WORKFLOW
FOR **ANIMATED** MESHES
FOR FOREIGN GROUND

ABSTRACT

This document proposes a workflow for animated meshes, as relevant for a graphics artist.
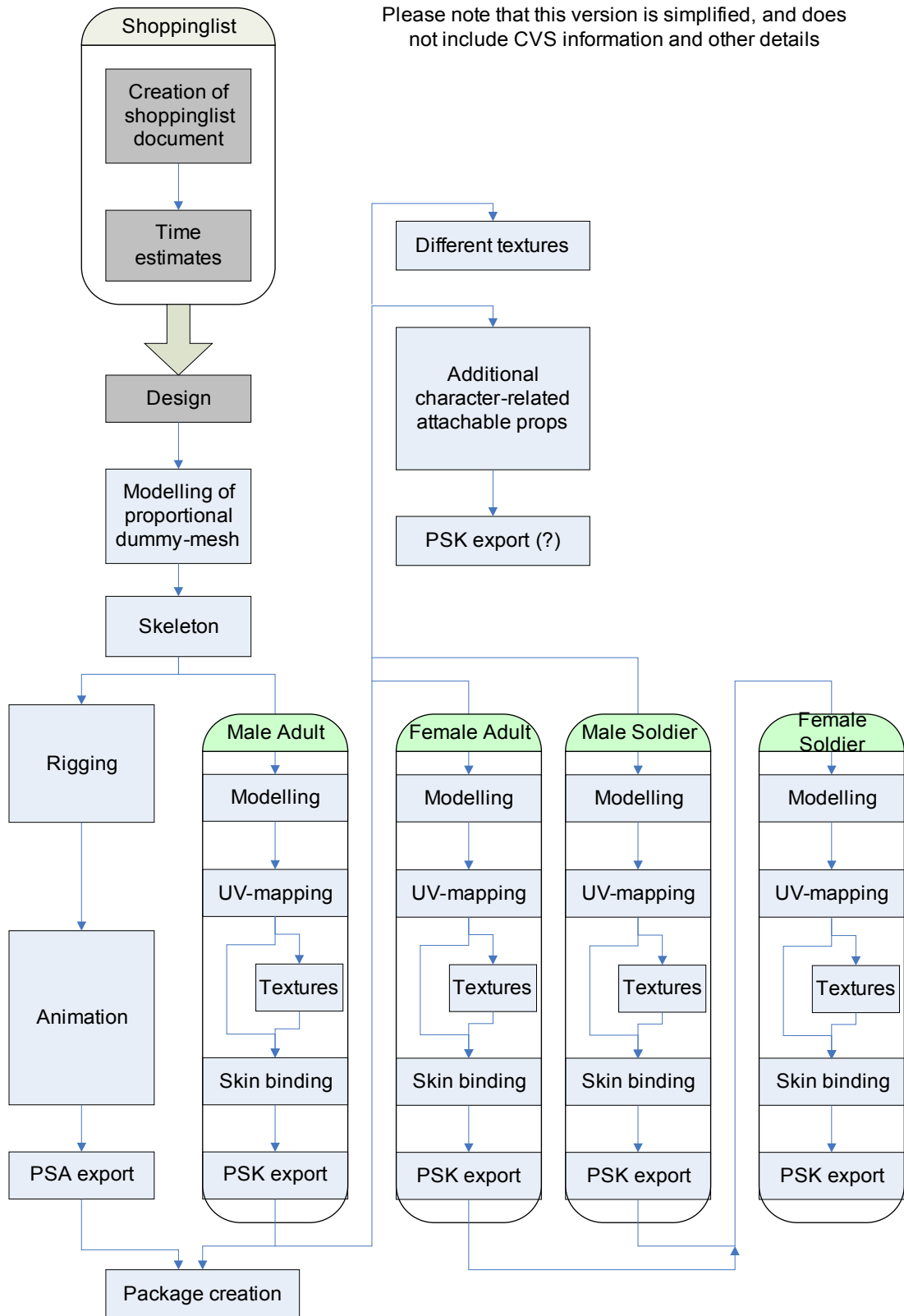
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DOCUMENT HISTORY

Version	Date	Author	Comments
PA1	2005-05-19	Oskar Holmstrand	First draft
PA2	2005-05-23	Oskar Holmstrand	Fixed error in Abstract
X	2005-12-14	Oskar Holmstrand	Changed to Bachelor Thesis version

Animated character meshes , workflow

Please note that this version is simplified, and does not include CVS information and other details

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      Skeleton
```

Different textures

Additional character-related attachable props

PSK export (?)

Rigging

Animation

PSA export

Male Adult
Modelling
UV-mapping
Textures
Skin binding
PSK export

Female Adult
Modelling
UV-mapping
Textures
Skin binding
PSK export

Male Soldier
Modelling
UV-mapping
Textures
Skin binding
PSK export

Female Soldier
Modelling
UV-mapping
Textures
Skin binding
PSK export

Package creation

1 OVERVIEW

The role as an animator or character modeller is less interdependent on the other roles than the role of the static mesh artist is. This means that there is more room for individual deviations from the workflow presented in this document. However, it is preferred that the artist atleast have read the document, so that he/she knows why I've structured it like this. This workflow is designed to make possible to do character modelling interdependent of character animation. The document also assumes that you have read the static mesh workflow document before.

1.1 CVS

Cvs is rarely mentioned in this document. It assumes that you use the CVS discipline outlined in the static mesh document when working with shared files. (update -> mark as reserved edit -> make your edits -> commit).

1.2 ActorX

The exporter being used for rigged meshes is ActorX. It is accessed by typing axmain when having the ActorX plugin installed and activated. It only works when having a mesh with a bone selected.
ActorX can also be used to create staticMeshes. To do this, type axmesh. It is also possible to use vertex animation with ActorX. (but it's very limited, so don't)

1.3 Shoppinglist

The first step is as always to decide what character models we're going to need. This document assumes that Male Adult, Female Adult, Male Soldier, and Female Soldier are the needed characters.

We can later make memory and work-efficient variants of these by using skins and attachable props.

The different characters will share the same skeleton and animations, which saves us much work when it comes to animation. The different characters will of course have some animations that only they use, but with this method, any character CAN use any other characters animations.

1.4 Design

Even though the characters are all regular persons, they need to be designed. How rigorous this is done depends on you.

1.5 Proportional dummy-mesh

This mesh is a first really basic version of a mesh. It is created only for one purpose – to have the right proportions in order for the skeleton to be correct. Most likely, the first character model will use this as a base too.
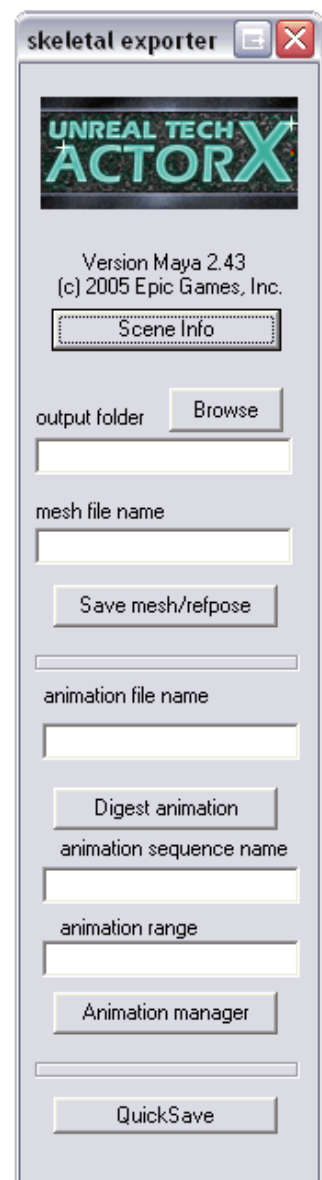

Fig 1. axmain

2 SKELETON

By defining the skeleton first, and the character after it – we allow for rigging and animation to start simultaneously as modelling. This first skeleton doesn't have to be totally final, but it is very important that the size and layout of it is correct. Save the skeleton as Source\Animations\Adults.ulx\rigged_adults.mb.

After the first version of the skeleton is completed, the workflow branches into two potential roles. I'll describe the animator role first.

3   ANIMATOR

3.1   Rigging

When the basic skeleton exists, rigging can start. During the course of the rigging, you might want to add bones. This is totally ok, as long as they are compatible with the model being made. Don't forget the bones needed for facial animation! The bones should be saved over the old rigged_adults.mb file, to make sure the modeller always can have the newest version.

At some point, the **skeleton** is going to have to be decided as final. This is a very important step, as it allows for moving on to animation, and for the modeller to do the skin binding. I really recommend that the final rigged skeleton is also backed up, because loosing this file is potentially very frustrating.

3.2   Animation

Exactly how the animation is done shouldn't matter with this workflow. As long as the skeleton isn't altered, any animation that can be baked should be ok. A few things to think about is that generally, the character shouldn't move, because that is handled by the game. Example: You create a walkcycle, where the character takes two steps forward, then you move it to the center, so that he just stands still, but he still makes the correct motion.
You can save the animations in different files, or in the same file. Most logical might be to have all the walks in one file, all the runs in one etc. Make sure you make a textfile that describes between what frames each variant is placed, because you are going to forget. Example of how such a textfile could look:
1-12 WalkF (13 keyframed)
14-26 WalkB (27 keyframed)
Since we want many of the animations looping, it's a good idea to have two frames exactly the same in the beginning and the end of each cycle – however we don't want to export both frames because that would make quick freeze each cycle.
Also, if an animation only uses some bones, you should note the startbone in the textfile.
Typical filename for a file with several sequences:
Source\Animations\Adults.ukx\sequences\walks.mb

3.3   PSA export

The animator is only interested in exporting the animations. Enter the animation sequence name (ex. WalkF) and animation range (ex. 1-12) and then press Digest Animation. Do this for all the sequences in your .mb file. Then go into Animation manager, adjust the settings of your sequences, and press ->. Then press Save As.

Now you have a PSA file which includes your sequences and is ready for import into an unreal animation package!

3.4   Package creation

In order to create an animation package, you need a PSA file and a PSK file. You then import everything into the package. There are some settings you can adjust for each sequence and for each mesh too.

4 MODELLER & TEXTURE ARTIST

When creating subsequent models, use your previous models as base. The female adult should hopefully just be some vertex pulling from the male adult, and the soldier will perhaps just have some item bags and helmets and other stuff attached to him. The female soldier can use the best parts from the female adult and the male soldier.

This is true for not only modelling, but also for UV-mapping, textures and skin-binding. Try to use previous work as base as much as possible!

4.1 Modelling

When modelling, use the skeleton as reference. You might even want to import it as a linked reference into maya. As a modeller, never alter the skeleton. You must fit your model to the skeleton. The skeleton is king – the model is it's servant! The model should be saved as Source\Animations\Adults.ukx\meshes\Male_Adult.mb.

4.2 UV-mapping

Do this whatever way you like doing it. My tips would be to not overlap UV space, because you may want to export skinweights later in case some trouble arise, and it's really messy with overlapping UV. Another tip is to try to share as much UV-mapping as possible between the different models, because then you can copy-paste texture elements, which is really smooth.

4.3 Textures

The textures can be (but doesn't have to be) started as soon as the UV-map is completed. UT has no pixel shaders, so faking of light values etc is recommended.

4.4 Different textures (skins)

Each character can have several different skins. In this scenario, the Soldiers will most likely only have 1 skin each, while the Male Adult and Female Adult will have several skins each. This allows for much variation of the locals, without adding that much extra work.

4.5 Attachable props

It is possible to create attachable props (like hats, backpats etc) to the characters. Although UT in it's vanilla state only have support of attachement of weapons, the development needed to enable arbitrary attachements should be slim in comparison to the potential gain.
Exactly how attachable props are defined and created is not defined yet.

4.6 Skin binding (weight painting)

Before starting to do any serious skinbinding, make sure the skeleton is final If not, you're gonna end up doing the whole work again. Exporting and importing weightmaps can be useful if troubles arise, but this only works with a functional UV-map.

4.7　　　　PSK export

Exporting a PSK is really easy. In axmain, put a name under 'mesh file name' and you're good to go.
Save the PSK as Source\Animations\Adults.ukx\meshes\?????.PSK.
Importing the PSK as a model into the animation package is so easy that I won't even describe it.

Finally, your modelled, textures and skin-painted is finished, and so is this document!