

Chapter 1 Motor City Sadness

The Boeing 737 rose above the LaGuardia Airport tarmac. Across the East River was Manhattan's symphonic skyline. Below me, Queens was spread out like an abstract expressionist painting, something Jackson Pollock might have produced after a bad hangover. My girlfriend, Sarah, is rubbing off on me. She loves art and literature. When she isn't teaching kindergarten in Hoboken, she is guiding me through the Metropolitan, Guggenheim, and Frick galleries, and through the experimental art galleries that flourish in Brooklyn's nooks and crannies.

I don't mind at all. As an engineering student, my electives were usually art, literature, or psychology. My pals looked at me cockeyed but all that learning served me well when I became an auto plant manager.

Tom Papas is my name. Our family name is Papachristodoulou. My brother Harry and I shortened it, we said, to fit on the back of our football jerseys. Harry is a PhD biochemist, a big wheel in

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pharmaceuticals, where you can charge 80 bucks for a little pill. I'm plant manager of New Jersey Motor Manufacturing (NJMM), which is part of Taylor Motors. We transform substandard processes, a spaghetti-like supply chain, and rigid management system into the Desperado, a magical muscle car the public loves. What do we get for our efforts? Negative margins and a catastrophic balance sheet. But I don't have to tell you how Taylor Motors is doing. You've heard it all.

Rachel Armstrong, our formidable senior vice president, has summoned me to headquarters in Taylor City, a Motown suburb synonymous with our company. Would she offer me the job of Vice-President of Continuous Improvement again? I turned it down once before because of all the travel required—too hard on my children.

NJMM, and manufacturing in general, is one of Taylor Motors' few bright spots. During the past five years I've become the toast of the company, the superhero credited with resurrecting the NJMM plant, and regaining some luster for our brand. Superhero thinking is a problem for us. If something good happens, we assume heroism—as if the normal functioning of our management system is incapable of producing great results.

At NJMM we make our production numbers every day—with minimal overtime. Our quality is the best in the Taylor system, and world-class in our segment. (Still way behind Lexus, though.) The new Desperado sports car has been a hit and the brand has regained its mystique. Sales, however, are down 25 percent since the economy collapsed—better than most car brands. I've been able to keep all our people employed. But I fear that J. Ed Morgan, our nefarious CFO, may try to chop a shift.

When our plant was facing extinction five years ago, I told my team that we were going “back to school” to learn “Lean,” the business system Toyota made famous, and that's been deepened and extended by the world's best companies

Our team members took it to heart, taking Lean books home with them, reading, reflecting, and practicing what they'd read. People are still learning. Not just managers, but also team leaders and team members. I made a deal with them. *You do everything I ask of you, and I promise nobody will lose his or her job because of improvement work.*

Since then, members of the NJMM team have become teachers through our on-site Lean Learning Centre. We've now put more than 200 senior managers, engineers, and team leaders through our "boot camps." As a result, there's a growing network of Lean learners in our manufacturing division. Losing a shift, if that's what Ed Morgan is planning, would be a terrible blow to NJMM morale, and would make a liar out of me.

The jet settled into its cruising altitude and the flight attendant offered us refreshments. It was a fine spring day. I had some water with ice and looked out the window at feathery clouds and a bright blue sky. I thought about how I got here.

We've been lucky at NJMM. Our *sensei*¹ is Takinori (Andy) Saito, an ex-Toyota heavyweight I coaxed out of retirement.² Andy has played Virgil to my Dante, leading us out of a manufacturing inferno. Every door that Andy opens leads to three other doors. At times I feel we're more screwed up than ever. Problems are painfully obvious, root causes elusive, and countermeasures—real countermeasures, not Band-Aids—rare. Yet we're winning quality and productivity awards! I always feel, "How could they give us an award? We have so many problems"

Socrates expressed it well: *The more I know, the more I realize I don't know*. Andy laughed when I told him. "Tom-san, I have been practicing for 40 years—and I still feel like a beginner!"

Toyota's recent fall from grace clearly pained Andy and reinforced how difficult it was to sustain Lean excellence. "To support growth, we must grow senseis, Tom-san"

Andy was encouraged that Toyota had applied its core principle—Stop production, don't ship junk—while they sought root causes. He was heartened that Toyota had accepted responsibility and not thrown their supplier under the bus. There was much reflection in Toyoda City, he told me. Hansei, the Japanese call it; the sincere acknowledgement of mistakes and weakness, and the commitment to improve.

I had a number of chats with my pal Dean Formica, who was Paint Shop General Manager at Toyota's Kentucky plant.

¹ Japanese for teacher, mentor, or "one who has gone before."

² Readers interested in the rest of the story are referred to *Andy & Me: Crisis and Transformation on the Lean Journey*, by yours truly.

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It was an emotional topic for him. “Lots of soul-searching around here, Tommy. We’ve had two tough years in a row, after 60 good ones.”

“What’s the root cause, Dino?”

“I agree with Saito-san. We’ve grown faster than our ability to develop senseis. Our system is a way of thinking and being. You can’t absorb it overnight. You need to study for years under the guidance of a capable teacher.”

“You certainly have lost senseis,” I commented. “People like me have benefited. Working with Andy has changed my life.”

“We miss him,” Dean said.

I felt a twinge of guilt. “I can imagine . . . So what’s next?”

“We’re going to bear down and relearn our system. Toyota University is up and running. I’ve signed up to be an instructor. We’re going to do everything we can to regain our customers’ trust. I love this company . . .”

Andy taught me to draw things out, to express ideas and learning points with simple sketches. My journals are full of them. Figure 1.1 shows my factory doodle.

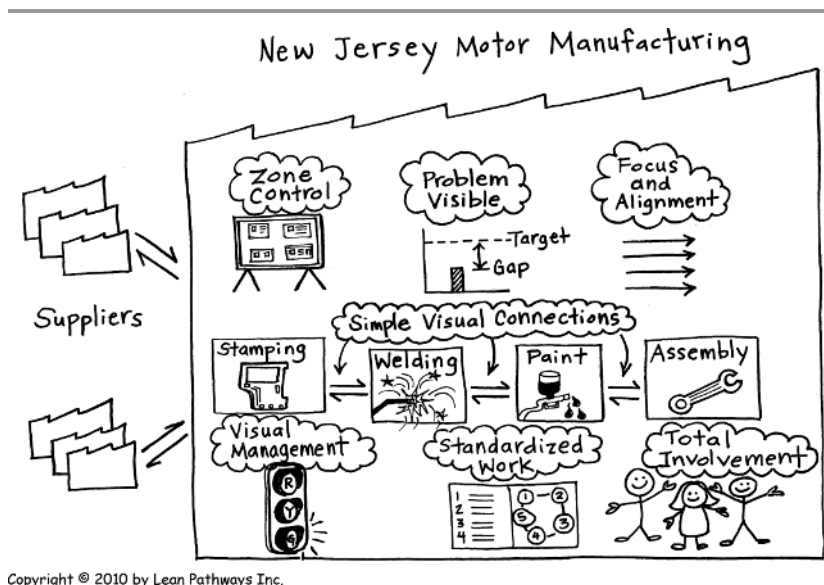


FIGURE 1.1 New Jersey Motor Manufacturing

We've tried to connect our processes—Stamping, Welding, Paint, and Assembly—with simple visual management. That means using kanbans—simple signals that tell suppliers what to make. In Stamping, kanbans are triangular pieces of metal that tell operators *what* to make, how *many*, and *where* to deliver it. In my dad's restaurant, kanbans are the chits that waiters and waitresses push through the serving window. In your car, the gas gauge acts as a kanban, telling you when it's time to fill up.

For us, *customer* means anyone in our downstream process, and *supplier* means anyone in the upstream process. Suppliers in our plant provide the volume, mix, and sequence that the customer consumes. But here's the catch, they supply only at the required rate and quality level, no more, no less. "Simple handshakes," we call it. We also try to make problems noticeable and involve all team members in their solutions, rather than trying to pin the blame on individuals. Pretty simple, really.

Andy taught us that a problem is simply a *deviation from a standard*, and that problems were *treasures*. Problems tell us how we can improve. Each year we try to focus our improvement work through strategy deployment or *hoshin kanri*, the world's most powerful planning and execution system.³ We found strategy deployment tough the first few years but are getting the hang of it. In a nutshell, it involves:

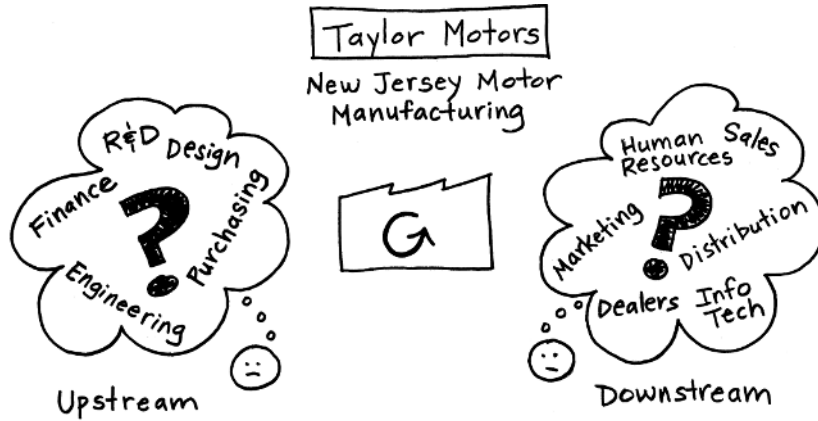
- Defining True North, your strategic and philosophical objective.
- Identifying the obstacles preventing you from achieving True North.
- Engaging everybody in the company in the solution.
- Applying and sharing what you've learned.

Again, pretty simple—but hard to do. I've learned that complexity is a crude state. Simplicity marks the end of a process of refining.

Our factory is a part of a vast management system that includes marketing, design, engineering, the supply chain, and our dealer network, not to mention all our business processes, including Finance,

³ For more information on strategy deployment, the reader is referred to *Getting the Right Things Done—Leader's Guide to Planning and Execution* (Cambridge, MA: LEI Publications, 2006).

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FIGURE 1.2 Taylor Motors

Purchasing, Information Technology, Human Resources, and Planning and Scheduling. We have 10 global design centers and 8 global engineering centers. Our supply chain comprises hundreds of Tier 1, 2, and 3 suppliers in a spaghetti-like distribution system.

See my Taylor Motors sketch in Figure 1.2.

So how do we get out of our current mess? Fixing our factories is necessary—but not sufficient. In my view, manufacturing is no longer the constraint. The remedy lies in dispersing the thick *fog* that envelops our entire company. By fog I mean the lack of transparency and communication, the absence of simple, understandable processes, and simple handshakes between suppliers and customers. I mean the lack of clarity around business objectives, and the lack of focus and alignment on the means of achieving them. I mean not knowing whether you're ahead or behind, whether you're winning or losing the game, because you lack clear scoreboards and simple feedback loops. I also mean the fog of complexity that we mistake for profundity, so we keep quiet during interminable meetings and let the PowerPoint junk run on.

I can't see downstream of our factory—can't see customer demand or how much inventory we and our dealers are carrying. Planning changes our production schedule each week. When I press our planners, it's clear that they don't really know what models, colors, and

options are selling. The constant churning creates havoc in our factory, and for our suppliers, who never know what to expect.

Upstream is equally murky. I don't *really* know what the customer likes or dislikes about the Desperado or where we stand compared to the competition. I don't know why our manufacturing equipment and processes are designed the way they are. I don't know what marketing campaigns are in the pipeline or what these campaigns are trying to achieve. I don't know our dealers' incentive structures or why they promote one model over another.

After hearing me describe the fog, Sarah read me a poem by Matthew Arnold. Here are the last few lines:

And we are here as on a darkling plain
Swept with confused alarms of struggle and flight,
Where ignorant armies clash by night.

"Bingo!" I said.

Sarah laughed out loud. "You have a way with words, Tom."

Like surfing, soccer, or ice hockey, manufacturing is about *flow*—flow of information, material, and people. My gut tells me that design, engineering, marketing, and the rest are also about flow—flow of *knowledge*. But beyond here all I have is questions.

What does knowledge flow look and feel like? Do people who work in business functions *think* differently? If so, what are the main differences and how do we accommodate them? What other obstacles do we face? How do we get around them?

Waste is waste. The customer doesn't care whether the launch was delayed by the factory, or by some upstream process. Her bottom line is, "Where's my vehicle?"

At NJMM we've started to apply Lean basics in finance, purchasing, planning, and other administrative areas—with mixed results. Team members in administrative roles seem uncomfortable with visual management, standardization, and continuous improvement. They seem to be afraid to make problems visible. Do they believe it reflects badly on them? Do they fear standardized work will turn them into robots? When I tell them problems are treasures, or that standards are simply a foundation for improvement—they look at me funny.

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I winced at the scale of the problem. “You are grasping the situation, Tom-san,” Andy told me.

Andy is more than my sensei—he’s my friend. When we met, I was in bad shape. Our factory was about to close down, and I was coming out of a terrible divorce with a vindictive ex-spouse. She wouldn’t let me see my little girls and seemed to enjoy tormenting me. When I told Andy about it at the Iron Horse, our regular watering hole, he smiled sadly. “Some problems have no countermeasure, Tom-san. One day they just go away.”

I didn’t know that Andy had resigned Toyota in despair and guilt over the loss of his wife, Shizuko. She had died a difficult death from cancer. But for a long time she had concealed her illness from Andy. He was launching a breakthrough vehicle for Toyota and was on his way to becoming President of Toyota North America.

“She was my wife, my best friend, my biggest supporter,” Andy had told me. “But when she needed me I was not there.”

I once asked Andy what he believed in. “Open mind, teamwork, challenge,” he replied. “Now I add one more—*family*. But too late . . .”

I remember learning the cardinal virtues at St. Irene’s Sunday school in Astoria: Temperance, Prudence, Courage, and Justice.⁴ For a long time, they were just abstractions. But my sensei paid a terrible price for his ambition, for his lack of *temperance*. Would I make the same mistake? I knew I was prone to it.

Andy’s loneliness also worries me. He spends his winters in Kyushu, near his daughters Yumi and Yamiko. But the rest of the year he’s alone in his house in Essex Fells, working on his garden. I was hoping Andy would meet a nice lady at the Japanese Cultural Centre in Jersey City, where he took meditation class. I met Yumi and Yamiko last year. “You are a great friend to papa-san,” they told me. “He is my friend and sensei,” I replied. “I would do anything for him.”

Things are somewhat better with my ex-wife, Teal Orcutt. She was born into one of New Jersey’s oldest families, a debutante, the whole

⁴ For more on the cardinal virtues, the interested reader is directed to *A Short Treatise on the Great Virtues*, by Andre Comte-Sponville (New York: Henry Holt, 1996).

thing. She writes a society column and blog for a major media conglomerate. Our children, Helen and Sophie, are 12 and 10. To get regular time with them, I took Teal to court—and won, or so I thought. Teal played ball and was even nice to me for a while—until I got serious about Sarah. Since then we’ve had some rocky moments. I’m tired of it. I want peace with the mother of my children. We’ve suffered enough.

The flight attendant refilled my plastic cup with water. This morning, before driving to LaGuardia Airport, I stopped for breakfast at the Humpty Dumpty Bar & Grill, my parents’ Greek town restaurant in Astoria, Queens. It’s a joint at the corner of 31st Street and Ditmars Boulevard. There’s a neon sign out front—Humpty taking a header, which for a long time seemed a metaphor for my life.

I’d had an early morning workout and was hungry. After greeting my parents, Nick and Noula, Uncle Louie, and the rest of the crew, I ordered the Corfu special—three eggs lightly whipped with a dash of cream, ham, olives, tomatoes, green pepper, and feta cheese, and a tomato salad. Mama’s famous spanakopita, a spinach and feta cheese pie that melted in your mouth, rounded out the meal.

When the breakfast rush was over, my parents joined me for Greek coffee. Mama was beaming about Sarah. “Such a nice girl, Tommy, after all you went through. Each night I thank St. Spyridon for your good fortune. God bless you, *chriso mou*.”

St. Spyridon is the patron saint of Corfu, the beautiful island where my parents were born. I’m hoping to take Sarah and the girls there next summer.

Dad was full of beans, as usual.

“TOM PAPAS—*PAPACHRISTODOULOU*, I SHOULD SAY. MY SON! LOOK AT HIM, NOULA. PLANT MANAGER! BIG SHOT! REMEMBER WHEN HE AND HIS BROTHER WERE SQUIRTS RUNNING AROUND THE RESTAURANT? HOW THE YEARS FLY BY . . .”

He has a howitzer-voice, big nose, and a grin full of gold teeth. Remember John Belushi in the old *Saturday Night Live* routine? That’s my dad. *Cheeseborg, Cheeseborg, Cheeseborg . . . No Coke—Pepsi!*

“Not so loud, Nicky,” said Mama, “the customers are looking at you.”

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“OF COURSE THEY ARE LOOKING! AND WHAT DO THEY SEE? A PROUD FATHER—THAT’S ME! AND HIS SON, THAT’S TOMMY!”

Mama made a mock appeal to heaven. “What are we going to do with him, Tommy?”

But I know she’s concerned about Dad’s health. Heart trouble runs on Dad’s side of the family and he has all the symptoms: fatigue, sleeplessness, loss of appetite. Luckily, Harry and I have inherited Mama’s robust health. My parents have worked pedal to the metal for 40 years. They’ve always seemed indomitable, the rock on which Harry and I have built our lives. It’s hard for me to imagine them slowing down.

We finally persuaded Dad to see a doctor. Every month we take him to Mount Sinai hospital for check-ups. I can’t help noticing all the waste there:

- Delay waste everywhere—*patient* is the right term.
- Overprocessing waste in the multiple handoffs between specialties.
- Conveyance waste in having to troop around from clinic to clinic.
- Rework waste caused by errors in diagnosis, and God forbid, treatment.
- Motion waste in all the workers I see running around looking for things.
- Inventory waste in all the patients waiting for something to happen in the vast warehouse they call a hospital.
- Knowledge waste in all these smart, dedicated people working in obviously broken processes.

The absence of visual management and standardized work is also painfully obvious. I ask hospital workers basic questions, like:

- How is each patient doing?
- What are the biggest risks each patient is facing?
- Who is the case leader?
- What’s today’s workload?
- Are you ahead or behind?

I know I’m a pain—I can’t help it. My questions elicit either blank stares or assurances that, “It’s in the computer.” That’s what we used

to say at NJMM. We've learned that "what's in the computer" is usually *wrong*.

"I don't trust this place," I told Harry. "The people seem okay, but the processes are hopeless."

Harry knows the system. "Your instincts are right," he said. "The system is made up of deep, deep silos. Everybody specializes. But the connections *between* silos are informal, so handoffs are bad. Nobody can see the big picture. Patients fall through the cracks."

I'm not surprised by the epidemic of hospital-induced or "nosocomial" deaths—caused by infections, wrong medication, wrong dose, and the like. In hospitals, I see the same fog that afflicts Taylor Motors. I'm worried that my dad might become another statistic.

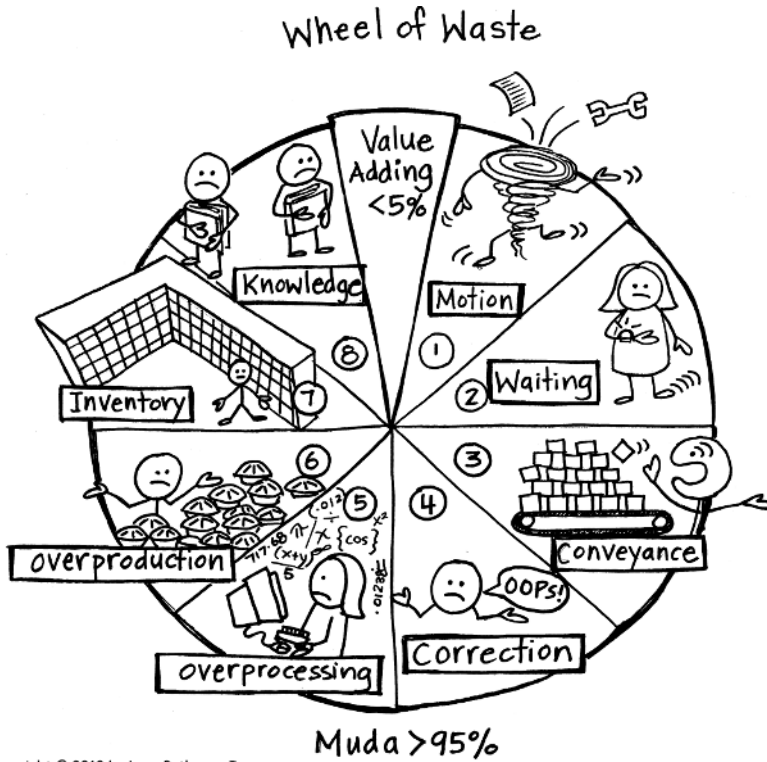
Working at the Humpty Dumpty as a kid, I learned the nitty-gritty of running a business. I learned about value, waste, flow, pull, and other core Lean concepts.⁵ I also met wonderful characters. My parents didn't call it Lean, of course. It was just common sense. Figure 1.3 shows the "Waste Wheel" I drew out when Andy began working with us.

Andy defined value as *what the customer is willing to pay for*. Everything else is waste, or *muda* in Japanese. At the Humpty Dumpty I experienced each form of waste viscerally. Motion waste, for example, means sore feet. The best waiters and waitresses effortlessly serve multiple tables with minimal motion. They always add value whenever they move—by greeting a customer, clearing a table, or closing out a tab.

Waiting waste means unhappy customers who don't come back. Conveyance waste means unnecessary trips to the farmer's market to get our meat and produce. Correction or scrap waste means making the wrong thing, or overcooking something, and having to throw it out. Overprocessing means too many steps in a process, so you fall behind—a killer during the breakfast and lunch rush. Inventory waste means carrying more raw materials than you need, which means either throwing stuff out when it goes bad, or buying a bigger fridge.

⁵ For a detailed discussion of these and other core Lean concepts, please refer to *Lean Production Simplified—A Plain Language Guide to the World's Most Powerful Production System* (New York: Productivity Press, 2007).

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**FIGURE 1.3** Wheel of Waste

Knowledge waste means wasting your time with other waste when you could be improving the business.

Andy taught me that overproduction is the worst form of waste—because it entails every other kind of waste. Again, it made intuitive sense. At the Humpty Dumpty, making more than we could sell was unthinkable, a sure way of going out of business. My parents understand value and waste in their guts, have a deep connection with their customers, and are open to my suggestions for improvement. As a result, the Humpty Dumpty is thriving against tough competition from national restaurant chains.

The jet was passing over Lake Ontario. Way down below, the water was breaking into waves. Soon we'd pass over Toronto, where I had cousins, also in the restaurant business. Then we'd descend into the decaying grandeur that was Detroit.

Our founder, Alfred Taylor, was an acolyte of Henry Ford and had helped to invent the auto industry. We had gone through bad times before, especially in the 1930s and the 1980s when it looked like we might go under. We had always bounced back. But nobody had ever experienced *anything* like the past year.

During the economy's sickening collapse, we lost *40 percent* of our sales. Our president and CEO, John Cafferty, went to Washington cap in hand, to ask for emergency loans. Despite borrowing *\$16 billion*, we had to file for bankruptcy protection. The Feds insisted on a radical restructuring plan, and rightly so. So we cut our number of brands and models in half. We cut our dealer network by almost two thirds. Our bondholders have had to accept a debt-for-equity swap that gives them nickels on the dollar. It was a disgrace; many retirees got screwed.

We cut the number of U.S. hourly and salaried employees from about 80,000 to 38,000, and the number of factories from 46 to 22. Each cut is a cry of anguish. I think of how hard our team members work . . . their camaraderie, easy grins, and gentle kidding.

"Hey Tommy, you got a funny walk, man. . . . How do I get a walk like that?"

"You still here, Sidney? I thought they retired your ass . . ."

We emerged from bankruptcy cleansed of the massive debt and crippling contracts that would have sunk us without government loans. We have a clean balance sheet now, a revamped cost structure, and a real shot at redemption. But has our culture changed? Even in freefall, our leadership refused to acknowledge our problems. The Feds had to hold a gun to our heads before we'd consider changing. John Cafferty finally admitted that we *let our customers down*, and asked the public to give Taylor Motors another chance.

John is a man of decency and integrity. He was dealt a terrible hand and I believe has done his best in the circumstances. He's trying to open up decision making in the company. He's reaching out to customers and team members with his blogs. But after 40 years of bad decisions, why should people believe us? Besides, John is outwardly focused. J. Ed Morgan, our CFO, and Fred May, his SVP of Finance, run the company, remote from the customer and factory, absent any understanding, or love, of automobiles.

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Morgan is a Yankee aristocrat whose mantra is “Cost walks on two legs.” May’s an Ivy League goon who terrorizes people through sheer meanness and physical size. Execs call it the May Treatment—vicious, unrelenting personal attacks until you give in or leave the company. I can’t stand the sonofabitch.

Last year, I made a presentation to the senior leadership team on NJMM’s progress. May’s body language and demeanor were openly disrespectful. At one point, trying to throw me, I heard him whisper, “This is crap . . .”

I stopped my presentation, walked over to May, and leaned in. “Do you have something to say, Fred?”

The conference room became very quiet. May looked like he’d bitten into a bad cashew. He wasn’t used to being challenged, certainly not by a lowly factory manager. “No, I don’t have anything to say,” he said.

“Good,” I said, “then if it’s okay with you, I’ll resume my presentation.”

It wasn’t smart politically. May cornered me later, crowding me, glowering at me. “I’m a bad enemy to have, *Papas*.”

“You got a problem with my name?”

“I think we had a maid named *Papas*,” he sneered.

“Not likely,” I replied. “Greek people don’t work for dogs.”

I half expected him to attack me. I would’ve welcomed it. Luckily, my friend and mentor Bill Barrett stepped between us. “Now, now boys, you mustn’t curdle the cream.”

Rachel Armstrong is Executive Vice President (EVP) of Operations and number three in the company, after Cafferty and Morgan. We call Rachel the “Iron Lady” She loved my confrontation with Fred May. “Thought you were going to tear him a new one!” Soon we’ll be calling Rachel the “Digital Lady.” She has been advocating the revolution represented by Google for several years now. “It’s a new way of thinking,” she says, “and we’d better get with it. Customers are in charge. Markets are a dialogue. We need to open up our design process and help customers collaborate with us . . .”

My head spins when Rachel talks that way. John Cafferty’s blogs are her idea. Rachel also blogs, twitters, and preaches openness and connectivity—heresy for much of the senior leadership team. Like all car companies, we’re secretive about design, cloaking new models like classified weapons.

Before Rachel, we had a series of caretaker executives in operations—old boys, nostalgic for the old days, and coasting to retirement. Rachel came in like a hurricane. She learned the Lean business system working with W. Edwards Deming, the great American quality guru, when she was young. Through Deming, she'd met Shigeo Shingo, Joe Juran, and other greats. She applied their teaching in the auto parts sector and eventually became president of one of our biggest suppliers.

It bugs Rachel when people call Lean a Japanese system. “Henry Ford, Alfred Taylor, Alfred P. Sloan, Peter Drucker, Joe Juran, Ed Deming—do those sound like Japanese names? We respect our Japanese colleagues: the Toyoda family, Soichiro Honda, Taiichi Ohno, and the rest. Andy Saito, our sensei, studied with them and we deeply respect him, too. But this system is not culturally dependent. No reason it can't succeed in America.”

Events have proven Rachel's insight. Lean thinking has spread across the world and is no longer just about Toyota and cars. There were brilliant Lean companies all over the place.

Rachel insisted that each factory implement Taylor Motors' version of the Lean business system. My New Jersey plant's overhaul five years ago was a test of Rachel's overall approach. Could a broken-down old brownfield implement the Lean way? If so, Taylor Motors had a chance. If not, Rachel's strategy was questionable—because most of our plants are old, and we can't afford to build new ones. Many executives had bet against Rachel and had been looking forward to her ouster. But as I said, we turned NJMM around, and other plants have improved, too. Much more work to do, but night and day compared to where we were.

Rachel rode shotgun for us. When Morgan conspired to shut down our NJMM transformation, and have me fired, Rachel in turn fired John Sylvain, Morgan's apprentice and my nemesis. Our success vindicated Rachel and put Morgan on the defensive—for now. He and his henchpersons survived the wrecking ball. Their tentacles still constrain the company, not least in the form of our cost-accounting system, that perverse scoreboard that encourages overproduction, and every other kind of waste.

It also bugs Rachel when people call Lean a *manufacturing* system. She loses no opportunity to highlight Lean success stories in fields

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like health care, financial services, design, retail, and education. Rachel has been trying to push Lean thinking upstream and downstream. “Lean is not a manufacturing system—it’s a *business* system. It’s about connectivity, transparency, and learning. Lean and Google are *simpatico*.”

Rachel has made enemies. Morgan is trying to portray her as rigid and power hungry, which, coming from him, is a joke. But I fear he is setting the stage for another showdown, this time at the board of director level, where he has allies.

I don’t care about Morgan or the board. I’m tired of Taylor Motors being a joke. Rachel may be aggressive, but she’s right. Fixing our factories isn’t enough. We need a remedy for our entire business.

The jet began its descent into Detroit Metro Airport. I looked out over the devastated cityscape. Nature was reclaiming the proud boulevards, handsome homes, and art deco buildings. Weeds and grasses were sprouting through the cracked sidewalks. Deer, coyote, and even beavers had returned. Some people believe it would be a good thing if Detroit disappeared.

I am not one of them.

STUDY QUESTIONS

1. Tom tells us that all he can see upstream and downstream of the factory is “fog.” Examples of fog in different business functions are given below—in the form of questions. From your experience, give at least one additional example.
 - a. Marketing—What’s the purpose of this promotional campaign? How does it relate to our other advertising activities? What were the targets and actual results of the campaign?
 - b. Design—What’s the capacity of our design studio? What’s our current loading? What’s our target and actual lead time?
 - c. Engineering—What’s our current project loading? What’s our capacity? What are our most important projects? Are we ahead or behind?
 - d. Research and Development—What experiments are we running this week? What phase is each experiment in? What’s in the pipeline for next week?

- e. Supply Chain—How many days of finished goods inventory are we carrying? What's our target?
 - f. Sales—What's our sales process? How does it adapt to different markets? What skills and skill level do our salespeople need? What skills and skill levels do they actually have?
 - g. Human Resources—What are our core HR processes? What are the steps and expected outcomes in each process? How is each process performing?
 - h. Finance—Who are the customers of our forecasting process? What does each customer require? How well do we meet each customer's needs?
2. Give an example of each of the following kinds of waste in your organization:
- a. Motion
 - b. Waiting
 - c. Conveyance
 - d. Correction
 - e. Overprocessing
 - f. Overproduction
 - g. Work in Process
 - h. Knowledge
3. Who are your *internal* customers?
- a. What do they want from you?
 - b. How do you know whether you're meeting their needs?
4. Who are your internal suppliers?
- a. How do you know whether they're meeting *your* needs?
5. Define overproduction. Why is overproduction considered to be the worst kind of waste? Give concrete examples from your industry.

