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## CHAPTER II – LITERATUR REVIEW

### 2.1. Cel Shaded

"Cel" is the first syllable of "celluloid," a plastic made of cellulose nitrate. Before digital ink-and-paint software, the pencil drawings used in hand-drawn animation were transferred onto these sheets of clear plastic using ink and paint. Cel shading or cel shaded is a type of non-photorealistic rendering designed to make computer graphics appear to be hand-drawn. It is a recent addition to computer graphics, most commonly turning up in console video games.

Cel shaded animation was born in Disney's transparent sheet which objects are drawn or painted for traditional, hand – drawn animation. This sheet is called, celluloid. With the advent of Computer Animation Production System, the use of cells has been abandoned in major production. The computer has replaced the traditional hand-drawn works. Nowadays, there's no more traditional cel shaded animation. The last traditional cel shaded animation that Disney has got was The Little Mermaid.

One way that the 2D world and the 3D world have combined into one is in a game called Simpson's Road Rage. The game engine is designed to render the 3D in a process that is called tooning or cel shaded. At render time, the 3D interpretation of the models is removed by drawing a black line around the outside edges of the objects. Then, the inside of the black line is filled in with one to three shades of one color. This creates a 2D look while still using the 3D game engine's advanced technology.

The essence of cel shaded animation is the shade. This style has ultra-contrast shade. The shade has two to three colors, based on the color of the object. The default shade has two colors, the one within shadow side and the one within light side.

Furthermore, the border from the outline edges of a model or object supports the shade. It is like having a bigger silhouette behind the model. The border makes more emphasize to the model. It also gives traditional looks to the works, especially cartoon. Because of that, cel shaded animation also called with toon-shaded style.

## **2.2. Ink**

Ink painting is the mother of ink splatter and ink smudge. The splatter and smudge add expressive effect to the painting. Ink painting is an ancient painting medium, associated with Eastern scholarly landscape painting and calligraphy. The potential of ink calligraphy is occasionally expressed by allowing the ink to splatter onto the page. It has two formal elements; they are the black line and the white space.

Ink splatter is an element of design that could give grunge looks to graphic works. If ink splatter and calligraphic strokes combined together, it would make contrast yet artistic scene. Derivate from Japanese kanji, ink splatter and calligraphic strokes could give more soul to graphic works. It blends beauty and strength into something artistic and expressive.

The splatter comes from the ink line. The line is a sensitive dynamic, an energetic expression which is complemented and, in a certain sense, defined by the

space through which it runs. The relationship between line, space, and splatter is as intimate as animator and computer in real life.

Calligraphic stroke have two major properties when it applied into colored graphic works. First, calligraphic stroke depicts both tone and texture simultaneously. Second, it works together with the illustration to express tone and texture. In the end, each single stroke is part of a texture that conveys both shape and illumination.

### **2.3. Non-photorealistic Rendering**

Animation technology is moving fast. Many styles are developed by technology. The technology brings cel shaded animation technique to a higher level, the 3D animation. In the world of 3D animation, cel shaded is a subset of non-photorealistic rendering. Non-photorealistic rendering is any technique that produces images of simulated 3D world in a style other than realism. Admittedly it is a little odd to name a field of study by what it is not. It happens in non-photorealistic rendering. In computer graphics, photorealistic rendering attempts to make artificial images of simulated 3D environments that look "just like the real world." So non-photorealistic rendering (NPR) is any technique that produces images of simulated 3D world in a style other than realism.

One of the NPR style is cel shaded. Often called toon shading, this technique allow for seamless combination of 3D elements with traditional cel animation. Cel shaded has specific style. The artist use tools and technique to make the 3D models look more like hand-drawn animation cel when rendered.

### Street Fighter IV



Figure 2.1

Due to fast growing technology, 3D artists can develop cel shaded style to become more attractive. One nice example is Daigo Ikeno, the Street Fighter 4 videogame's art director and character designer. He gave attractive visual effects accented in calligraphic strokes, ink smudges and ink sprays during the fights. He packaged 3D polygons into Japanese calligraphic soul. Figure 2.1 shows how Daigo Ikeno mix cel shaded, calligraphic strokes, ink smudges, ink sprays or splatter into one expressive and artistic videogame scene.

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