Avoiding the Damage of Product Recalls

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Recalls have increased significantly across all industries in recent years. And while their damaging repercussions are evident, the causes are often hotly contested. We have found that there are systematic reasons for product recalls that can be addressed by managers.

The reputation of Toyota cars, once known for workhorse reliability was seriously damaged by recalls of its cars in 2009 and 2010. The loss of life related to sticking accelerator pedals drew unprecedented levels of media attention, led to the recall of 9 million vehicles and the apology of Toyota's CEO, Akio Toyoda in front of the US congress. It may have also cost the company over $1 billion.

While such recalls undoubtedly damage company reputations, hurt stock prices and destroy customer loyalty, the reasons for product defects introduced on the production line or in the design shop are, more often than not, put down to fluke error.

But through an **empirical investigation** of the automotive industry, we have found that there are systematic reasons for the defects that lead to recalls and there are ways to reduce the chance of their occurrence.

It all comes down to too much complexity in the production process. If we look at the two main types of recalls in the automotive industry, design recalls and manufacturing recalls, we find that there is a much higher chance of recalls if utilisation of plants is high, if optional factory-installed add-ons are numerous and if there are multiple product lines in the plants.

Over-utilisation

We found that a plant can function perfectly well until it is running at 98 percent capacity. Once it crosses that point, by adding overtime for existing workers or bringing in temporary ones on night shifts for example, the chance of recalls starts to rise significantly. There is something to be said for fixed hours and full-time personnel that know the products inside out and are not overworked.

To put some numbers behind our findings, in our statistical analysis we find that every 5 percent increase in utilisation leads to a 13.6 percent increase in manufacturing recalls. Interestingly, the same increase in utilisation also leads to a 9.8 percent increase in design-related recalls. This can largely be attributed to a busy production line having less time to observe faults that could have been overlooked in the design and the composition of components.

If the lines are busy and deadlines are looming to meet customer demand, some issues may be overlooked or even purposefully brushed over. In a 1993 case study of a joint Toyota-GM plant, production personnel were said to have often force-fitted poorly designed connections between components to keep up with the rapid production pipeline. When workers are stretched, there is less time to down tools, observe problems and ponder solutions.

Increasing variety

Increasing the number of factory-installed options can also increase the chance of design-related recalls in a significant way. We found that installing three additional options results in an average increase of 30 percent in design recalls.

While we found that increased variety primarily affected design recalls, manufacturing recalls also rose when similar levels of variety were added to a busy production environment. Thus, while managers often avoid expanding capacity due to cost pressures; they should consider doing so as variety increases to avoid recalls caused by more complexity.

Focused factory

One element that can drastically reduce the chance of recalls is focus. What we mean by focus in the factory environment is the reduction of the range of products being produced in the plant. This in turn reduces the demands on individuals, processes and the facility in general. Focus can improve plant productivity and improve quality. In fact, we find that moving from a multi-model plant to a single-model plant can reduce recalls by as much as 74 percent and that the complexity of installing a large number of options is greatly reduced.

Long-term protection

Our research suggests that many reasons for product recalls can be managed. In particular, managers can use focus and keep a close watch on utilisation levels to mitigate the negative effects of variety on manufacturing recalls. If you’re running a factory that is producing only one car, your chances of a recall go down significantly and because utilisation rates can be varied by managers, extra capacity can be used as a cushion to absorb growing complexity demanded by customers.

When factories are under strain to meet high demand, important aspects can be overlooked in the pursuit of high performance, but what we demonstrate is that being mindful of capacity and making sure you focus, can protect your company from the long-term reputational damage of a product recall.

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