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Beam Manipulation Method :

Beam Manipulation Method refers to a set of techniques used to control the behaviour of a scanning beam, typically in display technologies like cathode-ray tube (CRT) monitors or laser scanners. These methods encompass processes such as *rasterization, anti-aliasing, clipping, shading, texture mapping, and others*. They are employed to efficiently and accurately render graphical elements on a display device, ultimately creating images or animations that are visually coherent and aesthetically pleasing.

- ❖ Rasterization: The process of converting vector graphics into a raster image. It involves determining which pixels on the screen are affected by a given geometric shape. The scanning beam moves horizontally across the screen, one line at a time, painting pixels.
- ❖ Anti-Aliasing: It is used to reduce the jagged or stair-step appearance of diagonal lines or curves in a rasterized image. It works by varying the intensity of pixels near the edges of objects to give the illusion of smoother curves or lines.
- ❖ Clipping: It is the process of determining which parts of a geometric shape are visible and should be rendered, and which parts are outside the view and should be discarded. This ensures that only the visible portions of objects are drawn.

Shadow Mask Method :

Shadow Mask Method is a technology employed in cathode-ray tube (CRT) displays, utilizing a metal grid called a shadow mask to precisely direct electron beams towards phosphor-coated dots on the screen. By controlling the intensity of these electron beams, different colours are produced, allowing for the creation of a wide range of colours on the display. This method forms the basis for colour rendering in CRT monitors and televisions.

The Shadow Mask Method, while a fundamental technology for its time, has been largely replaced by newer display technologies like Liquid Crystal Displays (LCDs) and Light Emitting Diodes (LEDs), which offer advantages such as thinner form factors, lower power consumption, and higher resolutions. Nonetheless, the principles of additive colour mixing introduced by the Shadow Mask Method are still relevant in modern display technologies.