Introduction

Game audio has enjoyed an enormous growth in the last decade. The current release of next-generation console hardware in conjunction with advances in personal computers has allowed more intricate and immersive audio soundtracks to be realized. The influx of handheld games has expanded the reach of modern video games. The availability of modestly priced home stereo and surround sound systems allows a wider demographic to experience enhanced sound, including surround sound, as part of the gaming experience.
In order to make intelligent decisions within a sound project's budget, it is important to understand the structure of a video game development company and the process a game traverses from conception to retail availability.

Categories of the Audio in a videogame

There are four categories in a game audio and these are:

-Music

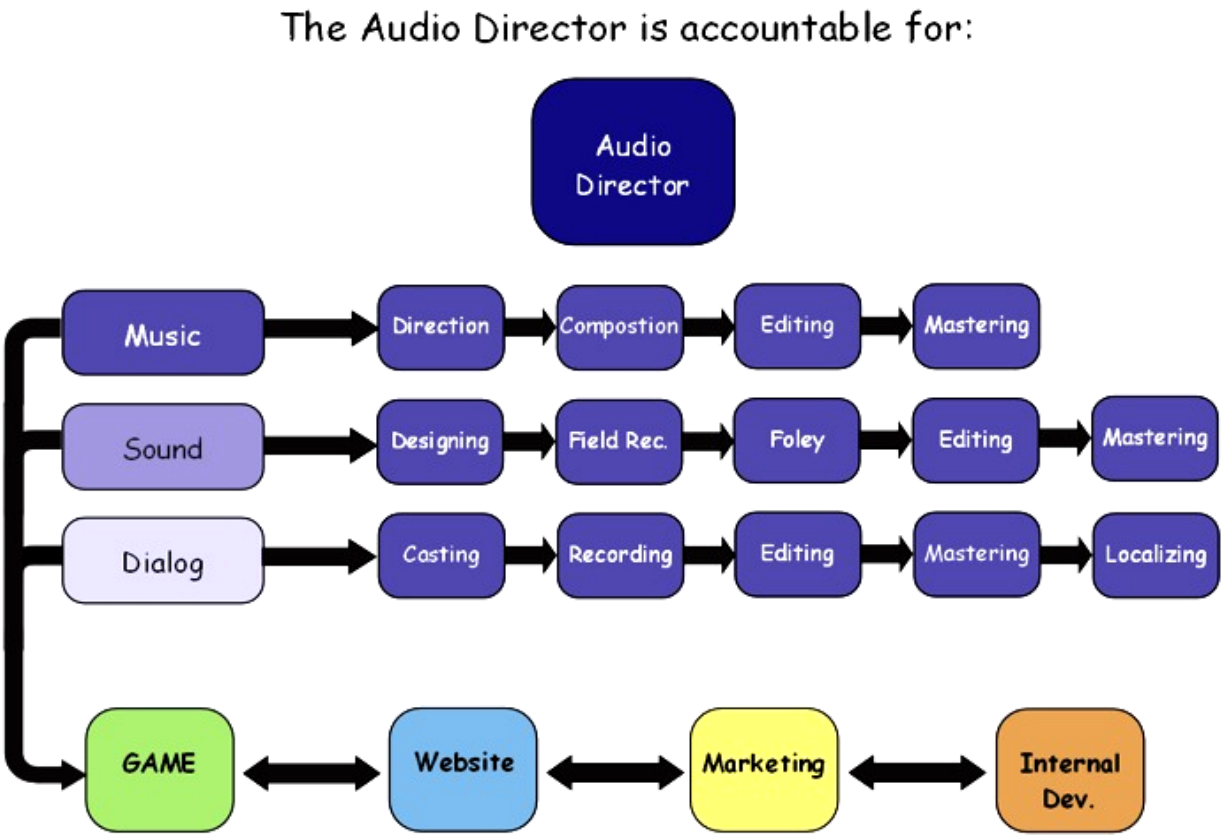
-Sound Effects

-Dialogue

-User Interface

Hierarchical Map of a Typical Game Company

An Audio director must manage a very complex combination of people and processes for completing a full and rich audio experience. Notice in this next diagram how much audio is being managed by the audio director. On a small project the audio team may be only one or two people, but on a larger project there may be several people working on any one of the boxes in the diagram.



Audio Design Document

The most important thing after it is established the direction of the audio is to create an Audio Design Document. The ADD is an overview to the goals and the purpose of the audio, the resources, the music style and execution as compared to the setting of the game. It will provide the roadmap for sound. Creating an Audio Design Document should be one of first tasks the audio team has to complete for a video game..
There are many angles that affect the final game audio. Knowing all of the details about the game system, the game design and the budget it will be helpful to build a successful and attainable strategy to complete the sound and music.

What should an Audio Design Document looks like?

The ADD is divided into 5 categories: I. Outline/Objectives, II. Research
III. Implementation, IV. Content List and V. Schedule. Each of these categories have their subsections.

I. OUTLINE/OBJECTIVES

It should contain a statement or two describing the goals and purpose of the audio and a brief description regarding the four categories of the audio.

a. OVERVIEW (setting in game)
Overall style of audio, purpose, what is trying to be conveyed as compared to the setting of the game.

b. MUSIC
brief statement about how this should work, outlined in very simple terms.

c. SOUND
(same approach as above)

d. DIALOGUE
(same approach as above)

e. MISC.: animations, promos, and so on.
(same approach as above)

[n.] [component]
(same approach as above)

II. RESEARCH

This section can prove to be valuable in looking back at past experiments on the project. Unless it's noted somewhere, it's easy to forget the details on research that never made it into implementation. Where research does turn into implementation, it's essential to note it in this section, even if it's described in simple terms.
Items that can be included in this section can be file formats tested and used, in-game audio experiments, and especially any proprietary audio research.

III. IMPLEMENTATION

A set of rules must be defined: permutations and boundaries (limits) as to how the audio works on a more detailed level. This section can be somewhat more technical. So long as it's not looking like C++ , we are on the right track. The goal here is to clearly describe how the audio world is defined.
The subsections of this section should include at least:
A. Music Implementation and
B. Sound.
If there are speech files for characters, narration and so on, then must be included a subsection for,
C. Dialogue as well.

To give a sense of the possible complexity of audio design needed in a game
i have provided an example of the audio implementation (III. A, B, and C above)
for an average game. Of course in the actual document the implementation is described on a highly detailed level but here I tried to just sum up each component in a line or two,
(this particular design can probably be thought of as "intermediate" in complexity).
I imagine that this audio engine harnesses up to six distinct layers of sound, with some layers playing simultaneously and others on their own. Here is an abstract outline of the imagined game environment:

Layer 0
An ambient sound effect layer. As the player passes over certain terrain types on the map, that terrain type's ambient sound loop begins to play. As the player passes over a second terrain type, the first ambient track gently fades out while the second fades in. There can be no more than two ambient sound effects cross-fading into one another at a time.

Layer 1
A 3D sound engine, where monaural sounds can travel through a four-speaker system, complete with a parameter list defining each sound's path, travelling speed, special effects, and so on. The goal here is not to have in-game dependent sounds, as the game itself is isometric, not 3D; but rather, to provide "enhancement" to the gaming experience, further immersing the player in an ancient, mythological setting.

Layer 2
Ambient sounds generated from terrain and buildings, which play only occasionally, and are randomly selected. Terrain here is played separate from the terrain played in Layer 0, which is a more of a "global" sound. Here, the sound played is more specific and complementary to the ambient terrain track being played in Layer 0.

Layer 3
Civilian, animal, monster, and all combat-related sounds are played here, including disaster sounds, user interface sounds, and so on.

Layer 4
Interactive music categories based on game events:
"General" music played when mundane activity is going on ,
"Action" music played when in combat,
"Special" music played during various important events in the game.
All of this music segues from one category to next as needed.

Layer 5
All narration and in-game dialogue for all characters. Narration is provided at the beginning and end of campaigns and/or missions; in-game dialogue is heard by moving the mouse over an on-screen character and right-clicking on it.

"An actual fact from the first Halo game is that there are more than 1600 script lines that were recorded" so consider the amount of files that had to be managed only from the dialogue!

IV. CONTENT LIST

The team that would be working on the ADD has to reference a separate list of all audio content for the game, including those for demos, marketing, the web site, and so on. Here is a generic example, where I give more detail in the first section, defining a pattern to follow for the rest of the list:

A. SOUND DESIGN
1. Action sounds
   a. Explosions: 5-10, varying from small to large
   b. Weapons: possibly a total of 30-50 unique sounds for 15 -25 weapons
   c. Characters
      i. human -- military: 5 unit types, 3-5 sounds each
      ii. human -- civilian: *unknown*
      iii. alien -- misc.: *unknown*
      [n].
    [n].
2. User interface
   [n].
  [n].

B. MUSIC
1. Setup mode
2. Mission panel
3. In-game music
4. win/lose music
[n].

C. DIALOGUE
1. in-game characters
2. narration
[n].

D. ADDITIONAL AUDIO-FOR-VIDEO CONTENT (marketing promotions, in-game animations)
 [n].
[n].

A basic sketch of content, such as the one shown above, can help to plan an attack in terms of scheduling audio production time, helping to decide who will be creating and programming what.

V. SCHEDULE

As in IV(Content List), you can outline a rough schedule here, perhaps updating it every month. We'll want to set some basic milestones, such as "all music done by [date]" or "75 percent of sound engine implemented by [date]." And by some method, even if it is the barest outline, we should indicate who is working on what, with some sort of timeline provided.

So now we have the design and implementation where we want it, and everything is under way. But we realize as our document comes to life, that it is opening up more and more complex questions that need answers. Support all the way through the project is crucial; with that, somewhere within the document there should also be the following considerations, taken as notes, mental or written.

For example, what if i creating sounds for a tiny mechwarrior robot, but at the last minute, Design Team says that the size of the robot will now be giant? And now with not one missile launcher, but three? And now what if it’s not using bullets anymore, but lasers? You can see where this is going. There are hundreds, sometimes thousands of design, art, and programming tweaks that occur along the development path.

Considerations
Aesthetic vs Technical

Working on a video game there are both creative and technical considerations. The audio aesthetic of the game must match the art direction and story. However, in games there will also be technical limitations to contend with. So below there is a diagram and a few considerations.