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GAMES DEVELOPMENT PROJECT

KRIEGORK - THE FUNGAL TYRANT

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PRE-PRODCUTION

PROJECT OVERVIEW

- The goal of this project is to concept and create a game ready creature based off Warhammer 40k's Orks in a realistic style to fit in the world of Monster Hunter.
- This project will be heavily influenced by the Monster Hunter team's design philosophy which is renowned for creating fantastical monsters, while keeping them grounded and realistic.







IDEA GENERATION

- The inspiration for the creature is the Orks from the • Warhammer 40K universe mixed with an animal to fit into Monster hunter.
- A gorilla felt quite fitting due to meeting the • requirements for the average Ork build.
- The ecology of the creature was then researched to • make sure the designs make sense, and the monster feels like a living creature.
- A lot of different ideas were scrapped for a simpler, • more grounded idea that embodies the core inspiration.



MONSTER CATEGORY

- The creatures in Monster Hunter are grouped into different categories which usually determine what characteristics they have at their core. for example, the Brute Wyvern category hosts monsters that lack wings and are more like dinosaurs such as a T-rex, relying on brute strength and force to get through obstacles. Another example is the Fanged Beast class that mostly consists of primate-like monsters which lack the usual scaly look that the other classes have due to them being wyverns.
- A monster class that denies this logic is the Elder Dragon class. Monsters in this category are considered anomalies in the game universe and rather than resembling a mixture of animals or concepts that are alien to us as the audience, they take the form of mythical creatures from different folklore. Two examples of this are Kirin and Malzeno, resembling a unicorn and Dracula, respectively.
- Because of this, I believe my creature would either must fit into either the Elder Dragon or Fanged Beast category as the primary animal used in the design is a gorilla.



EARLY CONCEPTS

- Different ideas were experimented with to see ٠ what would fit the aesthetics of the creature and would help establish the Ork-gorilla idea.
- The initial designs showcased a lot of armour ٠ plates on the creature, which didn't feel quite Ork-like as they rely more on pure physical strength, rather than protection due to their high pain tolerance.
- In the end, design 4 was taken further into ٠ production, with some pieces from design 3 that seemed fitting.



CONCEPTS

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- With the body design decided, more focus was ٠ put into creating different heads for the creature, while keeping the core shapes the same.
- Design 2 was then chosen to be taken further ٠ into production to be turned into the final concept.



INITIAL CONCEPT DESIGN

- The concept was detailed enough to be usable as a • basis for the Zbrush block out.
- The chest area was changed to lack the armour plates • it originally was meant to have, revealing a more primal, ape-like body.
- A bony bald area was added to the top of the head to ٠ add variety to the head.



FINAL CONCEPT

- The final design was changed to lean further into ٠ the "Orks are made of fungi" idea, with mushrooms covering the creature's back and smaller shelf mushrooms growing out of the arms and legs
- Arms were made longer to resemble gorilla arms ٠ more and the head was made smaller



MATERIAL RESEARCH

- The overall shape of the model should be covered with fur to resemble the gorilla side of the design.
- A double-sided axe is used as inspiration for the tail to reflect the Orks' weapon of choice.
- Rhino legs will be used for the creature's legs which allows it to charge at other creatures.
- The tusks will have a texture like elephant tusks, but more damaged to show signs of battle.
- The creature will have bony exoskeleton-like parts on its face and arms to shield itself from attacks.











PRODUCTION

BLOCK OUT - HEAD

• The block out process usually starts by getting the look of the head right by using primitive shapes and moving them around while using dynamesh. A mix of clay brush and damstandard were used to add volume and to dig into the model, creating important bony landmarks.

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- Once the head is in a stable position, with the primary forms done, the body will be added and the whole model is dynameshed.
- The head of a character is the most important part of a model as that's where the focus will be 90% of the time. By focusing on the head shape without having the body in the back as a distraction, one can really focus on the overall proportions of the head before moving on to the rest of the body
- Doing the block out this way helps give life to the character which makes imagining the rest of the model much easier.





## BLOCK OUT - BODY

- The rest of the body is made with different primitive • shapes put together to resemble different body parts. Once the proportions are fixed and finalized, all the subtools are merged, dynameshed and Zremeshed.
- Constantly comparing the overall shapes and • silhouette to real life references, as well the concept art, helps with the anatomical accuracy and the proportions.
- Furthermore, it's better to use real life reference for • the proportions, rather than the concept as the concept art could potentially be stylised or lack accurate proportions that make sense
- Getting feedback during this stage is also very • important as it is during the block out stage, where the model can be moved and changed drastically to fix proportions.





#### BLOCK OUT - MUSCLES

- This is the stage where the proportions are tweaked to look more anatomically correct, while matching the concept.
- While still nowhere near perfect, the overall silhouette and the placement of the muscles is the main point of this stage; making sure the underlying anatomy is correct before adding further detail.



#### ABANDONED IDEAS

- While trying to add the different accessories to the creature to match the concept, some of the design ideas were abandoned or had to be changed.
- Using coral mushrooms on the back didn't look quite fitting and made the monster look aquatic.
- The scales on the forearms were also abandoned as the silhouette didn't look good and they felt out of place.
- Though the shelf mushrooms on the shoulder blades seemed like an interesting concept, their placement made the back of the creature too cluttered and so their position were changed.





#### MUSHROOMS DEVELOPMENT

- Instead of the coral mushrooms, regular mushroom • types were used on the monster's back to further fit the forest aesthetic.
- This idea then developed into having the • mushrooms resemble the already existing ones in the Monster Hunter franchise, with all of them having different effects that the monster could use. (Figure 2)
- The mushrooms considered for the monster are • sleep, paralyzing, explosive and poison mushrooms.







#### MUSHROOMS PROBLEMS

- Once the rest of the shelf mushrooms were • blocked out, a very clear problem presented itself. The design was just way too overcrowded and noisy; with mushrooms all over the monster's back and arms.
- To remedy this, the size of the back • mushrooms were adjusted to be more in line with Monster Hunter's mushrooms instead of looking super stylised.
- Furthermore, The shelf mushrooms on the • back were removed, leaving them only on the shoulders and forearms, making a more cohesive silhouette that isn't too noisy.





#### MUSCLE AND SKIN

- Moving away from the dehydrated look of the • sculpt, a low intensity clay brush was used to fill in the gaps between the muscles; creating the illusion of fat and skin.
- Using layers in Zbrush made controlling this • process much easier as the intensity of each layer of fat could be adjusted individually, to find the perfect mix of fat and muscle.
- While more detailing would need to be done for the • surface to truly resemble skin, this would serve as a solid base to build the details upon.







#### SECONDARY DETAILS

- With all the core landmarks in place, the detailing process could begin.
- Starting with the shelf mushrooms, a lot of lines and patterns were added using simple brushes like damstandard, inflate and standard; making the shelf mushrooms look closer to their real-life counterparts.
- Furthermore, the area surrounding the base of the mushrooms was sculpted to resemble stretched skin, making it more believable that these mushrooms have grown out of the creature.
- The hand detailing was heavily inspired by real gorilla hands, with them having lots of wrinkles and a very short thumb.
- The axe tail faced some difficulties in terms of design during this process as it was hard trying to make the tail seem bony and organic at the same time.
- Furthermore, following Monster Hunter's style, the tail needed to look interesting as it's usually a core part of a monster's design as they can be cut during gameplay





#### SECONDARY DETAILS

- Moving on to the torso area, nipples were added for realism which would also serve as a landmark for the pecs and their shape.
- Skin folds were also added in between the pecs and the abs to make the monster seem strong and muscular.
- During this time, the general plan for the design was to have the monster be quite muscular, which resulted in very chiseled abs and pecs. This would later be changed.
- As for the legs, lots of wrinkles and skin folds were added to the back of the legs to somewhat resemble the thickness of rhino skin.
- This was done by creating shallow cuts using damstandard without any patterns to create an organic look that flows well. Then, once the shallow cuts have been sculpted, another pass is done, using a stronger damstandard and standard brush to create more contrast and make the folds stick out.
- Then, to detail the head area, skin folds were sculpted on the neck to make the skin seem thick.
- Some deep wrinkles were sculpted onto the forehead and the bony mask was detailed to look chipped and damaged, to show the aggressive and fighter nature of the monster.
- However, not a lot of skin details were added by hand as more detailing would be done using alphas.





#### SECONDARY DETAILS

- The mouth of the monster was also a great area of the focus. while the players wouldn't look inside the mouth closely, they would still notice any lack of detail in the mouth as it's on the head which is the most important part of a character.
- The fleshy membrane between the upper and lower was the first area to be detailed. The look of the flesh was heavily inspired by Deviljho's membrane area for style consistency; having muscle fibers going from to the top to the bottom of the flesh. (Figure 3)
- As for the teeth/tusks, a mix of long small lines and standard brush were used to create cavities and surface detail, stopping the sculpt from being too smooth.
- A similar approach was used to detail the inside of the mouth and the tongue; allowing for a higher fidelity sculpt.
- Finally, the bottom of the tail was sculpted to look softer with the fleshy bits sticking further out and folding over each other.



Figure 3



#### DESIGN AND ANATOMY CHANGES

- Before moving on to the low poly production, some big changes were made to the overall design to make the creature look more anatomically correct and to further boost its intended archetype as a tanky, immovable juggernaut.
- For starters, the mouth area was moved a bit forward to give more room to the neck, which would help the model deform better down the line.
- Furthermore, the ears were moved back to be more aligned with where ears are meant to sit, which is right above the mandibles.
- The monster's back knees were moved lower down too, as bending and deforming would be quite difficult with their original position.
- Continuing, the legs were also made thicker to allow the monster to support its own weight and to make it look much sturdier.
- Adding on, the tapering look of the tail was also reduced to make it look more capable of supporting the weight of the axe tail.





#### DESIGN AND ANATOMY CHANGES

- Perhaps the biggest change was made to the torso area. While the creature looked quite interesting with its chiseled muscles, it just didn't seem to fit the monster's archetype.
- Another issue was that the creature didn't seem to • have any space for its internal organs as it was simply too slim.
- To tackle this, a lot more fat was added to the creature's belly, giving it a more bloated, gorilla-like look.
- Furthermore, the pecs were flattened a bit and pulled down to replicate the effects of gravity on the creature's anatomy.
- More strongman type bodybuilders, as well as gorillas were used to make sure these changes made sense anatomically while still implying the existence of all the previously sculpted muscles in place.





#### RETOPOLOGY

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- The model was retopped in Maya while • paying attention to animation needs and implementing them where needed.
- More geometry was allocated to areas of the • model that would deform the most, such as hands head, legs and tail.

Total Poly Count: 80,759 Tris Hair Cards: 10,496 Tris No Cards: 70,263 Tris



## UVS

- The model was unwrapped and given multiple texture sets appropriate to different core parts of the model.
- Furthermore, each UV island makes use of the available space efficiently, making sure every part of the model has as much resolution as possible without having varying texel density.



#### TERTIARY DETAIL

- With the retopology finished, the low poly model was put back in Zbrush for the finer detailing.
- This was done at this stage so that the detailing can be done on a clean mesh with UVs. This allows for displacement maps to be exported out of Zbrush and be used in Substance Painter and Maya.
- The detailing was done using various alphas, as well as some hand sculpting in areas such as the back which needed to be asymmetrical.
- To make sure the alphas blend and don't overlap, a mix of layers and morph targets were used to have a greater control over the process.









## HIGH POLY RENDER







## HIGH POLY RENDER

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## HIGH POLY RENDER

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## HAIR CARD SOFTWARE

- Hair Strand Designer was used to create the hair maps for the creature.
- Using this software allows for quick and effective hair map generation as each strand can be controlled with a variety of sliders.
- The maps were then used in Maya to create a basic material that can be used to place the cards with.
- For the card placement process, GS CurveTools were used, allowing for a greater control over each card.
- Furthermore, each card type can be placed in separate groups with different colours which helps with the layering of the cards.

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#### HAIR PROCESS

- To start off, the thickest strands were used to create a base layer in areas that would need to be the thickest and not let any light in.
- Then, thinner, still large strands were used on top of that to build some form and volume.
- For the surrounding areas, much smaller strands were used to create a thin layer of chest hair.
- Finally, a layer of very thin strands were used to break up the pattern and fill in the empty space between the cards.





## LOW POLY RENDER





## LOW POLY RENDER



#### TEXTURING PROCESS

- First, the base colours were picked for each • part of the model to group different areas.
- Next, colour variation was added to each area • with fill layers, masked with different sized clouds, spots or dirt masks to break up the uniformity.
- Then, darker colours were introduced using • AO maps, cavity maps and curvature generators.
- Finally, roughness layers were added to break • up the roughness map. This was done using cavity and fill layers.





#### TEXTURING FINALIZED

- Using the same methods, the rest of the ٠ model was textured.
- Both skin and bone base materials created for • the head were added to the body as well as a foundation and then built upon with more layers.
- The mushrooms on the back were textured to • be like the mushrooms in Monster Hunter World as that's what they're based on.





#### RIGGING

- Using the rigging tools in Maya, a functional rig was created for the model, ensuring all parts move correctly and the model could be posed.
- Then, a suitable, dynamic pose was created to show of the creature's character and features.
- To show off the aggressiveness of the monster, a chest pounding pose was created using gorillas as reference.









# POST-PRODUCTION

#### UNREAL ENGINE

- Two separate scenes were created in Unreal for different styles of rendering.
- First, a cinematic scene was made with a small environment created using Megascans and Fab assets. This scene was used to create in-game style renders, showing the monster in action.
- Then, a neutral, studio scene was created for model showcase renders and turntables.
- This scene implemented a 3-point lighting set up consisting of a key, fill and rim light to cover every area of the model.
- Furthermore, a low intensity directional light was used as ambient global illumination.

















- For the High poly, the anatomy is realistic and believable, while still having alien features that make the creature fantastical. Plenty of skin folds and wrinkles were sculpted to add realism to the.
- However, Some areas such as the knees lack anatomical landmarks as some of the bones aren't very defined which makes retopping and rigging the model more difficult and inaccurate.
- In terms of the art style, overall, the model fits the style of Monster Hunter in terms of design and realism. While no high poly renders of Monster Hunter creatures are available, the official renders can be used to compare the sculpt to the industry (Figure 4).
- The sculpt could use more contrast to make the surface detail pop out more which would better suit the intended style and add further realism to the model.





Capcom's design philosophy (Figure 5).





Figure 5

Overall, head sculpting matches the art style, such as the creature's unique facial features, making it stand out amongst the many other designs in the games; fitting

However, the face could benefit from asymmetrical detailing, as the mask's cracks are too symmetrical and look intentional, which would break the players' immersion.

- Overall, the low poly model was well within the polygon budget of Monster Hunter Wilds. Rajang's model from an older game consists of 50k tris while the creature model is 80k tris. Considering the model was created for the newest installment, the higher poly count is within expectations (Figure 6).
- However, it is not to say that the low poly cannot be improved any further. Areas such as the face are very dense compared to other areas which can't be justified. The face also has many unnecessary loops that could be deleted for a more optimized mesh.







further optimize the model.

Figure 6

Figure 6

Moving on to the UVs, while they are optimized to maximize resolution and make use of the UV space efficiently, they are not as optimized as Monster Hunter's UV mapping. Firstly, almost every UV shell is folded in half in the industry example (Figure 6), which doubles the UV space available to the model. Furthermore, only two texture sets were used in the professional example, while four texture sets were used during this project. (Excluding hair) The UV folding method could be implemented to make use of the extra UV space and

- While the mushrooms are successful in looking like the ones from Monster Hunter World, they don't resemble their counterparts from the new installment (Figure 7).
- They lack the vibrancy and colour variety of the mushrooms in Monster Hunter Wilds which makes the model fit the intended arts tyle less.
- As for the hair cards, the process was successful, and the cards add detail and depth to the model. However, compared to the industry example, the card placements are too patchy and don't blend in too well in some areas (Figure 7). More layering would improve both patchiness and the blending of the hair.







Figure 8

- visuals more cohesive.

Figure 7

The overall texturing process was very successful, with the textures matching the intended art style. More colour variation could be added to the body and shelf mushrooms as they look quite analogous. However, looking at the industry example in Figure 8, the shown monster also uses analogous colours, which helps justify the colour scheme.

Furthermore, more contrasting colours could be used to break up the model's uniformity. These colours could be used to separate different areas of the creature and make the overall

Finally, slightly higher saturation of colours would help sell the art style more as the monsters in Monster Hunter Wilds are more vibrant than they are in the older games (Figure 7)

Overall, the presentation of the creature is visually pleasing and showcase the model's details. However, some things could be changed to further improve the renders. Fog could be added to the studio scene to create softer lights, which would make the renders look more realistic and high fidelity.

- Due to the borders of the renders not blending in, a similar approach to the industry example in Figure 9 was taken to ensure that the renders could be presented together.
- Adding on, Further experimentation with hair shaders using lumen would • help make the hair look more realistic as pathtracing makes the hair cards look flat and rough.



![](_page_47_Picture_5.jpeg)

![](_page_47_Picture_6.jpeg)

Figure 4

![](_page_47_Picture_7.jpeg)

- from the authenticity of the render.
- looking neat.

Figure 9

An attempt was made to replicate the rendering style of Monster Hunter (Figure 4), which was almost fully successful. While the quality of the render, as well as the background match the official renders, the plinth that the model is placed on takes away

The render would benefit from having the plinth removed and using a more dynamic pose that shows off the creature, rather than a neutral pose. This way it could further resemble the official renders that showcase each monster's personality, while also

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![](_page_48_Picture_10.jpeg)