How to successfully manage and overcome inflection points

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Technology and business historical (past) trends are widely used to forecast future trends. Typically, these trends are extrapolated 5–10 years out into the future and investments and products are planned on these assumptions. Quite often, only a few people cursorily analyze the ingredients that have supported these trends in the past and, after this review is completed, these trends are assumed to be valid (forever) and representing undeniable facts. However, it can be observed that approximately every 20 years some of the components supporting any kind of trend reach fundamental limits. These events typically catch the specific industry by surprise and doomsday scenarios ensue.

However, all of this can be avoided if a comprehensive preventive methodology is developed and proactive programs are adopted and implemented in a timely fashion. The electronics industry has demonstrated for over 50 years how this can be accomplished.

The first step consists in developing a comprehensive roadmap spanning 15 years out by a team of international experts. Careful analysis of the roadmap easily identifies when some specific items will reach fundamental limits. These limits (roadblocks) are labeled as "challenges" and possible solutions are developed. Since any industry ecosystem continues to evolve, it is imperative that the roadmap be updated every year.

The second step consists in supporting fundamental research to identify which solutions are actually viable. This effort typically occurs in universities and research organizations and takes about 5 years.

The third step consists in transferring this information to research consortia that can develop prototypes and select the most viable solutions. This effort also takes about 5 years.

Finally, the research and development organizations of industrial companies evaluate and select the most cost effective solutions. This effort takes about 5 years.

From the above considerations is clear that the whole process takes about 15 years. However, it has been demonstrated that if the above methodology is managed as an integrated program, the total time can be reduced to about 11 years. Detailed successful examples will be presented.