Case Report



# An Analogical JV Case Study on NUMMI

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Posted Date: 16 April 2024

doi: 10.20944/preprints202404.1043.v1

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# An Analogical JV Case Study on NUMMI

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**Abstract:** NUMMI was one of the most analyzed case studies in terms of joint ventures, management dysfunction, and international globalization. NUMMI is an acronym for New United Motor Manufacturing, Inc. This manufacturer was a joint venture between automotive US titan GM and Toyota of Japan. GM wanted to further monetize its Fremont factory, but also had limited opportunities during a US economic recession. Toyota wanted to expand manufacturing operations in the US for the very first time, creating an intriguing collaborative partnership between the two. However, various problems lead to dysfunction through cultural, organizational, or managerial differences. This case study is analyzed through its historical analogical scope, ultimately leading to hypothesizing remediation through an ethical data-driven and total quality management (TQM) approach.

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## Introduction

GM needed cars that were small, compact, and profitable due to gas emissions by their typical vehicle. These vehicles were extremely hard to build, and have been described as low quality, inefficient, and expensive[1]. On top of this, operations were during what was another US recession and even though GM was still a titan, they were having extremely noticeable production inefficiency as opposed to their Japanese counterparts[6]. The Japanese system implemented higher production quality for these smaller compact vehicles, that essentially the US couldn't catch up with quality[2]. Toyota implemented what was called the Toyota Production System as well as Kaizen which was the Japanese method for continuous improvement[1]. This was during a time where labor relations were notoriously bad for the Fremont factory, that essentially the factory was a depreciating asset or liability[3].

General Motors also were known for being entirely against ever stopping the lines due to costs, but Toyota had a different approach. Correcting the problem rather than letting it pile up, actually ended up being more cost efficient and boosted company morale[1]. Ultimately, NUMMI provided insights to the problems with the US autoworker in comparison to Japanese work cultures, as well as production in efficiencies[5]. Union workers were at peak low morale given these jobs were the best they can get, and due to Union leverage, they broke many rules. Some of these illicit activities included drugs, pot, drinking, and even sex in the factory. Absenteeism was embarrassingly bad[1]. Toyota changed things around and motivated the American workers.

They have created a collaborative organizational structure which could benefit cross functional teams[4]. Also, they inspired worker collaboration and team pride. Intentional workplaces create happiness[7], people need to feel like what they are doing has purpose. GM, a company ridiculed for being 20% less efficient than Ford[6], turn things around? Eventually, seniority and minimizing the size of the employee workforce was a demotivating result of the Japanese system for Unions[1]. Ultimately, NUMMI was a commercial failure over time, but provided insight on what the US could do right.

## Background

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GM's Fremont factory was notoriously one of the worst factories owned by GM or a US automaker and had a notorious reputation[5]. The defects were so bad, along with labor morale, that the factory needed to be shutdown[1].

Toyota at the same time were looking to expand operations globally and were forced to consider taking a major step in the US after foreign competitors made some initial moves[1]. This is what lead to negotiations for NUMMI which was a joint venture to take that factory around and produce vehicles with GM alongside Toyota[1]. This initially helped bring morale, but ultimately lead to eventual collaboration or cultural differences[1]. This included major differences between GM and Toyota, labor-union relations, and eventual clashes in which decentralization and plant managers resulted in not even implementing changes[1]. This was after a short success run with NUMMI, NUMMI being reinstated, and GM/UAW still not finding a reason to change[1].

NUMMI, involved early management alumni going to Japan for training or learning, and provided decent case studies[1]. Yet, it still took GM nearly 15 years to change[1]. NUMMI ultimately shut down[2], but what could be learned from this endeavor?

**Evaluation of the Case**

NUMMI was a special case, and we go from one of GM's worst factories to a turnaround, a story of stubbornness, and a mass layover, factory shutdown, and sell to Tesla[5].

This case study provides two different comparisons with the United States way of doing things and the Japanese way of things in terms of quantity versus quality, purpose versus laboring, improvement versus repetition, and data versus emotion.

Improving inefficient processes is crucial for staying competitive[4]. Without improving in cost and quality, the opportunity to retain market share is minimal or creates instability for an optimal competitive setting[4]. This was what essentially happened to GM with the inability to make cost-efficient compact cars[1], along with a lack of direction for what was essentially one of GM's worst turning points.

Let us start with this first criticality: *a people problem*. Labor unions were filled with a lesser educated class with limited job opportunities and a union protecting their employment at almost all costs. This led to people gaming the system, and sex, drugs, and sabotaging prototypes were a common occurrence[1]. In contract, Toyota on the other hand had nationalistic pride, company pride, higher levels of education, and dedication towards a continuous improvement process [1]. Essentially, they didn't cut corners, and this would result in a higher sense of both team effort and accountability[6]. GM's focus was quantity over quality. Given you can't stop the line due to inefficiencies, many individuals would simply route their problems to the next person in line[5]. This led to a low morale rather than intention, and a fulfilling workplace which is needed for employee happiness[7]. In theory, if it seems the company doesn't care or has a bare minimum attitude to just churn things out, perhaps lesser vehicles being produced with higher quality is better than a bunch of low-quality vehicles being rolled out.

Marketing and brand reputation is a huge thing, this is why when people have an Apple logo or buy a Tesla, a statement is being made[4]. When GM quality suffers, then brand reputation suffers, and sales potential suffer no matter how much cars are churned out. Toyota is a different story. A Corolla lasts long, and so does cars that

Toyota and Honda inspired such as the now discontinued Ford Fusion, Chevy Blazers, Ford Escapes, or foreign vehicles such as Imprezas and Jettas. Infact, without the Toyota Corolla, Honda Accord or Civic, most of those vehicle models may not be the same.

Of-course, this is just an assumption, but it seems obvious the Japanese influence for smaller, compact, consumer vehicles. This is why companies that innovate or do processes in different ways must have go-to market advantage, because newer categories create newer competitive landscapes[4]. Data, ethics, and quality *or total quality management* are all potential scopes to consider when considering the NUMMI case.

**Different Company Strategies**

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Both companies had different strategies. GM had a huge emphasis on production quotas, to the point that production numbers or line numbers made managers or chain supervisors better bonuses regardless of quality[1]. This is what may have led to the historical downfall[2] that NUMMI had as an eventual result of that mentality making its way through. Toyota on the other hand, the JV and capital provider that turned the Fremont Factory into NUMMI[6], emphasized quality or good batches. This is where you get the Toyota Production System from, GM's eventual Global Production System along with concepts like Kaizen[1] or broader scopes such as Total Quality Management. Good managers should be leaders and motivate their employees[4] rather than make it all about hierarchy. When bad quality gets pushed for the sake of quotas, morale suffers, and you end up with the inevitable result of GM's Fremont failure. Companies like Ford and other US Automotive manufacturers may also have something to learn from this cautionary tale[5].

Toyota encouraged stopping production lines if a problem is apparent[1]. Infact, you would have this string *or tight rope* that would make music to indicate the line should be stopped[5]. Pulling that rope empowered employees for the first time in terms of them now seeing that quality matters. Labor unions started to embrace Toyota's strategy slowly but surely, and morale was boosted.

Infact, people were given a sense of purpose or even lifted off their depression[1]. However, with changes comes loss. Eventually having accountability or lowering the count of inefficient employees were part of the system for continuous improvement[1]. On the other hand, managers and executives no longer received special parking spots. They also had to sit with blue collar employees during lunch. Viewing their bosses as equal and pride to come from work ethic over hierarchy was a key to boosting morale as part of Toyota's system[1].

Obviously, managers dictate tasks, and everybody has a certain level of responsibility within the company. However, the status symbols or the classist style of them having more value as a person rather than just another employee hinders an employee's purpose. People want leaders that also view themselves as equals, not leaders that view themselves as elitist. Many managers didn't like that, and in the podcast, it was described as grown men who actually rebelled or promised to quit over the idea of having to share a parking spot with a blue collar worker[1]. Both the workers and the leaders in GM's model were pursuing self-interest but had no pride in their work. It was just a means to an end for them. Toyota's work culture was something different[6].

**Growing Too Fast**

When NUMMI was incorporated, change was slow in the first month[1]. This however all changed, and production grew rapidly. Infact, the production growth was so rapid, that plant managers wanted employees to spy on NUMMI from other GM plants[1]. The problem with change isn't just what is being done, but the morale, ethics, and culture that are hard to implement[1].

Efficiency and work pride isn't a social culture or stigma, it is a management style and system. It takes a while to implement, and replicating it starts from the bottom up.

NUMMI workers were hesitant for change, but these were the same workers that got laid off and needed a job[1]. Sometimes people are resistant to change, but change could be a good thing[4]. When everything was working out, and production quality went up for one of the first times in that factory's history, a sense of pride that was diminished from lack of quality *as opposed to their Japanese counterparts*, was finally achieved[5]. People hugged each other, including Americans and the Japanese, celebrating in "tears"[1].

However, with fast growth comes resistance, burn out and a certain style of work ethics that not everybody was willing to adhere too. Eventually, GM went back to their old ways along with the newer or non-alumni *(of NUMMI)* union workers focusing on numbers over quality. The workplace culture became toxic because people started tattle-telling instead of focusing on accountability. They did this in order to keep jobs or purposefully lower employee numbers instead of them[1]. Hedonism mixed with survival of the fittest doesn't seem to always yield positive outcomes. This may have been one of those times. The Japanese had work ethic engraved to them for centuries, while the US worker was told they don't matter and are just a number for centuries. It is easy to point fingers at the unions, and overall, some of these core points are warranted.

 doi:10.20944/preprints202404.1043.v1



There needs to be a fine line between ethics, morale, and actually protecting an employee's rights over retaining people for the sake of retaining them. Accountability along with a purpose-driven culture may be what they needed all along.

**Minimizing Calculated Risk**

Lowering risk is key. The assumption that it is cheaper to keep the line going over stopping blemishes doesn't seem that data-driven. If risk isn't promptly calculated or not enough data backs a continuous repetitive process that causes monetary loss, then the inevitable happens. GM ultimately needed to be bailed from bankruptcy and costed US taxpayers more than $50 billion dollars[1]. This was one of the biggest bankruptcies in US corporate history[1]. Other risks such as rehiring many of the original Fremont workers that got fired was somewhat calculated on the hypothesis that Toyota were confident in their management style or dealing with former workers who are desperate for work[1]. Ultimately, circumventing risks is best when you start by calculating risks or create mitigation strategies before said change is even fully implemented *(in theory)*.

**Various Logistical Problems**

Again, logistics plays a huge role into management styles as well. This is especially true in the case of manufacturers. If you have bad logistics that lower quality, then the negative offsets will also be sunken costs in the form of absenteeism, morale, brand recognition, sales, etc. There were many ways that due to the lack of organization, that GM may have been indirectly creating an incentive for asset depreciation[6]. One might theorize that the way of doing things in Fremont was the epitome of that process. Again, if the company doesn't care enough about quality, then what makes an employee care more than the leaders in charge? This is especially true if the same said employees are looked at as numbers over people. People need to feel that your message is authentic. Let them feel like there is national pride in the US, that quality is important over quantity, and that they are easing the lives of families. Once you do that, turn that into a logistical supply chain structure and see what you end up with.

**Conflicting Interests**

Labor Unions, none-union employees, management and executives need to be aligned.

As somebody who works for a company, you should have a prīmā faciē duty for ethics, a moral code, and how that aligns with the company and consumers' best interest. It wasn't just Toyota's way of doing things, or the Japanese way, but also during an American recession, morale was likely already at all-time lows. Also, if there is minimal difference between a union worker having 15 years in the same role and someone new slacking off, what creates incentive for genuine work ethic? Unions are to protect the rights of employees and care for your fellow men[1], but at a time of low morale, quantity for the sake of quantity, and little executive responsibility, what drives purpose? Free market work cultures are innovation-driven[4]. How can you innovate if your main goal is a bunch of the batches out regardless of quality? Product is more important than marketing, and brand image depreciates easier than it is achieved. If you have no commodity, quality product, or uniqueness in your value proposition, then what are you left with? Lean manufacturing minimizes complicated process flows. Various other efforts were also underutilized preceding NUMMI. Toyota noticed various quality issues for US manufactured vehicles produced down the assembly line[1].

Many workers were blinded to the fact that they are making their own country look bad, and leadership were blinded by the fact that they weren't leading change. Retaining employees for the sake of retaining employees, and executive bonuses for the sake of bonuses creates little accountability to focus on the company or create a middle-ground for aligned interests. Likewise, not all union workers are one of the same. Many union workers looked at the continuous improvement and newer sense of accountability as a threat rather than newfound purpose. They shifted gears towards blackmail or sabotaging their fellow worker[1] over a new sense of pride. After-all, change isn't easy. A proper analogy would perhaps be that many crops have some thorns but alot of fruits.

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Unions used to be focused on pension pay, fair working conditions, some variation of layover insurance, and keeping up with the rate of inflation. That model hasn't been the same sense[1]. However, generalizing all union workers as inherently bad doesn't drive meaningful change. Fairness across the board means opportunity for growth needs to be equitable, but not guaranteed. Merits are crucial for effective corporate performance. Unions seemed to evidently change.

**Proposed Solution/Changes**

Perception versus actual metrics and data-driven realities aren't always aligned. GM was under the allusion of perception and them keeping their market share in the US[5]. They looked at Toyota as a threat in the compact vehicle space but didn't take them seriously as they should have prior to NUMMI[1]. Without metrics, market opportunity valuation, and analysis methods such as SWAT or Pareto analysis, you may be throwing darts in the air. Toyota is an example of Pareto. Pareto implements the principle that change happens as a result of small action by a select few[4]. Toyota made teams in the supply chain broken up into much smaller sections[1] and allowed them greater flexibility to mitigate defunct batches.

Small divisional structures implemented as part of larger hierarchies or organizations that focus on the closest total optimization of quality is a form of Total Quality Management or TQM[4]. Total Quality management needs to be implemented on the small level first and be brought up as a model for org-wide change. NUMMI was a potential case study into how the Japanese management, culture and manufacturing style were different[6]. This is something that is obvious for GM's benefit to model. Regardless of Toyota's much smaller size at the time, they were out-competing GM in a key category. This wasn't just compact cars, but quality and cost overall. Quality and cost are factors that can drive market share, fierce competition, and newer categories in the market[4]. When there are much more opportunities with similar quality and price or easy to access alternatives, competition is more balanced[4].

A popular example *known anecdotally by most* was the competition between Microsoft's Window Phone versus Apple. At that time competitiveness would be different than the current level of urgency for Samsung versus Apple. The windows phone was competing to survive, Samsung is competing to just continue slowly releasing upgraded phone variations. The likelihood of Apple making Samsung phones or even Android phones in general defunct is very minimal compared to the era of products like the Windows Phone or Zune existing. Toyota was small, but they had higher growth opportunity. GM was large, but they were in a comfort zone. This is what lead to us being outpaced by many of our foreign counterparts, and the eventual bankruptcy *(or near bankruptcy)* of almost every US automotive manufacturer[1].

The big three in automotive are also affected in the local level. Ford likely didn't even think much of Tesla [4] as recent as 5 years ago. Electrical Vehicles were a mass failure with the General Motors EV1, and even this paper's author is old enough to even remember Tesla being two dudes in a garage working on outfitting Mustangs and Corvettes to be electric. Musk acquires the tech, and the rest is history. Would it be unfair to theorize or assume that the production failures following NUMMI were similar in the EV1? Tesla's value add may not even be EVs or hardware, but their autopilot. Most algorithm engineers *regardless of what company they work for in automotive* shouldn't be blinded by the fact that Tesla's FSD performance *or autopilot* is mostly unmatched industry-wide. Ethical concerns regarding Elon Musk aside, that statement may still be true three to four years from now.

**Recommendation 1 - Total Quality Management**

The first recommendation for what should have been implemented to save NUMMI *(which was one of GM's greatest successes and greatest fantastic failures)*, would be an emphasis on TQM. A decent company structure is focused on maximizing *(profit)* efficiency when the core goal is being free market driven or competitively fierce[4].

Maximizing efficiency doesn't necessarily mean quantity or number of outputs[4]. The actual way to maximize efficiency should be centered around quality control and an organized supply chain. An organized supply chain is supplemental to be being able to maximize production due to the logistical

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needs for this era of globalism[4]. Many companies are now becoming more and more multinational[4], diverse, and culturally broad[4]. The size of companies also seems to be growing due to the accessibility of foreign investments, funding, and digitization playing a huge role into corporate growth nowadays[4]. For example, companies like Google, Amazon, Microsoft, Tesla, Netflix, and even more recently Fiverr and Shopify barely existed in the early 2000s, and the ones that did were at a much lower capacity. In the 1990s was the dotcom boom[4] post Microsoft IPO, and in early 2000 Steve Balmer took over to become one of history's most unliked CEOs. Balmer was in an extremely competitive time for the make it or break it era for personal computing and didn't see the iPhone as a threat *in a manner foreshadowingly reminiscent of James Hackett's infamous view on Tesla*. Both their comments have tainted their reputation in the public's eyes, and in all fairness, we never always accurately predict things. Never underestimate competition[4], similar to how GM underestimated Toyota, Honda, Nissan and others[1].

**Recommendation 2 - A Data-Driven Approach**

The second recommendation would be to be data-driven. Being data-driven may have exposed GM to the lacking sides of production. A marketing plan, business model canvas, foreign case study, and competitive landscape overview are all potential tools for planning competitiveness[4]. An example is underestimating innovation. Pocket PCs were becoming popular such as Dell's Axim *(owned one)*, and Microsoft likely considered Blackberry a bigger competitor than Apple. Though the early Windows Phones were touch-based, a crucial mistake still could have been underestimating the touchscreen as a mere novelty. To put things in perspective, many teenagers may have thought the iconic Nokia N-Gage or Sidekick was going to be the peak for a while. Again, this is reminiscent of the Virtual-boy not giving people massive seizures and headaches. Being data-driven allows you to have a greater degree of certainty when you under-assume the state of the market, rate of innovation, or competitiveness. Infact, in cases like Blackberry, Blockbuster, K-Mart and Circuit City, assumptions were brand killers[4]. Many people probably would have thought it was insane that Blockbuster would ever go defunct, or that GM would struggle competing with the Japanese. The same can perhaps be said about the executives thinking EV1 is a mistake only for it to later become a theoretical embodiment for Tesla's success. Obviously conventional bias and norms probably play somewhat of a role into these cases. Data in business shouldn't be centered around emotions if you could have more a more solid ground for empirical evidence, theory or observably.

**Recommendation 3 - An Ethics Handbook for Collaboration**

Ethical guidelines are crucial. You are talking about dealing with different cultures and diversities [4], and not everything is within a traditional western landscape. This is especially given the strong work ethic in many Eastern cultures[4], along with the more common traditions of intergenerational wealth[4] or other differences. Outside of international ethics, you obviously will still have the concerns surrounding local ethics. What was happening locally for GM's Fremont factory was compared to a prison of sorts[1]. Obviously, discipline was lacking to say the least[5]. Ultimate, this same mentality made what could have been GM's much successful factory or venture, a pipe dream with both inspiration and a painful reminder for many.

To summarize here are the proposed changes:

1. Be data-driven.
2. Have ethics as a central theme.
3. Focus on Total Quality Management.
4. Give employees a sense of purpose.
5. Don't ever underestimate competition.

**Recommendations**

Out of this, comes the ultimate recommendation from all these. Obviously, sense of purpose is key, however, without quality where is the purpose? Also, if you are data-driven, quality and

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performance might be theoretically optimized. An unethical company likely couldn't manage productivity or quality in ways that it should. This is in relation to work ethics, honesty, integrity, and productivity. If one knew how big their competition is, then a TQM approach embodies a very horizontally scalable approach. Therefore, due to this, I think Total Quality Management should be the standard for US automotive manufacturers. This takes the essence of Kaizen, Pareto Analysis, and effect leadership in order to create a transformational leadership style. One that is perhaps data/market-driven, motivational, and lowers the sunken material cost fallacy.

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