This chapter focuses on the period that precedes commercialization of the product and is based on the VCR case study. Only one or a few companies can succeed, usually after many attempts, in developing a sufficiently excellent product to achieve the dominant design. In this chapter, first, the time until the emergence of the dominant design is separated into three parts: the embryo period, the fetus period, and the birth period. Next, the basic requirements for achieving commercial success are discussed. It is very important for any new category of products to satisfy all the minimum consumer requirements rather than to improve a critical factor because those products which can not satisfy some minimum requirements are defective and will not diffuse widely. To complement the discussion in this chapter, the movement of Sony and JVC in this period and the emergence of the video software industry are explained.
Periodization until the Emergence of the Dominant Design

Embryo Period (In the 1950s and 1960s)

It took almost two decades to succeed in commercializing the home-use VCR since the emergence of the VCRs for broadcasting. The demand for VCRs for broadcasting was born in the US because broadcasting stations needed to broadcast the same program at different times, taking into account the time differences within the country. Ampex and RCA developed most essential technologies for the VCR in the 1950s. Ampex monopolized the VCR for broadcasting in the 1950s and RCA invaded the area in the 1960s. At that time, Japanese companies demonstrated excellence in mass production in the preceding industries of cassette recorders and TVs.

During the 1950s, a few companies succeeded in developing experimental VCRs. In 1950, RCA, which had the latest technologies in TV, developed the prototype of the monochrome VCR. In 1951, Bing Crosby Enterprises demonstrated the monochrome TV recorder (12 heads). In 1953, RCA succeeded in prototyping a three-head color VCR. BBC also developed a monochrome VCR, VERA, in 1956. These models all had the fatal defect of utilizing a stationary head that recorded the signals in a longitudinal direction with AM sound. They wasted videotapes and required the mechanism to run the tape at high speed. This waste of videotape made them unstable in operation. The models were huge and heavy.

Ampex developed the essential technologies of FM (Frequency Modulation) recording and rotary head recording for the VCR. These technologies reduced the volume of signals and increased the utilization of videotape. As a result, the recording capacity of videotapes expanded dramatically. Subsequently in the mid-1950s, Ampex presented the first practical VCRs, in the form of the VR-1000, and the MARK III and IV (VRX-1000). They each cost $75,000 and recorded the signals on the bias of the surface of two-inch tape with AM sound. CBS started using the VCR on the air on November 30, 1956. Douglas Edwards and the News was a delayed broadcast for the West Coast. NBC and ABC also started using VCRs in 1957. Ampex monopolized the VCR for broadcasting and sold about 600 units until RCA entered the market at the beginning of the 1960s.