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909A27

GPS-TO-GO TAKES ON GARMIN

Donald A. Pillittere wrote this case solely to provide material for class discussion. The author does not intend to illustrate either effective or ineffective handling of a managerial situation. The author may have disguised certain names and other identifying information to protect confidentiality.

 Version: (A) 2009-12-11

Joseph Thomas sat quietly in his office after a managerial whipping at the hands of his boss, Michael Scott. Thomas knew the cost meeting was going to be painful, but did not know it was going to be so severe. As the vice-president of operations for GPS-to-GO, it was his responsibility to drive the latest Global Positioning System (GPS) products towards their target cost. However, what the design had created was a Frankenstein monster full of overly expensive components and extensive modifications that required lengthy testing to ensure performance.

Thomas also wasn't sure the design was truly done, meaning additional cost might be added prior to launch. The current cost was anywhere from 12 percent to 74 percent higher than the target based on volume and factory location (United States or China). Adding to the situation was Scott's naïve fantasy that building the product offshore would somehow magically achieve the cost goal. Numbers don't lie, and the cost reports from the initial production builds were the proverbial pig with lipstick — underneath, it's still bacon.

GPS-to-GO developed complex air traffic control and logistic GPS systems and company managers had decided that the time was right to move down market and provide units for the everyday man, woman and teenager. Thomas was part of a team that was getting ready to launch a new series of GPS products into the market, but at the current production cost, each sale would be upside down in terms of profit. Thomas's other dilemma was that the Consumer Electronics Show (CES) for launching the products was just two short months away. Typical market sales by quarter for successful launches were 45 percent, 25 percent, 20 percent, and 10 percent. Even if Thomas had some cost reduction magic up his sleeve, time and the huge initial demand for units were not on his side.

Though GPS-to-GO could command a premium for the abundant and unique features its systems would include, this was not going to compensate for the current unit manufacturing cost (UMC). On top of this, other competitors were well established and could profitably discount products, given their ability to build units offshore for significantly less money than GPS-to-GO. This advantage related to years of fine-tuning product design to leverage common components across multiple products, taking into consideration manufacturability and higher volumes due to demand.

As Thomas continued to review the cost report, he kept coming back to a major redesign as the only way to meet the target UMC even though management would prefer to push to transition the product directly into the U.S. factory to have units ready in time for CES. He also knew management wasn't going to change course for the project this close to launch and continue to burn $200,000 per month for a redesign that could take up to six months. As he locked his office for the night and headed home for a late dinner with his family, he came to the conclusion that design, marketing and operations were going to have to tackle this issue together. There was just no way Thomas felt comfortable digging into the product for ways to reduce cost without bringing the engineers that caused the problems in the first place along for the bumpy ride.

GLOBAL GPS

GPS-to-GO was a subsidiary of Global GPS, a company with a great heritage of developing state-of-the-art GPS systems, mostly for government and retail applications. Management at GPS-to-GO, especially Scott, reasoned that GPS-to-GO could also dominate the consumer market. With a huge portfolio of patents from parent Global GPS, GPS-to-GO could easily out-feature the competition; the challenge was doing so against well-established competitors at a profit. In the past, most contracts were cost plus, so any cost overruns were paid for by the government or major retail customers. In addition, the idea of a target cost for building some of these complicated systems was an issue ––with lives at stake in terms of air traffic control the government just wanted a working GPS system, period! For the major retailers with billions of dollars in inventory to manage across thousands of stores, accuracy of data and location was critical to maintaining their competitive advantage and low pricing.

Scott was a driven corporate climber who was named CEO of GPS-to-GO in the beginning of 2009 and wanted to establish himself in an even loftier position — CEO of Global GPS. As a former Silicon Valley engineer, he liked nothing better than being part of a company that could develop the next best techno-toy. With Global's massive intellectual property (IP) inventory, Scott was the kid in the proverbial IP candy store and he wanted to take on the likes of Garmin and TomTom with this arsenal. GPS-to-GO had been a struggling subsidiary with no clear strategic direction until Scott showed up and quickly planned a future of dominance in the consumer GPS market. This strategy coupled with financial backing from Global GPS provided the necessary ingredients to help move GPS-to-GO to the next echelon.

GPS MARKET

Based on the various market research reports available to GPS-to-GO, the compound annual growth rate (CAGR) for GPSs was expected to grow at anywhere from 20 percent to 24 percent in the United States through 2013 for usage in automotive and consumer applications. Total U.S. revenue in this timeframe was forecasted between $9.2 billion and $10.3 billion by 2013. Market leaders included Garmin, TomTom and Megallan, with Garmin well ahead of others in market share. The one unknown for 2013 was going to be the mix in terms of standalone car-mounted devices, factory-installed units and GPS-enabled cell phones. Suffice it to say that the consumer demand for positioning units was a rare bright spot in the economy.

GPS-to-GO wanted to take advantage of this growing market and firmly believed that eventually the GPS would be a common consumer item throughout the world. GPS-to-GO wanted to carve out a small niche at first with one-of-a-kind features, then build brand awareness over time and eventually overtake Garmin at the top. Scott idolized Steve Jobs at Apple and wanted to eventually take consumer GPS units to the

level achieved by the iPod. At least this was Scott's vision. Scott's reasoning for his lofty ambition was that Global GPS basically invented global positioning technology through its government contracts, and had the engineering expertise, patented technology and deep pockets to become the dominant player.

PRODUCT DEVELOPMENT

Product development at GPS Global was littered with processes galore in order to manage government contracts and ultimately tax payer dollars. Owing to the "more is better" philosophy, processes and new procedures were constantly added as a way — at least that's the thought — to make sure that Global GPS would be in a position to pass any and all government audits. Most of the time, new processes were added in response to problems, which delayed previous projects, which cost Global GPS bonus fees. No one wanted to review new processes to see if they duplicated others; it was just better to follow along and add more paper work to an already burdened system and staff. In fact, many joked that success at Global GPS went to the person with the largest volume of office paper.

Development in terms of people followed the processes, with the division of labor in line with what Henry Ford instituted at Ford in the early 1900s. Project teams could easily comprise more than one hundred people from design, production, quality, supply chain and regulatory compliance. One reason for this was the complexity of product design; another was that many members were required based on the many processes and cross-checks instituted over the years. Even with many incredibly brilliant employees, nothing was ever done in a timely fashion, as individuals had to chase down multiple people in the organization to get to the one person who had authority or responsibility to perform a task.

Another issue that hurt Global GPS was the urgency or lack thereof when performing project tasks. With some projects taking years to complete, schedule slips of days, weeks or even months tended to rarely push teams to compensate for lost time. The problem with this tendency was that when there were multiple schedule slips, the overall schedule could be pushed out by year(s), at which point it was too late to alleviate the situation. Trying to get this group to develop a consumer GPS in a fast-paced market scared Thomas; however, he was confident that eventually the company would create something far more advanced than competitors. The problem was the definition of "eventually."

INTELLECTUAL PROPERTY

Global GPS sat on a mountain of IP, thanks in large part to decades of developing government GPS systems. Even though some of the IP could never be commercialized as part of a consumer product, other IP had the potential to far surpass anything companies like Garmin, TomTom and Magellan could offer. One potential feature was voice command to access the various menus of the GPS to minimize the driver being distracted by fumbling through the menu by hand. Another was a patented feature (code-named TripSaver) that could find the most cost-effective route to travel, taking into account distance, gas prices, tolls and construction. One feature that was hotly debated internally was the ability to use your own voice to provide directions. The user was able to record their voice through a small microphone in the GPS unit and unique software/hardware then customized all recordings with the customer's voice.

On one side of the debate were some of the male engineers who feared that their wives and/or girlfriends would customize the system with their voice, which somehow went against the male gender's distaste for asking for directions let alone having their significant other provide them. Others tried out the system and were surprised at how annoying their voices were after a very short time. On the positive side, some of the

marketing staff thought the ability to customize a voice would play nicely with teenagers and twenty somethings that loved technology and tended to be more self-absorbed.

Global GPS also had in its IP library the ability (code-named TripPoint) to track a person's trip and post locations and Tweets about the trip through the GPS system. Again there were heated debates, with some concerned about the distraction of reading text messages while driving and others stating it was safer to read than talk or text via a cell phone. Plans were also in the works for adding cell phone and MP3 capability into the product line, of course all based on voice commands in addition to the touch screen. Accessory products to mount the GPS into a speaker system were in the product family plans as well.

Unfortunately no one wanted to test these concepts outside of Global for fear of the competition getting wind of them and attempting to beat Global to the market. Many in Global didn't even share some of these ideas with their family or friends, given the way information could quickly spread through Facebook and other digital communication avenues.

PRODUCTION

Production at Global GPS was created over the years to build very complicated one-off systems for the government. Volume of any kind might be a handful of systems: one for use, another for backup and the third for a redundant backup or spare. Therefore operations was more of a job shop than any kind of full-blown production system with very skilled workers using technologically advanced equipment to assemble and test units. Failure of any kind out of the factory was unacceptable, so testing of the system consumed a large portion of labor. GPS-to-GO had no formal production facility so the choice was either leverage Global's factory, create its own or find a contract manufacturer.

Thomas knew all too well of the problems he would face if the consumer product was built at Global; he was also aware of the cost and time necessary to build a production facility at GPS-to-GO. So early on he started to reach out to contract manufacturers (CMs) that could produce GPS units in volume. He wanted to partner with a CM that could transition the product from the United States to China after the production process was fine-tuned to take advantage of lower labor rates. In addition, the marketing manager thought it made sense, if GPS units took hold in China, to have a local presence to get around tariffs and duties. Needless to say, even with a head start in choosing a CM, Thomas was behind schedule on factory start-up due to delays in development.

OFF-SITE MEETING

One of the first things Scott did when he landed the job at GPS-to-GO was to schedule a week for an intensive off-site meeting. Each functional manager was expected to present the current state of the business, issues they were facing, and plans for addressing issues to better position GPS-to-GO. In advance, Scott had sent a handful of slides with his proposed product portfolio, which had his managers questioning his understanding of the difficulty of successfully designing and launching a consumer product, let alone a family of them. Many of these managers were from Global GPS and had never been part of an off-site meeting that didn't include a government customer who basically dictated the what, when and how of a product that would take years to design and build, not months.

Scott started the meeting with his thoughts about the future, constantly reminiscing about his days in Silicon Valley, where the impossible was always possible. With his $1,000 custom-made suit, perfectly

pressed shirt, silk tie and Italian shoes, Scott was almost as impressive as he thought he was. He spoke with a confidence that was unheard of for someone new to the Global community since many people gained this level of respect only after many years at Global. And yet Scott in his first week addressed the managers as if he had been with Global his whole career.

As each manager presented, Scott pushed them to do more especially as it related to his vision for GPS-to-GO. It didn't take long for the management team to realize that they were going to have no choice, as GPS-to-GO under Scott's leadership was going to launch a series of GPS units at the same time for consumers. Thomas had seen managers like Scott in the past and wanted to believe that Scott would be a man of his word. Thomas liked nothing better than an impossible challenge and Scott was presenting one during the off-site meeting. Thomas was the everyday manager who had grown up at Global and commanded great respect from his peers. During the meeting, Thomas listened to Scott and raised potential issues that could derail the project, even suggesting some risk mitigation activities, but each time Scott chose to ignore him. At the end of the off-site it was decided that the overall strategy needed some fleshing out and another meeting was set up for the following week.

PRODUCT PORTFOLIO

A week after the off-site, Scott, Thomas and Joan Dolce, the marketing manager, met to finalize the product portfolio and attendant features that Scott wanted to launch. His strategy included a me-too product with similar features to the competitors and with a small price tag; a middle-of-the-road with better features; and the premier version with unique features such as voice commands, TripSaver and the ability to use your own voice as the narrator. Dolce did her best to provide potential volume, selling price with channel discounts, channel partners and unit manufacturing cost (UMC). With Garmin's market dominance and channel discounts, the overall market price and target UMC left little room for GPS-to-GO to maneuver.

Scott argued that, with GPS-to-GO's premium features, teenagers and twentysomethings would spend the extra money, thus offsetting the need for UMCs on par with competitors. The flaw in this argument was that Dolce's price elasticity calculations disagreed with Scott's price target and even the best case volume would cause GPS-to-GO to lose money on each unit even if Scott was correct. The only way the overall business case would be positive was if there was a "perfect storm" of high demand, skyrocketing gas prices (a TripSaver driver) and a flawed price elasticity model. Both Thomas and Dolce doubted that this would happen, due to Garmin's ability to undercut GPS-to-GO on pricing.

At the end of a series of meetings and after much discussion, some heated, Scott, Thomas and Dolce agreed to what Scott ultimately wanted — the simultaneous launch of GPS-to-GO's new portfolio:

- GO I GPS $100 to $249 segment
- GO II GPS $250 to $349 segment
- GO III GPS $350 to $499 segment

Each unit had comparable features to existing market leaders and included one or two more that Scott thought would be order winners for the end consumer. The GO I GPS was loaded with features that were years ahead of the competition, and the big question was whether the market was ready for these and their attendant premium.

LADIES AND GENTLEMEN — START YOUR ENGINES

Teams were quickly assembled within the ranks of GPS-to-GO to get working on the three product families. Even though some at GPS-to-GO, including Thomas, wanted to spend time on developing a common architecture across products to reduce costs, better enable service and minimize duplication of effort, Scott's date had to be met, so little was done in this regard before pushing forward. In fact, Scott met with each team and gave them his great vision for the future and the role they played. Each team had the same assessment of Scott — that he gave great presentation!

Hard work was nothing new for these teams; however, a rigid end date was an anomaly. To help offset the culture at Global GPS that passed into GPS-to-GO, project leaders were chosen that had reputations for meeting critical delivery dates. Scott wanted to leave nothing to chance; failure was not going to be an option. To keep team engines running at peak efficiency or just running, Scott periodically attended meetings without warning and continued to push for launch readiness. In the frenzy to get something launched, engineers designed for features, not cost, even as members from Thomas's team attempted to suggest ways to reduce cost while maintaining performance. No one on the project, especially the leaders, wanted to miss the end date dictated by Scott.

The teams eventually set up a race between each other, with beer and chicken wings going to the winner, courtesy of the losing teams. This internal competition accelerated the project activities and within six months, working prototypes were being demonstrated to Scott. As crude as some of these units were, everyone, most importantly Scott, was pleased and gained more confidence in being ready for CES. After working prototypes, beta units came three months later with actual production enclosures and screens. Given the secrecy of the project, team members including design, marketing, service, quality and operations ended up being the beta testers. Each beta tester had to follow a formal process and write down their weekly experience and provide great detail on even the slightest problem.

Momentum was building and software bugs found by internal beta testers were fixed almost as fast as they were discovered. In parallel, features were added and tested and problems were fixed as the launch date rapidly approached. The problem with the focus on design was that the time needed to transition into production was consumed as more ideas for features were generated and implemented. Thomas constantly had to pester Scott to force the engineers to provide him with the required documentation to start preparing for the production build.

UMC DEBACLE

Thomas's team had much to do in order to set up the material requirements planning (MRP) system to plan for the construction of the three GPS units. Many of the parts needed, such as circuit boards, enclosures and packaging, as well as the touch screens and adapter cables, were in the system. Thomas's conversations with Scott freed up some of the last pieces of the bill of material (BOM) puzzle for just the GO 1 GPS, so a request for quote package could be completed. Purchasing put together final quote packages and sent them to five well-known contract manufacturers. Volume was based on the range provided from Dolce as part of a planning meeting that took place almost a year earlier.

Thomas was anxious to receive quotes to understand whether tooling and labor cost were in line with his expectations. His other hope was that GPS-to-GO could leverage volume purchases of common electronic components by the CM to reduce the circuit board cost to match or beat the target cost. As quotes were received, dollar savings from common parts were minimal as it became apparent that recommendations

from purchasing on less expensive components were mostly ignored. To add insult to injury, the complexity of the boards in terms of parts count just exacerbated the situation. Even across products there were few common parts, such as the display, that could help offset cost.

Even before loading the cost data into Excel, including parts, labor (United States and China) and fixed and variable costs, Thomas knew that the GO I GPS was well over the target cost. The finalized cost sheets (see Exhibits 1 and 2) showed that the most pressing cost drivers were the parts cost and the labor dollars required to perform product testing. For example, the actual parts cost for the GO I GPS product was 47 percent higher than the target at 100,000 units and 42 percent higher at 300,000 units. This was the case regardless of the manufacturing location. The labor cost (direct and test) for building the GO I GPS was more than double the target cost for the U.S. factory, and, at minimum, 43 percent less in China. Assembling the product in China enabled GPS-to-GO to better the labor targets, but this assumed that the support cost to get the factory running would not offset the savings. With quotes due for GO II GPS and GO III GPS within the next few weeks, Thomas knew that both would also fall short of their target cost.

Thomas decided to call a team meeting to figure out if anything could be done to drive down cost before he had to share the numbers with Scott. Thomas wished there was a way to improve the cost prior to his meeting with Scott later in the week, but understood that the reality of the situation was not going to change. Later, after golfing in a company league, Thomas shared some of the data with his friend Mark Smith from engineering. Smith's opinion was that you could only get so much out of the current design, unless demand for these products was exponentially greater than forecasts, which was highly unlikely. Smith suggested going to market with the current design and rapidly redesigning in parallel to meet the target cost. Smith's last words were "Good luck convincing Scott that this is the right thing to do."

Exhibit 1

CONTRACT MANUFACTURER (UNITED STATES)

Total Fixed Manufacturing Overhead Cost		$2,000,000		
Volume (goal 200,000 units)		100,000	200,000	300,000
Manufacturing Cost Summary:	**Goal**	**Per Unit**	**Per Unit**	**Per Unit**
Raw Materials	$ 85.00	$ 125.00	$ 122.50	$ 120.70
Labor:				
Direct	$ 14.00	30.00	28.25	26.80
Test	10.00	25.00	24.25	23.60
Variable Manufacturing Overhead Cost	12.00	27.50	26.25	25.20
Total Variable Manufacturing Cost	$ 121.00	$ 207.50	$ 201.25	$ 196.30
Fixed Manufacturing Overhead Cost	10.00	20.00	10.00	6.67
Total Unit Manufacturing Cost (UMC)	$ 131.00	$ 227.50	$ 211.25	$ 202.97

Margin Summary:	**Goal**	**Per Unit**	**Per Unit**	**Per Unit**
Retail Price	$ 249.99			
Channel Discount	25%			
Channel Price	$ 187.49	$ 187.49	$ 187.49	$ 187.49
Margin	$ 56.49	$ (40.01)	$ (23.76)	$ (15.48)
Margin Percentage	30%	-21%	-13%	-8%

Exhibit 2

CONTRACT MANUFACTURER (CHINA)

Total Fixed Manufacturing Overhead Cost		$2,000,000		
Volume (goal 200,000 units)		100,000	200,000	300,000
Manufacturing Cost Summary:	**Goal**	**Per Unit**	**Per Unit**	**Per Unit**
Raw Materials	$ 85.00	$ 125.00	$ 122.50	$ 120.70
Labor:				
Direct	$ 14.00	7.50	7.06	6.70
Test	10.00	6.25	6.06	5.90
Variable Manufacturing Overhead Cost	12.00	6.88	6.56	6.30
Total Variable Manufacturing Cost	$ 121.00	$ 145.63	$ 142.18	$ 139.60
Fixed Manufacturing Overhead Cost	10.00	20.00	10.00	6.67
Total Unit Manufacturing Cost (UMC)	$ 131.00	$ 165.63	$ 152.18	$ 146.27

Margin Summary:	**Goal**	**Per Unit**	**Per Unit**	**Per Unit**
Retail Price	$ 249.99			
Channel Discount	25%			
Channel Price	$ 187.49	$ 187.49	$ 187.49	$ 187.49
Margin	$ 56.49	$ 21.86	$ 35.31	$ 41.22
Margin Percentage	30%	12%	19%	22%