Research Watch

The Importance of an After-Work Smile

Does working parents' absence affect children's psyches? Two new studies examine the question from different perspectives. It turns out that early adolescents' sense of well-being isn't affected by how much time their parents spend at work, but it *is* affected by their view of their parents' moods at the end of the workday, according to research by **Sandee Tisdale** and **Marcie Pitt-Catsouphes,** of Boston College. The better the perceived mood, the higher the well-being. Another study of this age group, led by **C. André Christie-Mizell,** of Vanderbilt University, found no link between bullying and parents' work hours per se—but saw increased bullying by children whose fathers work full-time or more and who feel that their fathers don't spend enough time with them.

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MANUFACTURING *by Ryan Boas and Edward Crawley*

The Elusive Benefits of Common Parts

For manufacturers, it's supposedly a surefire path to higher profits: Standardizing parts in a product line—a practice known as commonality—generates economies of scale and other savings. An automaker, for example, might cut costs by using the same braking system in all its models. But firms often fall far short of commonality goals. Why?

We studied seven leading companies in industries including aviation, satellites, automobiles, and semiconductors, spending 32 days on-site and conducting 119 interviews. Managers, we found, are well aware of the potential benefits of commonality: shorter lead times; lower fixed development, sourcing, and variable costs; and higher product reliability. However, we observed a pattern that limits these benefits.

It starts when the development team creates conceptual designs for individual models in a line. At this stage commonality is typically high. But as the designs progress, changes are made that cause a continual drift away from commonality. Although each change may be small, the net effect—what we've termed "divergence"—can be great indeed. An initial goal of commonality across a large subsystem, such as an engine, may give way to commonality only among low-level parts.

Several factors contribute to divergence. Commonality may erode as the needs of different market segments become better known and evolve. Development teams don't coordinate effectively when making changes, and decreasing commonality becomes the default. New technologies can require adjustments to some models. And because of resource constraints and the need to offset risk, the products in a portfolio generally follow different design timetables that may span several years, exacerbating the factors above and reducing the gains that commonality might yield.

WHY DID ONE COMPANY DRIFT AWAY FROM COMMONALITY?

An aircraft manufacturer planned to control costs by using highly common airframes, engines, electronics, and supporting software in several new models. During development, however, customer specifications caused commonality to plummet: For example, different landing requirements and the need to avoid excess weight drove major changes to certain models. At the time of our study, commonality had dropped from 80% to 35%; with development still in progress, the final figure is likely to be lower still.

Our case studies suggest several ways to better exploit the synergies and extract the profits available from commonality:

First, shift your company's culture away from a focus on individual products; think about product families instead. Modify development processes with an eye to the costs and benefits across a product family—and recognize that choosing a common part may hurt one product but deliver savings for the family as a whole.

Second, ensure that your organization has strong "platform managers" charged with aligning incentives toward beneficial commonality. Companies often give too much power to individual product managers, who are incentivized to make decisions in the interests of their own products, even if those decisions create divergence that hurts overall profitability.

Third, actively manage commonality throughout the product family life cycle. Too often companies plan early on for common parts but neglect those plans during later stages.

Last, be realistic. Commonality can be a powerful profit driver, but it's not an end in itself. If products become insufficiently differentiated, reduced sales may negate any cost savings. And even when you implement commonality carefully, the obstacles to realizing its full potential are very real.

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