

# North Pole Workshops is skating on thin ice when demand for one toy suddenly surges and another goes from "in" to "over" in a blink. How can the team avoid disappointing customers - without a crippling increase in costs? 

# Just in Time for the Holidays 

by Eric McNulty

ABITING WIND WHIPS AROUND THE sprawling manufacturing campus at North Pole Workshops. The streets between the solid brick buildings are covered in fluffy white snow. Flurries swirl against the steely gray sky of a late November morning. But the soft glow of light from the windows and steady hum of machinery hint at the productivity inside.

Buildings 1 and 2 house the company's massive mail facility, where children's letters to Santa are sorted and matched against a database that tracks the writers' behavior over the course of the year. Inside Building 3, gleaming steel equipment moves board games and Erector sets toward pallets where they are shrink-wrapped and readied for distribution on Christmas Eve. Red garland is draped across the windows that line the outer walls, though none of
the busy elves seems to notice the festive touch.

A large man in a red suit walks among the workers. His smiles and waves are returned by the elves bustling on the shop floor. It is just five weeks until Christmas, and the plant is in high gear. The man is startled by the short, sharp blast of a horn and turns to find a forklift stacked high with boxes pulling up alongside him.
"Sorry for the horn, Santa. Not a minute to waste," says the elf at the wheel.
"How's everything going, Smitty?" Santa Claus asks.
"It seems that all the children want Timmy!" The elf pauses to wipe a handkerchief across his forehead. "We got the news late last night-put the pedal to the metal on Timmy the Tinsel Town Train. I've been on this floor for almost

75 years, and I've never seen it busier. Gotta run!" The elf toots and waves as the forklift scoots around Santa and heads toward the far end of the building.

## All I Want for Christmas

A few moments later, Santa sits high above the whirring conveyor belts in a glass-walled office that provides a sweeping view of the activity below. Two elves have joined Santa at his bright-green conference table, grinning as Santa pores over a hefty computer printout.
"Well, this is unexpected," says Santa. "Look at the spike in demand for the anniversary edition of Timmy the Tinsel Town Train. It's good to see an old favorite doing well," he says with a surprised chuckle.
"Uh, that's the CD-ROM for Timmy's interactive adventure series, Santa," says Isobel Lee, Director of Wish List Fulfillment and Delight. "The train set is just, well, chugging along."
"Oh," he laughs, adjusting his spectacles. "Well, regardless, it's nice to see that kids still love Timmy."
"Maybe too much," says Dexter Pepperflepper, Chief Shoprunner. "I don't know that we can keep up with that demand. We weren't expecting it, and our duplication facilities are maxed."

Santa strokes his thick white beard. This is the third time in three years that his elves have been caught off guard by a toy's sudden surge in popularity. Earlier in the season, even a month ago, it would have been possible to find capacity, but now every line is running full tilt. The elves are on overtime in the sprint toward Christmas.
"How does this keep happening?" Santa asks. "I thought we had all kinds of fancy new planning software."
"We do," says Lee. "But it's not perfect." She explains how the list-checking team looks at samples of incoming letters and e-mail traffic and extrapolates

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demand. Those figures are then matched against the naughty and nice database. "But the percentage of children rated 'very good' is running $20 \%$ ahead of our assumptions. And technology penetration in Eastern Europe and the interior of mainland China is greater than projected."
"We can't disappoint the children," says Santa. "And we don't have much time left before Christmas." He lifts his bulk out of the chair. "I'll see you two at the operating committee meeting this afternoon. We can't solve this on an empty stomach." With that, he heads out of the office into the blustery, cold afternoon toward his house for a muchneeded bowl of porridge.

## Dashing Through the Snow

On his way home, Santa detours to the stables for his daily visit with the reindeer. A few minutes watching the young reindeer calves playing their rambunctious games and feeding them carrots is enough to remind him how much he loves the holidays and making children happy on Christmas morning.

He looks up at the sky and watches the vapor trail of a passenger jet slowly dissolve. Not so many decades ago, he had the airways to himself. So far, he's been able to avoid a collision, but last year there were three near misses, and air traffic seems to get heavier all the time. The GPS navigation system installed last year saved him more than 50,000 miles and almost 14 minutes on the run-but the number of deliveries continues to grow. Maybe he should ask Cindy Counterwaite to look into an upgrade that would allow him to adjust the flight plan based on live weather reports. Or perhaps he should invest in nimbler reindeer - or maybe even motorize the sleigh. But as his eyes return to the exercise field, Santa knows that he wouldn't have the heart to say goodbye to Rudolph and the gang.

Santa walks toward his house, a simple peak-roofed structure adorned with gingerbread detail. It looks almost like a toy itself among the solid manufacturing buildings. Inside, Santa plays with the steaming porridge in his bowl. Be-
hind him, a fire roars in the oversize fieldstone hearth.

Mrs. Claus comes up behind her husband and lovingly pats his shoulders. "It's always hectic about now," she says. "And every year, you and the elves make it in the end."
"But it gets harder every year," Santa says. "More kids. More toys. Lists that arrive later and later. Oh, it used to be so simple - wooden blocks, a train set, a doll. We made the same toys year after year, and the kids were thrilled to get them. I was able to trust my own intuition. Now we have more than a million SKUs. It's getting so I have trouble keeping them all straight. Trends jump across the oceans in an instant. I've asked the elves in the field to go beyond reporting on kids' behavior and start trend spotting. I've invested in software. But still I can't help thinking that one of these days we're not going to be able to do it."
"You're worrying too much about this," she replies. "You still have good intuition. You know the kids; you know what they like-in fact, you know better than they do. They're always changing their lists based on the latest television ads. You know what they'll truly love. That's the magic of getting a gift from Santa Claus."

Santa puts his jacket back on and fastens the thick black belt. He knows that Mrs. Claus is right, but he also knows that even elfin magic can't always save the day.

## Naughty or Nice?

Santa pauses outside the boardroom and nods appreciatively at the activity below. He is startled from his reverie when his executive helper, Stanley Wibersham, rushes up behind him out of breath.
"You have to see this, Santa." The elf hands him a copy of Teen Scene magazine with the headline "Teen Queen Spat: Juicy Details Inside."
"Page 36," wheezes Wibersham.
Santa flips open the magazine and reads in disbelief.

In an exclusive Teen Scene interview, Rebecca June hinted that Leslie Line-

han missed the Teen Scene Awards because she had put on a few pounds (not that we could see them when she was clubbing late into the night in LA). When we caught up with Leslie, she shot back, "Rebecca June is juvenile. How can you take her seriously when she walks around with a stupid kitty cat on her wrist? That's so yesterday."

Santa points at the grainy shots in the magazine. "A few extra pounds? Either one of them could be blown away by a stiff breeze." He glances down at his own few extra pounds and closes the magazine quickly, resisting the urge to put both girls onto the Naughty list. Rebecca June's "stupid kitty cat" is the new Meowrrr, a big-eyed, plush kitten cell-phone carrier with eyes that light up
when the phone rings and purrs when stroked, thanks to special sensors embedded in the fur. It's also the product North Pole has planned to be the top choice among girls eight to 15 years old.

When Santa arrives in the boardroom, the senior elves on the management team are merrily watching Holly - the model for the Meowrrr chase a candy-cane wrapper across the
floor. Cindy Counterwaite, Chief List Twice Checker, and Dexter Pepperflepper are standing on their chairs, dangling brightly colored ribbons in an attempt to attract the kitten's attention.
"OK," says Santa, as he makes his way to the head of the large rectangular table. He holds up the magazine. "In case your copy of the latest Teen Scene

## "We are the original just-in-time business.... We have one delivery date: December 25."

hasn't arrived yet, the Meowrrr has been called 'so yesterday' by the young lady with the number one pop album in the U.S." He picks up a sample Meowrrr from the table and strokes it gently as it mews at him. "How can you be so yesterday when you haven't even had a chance to be so today?"

The room grows quiet as the team realizes that along with the challenge of a spike in demand for Timmy CDs, they are also looking at a likely sharp dip in interest in the Meowrrr. Pepperflepper winces when he checks his units-onhand report and sees that there are ten million Meowrrrs ready to go. He considers the possibility of turning the toy into something else, but very few of the components are reusable.
"I think I may have at least a partial solution," says Barry Fiddledip, Chief Bedazzler. He flashes the Teen Scene ad sales numbers on the projection screen. Fiddledip explains that Teen Scene's circulation is mostly in the U.S. and Canada, so distribution plans for Asia and Europe can go ahead as scheduled.
"Cell phone penetration in Africa is up significantly, so we can shift some units there," he adds. Fiddledip's bright blue eyes are alive with the eternal optimism of a marketer and the undying mischief of an elf. "And I haven't given up totally on North America. Rebecca's fans may want the Meowrrr to show their support."
"That's a nice bit of elf marketing magic if it works." Santa turns to Coun-
terwaite. "I know we can pull our lists based on naughty and nice. Can we segment Rebecca June fans versus Leslie Linehan fans?"
"No, sir," says Counterwaite. "Celebrity preferences among preteen girls change too frequently. I can pull Barbie lovers."

Santa turns back to Fiddledip. "So net net?" He scoops a handful of red and green butter mints from one of the bowls in the center of the table.

Fiddledip clears his throat and squares his shoulders. "I think we can still move seven to seven and a half million units." An uncharacteristically somber mood descends as the elves contemplate three million Meowrrrs sitting in the warehouse, unloved, on December 26. And, worse, millions of disappointed children who might not find a Timmy CD under the tree.

## Making a ListAnd Checking It Twice

Santa stands and paces the room. "Let's talk about the bigger issue. We are the original just-in-time business. We have one market: the world's children. We have one deliverable: the right toys to the right kids. We have one delivery date: December 25. We can't move extra merchandise through after-Christmas sales. We don't have outlet stores. We have to get these things right. Cindy, how can we improve our planning?"

Counterwaite shuffles the papers in front of her. "Our ERP system is certainly adequate, Santa. But it isn't state of the art by any means." She explains that there is no direct link between the letters received from children, which have to be hand keyed into the system, and the procurement and manufacturing systems. Indeed, Jeffrey Peartree, North Pole's Chief of Children's Correspondence, had repeatedly commented on the fact that incoming mail was sorted so efficiently and yet the data didn't feed into the planning process. Sitting back in his chair now, Peartree simply raises his pointy eyebrows in resignation.

Counterwaite flashes a new slide onto the screen. "If we invest in upgrades to
the system, we can make our processes leaner and be more responsive with our manufacturing." She goes on to advocate investing in a system that would allow them to get a better sense of real demand, rather than extrapolating from early data. She describes for her colleagues multilingual scanning capabilities, which would get the kids' requests into the system more quickly, and a true CRM module that would let them tag gift requests with all the available data points about each child's behavior over the course of the year-data that comes in from a variety of sources such as mall Santas and report cards.
"What Cindy says is all true, I'm sure," interjects Pepperflepper. "But none of that would help us cope with this situation. All the planning in the world can't help when there are sudden shifts in demand like we've just seen. We need to be able to turn our manufacturing on a dime." He puts up a slide that shows the cycle times for the manufacture of various sample product lines. It highlights the improvements that have come with outsourcing, starting with block cutting ten years earlier, electronic components five years earlier, and software development for the past two years.

Suddenly, Fiddledip leaps onto his chair. "I defy you to find anyone who can match an elf's artistry and craft in toy making!" The room is quiet for a moment until Holly pounces into the bowl of butter mints, sending them flying in all directions. The group bursts into laughter, and the debate continues with urgency but good humor. Santa watches the interaction, weighing the alternatives. Would better software give him an accurate picture of demand? Would more market research eliminate some guesswork? Or should he give up on accurate predictions altogether and make manufacturing more flexible? All the elves in the room, he knew, wanted to make the kids happy. They just didn't agree on how to do it.

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Santa should stop thinking of himself as a victim of demand uncertainty. He needs to stop reacting to fads and start creating them. That's just the way it works in the toy business. Yes, toy makers do market research, but focus groups for kids produce notoriously inaccurate results. A child might honestly like a toy when he's alone in a room, and he might even ask for it in his letter to Santa, but his wishes will morph instantly when he sees what other kids think is cool. Even the best technologies for capturing early demand indicators don't always work for toys.

Instead, Santa needs to invest more in helping the children understand what's cool, making his products cool, and creating an agile supply chain that can deliver what's cool. Old-fashioned advertising works well. Even better are tie-ins to other fads. The elves should visit playgrounds to see what kids are talking about and research potential hit movies scheduled for release during the holiday season. All the better if they can make the toy tradable and collectible, like Yu-GiOh! cards. Linking a toy with a pop culture icon is a good strategy, too-though it can be risky, as North Pole Workshops learned. Movie tie-ins aren't risk-free either. A Bug's Life sold some toys; Antz, not so many.

Baby anytime, but you can't necessarily get, say, the white cat. Many of the really hot toys like Pokémon cards and Furbys have benefited from this approach. Every year, the media feed the impression of an overall shortage for a product, when in fact only one version is hard to get. Part of this trick, of course, is to get parents and children to substitute within the category and still be happy.

Mattel has pursued a variety strategy a form also called a rolling mix-for its Hot Wheels line for some time. This month you might have the green Ferrari. It stays in the collection for a short time and then disappears. You don't promise retailers any particular version. Instead, you ship a "basic assortment," a box of cars or action figures, and you change the mix every week. Kids love rooting through the boxes to see what they can find. The strategy drives traffic and awareness, and it creates collectors. Variety strategies require a supply chain that thrives on change, but surprisingly, such strategies don't force retailers to manage an endless number of SKUs. A car, any version, can be a unit.

Some high-tech companies have begun to use a kind of rolling mix strategy, and Zara, the Spanish retailer, does it all the time. It makes a small weekly shipment to each store,

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Another tool that toy companies use all the time to build demand is controlled scarcity. In other industries, a shortage is a bad thing. In the toy industry, you might find executives giving each other high fives over a shortage. It creates buzz. The trick is to start a fad and allow some shortage, while avoiding so much scarcity that you disappoint a lot of people. One way to do that is to ship a limited quantity of the product to stores in the fall, making it tough to find, and quickly catch up around Thanksgiving.

Better yet, combine scarcity with variety. Look at Beanie Babies. You can get a Beanie
and when the clothes are gone, they're gone. Zara has trained consumers to come back every week to see what's new - and created urgency to buy while the item is available.

One more thing: The elves are understandably resistant to Elf Pepperflepper's idea of outsourcing, but it is the norm in the toy industry. Toy makers have outsourced production nearly completely. Well before China was cool, Mattel was sourcing from China. The industry is on the leading edge of lowcost sourcing. And toy companies source from many different countries to protect against currency risk and political risk.


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5anta Claus doesn't seem to be thinking very clearly about the future. He's been in the business much longer than I, but I can still claim 50 years. I would advise him to keep three things in mind: first, the hazards that short-term strategies conceal; second, the responsibility he has to his customers; and third, the limits of an automated cus-tomer-management system.

Children drive the demand in our industry. Of course, large companies manipulate children's desires with clever marketing and gigantic budgets. For example, the Star Wars films introduced a whole army of Darth Vaders and Luke Skywalkers to the toy box. The demand these campaigns create is usually short-term, and in no place on earth is short-term demand created better than the United States. There is a major trade fair in the U.S. each February where retailers decide what to buy for the next Christmas season. But one cannot help going wrong if one chases the trends.

Our philosophy here at Playmobil might help Santa Claus. We believe that as a toy manufacturer, we have a pedagogical responsibility to our customers that transcends our profit goals but that also yields lasting success. We offer products that help children develop motor skills, refine a sense of taste,

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and understand the world. We make it more fun for them to play than to sit in front of the television, and we try to guide their aggressions into healthy channels. Of course, we pay attention to trends. But we try to ignore them as much as we possibly can, even if it hurts our short-term revenues. For example, we do not purchase licenses for brand names such as Disney, Star Wars, or the Olympic Games. This is connected with a rule that Hans Beck, the inventor of the Playmobil figures, set for us 30 years ago: Never disappoint the customer. If we were
to rely on licensing, disappointment would be inevitable. There is the danger that the children might not get what they want because we made a bad choice. Or parents might have to spend extra money because they are supporting the originator's licensing costs.

I also do not believe that Santa Claus can solve his problems by collecting more data on his customers or by evaluating them better. Market research is very difficult in the toy industry. One cannot simply interview children and then transfer these data directly into product development. One must consider more clever methods to understand children's desires and fantasies. Just like Santa Claus, we receive many letters-about 150 per month. If we were to merely transfer information from these letters into CRM software, everything between the lines would be lost. That is why we look at these letters not as raw data but rather as feedback from loyal customers who wish to share their experiences with our products. They provide us with precious ideas. For example, we introduced a line of firefighter figures and vehicles to the Playmobil set. Children wrote to us saying that they wanted a fire station for the figures. Good idea. We developed a very nice fire station. We also try out our toys before we market them by observing children at play with new Playmobil products. But a human being must interpret these samplings.

If Santa really wants to fulfill children's wishes, there should not be any talk about outsourcing his production. We at Playmobil are in the process of retrieving outsourced production back to our main facility. This way, we can closely monitor production to our strict quality-control standards, and we can react to market signals during the Christmas season.

We also believe that outsourcing is the wrong strategy for us from an organizational standpoint. As an enterprise, we bear responsibility not just for the children but also for our employees. Just think how hard it might be for an unemployed elf to find another job!

# So-called planning methodology is built on the premise that a good point forecast for demand is available and all we need to do is get it and then use it. 



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Talk about fourth quarter pressure! Santa deals with volatile and unpredictable demand in a very short selling season. While focus groups (or a review of children's correspondence to Santa) and analysis of earlyseason demand are beneficial, there is no foolproof way of obtaining error-free forecasts in this environment. Unfortunately, a great deal of so-called planning methodology is built on the premise that a good point forecast for demand is available and all we need to do is get it and then use it. Virtually all MRP systems work that way, and many managers have apparently been trained to think deterministically rather than in terms of probabilities.

Once we agree that demand for a specific toy in December is inherently difficult to forecast, what can Santa do? The standard academic solution is to apply the Newsvendor model, which involves four steps: Plot a bellshaped curve representing demand uncertainty; assess the cost of underage (being short); assess the cost of overage (excess inventory); and conduct economic balancing to minimize expected costs.

Santa might argue that he must satisfy $100 \%$ of demand, but since the bell curve goes on indefinitely to the right, that's mathematically impossible. The Newsvendor model forces Santa either to make an economic determination of the shortage cost or fall back to a "service level" or fill rate approach and decide that, say, he wants to fulfill $98 \%$ of demand without stockouts. Presumably the other $2 \%$ can be explained, and buffered, by the Naughty List to achieve Santa's mis-sion-the right toys to the right kids.

After applying the Newsvendor model, there will still be costs of overage and underage; even if they have been minimized, they will not be zero. Now Santa and the elves can start thinking creatively about other ways of coping with product shortages:
substitution; risk sharing or hedging; and postponement.

Product substitution is a tried-and-true device for coping with stockouts in many markets. If a grocer runs out of ketchup in 10 ounce bottles, he may substitute 12 -ounce bottles. Of course, as all of Santa's helpers know, with trendier items like toys this strategy will carry you only so far.

Risk sharing, typically applied between a supplier and an OEM, replaces a price-only contract for components with a contract that states, for example, the OEM's willingness to pay a small price premium per unit; in return, it would gain volume flexibility from the supplier. Instead of purchasing 10,000 components for \$1 each, say, the OEM might offer to purchase a minimum of 9,000 components for $\$ 1.04$ each, as long as the supplier agreed to provide up to an additional 3,000 units on short notice.

Yet another strategy might be risk hedging combined with a standard supply chain concept called postponement; that is, shifting risks to material and capacity management instead of finished goods, redesigning products so that many SKUs share a common base. Consider the case of the HP Deskjet printer, which was redesigned so that country and language localization took place at a relatively late point in the supply chain. In Santa's case, the Meowrrr's underlying technology could have been developed early on, with the color split and volume postponed until closer to reindeer liftoff. A combination of postponement and hedging can help Santa balance production planning with demand forecasting.

If managers think that $100 \%$ service is attainable, they will be disappointed when it doesn't occur, whereas if Santa's elves think probabilistically, they will sleep better at night when the inevitable glitches do occur. But probably not until December 26 .

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t may sound obvious, but the first thing to do is to stop production on the Meowrrr immediately and try to reschedule the duplication lines to run Timmy CDs. And since the Timmy train is very stable, North Pole Workshops should produce the remaining units as quickly as possible and then shift capacity dedicated to the train to the CD. The shortfall should then be outsourced.

These steps may avert a total meltdown this year, but Santa needs to make sure this doesn't happen again. And the most effective solutions lie in better planning, not real-time technology. When it comes to planning, Santa's mistake is that he's treating all items the same way. A key component to planning and, as time progresses, execution, is classifying items according to how much value they bring to the business and the degree to which you can forecast demand for them. Business value can be assessed with something as simple as unit sales or as complicated as a blended measure that takes into account order frequency, inventory costs, and profit margin. Forecastability depends on
this strategy is that the organization has to be ready to write off or dispose of extra inventory. But using a cost/benefit analysis, it will be easy to determine the breakeven point between production and inventory.

The Timmy CD might be an example of a low-value, low-forecastability item. The elves should develop a base level of inventory and reserve outsourced duplicating capacity for scenarios such as this, where demand unexpectedly takes off. This allows Santa to avoid the cost of full investment in greater capacity, trading off inventory risk for flexibility with a defined cost.
The Meowrrr falls in the high-value, lowforecastability quadrant. Santa could follow one of several strategies, depending on the toy's cost structure. One would be to build to a high level of demand and take the risk of having to destroy significant amounts of excess product. Another would be to hold open internal capacity to maintain flexibility and postpone production until actual demand was known. This would be feasible because North Pole Workshops has already made the

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factors such as how new a product is and how connected it is to trends in the marketplace. Santa should set up a matrix that classifies toys according to these two dimensions and plot every toy on the matrix. Then his production strategy should vary by quadrant.

Timmy the Tinsel Town Train, for instance, falls in the low-value, high-forecastability quadrant. It's low value, relatively speaking, because while sales chug along, the toy is unlikely to command a premium. Santa should run the trains through the duplication facilities very early in the season to free capacity for more volatile items closer to Christmas. He'll be able to reduce capacity requirements in his busiest season without a significant increase in working capital and without taking a large inventory risk. Then the elves can watch for any external events that could cause a spike in demand and add extra production if necessary. The key assumption in
low-value Timmy trains earlier in the season. Santa would be able to shield his organization from the inventory risk associated with high-fashion items and still meet demand. Once again, his elves would have to conduct a cost/benefit analysis of the strategy.

Each of these strategies has both a demand and a supply component. By planning in advance how to address demand variability, North Pole can monitor its assumptions and approach to supply and fine-tune its position up until the pre-Christmas crunch. Another important implication: Because this is a process framework, it won't require any significant investment in new technology that may or may not make a real difference in the elves' ability to meet demand. Next Christmas should be much merrier in the North Pole.

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[^0]:    How can North Pole Workshops better respond to shifts in demand?

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