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Is Planning a Strategic Requirement for CE Success?

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1. Introduction

Many progressive companies are interested in maintaining a competitive edge in the world marketplace and in producing high quality products. They would like to do this at a lower net cost of production than their competitors. One easy way to increase one's productivity or efficiency is to squeeze more out of the current system. This often boils down to either working harder than before or automating some of the manual tasks rather than working differently. *Automation of tasks to some may also mean repeating the same mistakes but doing it more often and more quickly.* Many companies are finding that true increase in productivity and efficiency begins with such factors as clean and efficient process, good communication infrastructure, teamwork, and a constancy of shared vision and purpose. The challenge is simply not to crank up the speed of the machines so that outputs (per unit of time) are increased or doubled, but to change the basic machinery or process that produces the outputs. To accomplish the latter goals, today many organizations are applying CE principles through benchmarking [1], CPI [2], organizational restructuring [3]. Ts renovation (see References [4] and [5]), ACE (automated concurrent engineering), and process re-engineering [6,7,8] which are relatively newer concepts. The walls between various groups and departments that existed a few years ago, are crumbling. Today, it is becoming more important to get inputs from all facets of an organization, since no single group or department is expected to know or do everything. An organization is looking at how to run its business effectively and determine if it can be improved in some way. One item that is becoming important is that not only everyone in the organization should know what activity he or she is performing or engaging in, but the rest of the team should also know how their activities add to the rest of the organization as to the big picture. There are six parts to winning a competitiveness battle (see Figure 1):

- what [inputs, outputs, and process steps (tasks) including measures and decision points]
- how (techniques, tools, process boundaries, and process flow)
- who (talents, teamwork, customers, and supply chain)

- why (techniques, process, purpose, function, and rationale for decision making)
- when (time, process order, and structure)
- where (technology gaps, process relationship, and its context to the whole)

Knowing what information is required or what task to perform is one sixth of this battle. How this information or task satisfies the corporate goals is the second one-sixth piece. The remaining pieces are:

- Who makes up the team? Who needs it?
- Why this technique or process will not work? Why is this information needed?
- When is the optimum time (to do it)?
- Where are the right places to use this? Where will this information be used?

In Figure 1, though parts are equally divided, in practice one piece will be more important than others. "Who needs it" facilitates smooth communication and "why this information is needed" determines how valuable it is to a person, team, or organization. "Where this information will be used" determines the right place, "When to do it" denotes the right time and is the contributing factor to meeting fast-to-market or concurrency goals. By knowing what we do today and how we do it, we will be in a better position to identify bottlenecks and barriers in the current system and possibly improve operations, if opportunities arise.

2. Strategic Product/Process Planning (SP³)

Strategic Product/Process Planning (SP³) is a concept often used to accomplish many "lean" production goals. In some organizations, "process improvement" is often perceived as an after-thought—a functional service to be called upon periodically for productivity improvement [9]. In such companies, process is viewed closely with "work force productivity improvement (continuous process improvement) or organizational restructuring (reordering of tasks)." Others who have paid more attention have concerned themselves with "process restructuring." Process restructuring is often targeted toward causing piecewise or one-at-a-time im-

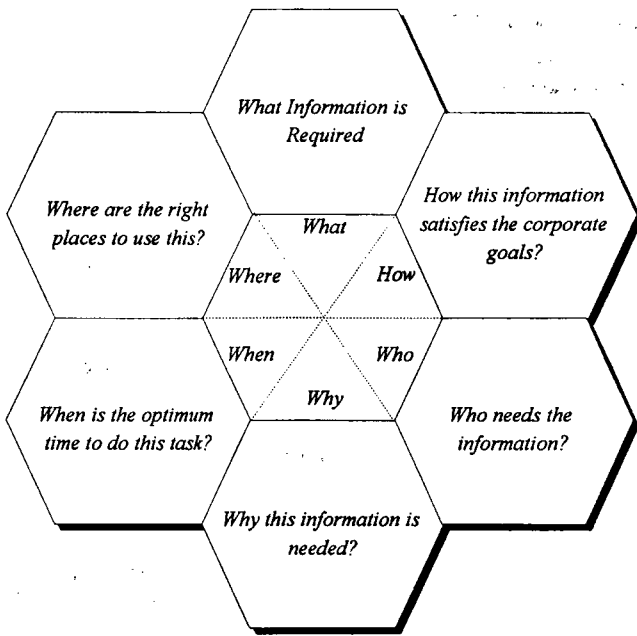


Figure 1. Questions assessing the improvement needs.

Improvements due to an incremental or add-on approach of continuous improvement in manufacturing process, product quality, etc. However, the perception is clearly different in companies following lean production principles. In those companies, SP³ is seen as a pervasive set of renovation activities that form the lifeblood of the company's regenerating profit potential. SP³ is a renovation approach that critically examines those six pieces of the battle, rethinks them, and then redesigns the mission-critical "products, processes, and services" within an organization.

A question often asked is "if the design process is to be changed, what would be an appropriate approach to product design?" The answer is not very difficult. Figure 2 illustrates the pattern of resources that are spent in product's definition, design, and redesign phases for both British and Japanese companies [10]. The British pattern (mirrored in the USA) is one where meager resources are committed to the definition/design phases (17%), compared to what is ultimately spent in the redesign phase (50%). For example, some firms take people off projects/tasks that are just starting up and move them to projects/activities that are already in late. The result is that they are always in a fire-fighting mode; there is never time to do less important things

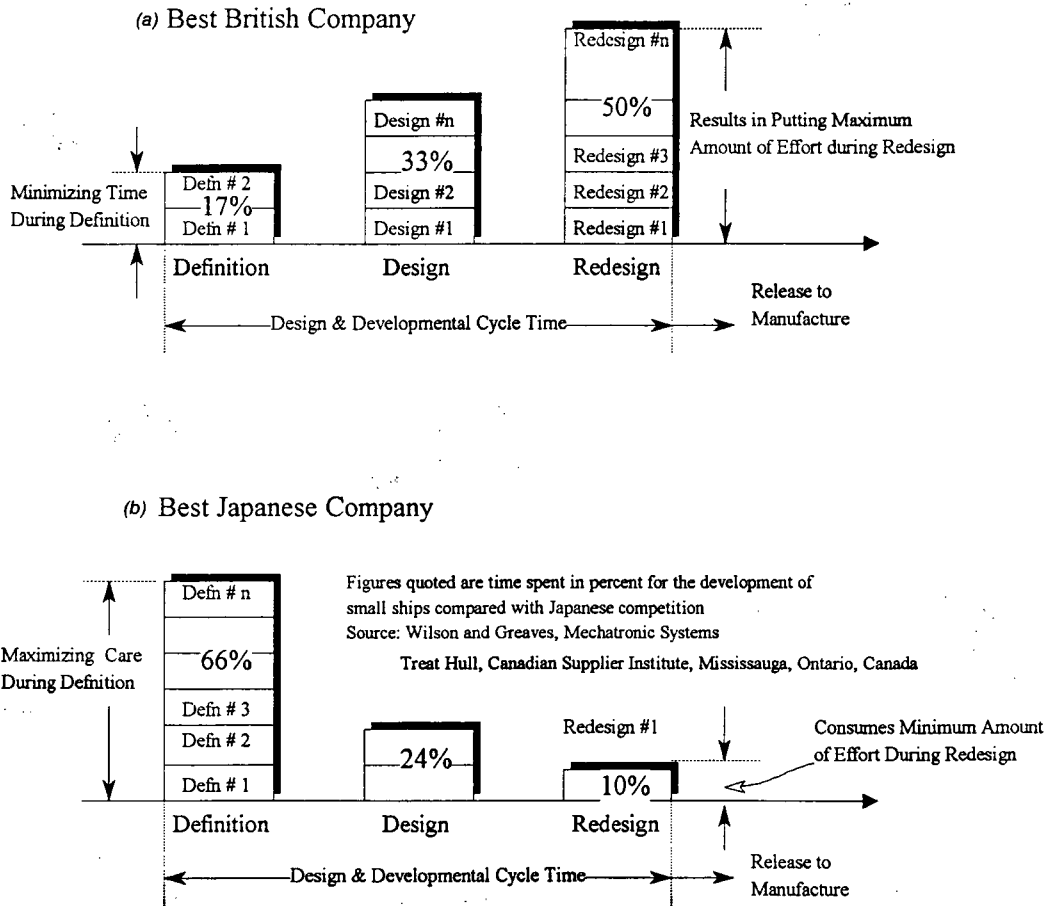


Figure 2. An example pattern of product development efforts (a) Best British Company, (b) Best Japanese Company.

because there is always something urgent. To achieve a comparable level of quality, the Japanese do things quite in the reverse time order. They strongly focus on product definition supported by optimizing techniques during design (a hefty 66% of the effort is spent here). This results in getting the product design correct the first time, thus reducing the need for any extensive redesign. The average time spent by the Japanese in the redesign phase is relatively very small—somewhere in the 10% range.

The percentage quoted in man-hours is for a British company designing small ships and that of a Japanese counterpart. In the British company case, the penalty was further compounded by the cost when another similar vessel was ordered. The incremental design cost for a second Japanese vessel was almost negligible (10%), but that for the British vessel was five times more (close to 50%) of the man-hours of the total effort [10]. Today, the relative gap, however, is closing. Some U.S. manufacturers have achieved impressive results. Chrysler brought the viper automobile to market in a three-year development cycle-time, significantly breaking previous five-year standards.

The difference between the Japanese and British approach thus boils down to two main points:

- (a) the difference in life-cycle management methodology such as CE, KBE, etc.
- (b) the effectiveness with which life-cycle management is practiced (Those who are able to make sound decisions during the early life-cycle will win the biggest competitiveness and profitability battle.)

3. Concluding Remarks

It is important, therefore, to set up a (SP³) team to do Strategic Product/Process Planning before jumping to automation. The role of the SP³ team would be to define a structure or a strategic roadmap for automation. This roadmap

will outline a set of high-level requirements and a structure for building various KBE and CE modules, which account for "reusability," "accessibility," "shareability," and other X-ability considerations [11] relevant to an organization based on its business needs.

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