CTG Character Rendering Development Plan

MDL, January 10, 1996

1. Introduction:

Character representation and animation are becoming an increasingly important part of Maxis' products, as well as those of our competitors. Project Y is the first Maxis product to require a more ambitious character rendering system, one that can render small figures, a few pixels high, to relatively large realistic looking characters that are moving and interacting with the player. Beyond Project Y, this kind of technology is seen as potentially providing benefits to other Maxis titles.

This document will cover the goals, milestones and delivery schedule for this technology into Project Y's hands.

2. Goals:

The main goal for this project is to provide Project Y with better looking characters at acceptable performance levels. As mentioned in the introduction this kind of technology is seen as potentially applying to other products in the future. The character renderer is being built with an eye towards providing benefits to other projects that require quality and optimized rendering of humanoid figures. The human eye is very good at detecting deficiencies in the rendering of human figures (compared to any other type of animate or inanimate object)—therefore it is important that the rendering of humans be of high quality without running away with the CPU. Through this effort Maxis will obtain technology that enhances the believability of the environment, and opens the door to other types of character interaction and game-play in future titles.

2. Development Stages:

Character renderers already exist in Project Y, and the current rendering of small characters is considered adequate. However, these same rendering techniques when applied in a larger scale appear somewhat crude and clumsy. This is where we plan to spend much of our technical candy, on developing improved rendering techniques for larger scale characters, and at the same time not significantly slowing the frame rate or rendering of Project Y. Therefore, the following development stages (note that the sub-milestones are in chronological order) are proposed in order to develop the Project Y character renderer.

1. Getting Started
   - Get the latest version of the Project Y code from Ed.
   - Set up the development and build environment, and compile the code.
   - Build a test loop that involves large scale character rendering in a good Project Y representative scene. This measure will be used as a benchmark to test all future modifications to the character rendering engine in order to evaluate rendering quality and to determine the CPU impact of the modifications.
   - Profile the latest version of the Project Y code within the test loop.
   - Generate review and prioritize a hot list of potential character rendering solutions. This list will be used in the next milestone to weigh and evaluate the potential renderers.
2. Research Phase
   - Build quick tests of potential character renderers for cases when a quick example of the technology can be used to determine CPU impact, or the quality of the rendering can be tested.

- Benchmark potential technologies against the base line measure in the previous milestone.
- Determine the feasibility of the renderings in terms of the required artwork, CPU requirements, and quality of rendering.
- Determine the winning rendering technology to develop in next milestone.
- Specify artwork requirements for the candidate rendering technology. This information will be passed on to Ocean in Walnut Creek.
- Build and deliver any artwork/integration tools, if needed.

3. Development
- Build and benchmark the character rendering engine decided upon in the previous milestone.
- Get latest Project Y code drop from Ed, for testing purposes.
- Integrate and QA character rendering engine with latest Project Y code drop.
- Deploy character rendering engine via Ed.

4. Followup
- Contribute to the maintenance of the rendering engine.
- Asset integration.
- Quality assurance.
- Look ahead to leverage technology on other products.

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3. Milestones:

The milestone dates follow the development stages given in the previous section. The overall target end date for this project is 4/30/96 due to the planned QA date for Project Y of 6/1/96. The first milestone has a firm delivery date. Milestone 2 is the research phase and the length of time during this phase is largely determined by the size of the potential rendering candidates, as well as the end delivery date for the project. The following are the delivery milestones for this project:

Milestone 1: 2/15/96

This milestone will consist of a code drop, designed test loop, profiling, hot list of technologies and a schedule for milestone 2. This milestone will end with a meeting with Will and Ed to discuss the proposed technologies and representative benchmark.

Milestone 2:

Narrowing down the list of potential rendering solutions with specific tests and analysis. The outcome of this milestone will be a demo of the winning rendering technique, and a schedule for milestone 3.

Milestone 3:

Develop and deliver a character rendering solution to Project Y.

Maintenance:

This will be supplied on a as needed basis to support the character rendering engine.

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4. Resources Needed:

Because this project is tied into a deliverable product that is on a path for a September 1, 1996 release, some additional resources will be needed. Some of Ed's time will be needed over the course of the project in order to get up to date on the Project Y rendering engine. Additionally, at the end of the project some of Ed's time will be needed during the hand off of the code to incorporate the new character rendering engine. These demands will be fairly low level, and are not expected to impact Ed's time much. Some sample artwork will be needed during milestone 2 with the evaluation of the potential rendering

solutions. This artwork will either be generated by CTG, or a request will be made to the Art Department well in advance of evaluation of rendering solutions. Additionally, a list of the assets requirements will be generated, in conjunction with the Art Departments input, at the end of milestone 2 for the character renderer.

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5. Conclusion:

This project is firmly tied to supporting Project Y's development effort, however long term benefits are planned. This project is designed to provide Maxis with technology that will directly benefit a deliverable project, as well as providing benefits for additional titles. Consumers expect a high degree of accuracy in the rendering of human characters, therefore it is important for Maxis to develop the technology and expertise in this area.