + B	Bind selected camera to selected marker
[/]	Select keyframes before/after current frame
Ctrl + K	Select all keyframes on current frame
Graph Editor	
Ctrl + [1]RMB	Add keyframe at cursor
N	Properties and modifiers
Tab	Lock selected channel
Rigging (Armatures)	
E	Add new bone
Shift + D	Duplicate bone
Shift + W	Bone settings
Ctrl + R	Roll
Alt + R	Clear roll
Shift + N	Recalculate roll
Ctrl + Alt + A	Align bone
Alt + F	Switch bone direction
Alt + M	Merge bones
Ctrl + X	Dissolve bones
Y	Split
P	Separate
] and [	Scroll hierarchy
Posing Mode	
i	Add keyframe

Shortcut	Action
Alt + G	Clear location
Alt + R	Clear rotation
Alt + S	Clear scale
Ctrl + A	Apply pose
Alt + P	Propagate pose
Ctrl + E	Push pose from breakdown
Alt + E	Relax pose to breakdown
Shift + E	Pose Breakdowner tool
Ctrl + C	Copy pose

[1]LMB = Left Mouse Button

MMB = Middle Mouse Button[SEP]

RMB = Right Mouse Button

Shortcut	Action
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3	Face select mode
Modeling	
E	Extrude
I (Only for Face)	Inset
Ctrl + R	Loopcut
K	Knife
F	Fill face
Ctrl + F	Fill selected face
Alt + M	Merge
Texturing	
U	Unwrap
¹LMB = Left Mouse Button	
MMB = Middle Mouse Button[SEP]	
RMB = Right Mouse Button	

Start Modelling

After the storyboards are finished and approved by the client, the task of building the props, environment and characters begin. The proper term is called 'modelling'.

Modelling is the process of taking a shape and moulding it into a completed 3D mesh. The most typical means of creating a 3D model is to take a simple object, called a primitive, and extend or "grow" it into a shape that can be refined and detailed.

Primitives can be anything from a single point (called a vertex), a two-dimensional line (an edge), a curve (a spline), to three-dimensional objects (faces or polygons). Using the specific features of your chosen 3D software, each one of these primitives can be manipulated to produce an object. When you create a model in 3D, you'll usually learn one method to create your model, and go back to it time and again when you need to create new models. There are three basic methods you can use to

create a 3D model, and 3D artists should understand how to create a model using each technique.
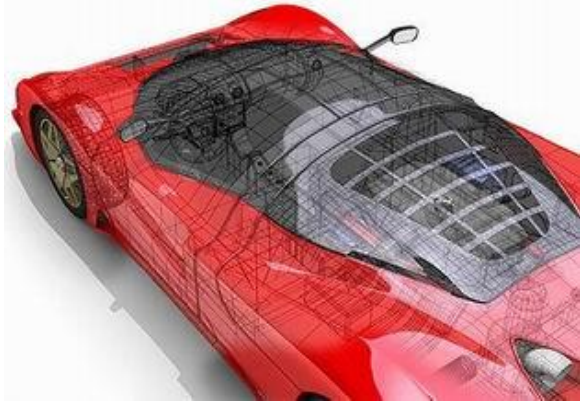
| Figure 3 3D Object | Figure 4 3D Object |

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Example of assignment of 3D modelling of a Logo

Scenario:

A local company or sports team wants you to design an animated logo for them. They need the logo to be 3D and useful for their promotional needs.

For this exercise, you will be creating a 3D logo for a favourite team, company, product, or school while using many of the techniques discussed.

Your first step is to get image of logo of the company you wish to model from. For this example, we assume we will be using a Blender Logo.

1. Open Blender and delete the initial cube.
   a. Click "x" and click delete or press delete button on your keyboard.
2. Press "Shift" + a
   a. Image + Reference
      i. Choose folder and file and click Load Reference Image
3. Press "7" or from View + viewport & choose Top view
4. Press "n" on keyboard and make sure all rotation values are "0" if not change to "0" and press "n" again to close panel
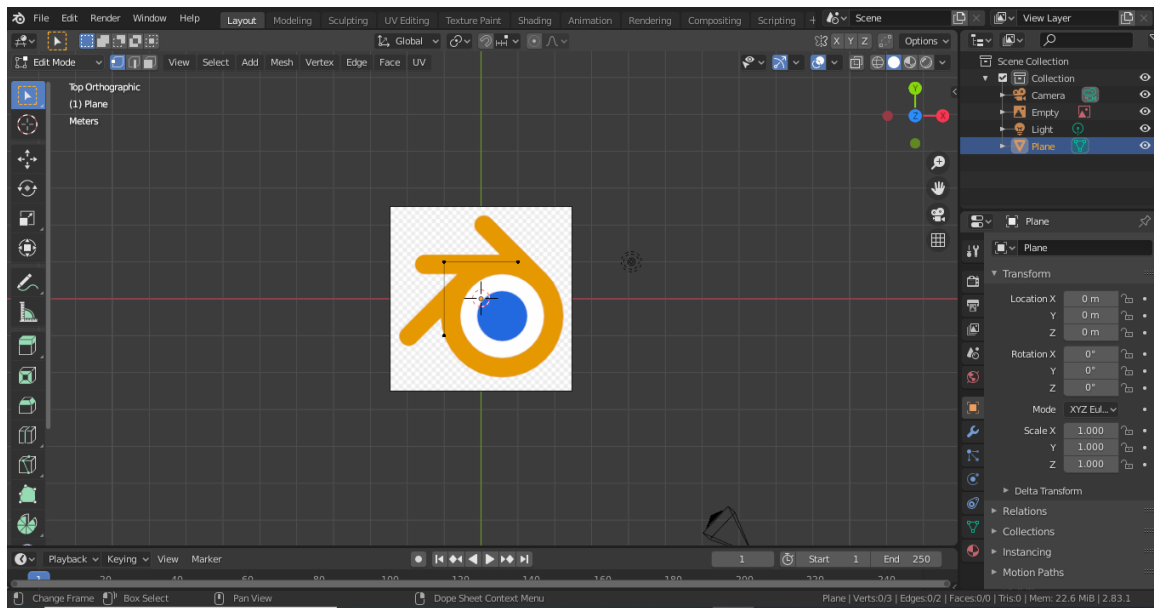5. Press shift + 'a" and insert mesh + plane

Figure 5 Blender Logo
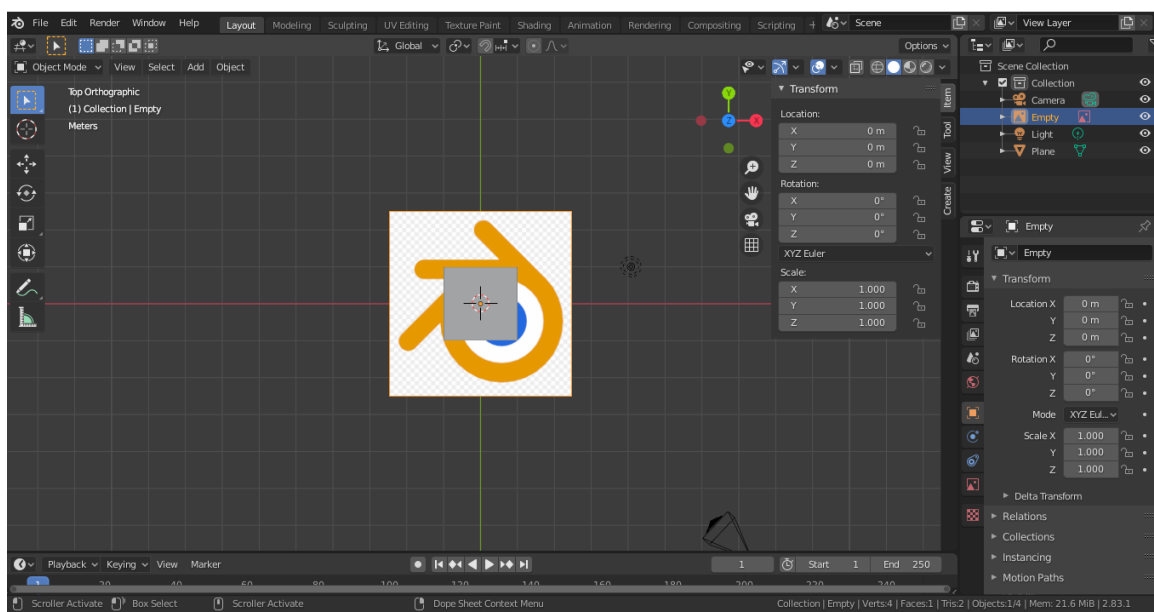
Figure 6 Blender image reference Image with Plane

6. Press "Tab" on keyboard or Change from Menu to "**Edit Mode**"
7. Press "1" to choose **vertex** or choose vertex from menu
8. Select one of the vertices from Plane and press "x" or delete to delete one vertex from plane

Figure 7 Delete one vertex in edit mode

9. Select vertex and align with the shape and press "e" for extrude to continue until finish the end.

10. In the end select last vertex and click shift to select first vertex and press "f" to connect them together.
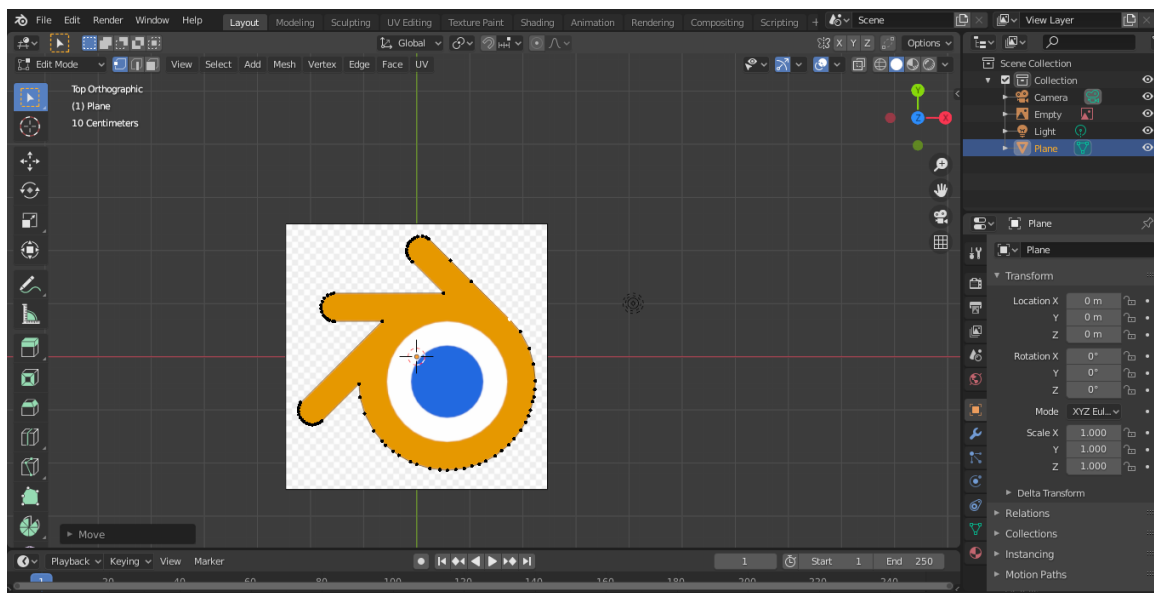
Figure 8 finishing outer logo with vertex

11. Press shift +" a" and choose circle – press "s" for scale and drag until to fill the circle inside logo
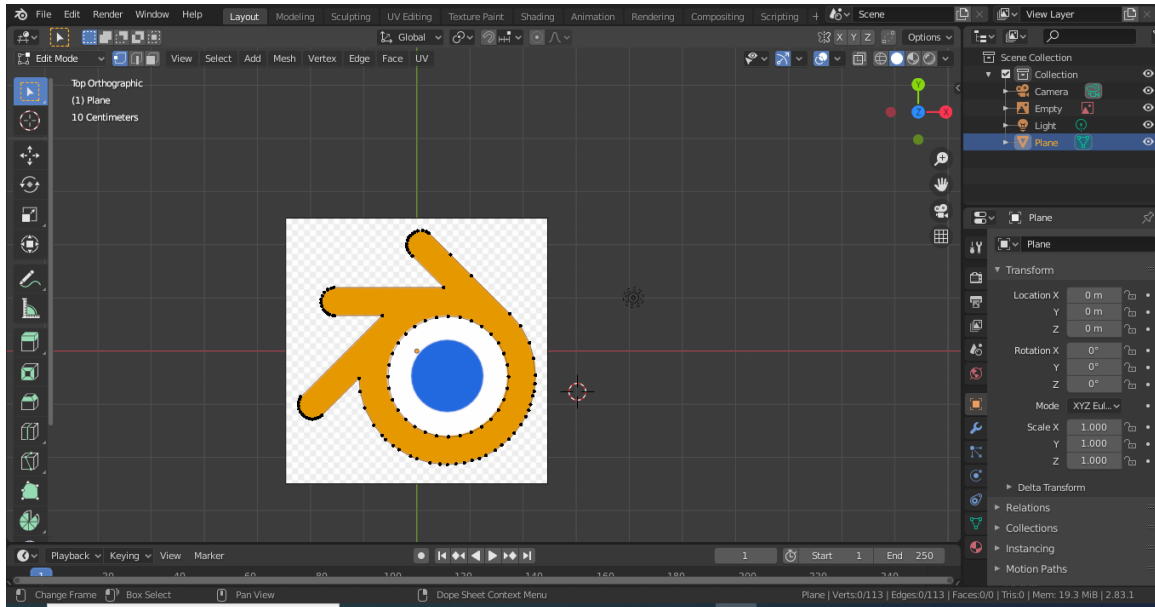
Figure 9 logo after inserting circle

12. While inner circle selected press shift + "d" to duplicate the circle and pres "s" for scale and make the size of inner circle

13. While inner circle selected press "p" and choose selected to separate inner from others.

14. In the outer panel rename the circle to outer logo and circle001 to inner logo
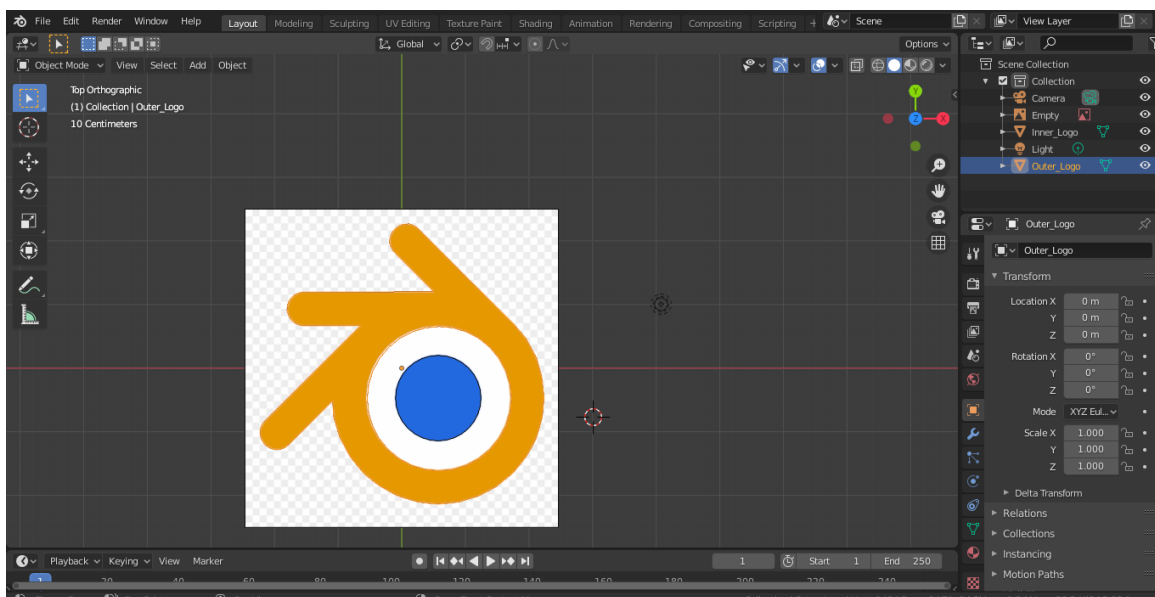
Figure 10 logo after separation and rename

15. Select outer logo and go to edit mode

16. Press "a" to select all and press Alt + 'f' to fill the face
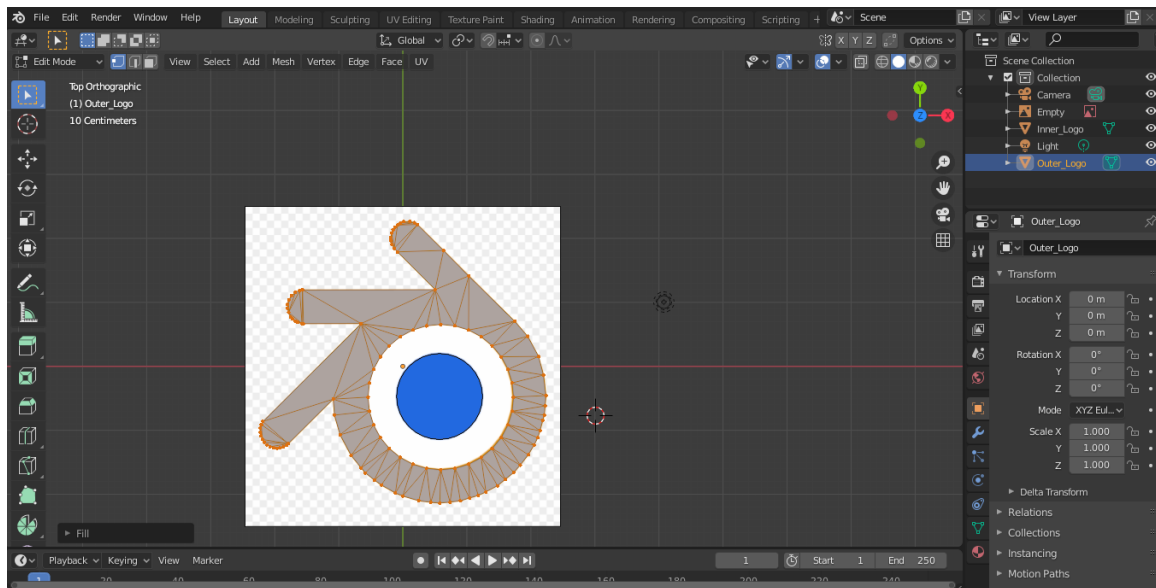
Figure 11 Logo after filling faces

17. Go to object mode and select inner logo and go back to edit mode
18. Press "a" to select all and press and hold Alt "f" to fill the face
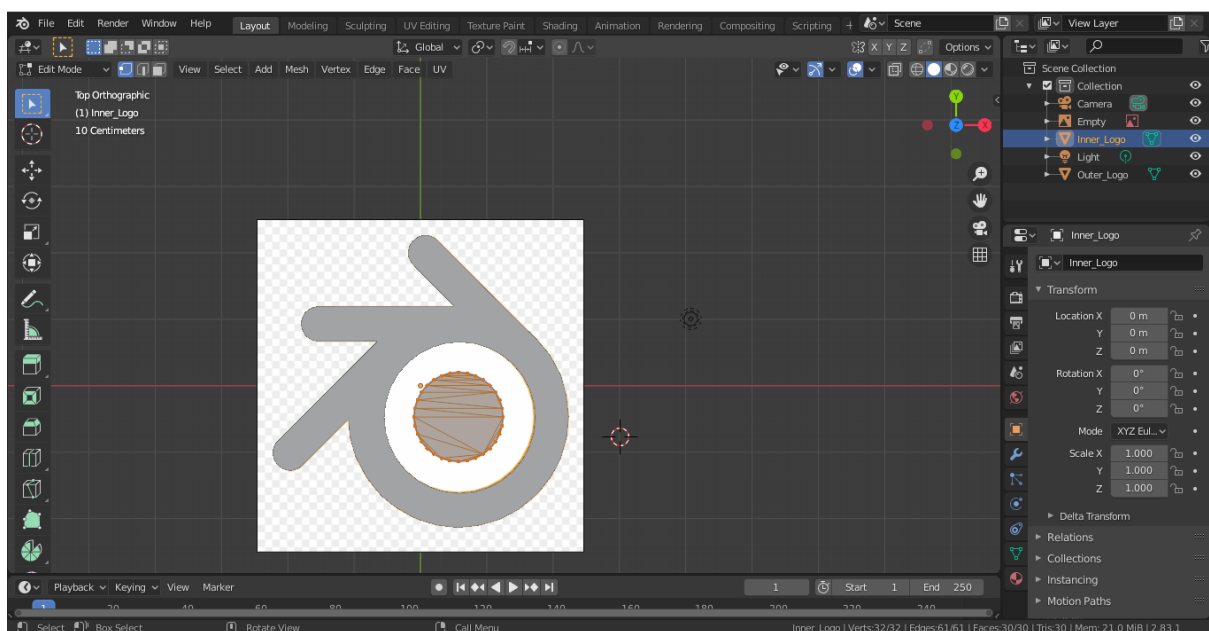

Figure 12 logo after inner face filled

19. Go back to object mode and select both Inner logo and Outer Logo and go to edit mode
20. Go to front view by Press "1" on keyboard or from view + viewpoint + front
21. Press "e" for extrude and press "z" for z axis and move up until desire value
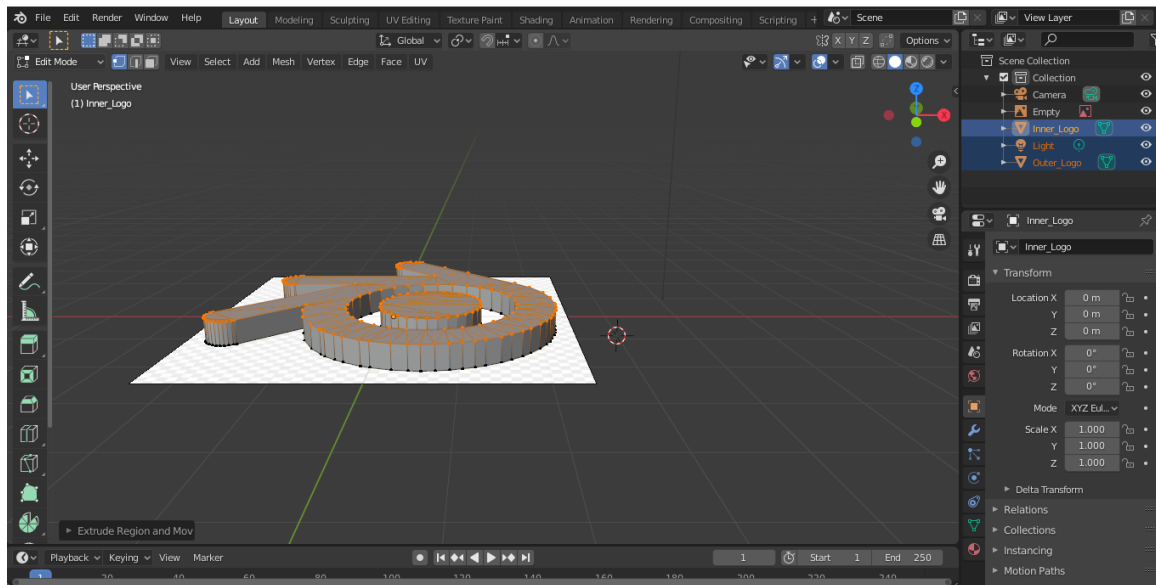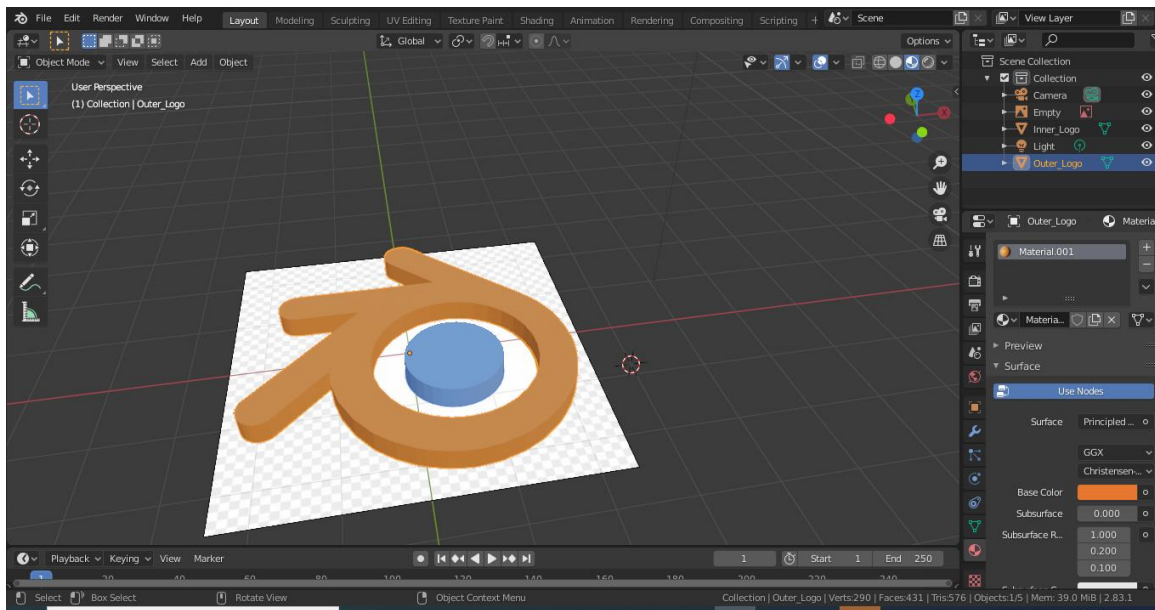
Figure 13 Logo after extrusion

22. Now need to color the Logo. Go to object mode
23. Choose inner Logo and choose Material from properties panel and presas new material and rename to Inner Logo
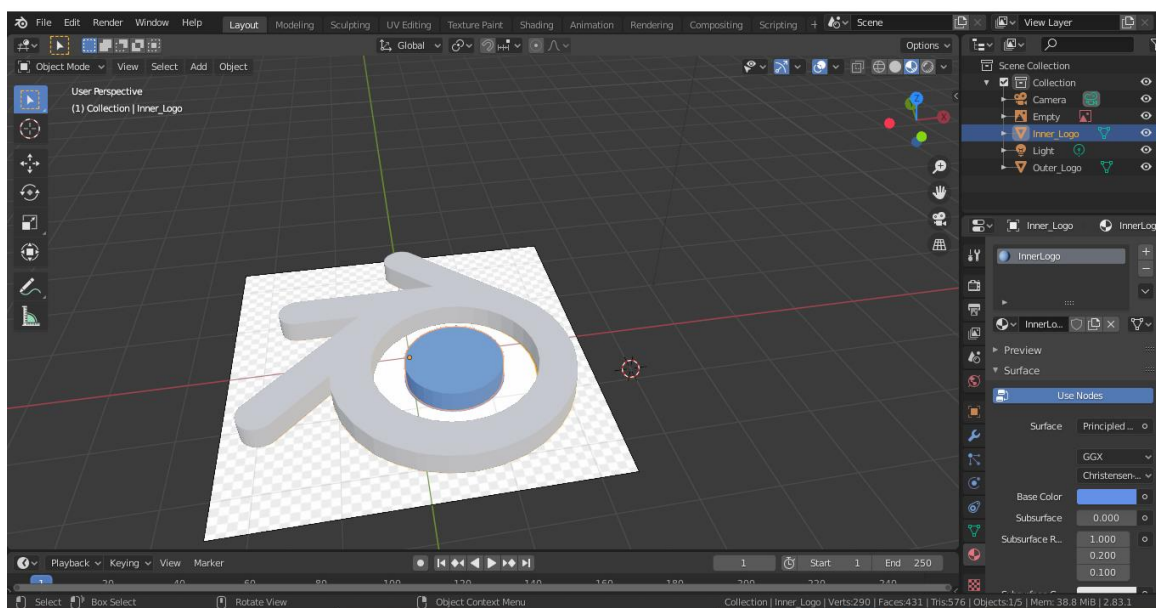

Figure 14 Logo after applying material to inner circle

24. Do the same to outer_Logo as did for inner_logo

*Figure 15 logo after Applying material to outer logo*

25. Select Inner logo and click shift select Outer Logo & press Ctrl + "j" to join them together

26. Right click on logo and select shade smooth & go to data object in property panel and find "Normal" and click on auto smooth click on angle "30".
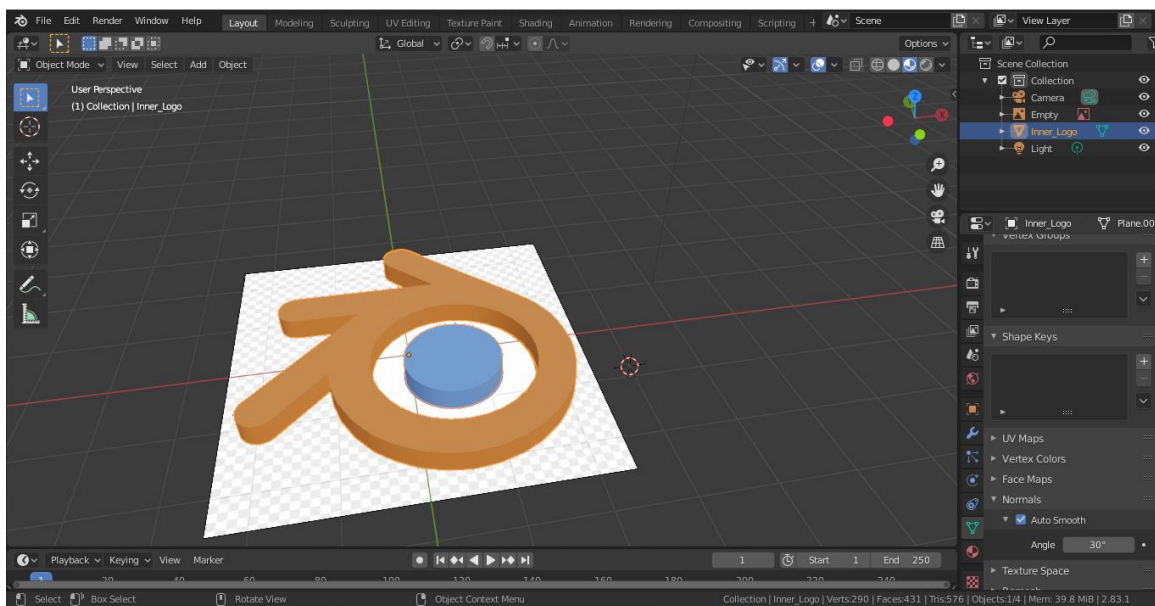
Figure 16 Logo after auto smooth

27. Now the logo is ready we can delete the reference image from scene. Select empty in outer panel and while our mouse on image press "x" to delete or press delete.
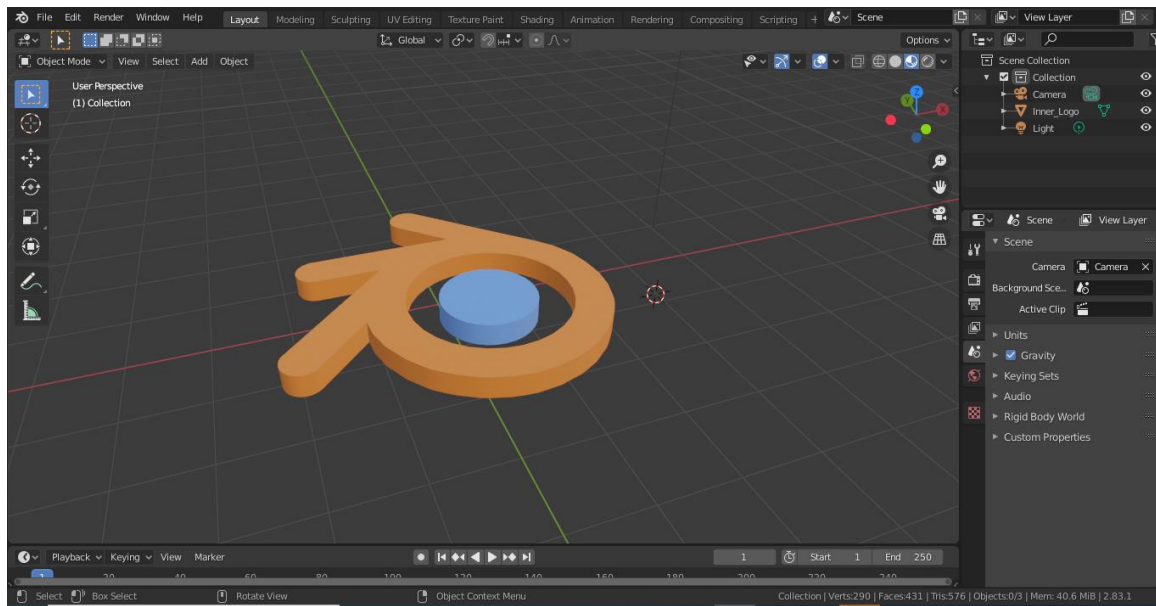
Figure 17 our final logo

Now the logo is ready and we can move to animation if necessary.