

Foreword

“Sharing of Dreams and Collaboration for Completion”

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We often hear it being said that “Engineers should have ‘dreams’.” The word “dream” sometimes refers to some personal passion, while at other times it suggests a goal and a set of values that certain groups consciously share and future visions that are unconsciously shared by groups of people and societies across the generations. What then are the “dreams” that the engineers at Komatsu wish to have?

In the world of semiconductors, Moore’s law states, “the processing power of CPUs will double every 18 months.” This is the hypothesis advocated by Gordon Moore, the founder of Intel, in 1965. Surprisingly, 40 years after Moore first advocated this hypothesis, semiconductor devices continue to advance in line with this hypothesis. However, this is not a phenomenon that has been accidentally brought about as a result of random research investment and free competition. On the contrary, Moore’s law itself has contributed to realizing this evolution.

The “dream” continues to be realized as a result of a gigantic system of the division of labor that has tacitly been formed first by manufacturers of materials, manufacturing equipment, devices and final products and other related industries sharing the “dream” and “vision” advocated by Moore and as a result of them setting and solving tasks to realize the “dream” in their particular fields of interest. As this example shows, large scale division of labor is needed to negotiate the hurdle that has to be overcome to realize such visions. This requires the sharing of “dreams” across related fields. In short, a high hurdle that cannot be cleared easily is needed to spur different fields to share their “dreams.”

The engineering staff of Komatsu is now facing the challenge of a high hurdle that must be cleared. The task we are up against is to clear the gas emission regulations that are to be tightened from Tier 3 to Tier 4 to reduce our environmental impact and, at the same time, to develop and supply products that have outstanding features in the areas of “environment,” “safety,” “economy” and “IT.” This is a hurdle that cannot be cleared overnight.

Engineers relish challenges. If we are not challenged by tasks that must be resolved, no company would ever invest in new technology development and all companies would merely limit themselves to some minimum development efforts, choosing to continue to follow conventional technologies. Difficulty and adversity are virtues. They provide opportunities for engineers to ascend from “personal dreams” to the “collective dreams” through the painstaking process of corroborating the potentiality and appropriateness of the new technologies and ideas they have developed within their own minds.

First, the engineers and technical departments of Komatsu are invited to pluck up the courage and propose new technical ideas that may be the seeds of great potentiality and present the evidence they have to support the feasibility of these ideas they believe can effectively surpass the “hurdles” that have to be overcome. The moment of these personal dreams have been communicated, they become “collective dreams,” dreams that are shared, “product images of the next generation and the generation after next” and “salient features” that call for cooperation throughout the department. This “dream making process” that necessarily precedes the “sequence of events that turns these dreams into some tangible reality” is absolutely vital. This is the stage in which the engineer as the footman of the technical scheme of things comes into his own. In this sense, the next five years may rightly be described as the “proving ground of the engineering force.” With the edge of our courage and creativity, we can conjure up great and splendid dreams which when shared can be put into reality through the cohesion of teamwork.