

## Building a Marketplace and Workforce for Innovation

### The Business of Manufacturing

The business of manufacturing is suffering from something of an image problem. It's common to hear people talk about the U.S. economy in terms of the service and finance industries, but in fact, what drives our economy – and any modern economy – is not what numbers we crunch or what markets we serve, but the goods we produce. Despite all the technological advances we've seen in recent years, the pillars of our economy are still mining, agriculture and yes, manufacturing.

The word still conjures images of belching smokestacks, giant churning machines and sweaty, dangerous work. But manufacturing today is high-tech machines and educated workers driving increasingly sophisticated processes. Technological improvements have never moved faster. The U.S. auto industry, after years of struggling with an aging workforce, a credit crunch, stifling policies, and the rise of truly global competition, is poised to take advantage of those rapid changes and begin to grow again. But the industry finds itself awash in ideas without effective ways to communicate and implement them. Intellectual property does not always equal innovation – yet.

Dr. David E. Cole, Chairman Emeritus for the Center for Automotive Research and Chairman and Co-Founder of AutoHarvest.org, explains the challenges the industry faces, the changes that have given automakers an opportunity to reinvent their success, and new tools that any manufacturer can use to accelerate product development, grow their company, and create new jobs.



### The Challenges of Today's Economy

In recent years the U.S. auto industry has struggled with a loss of revenue caused largely by depression-level sales. In a recession that's hardly unique, but in an industry where costs are not only high but also fixed, a dip in revenue can be devastating.

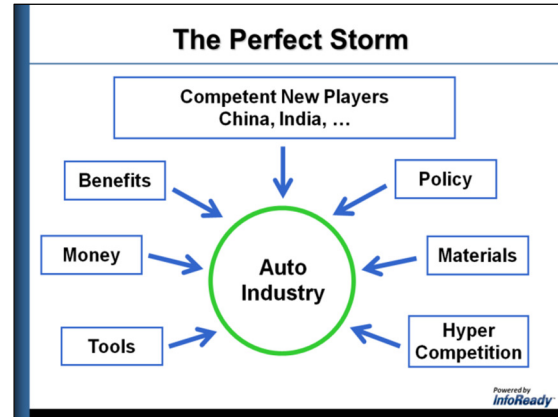
But the picture of what's ailing the U.S. auto industry is about much more than revenue. Though the actual cost of making a car has declined in the past decade, Cole tells us to "take a look at the 'perfect storm' of pressures that have made building automobiles so difficult in recent years":

- There are competent new players like China and India.
- Government policies, often drawn by bureaucrats who don't understand the auto industry, impose regulations like fuel-efficiency standards that are difficult to meet.
- The cost of raw materials, like steel and aluminum, has been all over the map.
- Benefit costs such as healthcare have increased dramatically.

- The collapse of the credit market caused massive problems throughout the supply chain.

“The auto industry of the future is best described as a world of vanishing boundaries,” Cole says. “Engineering disciplines that were once clearly delineated – mechanical, electrical, chemical – are all part of today’s auto industry.”

Boundaries between manufacturers and suppliers are dissolving as the development of intellectual property shifts from manufacturers into the supply chain. Even



international and corporate boundaries are disappearing as companies around the world collaborate.

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Those changing boundaries mean there’s a need for a new business model that takes into account a number of contemporary issues, including energy, government policies, and the credit markets. Another critical component is the profound change that will come with the aging baby boomer generation. As baby boomers age out of the workforce, we will see dramatic changes in consumer behavior, the socio-political landscape, health care costs, and the loss of skilled workers. The U.S. is hardly alone: Japan has a birth rate of about 1.3 and their immigration is limited. “That means in the next several decades Japan will see a population decline of 30-40 million people – and be forced to reconsider the country’s economic model,” says Cole.

## Knowledge – the Competitive Edge

In the years ahead, the U.S. auto industry has the potential to generate thousands of new manufacturing jobs, but not for uneducated workers. The assembly-line worker who dropped out of high school and did exactly what his foreman told him, over and over again, for 8-10 hours a day, is a relic of the past.

Instead of a foreman, there’s a self-directed work team, and that team’s members need some educational footing to help them intersect with the continuing advances in technology. But building that type of workforce comes with its own challenges. Among them:

- Students coming through the K-12 education system aren’t thinking about manufacturing as a career.
- The industry hasn’t had much success at drawing young women into manufacturing; women today only comprise about 20-25 percent of engineering students.
- The industry has presented no universal message that expresses its importance to our economy.

The moral of the story is that we haven't put the resources toward making sure the pipeline is filled with the kind of people we will need to be part of the manufacturing industry of the future. All these challenges have created a river that is getting faster, deeper and wider. "But" Cole states, "the pot of gold is getting larger, and industry changes have created prime conditions for the company that adapts its strategy."

For example, U.S. labor costs have come down to the level of international producers. Through a relatively high birth rate and immigration, the United States is adding a million households per year, which means a steady stream of potential workers. The poor economy has suppressed car buying, which has created a pent-up demand. Capacity has been reduced by several million units, so the market won't be flooded with surplus vehicles driving down prices. Increased scrappage has eliminated many used cars, keeping their prices significantly higher than in the past. All these forces have given automobile manufacturers pricing power; switching from a buyer's market to a seller's market.

"That's all good news," says Cole. "The challenge is getting to the other side, but the acceleration has begun."

## Enter AutoHarvest

AutoHarvest envisions as a comprehensive ecosystem to accelerate the process of turning big thoughts into big actions. This is not just high-end technology. AutoHarvest, a nonprofit foundation with over 130 leaders from R&D and manufacturing, is about putting people together for the right reasons. Relationships are still important, and in an industry where the pace of change is fast and getting faster, it's critical to leverage all the scientific and technological capabilities that we have.

"There are certain universal truths about the manufacturing industry that are necessary to keep acceleration on course," states Cole:

- Manufacturers must take risks. Not stupid risks, but chances that something could go very right.
- It's important to obsolete your own products. 3M is a great example: when they develop something, they immediately attack it, which reveals ways to improve it. It's always better to obsolete your product rather than watch someone else do it.
- Taking on the tough problems gives you a competitive advantage.
- Think in terms of systems so you never lose sight of the big picture even as you're working on the details.
- Knowledge is central. Smart people are going to win this game.

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"But that doesn't apply to smart people working alone" states Cole. Those who collaborate as part of a network will be able to find people who can help get them where they want to be. Collaboration is es-

sential to meeting goals and tapping into intellectual capabilities wherever they exist – whether in other companies, universities, or being incubated by today’s entrepreneurs. “One of the driving forces for AutoHarvest is recognition that if we’re going to be successful, we’re going to be dependent on collaboration, which means crossing boundaries that are difficult to cross,” Cole says.

Cole believes AutoHarvest brings to light several key components of success in the modern marketplace:

- Technology and innovation must come together.
- Finding the right information is critical for technology growth.
- Matching the right people to the right information is critical to creating innovation, and that’s true for buyers and sellers, collaborators and investors.

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All those connections become easier with AutoHarvest, a virtual marketplace that can connect people who might not otherwise find each other. AutoHarvest.org has created an industry-inspired, open innovation marketplace that supports advancement of the auto industry through collaboration. The organization’s goal is to provide a richer, deeper pool of intellectual property.

AutoHarvest not only brings information to people, it brings people to the information. It’s about communication, collaboration, cooperation, alliances and teamwork, all of which will be needed to help the industry grow and create jobs.

Are you looking for a solution? Can you solve a problem? Do you need technology? Those are all questions that are answered by the AutoHarvest platform, which was built by InfoReady Corporation to support both companies’ shared vision – to give AutoHarvest the capability to bring people and information together for high-value business results.

AutoHarvest selected InfoReady, an Ann Arbor, Michigan software firm as their partner to develop AutoHarvest’s online IP marketplace. The InfoReady Action Platform offered the capabilities that this open ecosystem needed: a strong contextual search function, secure workspaces for user-to-user collaboration, the ability for users to take action at the point of contact, and real-time reporting on all activity.

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## **A New Business Model**

In the new way of doing things, the key to success is doing things the right way, so it’s important to know not only whether we’re doing the right things, but also whether we’re doing the right things well and whether we’re really adding value.

“In the past we’ve talked globally but acted regionally,” says Cole. “We’ve worked with a linear structure. And we’ve talked about being lean, but today lean is not enough: we need to be lean-agile.”

Cole's example of working lean is the Ford plant in Atlanta, where workers could build a Taurus or Sable in about 15 hours. That's very lean, but that plant is now under one of the runways at the Atlanta airport – because it was lean but not agile.

The new, lean-agile structure uses virtual prototypes rather than physical prototypes. Coaches are leaders rather than kings, and leaders must accept the fact that in any organization there is a flow of people. Ask any young person and they will tell you they expect to hold 8-10 jobs over the course of their career, which is very different from the old model. There's also *coopetition*, where companies can cooperate on one level and compete on another level. Collaboration is absolutely fundamental.

"This is the new model, it is happening in real time, and if you're not on course you're in deep trouble," says Cole. "We have to change or we're going to die in the process of sticking to the old model."

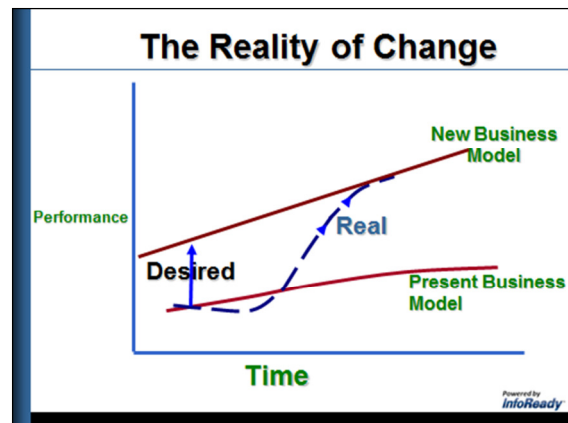
When AutoHarvest users identify a potential business opportunity, they can participate as a buyer, seller or collaborator. They can build company and personal profiles in a secure management platform, and showcase intellectual property and technology via secure video demonstrations and presentations.

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"When you think about change, what we would really desire is on Friday we stop doing things the old way, and on Monday we do them the new way," says Cole. "But real life doesn't work that

way. Any change will encounter problems and things that weren't envisioned; in fact it never happens as fast as we think it will. Though change is fundamental, it is not easy, and sometimes it happens more slowly than we would like."

But participants can speed up the process by building virtual think tanks within AutoHarvest to discuss the possibilities of selected technology for their environment. All proprietary documents and discussions are stored in AutoHarvest's secure web-based environment, but still accessible to those who can keep the innovation process moving forward. Built-in tracking tools let collaborators focus on the innovation opportunity instead of time-consuming project reporting.



Some people think of global integration – one company worldwide – as unification of platforms and components. However, research and development processes, plants and every aspect of the business must be tied to a single methodology, set of policies and end-to-end process. Coles says that "One Ford' is working, and now General Motors is moving toward a worldwide model – because that's the lean-agile way to do things."

Now the concept of lean-agile really applies to everything: investment, engineering, manufacturing, everything! Cole cautions, "we're not just talking about technologies and what happens on the shop floor,

we're thinking about the entire enterprise." Lean-agile is exactly what AutoHarvest promotes, at a time when competitive forces are greater than they have ever been. Under those conditions, knowledge is the competitive edge.

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"It is nice to be smart and rich, but smart is more important than rich," Cole says, adding that being smart means putting knowledge into action in today's products and processes. The auto industry faces a constant pull from customers who want more features and better prices. The response has been an amazing technological push, and research labs and companies are creating knowledge at an incredible pace.

"As we grow knowledge, application of that knowledge has unfortunately trailed and the gap between what we know and what we apply is growing," states Cole. "The challenge is to pick good ideas off the knowledge curve and place them on the application curve. If you do it and a competitor doesn't, you have a competitive advantage. If your competitor does it, you lose."

That's why doing things smarter is so important. As an example, Cole points to a past situation in which collaboration between GM and Ford would have been out of the question, an absolute violation of anti-trust rules. Today nobody really has the dominant position, and both companies have seen the wisdom of cooperation. Recently, GM and Ford collaborated on a six-speed transmission, and they saved nearly a year of time and tens of millions of dollars.

Those types of collaborations are easier than ever with AutoHarvest, where users can conclude transactions more effectively with point-and-click, industry-vetted licenses, non-disclosure agreements, and sponsored research templates -- all provided for user efficiency by AutoHarvest.

"The reality of today is that when we look at the shortage of natural resources, financial resources, human resources and time, we have to learn how to work together and how to cross boundaries more effectively and efficiently than we have in the past," states Cole.

### **The Results: Impactful Data, Quicker Innovation Adoption**

With the straightforward, powerful capabilities of the InfoReady Action Platform, AutoHarvest.org helps accelerate product develop by highlighting useful IP to the growing community of AutoHarvest users.

Technological and economic forces have changed manufacturing dramatically. It's a new day, and a leaner, more agile auto industry is poised to reclaim its place as a driver of the American economy and a place where people can find jobs. But rather than brawn, this job will take brains. It will take smart, educated people using the right tools for the job. When it comes to bringing information to people and people to information, there's no tool better than AutoHarvest.

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