

What we can learn from the lean car plant, NUMMI

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By Ed Wong

The car in the *photo above* is a Chevy Nova that was produced in Fremont, California, at a factory that was known as the New United Motor Manufacturing Inc., or NUMMI. If you think it looks a bit like a Toyota Corolla, you would be right, for reasons that will become clear.



The story of NUMMI is a fascinating one, and I first came across it when the NPR radio series, *This American Life*, broadcast an episode about it. You can listen to the whole one hour episode in the embedded player, below. You can also go to the [This American Life website](http://www.thisamericanlife.org/403/nummi) to listen to the episode in 2 halves, or read the transcript. I come back to listen to it every few months, because it can tell us a lot about the nature of change, quality, empowerment, motivation, and culture in organisations.

<https://www.thisamericanlife.org/403/nummi>

Culture change

NUMMI was formed in 1984, from the ashes of a plant that GM had closed in 1982. General Motors reopened the plant, employing many of the same workers who had staffed, according to the United Auto Workers union, the former worst performing plant in the US. Employees of the defunct factory regularly drank on the job, had very high rates of absenteeism, and performed deliberate acts of ‘anti-QA’ sabotage, such as putting empty bottles inside car doors to annoy customers.

GM and Toyota had formed NUMMI as a joint venture to satisfy imperatives for both companies; GM needed to learn how to manufacture small cars cost effectively, with high quality standards, and Toyota to learn about producing cars in the US in the face of changing import laws.

Some of the American workers were sent to Japan to learn the [Toyota Production System](#), and the results were remarkable. In a massive turnaround, NUMMI almost immediately began producing vehicles to quality standards that rivalled the Toyota factories in Japan that they had learnt from. The emphasis on quality inherent in the TPS, meant that employees became empowered to do things such as stopping the production line when they saw a problem, rather than allowing defects to build up and have to be fixed at a later stage.

“I believed that the system was bad, not the people” – Bruce Lee, union representative

Initially, the reemployed workers hated the idea of change, until they started going to Japan to view Toyota’s system at work. They were amazed at how empowered workers were in the Toyota Production System, and that people were expected to continuously improve, as a team.

“They had such a powerful and emotional experience, of learning a new way of working, a way that people could actually work together collaboratively, as a team” – John Shook, Toyota trainer.

The changed way of working and management, handed the NUMMI workers the opportunity to build in quality and to be engaged in problem solving and making improvements.

As Shook noted in a piece for *MIT Sloan Management Review*:

What changed the culture at NUMMI wasn't an abstract notion of "employee involvement" or "a learning organization" or even "culture" at all. What changed the culture was giving employees the means by which they could successfully do their jobs.

'No Problem' is a Problem!

The ability to highlight problems and fix the cause without placing blame on individuals, is a key learning. If fingers are pointed, people will have a tendency to pass the problem "down the (production) line" to make sure that there aren't personal repercussions; asking "why" and not "who". The American culture was, when asked how things were going, to respond "No Problem!". However, the Toyota view was that saying "No problem", was a problem itself. There are always "problems", that if solved can spark improvement.

As Shook said when concluding his article:

The famous tools of the Toyota Production System are all designed around making it easy to see problems, easy to solve problems, and easy to learn from mistakes. Making it easy to learn from mistakes means changing our attitude toward them. That is the lean cultural shift.

What happens at NUMMI, stays at NUMMI

When GM tried to take the successes experienced at NUMMI to its other factories in the USA, it was generally a failure; at least for the first 10-15 years! Initially, GM sent 16 managers to California to start NUMMI, the 'Commandos', with the idea that they could go back to other parts of the company. However, there was no 'master plan' beyond that to extend this to other parts of such a large and complex organisation.

People at other plants didn't have the same motivation to take on different ideas as the NUMMI workers had. "It's a lot easier to get people to change if they have lost their jobs and then you offer them back"

To make real change, GM managers had to leave the US, and overhaul operations in Germany and Brazil, in the mid-90s. It took a decade and a half, a generational transformation, until there was a critical mass of people sufficient to change the whole of GM. To the point that by the early 2000's, GM had what they called the "Global Manufacturing System".

Collaboration or a Clash of Cultures?

The incumbent culture at GM rewarded 'seniority'; the time that someone had worked at the plant determining career progression. The team culture of the TPS clashed with this. Workers had to learn every job on the team and take turns doing them. Knowledge and sharing learning was important, but clashed with the entrenched culture, such that it "pit worker against worker". For example, people started pointing fingers about what other people were doing wrong.

Managers also had their own vested interests (e.g. reward systems based on the number of vehicles produced, regardless of defects), and mini-empires to protect. Smaller perks and privileges such parking spaces, and cafeteria arrangements, also came into play.

"there were too many people convinced that they didn't have to change"

Local Optimisation?

The TPS relies not just on conditions on the factory floor, but also with their *keiretsu* suppliers. Keiretsu is a Japanese term referring to "a conglomeration of businesses linked together by cross-shareholdings to form a robust corporate structure." At NUMMI, Toyota learnt how to adapt to this to US suppliers, as well as the regulatory framework, and unions.

GM's "throw it over the wall" nature, meant that improvements in one factory were stymied by problems in the rest of the company or its suppliers. There was a destructive relationship with suppliers, but everyone had a place in the dysfunctional ecosystem, and so it was extremely difficult to affect change, and improvement.

Added to this, there was no sense of urgency in GM. They went from 47% US market share in the mid-1970s to 35%, but over a period of a decade. It was only when they made a \$23.5 billion loss in 1992, that the imperative to change became great enough that an overhaul of the whole company was attempted. Even then, "The cultural gap between NUMMI and the rest of GM was so vast, that even with clear marching orders to change, some of the people running the company didn't know where to begin."

For more this, check out this blog post on *Harvard Business Review* about, [What Toyota Learned and GM Didn't](#), and the other links in the Reading List, below.

If you've been involved in a "transformation" in an IT setting, you might be able to see some parallels with the NUMMI story. I have certainly seen parallels in organisations that I have worked in/with before. As I have discussed previously, it's useful to have some "[Air Support](#)"; top-down from the management of your organisation, enabling you to proceed without having to waste time and energy fending off detractors. We would hope in this situation that there is a strategic level to the implementation, so that the entire system is thought about, not just the software development level.

Even if there is support for a team or teams in a company, there is still a risk of local optimisation. For example, companies will often find that concentrating on customer collaboration is difficult when simultaneously having to negotiate contracts with 3rd party vendors. You can only get limited benefit from an agile team that is working within constraints that they will quickly be limited by.

The noted organisational theorist, [Dr Russell Ackhoff](#) once said:

"If we have a system of improvement that's directed at improving the parts taken separately, you can be absolutely sure that the performance of whole will not be improved...most applications of improvement programs are directed at parts taken separately, not the whole"

Acting locally

On the other hand, what if it's not a 'top down' implementation? A way forward is to borrow the "act locally, but think globally" tenet from the environmental movement. You're expected to produce results, so why not use agile and lean techniques, personally or with your own team, to help you achieve them.

Being able to regularly show working, tested software, and to improve communications with other parts of your organisation, is a good place to start. Being agile (doing things that add value) instead of "Going Agile", is sometimes the way to go here. You don't need to mention the word 'agile', either.

The most immediate benefit is that you will be positively making an improvement on your day to day work, the projects you work on, and the colleagues you interact with on a daily basis. As you go on, show the results, and start talking to people about why improvements have happened. In this way, you seek to increase your "sphere of influence". If you quietly increment and iterate, you may be able to eventually influence the whole.

If you were to take Systems Thinking to mean that "you must know the whole, in order to improve it", you never will because when you think you know all about the system, you either don't, or the system has changed...so you might as well do what you can, with what you know now.

Fearless Change

A great reference on introducing new ideas, and then helping them to take hold, is the book *Fearless Change*, by Mary Lynn Manns and Linda Rising. It deals with the subjects of organisations and change, where to start, how to continue, convincing people, and dealing with resistance, amongst others. It also has a series of patterns,

to give you starting points in manageable chunks. One of my favourites is “Do Food”, which I’ve previously discussed here. The patterns “Local Sponsor”, “Royal Audience”, “Trial Run”, and “Corridor Politics”, might be more applicable to the subject if this article, though.

One thing to note about *Fearless Change*, is that as far as I can remember, it doesn’t mention ‘agile’ often, if at all. The book is largely focussed on IT, with a Foreword from a Microsoft employees, and an “Experience Report” about a project at Sun Microsystems included, but the patterns largely focus on the interactions between people...now where have I heard that before?

Sources and further reading

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