A lean approach to ERP
At first glance, lean principles would seem to be at odds with the way enterprise resource planning (ERP) systems operate. After all, ERP is top-down, hierarchical in nature and depends on sales forecasts for materials planning (“push”), while lean initiatives are employee-driven and function on a “pull” approach for maximum efficiency (i.e. forecasts are irrelevant). Lean proponents often say their framework operates outside the purview of technology, while most businesses now run their business on ERP.

The fundamental tension between lean and ERP can be resolved, as we discovered at GE Appliances, if you avoid the traditional approach to systems development in favor of a more efficient method. As pressure on our on-shore manufacturing operations increased, we looked to lean to increase operating efficiencies. Taking a page from the book of our other manufacturing operations, we implemented a leaner approach to ERP, which greatly improved cycle times for changes to the system while reducing cost and increasing value to the business. To accomplish this requires a shift in the way a company interacts with its enterprise systems, a lesson we learned quickly at the end of the last decade when we were under intense pressure to increase the competitiveness of our Appliances business. Our results speak for themselves.

**GE Appliances through the years**

In 1950, General Electric picked Louisville, Kentucky, as the home for our appliance business because it had a great workforce, along with excellent air, water and rail transportation. GE built six manufacturing plants with over three miles of conveyors to deliver products to a 47-acre warehouse. The facility covers more than 900 acres, and has its own railroad, medical center, and zip code.

The Appliance Park (as it is now known) quickly gained a reputation for innovation across the appliance industry and was a huge success. In 1963, the self-cleaning oven was a major breakthrough and an...
To support this business transformation, the IT department of GE Appliances also needed to retool. Along with the creation of a cutting-edge, energy-efficient cloud computing center, we began and still are retooling our application portfolio, which ran on 530 silo platforms (see figure 2). As with our plants and infrastructure, we hadn’t invested in modern IT in decades.

Toward a leaner ERP
To increase our competitiveness via reducing cost and improving performance, we are nearly at the end of a three-year project to replace 75 percent of the legacy IT

instant hit. Also, a revolutionary dispenser feature allowed consumers to get cold water and ice from a refrigerator without opening the door. Employment peaked at 23,000 in 1973. But then the tide turned.

Over the next 30 years, as the business became less profitable, GE began outsourcing manufacturing to low-cost countries. The decision was relatively simple. We had strong brand recognition and customer loyalty — two things we believed would continue whether our products said “made in Kentucky” or “made in Korea.” We reasoned that if we could lower our costs enough, we would reverse the slide in profitability.

But for our appliances business, the service providers in emerging markets to which GE historically outsourced eventually offered something else: competition.

As foreign competitors improved their lines and lowered their prices, even customers who had grown up with and knew only GE refrigerators and dryers began to explore alternatives. Add to that challenge an economic recession that saw the rapid decline of the housing market, which resulted in increasing home foreclosures and the tightening of credit.

So by 2008, GE considered getting out of the major appliance business altogether, and GE Appliances briefly went up for sale. Rather than pursue divestiture of that business, GE changed plans and in 2009 announced plans to invest $1 billion in the major Appliance business to create thousands of new jobs here in the United States, developing and building a new generation of hot water heaters, dishwashers, refrigerators, clothes washers and dryers.
systems at Appliance Park with a handful of integrated platforms — with ERP at the core — that will streamline our processes. We believe this migration will standardize, centralize and automate our business while enabling faster and better decision-making. When we embarked on this IT transformation, we knew we had to think and act differently to make such a massive change in such a short time. At the heart of that change is how we interact with ERP. We studied how our other manufacturing operations approached ERP and adopted their approach.

By contrast to the traditional approach, today we operate ERP as if we were a start-up company. Under the old way, when it was time for new ERP functionality, the project team would interview users and gather huge binders full of user requirements and then the developers would go off and do the coding. A year or more later, the release would be ready and testing would begin. Often, after much time and money had been expended, the release would not meet anyone’s requirements. This is the traditional “waterfall” process of application development.

Today, we use a much leaner approach to ERP migrations and changes. Our team produces a mock-up of the new environment, which it then gives to the most advanced users who experiment with it. To cut down on the inevitable requests for customization, we do not ask users to tell us what they would like, we ask what they would do with the new functionality. The team configures the software while sitting with the users.

Moving from silos: More than 530 apps

Zero customization is a core goal of our lean ERP. In our view, there is nothing less lean than endless development cycles. We do allow localizations per geography (for example, different tax algorithms for different jurisdictions or nuances due to local regulations). Once we have a release that fits most users’ basic needs, we do a soft launch with the prior version running in parallel to reduce risk. We go back and tweak the release a few times before turning off the old code and releasing the new code to our entire user base in a typical “big bang.” Each subsequent release aims to build on the ones that came before and add value.

Another lean principle: We do not miss release dates. Under traditional development practices, release dates were often pushed back. We may scale back the release if necessary, and the team may need to make adjustments in the next release but we do not let an anticipated deadline go by the wayside — too much waste and scope creep can happen that way.

Our business is evolving as we deploy, so our ERP deliverables need to be flexible and move as quickly as possible. Relying on low-cost contractors under this new framework was not going to get the job done. We utilize the best talent we can find, and most are on staff, empowered to make real-time decisions and adjust as needed.

We have shifted course several times since the migration began. For example, we had initially planned deployment of our supply chain module near the end of our three-year ERP migration. But the head of GE Appliances made the call that it would be better to focus on supply chain earlier rather than waiting per the plan. So the team marshaled its resources on supply chain for many months until the plant performance started improving. Plant personnel gained access to product genealogy data and repair histories via an iPhone, which provided a major boost.

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Being lean is a far-reaching philosophy of operation that transcends use of technology. Our team employs several core lean practices outside of ERP, including walking around the production floor in daily *gemba*, a Japanese term that means “the real place.” Lean dictates that problems are visible where the action happens, so our people are out there looking around and asking questions. We put notices on the wall for everyone to see. If a problem surfaces, we escalate it immediately.

**Fail fast, succeed sooner**
Another lean principle we use with our ERP migration: Shut down anything that is not working as expected. Case in point: We originally planned to use an e-business suite from our ERP vendor paired with an order management module from a best-of-breed vendor. We piloted this approach for one small retailer customer. As it turned out, we could not achieve proof of concept because that approach would have required vast customizations, which violates our operating model. Under the traditional, non-lean approach, we would have continued trying to make the plan work, probably pulling the plug much further down the road or else approving large amounts of customization in order to make it work.

Here, instead, we changed the plan, substituting a different vendor for order management, right after we realized it wasn’t going to work for the one small retailer. The project was only a “failure” in that it departed from what we started with. In actuality, it was a major win because we corrected our course quickly and without wasting too much time or money — a lean success story.

**Lean ERP benefits**
As many people know, measurement and metrics are central to the way we do things at GE. But there are times when measuring in a quantitative sense is neither desirable nor workable. That is the case currently with our ERP migration at GE Appliances. There are simply too many variables (including things like logistics and fuel costs and the need to build up inventory temporarily in anticipation of plant cutovers) to be able to assign a hard cost savings number to this project to date.

The softer benefits we have achieved are profound. For example, when we brought up the new forecasting system, users of the platform got better visibility into data so their forecasts became more accurate. Another example: Our injection molding center of excellence found dishwasher parts that were defective.

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**How we accelerate**

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<tr>
<th>From traditional:</th>
<th>To lean:</th>
<th>Benefits to lean:</th>
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<tbody>
<tr>
<td>• Sequential schedules</td>
<td>• Parallel implementation</td>
<td>• Eliminates big bang risk</td>
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<tr>
<td>• Customized solutions</td>
<td>• Out-of-the-box solution</td>
<td>• Flexible to business change</td>
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<td>• Waterfall methodology — locked-in deliverables</td>
<td>• Agile methodology — flexible deliverables</td>
<td>• Value along the way</td>
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<td>• Quarterly checkpoints</td>
<td>• Daily huddles — Gemba</td>
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<td>• Fixed price — army of low-cost contractors</td>
<td>• Top talent — make real-time decisions and adjustments</td>
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<td>• Years before big bang go-live (requires rework)</td>
<td>• 1st launch in 3 to 4 months — install and iterate</td>
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Previously, they would go back and clean a die or adjust a machine to correct the problem. Now, by tracking the defect, the Center of Excellence discovered that those parts were made a year ago and had been fixed a year ago. That’s what visibility can do for the business.

We believe our ERP migration is helping GE Appliances be more competitive in the global marketplace. The lean approach we take to ERP helps us avoid waste, hold down costs and maximize efficiency. We believe lean and ERP taken together are the right way to run our business.

Key takeaways

• Lean and ERP are by no means incompatible. In fact, taking a leaner approach to ERP helps companies save costs, speed time to market and, naturally, improve productivity.
• Lean ERP also helps reduce risk to the organization by encouraging quick course correction if the project does not proceed as planned.
• Using lean ERP can improve a company’s competitiveness, as it is doing for GE Appliances.

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