**Xilinx**

Xilinx is a semiconductor manufacturer with headquarters in San Jose, CA. The semi-conductor industry is very volatile due to the wide variety of products and short product life cycle. Semi-conductor manufacturers are suppliers to OEMs in the telecom, small electronics and aerospace industries. However, they have a supply chain of their own which requires assembling and configuring wafers of silicon into programmable dies which later become integrated circuits. Their position in this multi-echelon supply chain makes forecasting for specific end product demand costly, impractical and very inaccurate. In addition, semi-conductor manufacturing is quickly becoming a commoditized process. Comparative intellectual and technological benefits that leaders in this industry were accustomed to are now becoming less of a competitive advantage. The focus has shifted from intellectual advantage to supply chain efficiency as a means of differentiation.

The life cycle for an integrated circuit is anywhere from six months to two years. During that time new technology will make existing products obsolete. Having long manufacturing lead times cripples a company‘s ability to quickly respond to these changes as well as changes in customer specific orders. Having a generic product and creating a postponement point separating a die with generic qualities and one with a specific-logic-configurations allows them to respond quickly and offer flexibility to their customers.

Xilinx began with a combination of both process and product postponement. Product postponement was implemented by redesigning the dies to a certain range of parameters for the different characteristics. For example, there are four major sources of variety in an integrated circuit; speed, number of logic gates, package types and voltage. Customers can specify generic capabilities and can customize the chip to their specifications after the fabrication stage.

“Product postponement is very suitable for programmable devices because a near infinite numbers of varieties can be created from a few thousand physical-product permutations. The amount of variety makes postponement very beneficial. Xilinx can manufacture 200 different dies that can proliferate into over 4000 different end product combinations. That makes the ratio of generic dies to end products roughly 1:20.

The manufacturing process is broken up into two stages. Suppose a certain generic die A can be configured to take on 20 different configurations say A1 to A20. When a customer requests the specifications, they only need to specify the generic die. Once it is pulled from “A” inventory it is customized to a certain degree depending on customer order specifications. This specification can take place at Xilinx for high volume orders or it can be delayed even further so that the point of customization occurs at the customer. Approximately 20% fall into the high-volume category and the remaining 80% are left for customization at the customer.

The final customization is a matter of programming the software within the chip. By eliminating this process from the front end (manufacturing) process, Xilinx cut manufacturing lead time from three months to three weeks. Manufacturing usually takes place in Taiwan or Japan and then product sits in inventory at Xilinx awaiting testing. Testing facilities are located in Korea, Taiwan and Japan. This step was not always outsourced overseas. Assembling and testing first took place in San Jose until Xilinx started to take advantage of cheaper labour and the educational capital found in Ireland and most recently in Asia in 2004.

While postponement has reduced inventory and helped Xilinx meet customer requirements with more accuracy and on-time deliveries, it is just the beginning. It is forecasted that postponement within the semiconductor industry will extend far beyond customer configuration capabilities. It is believed that companies such as Comcast will be able to change the logic of a given circuit from a remote location taking the responsibility away from the customer completely.