TWO OPTIONS: TRANSFORM – OR FALL BEHIND

Manufacturers must continually transform their processes to stay ahead of dynamic global markets. Engineering leaders are at the heart of this change. Here are their toughest transformation challenges – and the critical resources they need.

Transformative Leadership

Were you surprised when Samsung recently surpassed Apple in smartphone sales?

In a global business arena repeatedly jolted by new competition, emerging markets, technological change, and economic shocks, Samsung has managed to rise above.

And it's not just with smartphones. Successfully taking on – and now outselling – what may be the world's most revered brand, in its highest-profile product category, is only the most newsworthy of Samsung's recent accomplishments. (See the sidebar on page 5 for more.)

What's Samsung's secret? Short answer: a complete transformation of the company. It began some 20 years ago, determinedly led from the top – and it remains ongoing today.

Engineering leaders everywhere can find guidance in Samsung's story. It couldn't be clearer that continual transformation – in response to continual change – has come to literally define Samsung's growth strategy. It's their standard operating procedure.

Will Samsung keep extending their reach, excelling in quality, and increasing market share throughout the world? Time will tell. But if they do, it will be their exceptional ability to anticipate and adapt to change – through strategic transformation – that will seal the deal. Because even Samsung, with its growing industrial might, faces the same, constant, potentially paradigm-shifting pressures as every other manufacturer today.

Not the least of which is the dynamic global marketplace.

Uncertainty Abounds

The world's markets and economies are unpredictable. So is the competitive landscape. For example: Not so long ago, LG was known mainly as a phone maker; now they're one of the fastest-growing producers of home appliances and electronics.

Meanwhile, emerging markets keep bringing new consumers to the table. This creates huge opportunities for global manufacturers – but also big challenges.

User needs and expectations vary significantly from continent to continent, from country to country, and even from region to region. So do trade and regulatory requirements. The numbers of product models, versions, and configurations keep multiplying. Parts lists grow ever longer.

Innovation can streamline processes, but it also adds challenges. Take the growing use of process management and decision-support software to speed product development. Its successful use has raised customers' expectations for faster, cheaper, better – everywhere.

Put simply, the layers of complexity for product engineering today are only deepening. This makes it more difficult than ever for engineering leaders to plan for and achieve their companies' time, cost, and quality objectives.

Changing Workforce

Internal dynamics also put pressure on engineering executives. They must optimize the performance of a globally distributed workforce that is changing just as rapidly as the global marketplace.

As manufacturers extend their operations to all corners of the globe, keeping teams aligned is a bigger challenge than ever. Languages, standards, systems, and skill sets – practically everything, in fact – vary by location. Mergers and acquisitions, always disruptive, apply further stress on cross-team collaboration.

At the same time, "re-shoring" has become a trend. Many manufacturing facilities that had been moved offshore are now returning to their ports of origin. This is great news for job creation in the manufacturers' homelands, but it's challenging nevertheless. There is, just to start, the need to recruit new employees and rapidly train them.

Plus, the generational employment shifts continue. In the U.S., retiring Baby Boomers are leaving big gaps in knowledge and experience for manufacturing companies. Similar "brain drains" are happening in other industrialized countries. The new Millennials coming in to carry on their company's business have been raised in a digital world, where they have learned to work more collaboratively and transparently – largely online.

It's a wide chasm to cross. Engineering leaders must find ways to capture the institutional expertise of their older workers and effectively transfer that know-how for their younger staff to build upon. The engineering executive today is thus not only a bridge-builder across countries and continents, but across generations and work styles as well.

Product Complexity

When precisely did your car become "just a big smartphone on wheels?"

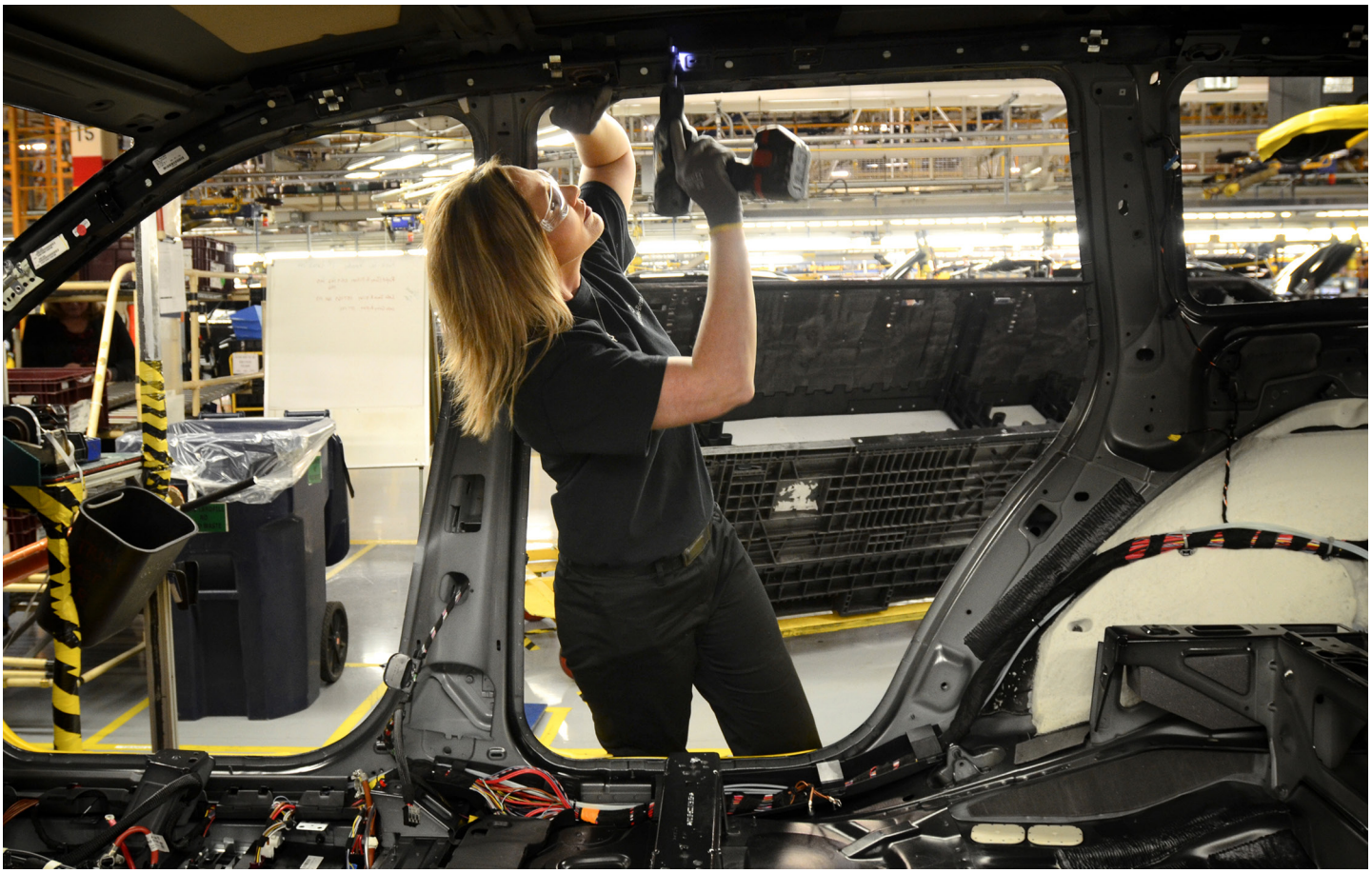
That's how Randall Stephenson, CEO of AT&T, characterized the automobile of today while announcing the company's partnership with GM to add 4G technology to the automaker's 2015 models. The plan: to enable car owners to use their Chevys, Buicks, Cadillacs, and GMCs as wireless hot spots. They'll stream in data, possibly including video streaming for rear seat passengers. (Who needs books on tape?)

The fact is that a car today is no longer simply a car. It's at least as much an electronics, software, and telecommunications product as it is a mechanical piece of equipment.

And automotive is just part of the picture. As consumers increasingly use personal computing and communications for on-the-go work applications as well as fun, products of many kinds are designed with these needs in mind. Customers are demanding it, and the low costs and abundant supplies of high-tech components have made it possible.

Globalization complicates products even more. The trend to "design globally, build locally" is gaining steam. Today there are probably few true world products. More typical are custom configurations and adapted models to meet regional customer needs. Consider, too, the many extra service parts and procedures these localized product versions require.

Put simply, products that were already highly complex have become even more challenging to design, engineer, manufacture, and keep up and running for customers.



Doing More – with Less

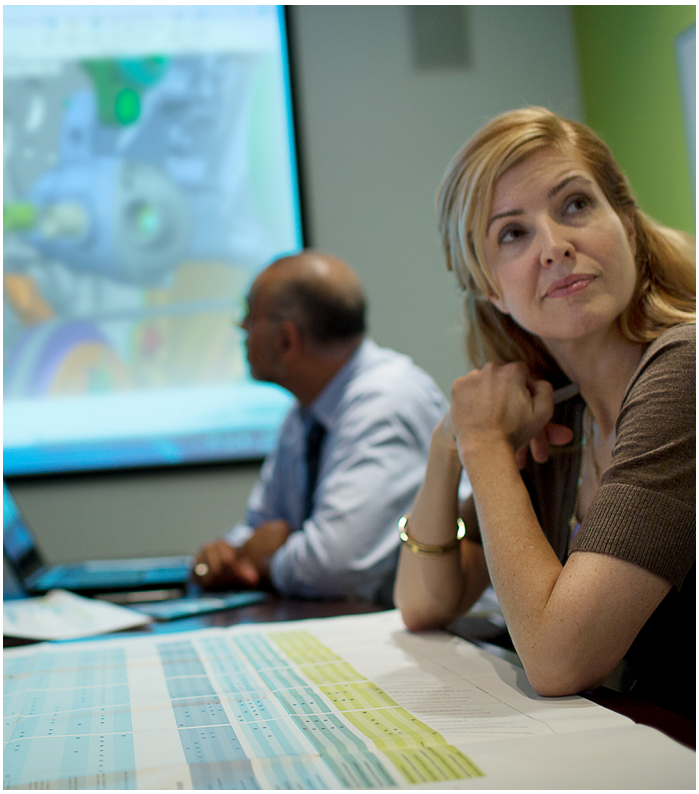
Basically, today's engineering executives must deliver more, more, more. And more!

They're charged with producing more innovations, with more speed and more quality – and always at more profit. They must do this while having to manage more widely distributed people, covering more engineering disciplines. It's all to meet more customers' needs, in more parts of the world, with more product configurations growing more and more complex.

And yet the engineering leader's resources remain limited.

As competitors and investors pressure manufacturers to minimize costs, they can't simply throw money at opportunities and problems. The bottom line ultimately rules. So the engineering leader today is expected to accomplish it all – with less. Needed results must come in less time, at lower risk, and with lower cost of goods.

This may be the textbook definition of increasing productivity, but it doesn't make the challenges any easier for the engineering leader struggling to meet them. Investments must be prioritized, and resources must be allocated effectively and efficiently.



Voices of Transformation
Meshing the Digital and Mechanical Worlds

> The world is on the threshold of a new era of innovation and change. It is taking place through the convergence of the global industrial system with **the power of advanced computing, analytics, low-cost sensing, and new levels of connectivity permitted by the Internet."**

Peter C. Evans,
Director of Global Strategy and Analytics, GE

> The deeper meshing of the digital world with the world of machines holds the potential to bring about profound **transformation to global industry, and in turn to many aspects of daily life, including the way many of us do our jobs."**

Marco Annunziata,
Chief Economist, GE

The authors found that, in the U.S. alone, the Industrial Internet could boost average incomes by 25 to 40 percent over the next 20 years and lift growth back to levels not seen since the 1990s. If the rest of the world achieved half of the U.S. productivity gains, the Industrial Internet could add from $10 to $15 trillion to global GDP – the size of today's U.S. economy – over the same period.

Source: "Industrial Internet: Pushing the Boundaries of Minds and Machines" by GE's Evans and Annunziata, referenced in GE Reports (gereports.com) on November 26, 2012

Opportunities to Transform

For decades, PTC has partnered with global manufacturers to help them gain competitive advantage through improved product development. From these experiences, we've identified the seven most common engineering management initiatives aimed to create value for these companies. All require transformative leadership to succeed:

- Improve global product development
- Achieve on-time delivery and reduce time to market
- Reduce product development costs
- Improve product quality
- Accelerate product innovation
- Streamline regulatory compliance and reduce product risk
- Reduce product costs

Ultimately, a manufacturer's goals are to get better products to market faster – and keep the products up and running longer. This increases customer value. Satisfied customers remain customers, and the company optimizes revenue and profits. Market share grows.

But much can stand in the way of this vision. The uncertainties and complexities of today's global marketplace aren't abating. If anything, they grow only more daunting.

So, indeed, each of the value-focused initiatives cited above may loom as a major challenge. Yet each also reveals major opportunities for engineering leaders to help transform and improve the ways their companies create and service products.

Samsung's Mission to Transform – and the Leadership Needed to Accomplish It

At Samsung's Human Resources Development Center in Yongin, South Korea, employees take on hushed tones as they enter the hallowed Frankfurt Room.

It's a recreation of the German hotel conference facility where, in 1993, Samsung chairman Lee Kun Hee gathered the company's top executives to lay out a plan for thoroughly transforming the company. Samsung was, at the time, a second-tier TV manufacturer. Chairman Lee's vision: to become the world's largest and most successful electronics company – and much more.

In the Yongin center, Samsung employees hear recordings of Lee's speeches from the three-day Frankfurt conference. "Change" is a dominant theme.

Samsung's New Management, as Lee dubbed it, called for Samsung's leadership and staff to remain in "perpetual crisis" mode. The company's need for transformation was immediate, and would remain constant. "Change begins with me," employees hear.

Today few would argue with the effectiveness of Lee's mission to transform. While other big names in electronics have struggled in recent years, Samsung keeps moving into new product categories – and gaining strong or even dominant positions there.

Why transform? Samsung's success makes a strong case for the strategy. And it's not just in electronics. The company also has thriving businesses in construction, shipbuilding, textiles, home appliances, real estate, insurance, advertising, and other industries.

Samsung's total revenue today comprises 17 percent of South Korea's gross domestic product. Is there a better testament to the power of transformative leadership?

Learn more in "How Samsung Became the World's # 1 Smartphone Maker" by Sam Grobart – published on March 28, 2013 at BusinessWeek.com.

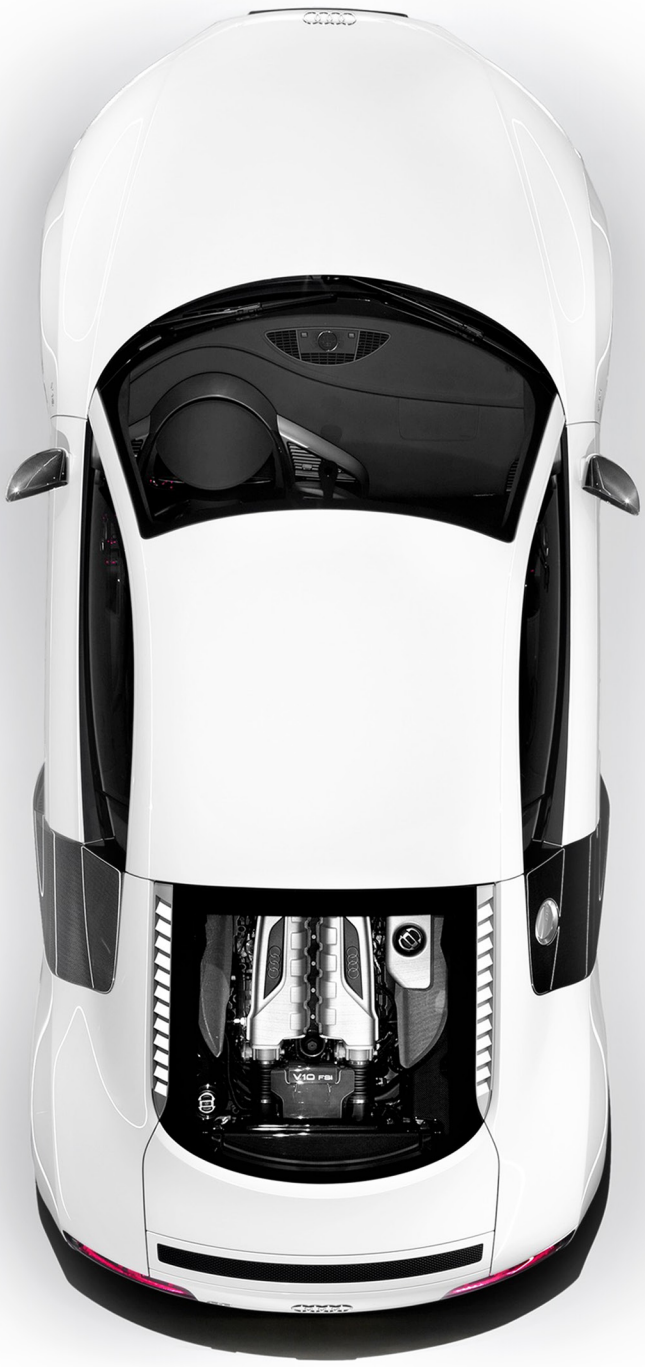
Success Factors

Success requires engineering executives to approach their challenges from an enterprise-wide perspective encompassing process, technology, and people. These are also the critical success factors for transformative leadership. Each calls for strategic focus:

- **Process is pivotal.** Developing and supporting products integrates widely distributed, cross-functional processes spanning the life of the product – from planning and design through engineering, production, installation, and service. The engineering leader should seek partners who understand best practices and can help implement best-in-class solutions, not only for improving specific processes, but also to cover the comprehensive scope of product management.

- **Technology must be targeted.** The tools selected should be specially designed for the entire product lifecycle – from concept through development and into service. They should work in an integrated way to help manage the complexities, enable extensive design reuse, and improve the productivity of global engineering teams.

- **People make it happen.** The engineering leader's imperative is to engage and involve all stakeholders in process transformation's success. This includes staff, suppliers, customers, partners, and C-level executives alike. All should align and sign on to the value they're aiming to create through transformation, the roadmap to attaining that value, and the governance required to deal with surprises along the way.



Transformative Solutions

The situation is urgent. Competitors are hungry, and customers are less and less loyal to their long-preferred brands. Manufacturers must innovate quickly – but without compromising on quality. It's up to engineering executives to lead.

The determination to transform is essential. Engineering executives who dodge their organizations' toughest challenges – and shy from making truly transformative decisions – will fail to help their companies get and stay ahead. By not leading, they'll fall behind.

But there's good news. PTC combines process expertise with technology solutions to help you lead the change, wherever improvements are needed across the product lifecycle. With our proven solutions, you can increase customer value and improve company performance – now and in the future. We provide the people, know-how, and tools to support your quality initiatives for gaining product and service advantage.

Let PTC be your guide. Learn more about what it takes to drive value through transformative engineering leadership at **PTC.com**/topics/leaders-transform.

Next-Gen Efficiency in Air Transportation

"We are not at all at the end of the story. **There's a great future for aviation."**

Charles Champion,
Executive Vice President of Engineering, Airbus

Champion's team hopes to develop an intelligent tractor that would aid aircraft in take-off. The tractor would help propel the plane down the runway, enabling the aircraft to start its engines at the last minute. The idea is to allow planes to carry less fuel, making them lighter and saving money while also reducing emissions.

Source: "Coloring the Skies Green" from IndustryWeek.com, March 14, 2013

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