INVENTORY AND CRISIS MANAGEMENT IN A CASH-IN-TRANSIT COMPANY

Ricardo M. Pino, CENTRUM Catolica – Pontificia Universidad Catolica del Peru
Jorge Peña, CENTRUM Catolica – Pontificia Universidad Catolica del Peru

CASE DESCRIPTION

The authors present a study case that allows the analysis of both inventory management and crisis management in a cash-in-transit company, one of the leading companies in its sector, which operations in South America. Crisis appear without notice and, although many companies have a crisis management protocol and operation manuals indicating how to act, little is known of what to do if, when they face the crisis, they realize that the protocol is out-of-date. In this case, not only the inventory management system has to be reviewed but the whole crisis management system as well.

Keywords: Crisis Management, Inventory Management, Leadership, Stock Reposition.

CASE SYNOPSYS

Camilo is the new Director of Customer Service at Tanque S. A., a cash-in-transit company who, suddenly, realized that the stock of the bags used for money transportation, the main input the company uses, is about to broke. When he informed the CEO about the crisis, the CEO asked the crisis management team to resolve the situation, but, after more than two hours of deliberation, the team members realized that the crisis manual is out-of-date, and the protocol is useless. Camilo must resolve the crisis on the fly and learn-by-doing. At the end, the crisis was resolved, and the situation left several lessons for improvement on how to avoid a situation like this one ever happens again.

INTRODUCTION

Crises arrive with short notice. For companies, there is a need to develop and handle protocols to react promptly when they face an unexpected situation that could put their future in danger. Nevertheless, to develop protocols are useless if the actions plans contained in them have not been tested previously. Surprisingly, this situation has received little attention in the literature. To tackle this problem, we present a case study, considering a leading service company; although, for confidentiality reasons, the name of the company and people mentioned in the study have been changed. The name of the company is Tanque, and the country, Argentina.

Tanque SA was a company which core business was to transfer money from bank to customers and the other way around. Those kinds of businesses are known as *"cash-in-transit"* (CIT) companies. Tanque operated in several locations of Argentina, one of the biggest countries in South America. Logistics processes used to be Tanque's pride, as the core business of this company was to pick up, handle and deliver money, and documents, to their customers. At one moment of time, the company CEO decided to hire a Director of Customer Service (DCS), supposedly to start designing new ways to serve customers. However, few months after the DCS started his new job, the company faced a problem with its main input, a plastic bag, specially prepared for money-handling. The DCS was shocked by the news he received one Friday and wondered how the company had come to face this problem that could refrain it from bringing its services to their customers. The situation was so critical that it could end in company bankruptcy as its customers would, mainly, switch to one of its competitors.

Camilo, the new DCS, had started its job with high expectations but with no experience in the industry, as he had previously worked as a senior IT manager in a large high-tech consultancy company in Buenos Aires. He was supposed to work in long-term projects at Tanque and to be the manager of a highly trained team or, at least, that was what the CEO told him when Camilo was hired. Camilo understood that the situation should be resolved without delay.

Seeing from the outside, the cash-in-transit business seemed to have simple processes to care about. However, money transportation required a well design logistic process and the use of sophisticated materials that comply with all safety requirements according to international standards. All local competitors of Tanque operated with a similar, and apparently successful, business model. Their main customers were companies from the financial sector, as banks and insurance companies. Also, they used to have, as customers, companies from the retail sector; as supermarkets, department stores, and others. Other important industries that they attended were mining, government organizations and, also, non- frequent customers that were in the need to transport money once in a while. Those companies also transported documents, but that required a completely different logistics process and the revenues produced were no significant. Roughly, 90% of the business in the industry were for money transportation, and the rest for documents.

Because of the inherent risk in this kind of service, for money transport they used special designed vehicles, with reinforced steel, and over dimensioned motors, capable to resist machine-guns attacks. There were, also, strict protocols to be followed, including highly-skill personnel trained in the use of guns and tactics to repel almost any kind of attack. Those armor-plate trucks used several different routes to deliver money and, as part of the security protocol. The route and the crew were defined only a few minutes before departure and communicated in written form to the truck driver.

Tanque had more than 25 years of experience and opened offices all over the country. It was, also, the incumbent with the most market share in the industry. Tanque had more than 1,000 customers nationwide. However, following Pareto principle, 20% of the customers produced more than 80% of the company revenues. Tanque had a good reputation in the market because of its experience in safety money transportation and on-time delivery, attending almost all cities in the country, and also making inter-cities money transportation. Weather conditions were not always ideal, and climate could made transport a dangerous activity. Inside main cities, traffic jams complicated money delivery, especially in rush hours: From 07:00 h to 10:00 h and from 17:00 h to 21:00 h. In addition, this kind of service had a 24/7 format, because many of the customers require not only scheduled attention, but also on- demand. This blended type of service demanded a tidy logistics.

In this type of businesses, the revenue was directly related to the amount of money transported, as the companies charged customers a percentage of the requested money- transfer. For that reason, paper-money transportation was, by far, more profitable than coins transportation; however, all customers require both, so Tanque made no difference in its quotes regarding the type of money asked for transfer by its customers. The transportation of bills and coins require different special plastic bags, being the ones used for bills the most sophisticated ones, not only to avoid unauthorized opening but to prevent any cut with the edge of the bill, especially from the new bills. Those bags required to be resistant to support five kilos weight and needed to be dark from the outside, to have a security zip, an anti- scratch system, as well as to have Tanque logo printed in the outside of the bag.

Because of the technical specifications, no local company could manufacture those special bags, so Tanque imported them from a Columbian manufacturer, who provided this kind of bags to different companies in Latin America, as it was the unique company that had the required manufacturing technology in that part of the world. So, Tanque used to import the bags for bills from that sole supplier, which whom they had maintained a very good relationship through the years. For security reasons, the bags could be used only once because once they were opened, they became useless.

Special bags for coins could be purchased in the local market. They were smaller than the bags for bill transportation. They supported also five kilos and had a security seal that was destroyed when the bag was opened. Another difference with the for-bill-bags was that coin bags were transparent.

The process of transferring money, from one place to another, had two starting points: The first one was when the customer filled the bags with money and waited for the CIT company to pick them up, and the second was when the customer required her money and the CIT company filled the bags with the customer' money, which was kept under custody in the CIT company vaults. Once money was delivered, the customer received her money and the bag was thrown away. The bag was the only authorized way to transfer money from one place to the other, as there was no other alternative way of doing this. For this reason, Tanque used to sell the special bags to its customers and must have kept enough stock of the bags to deliver the money to its customers and to sell the bags to them.

Due to the relation volume-cost, the bags were imported by sea. The process for inventory replacement at Tanque was as follows: Existing stock was reviewed once a month and it was established the replenishment point for each input, including bags. A purchase order was put to assure stock for three months, the supplier took one month to produce and deliver the bags. Transportation took one week, and then it took one more week to customs clearance and to put the imported products in Tanque warehouse.

The morning of February 2nd, 2018, the logistics chief communicated Camilo that the stock of bags for bills was about to broke. The available stock guarantied bags for only five more days. Without bags, the company could transfer only documents, and that accounted for, roughly, 10% of the total revenue. There were plenty of bags for coins, but no customer used to ask for transfer only coins, as the requests were for bills only or for bills and coins.

Camilo's initial thoughts were regarding the very high probability that Tanque must stop its operations for the first time in 25 years and the unimaginable damage to his image and reputation that this situation would produce. He was wondering what could have caused that the replenishment program failed. There were people supposedly in charge of inventory management. Camilo tried to figure out, also, the cost of the urgent reposition of stock and wondering why nobody would had detected the problem, nor in the purchasing department, neither in warehousing. The only thing that became clear to him was that the problem needed to be resolved urgently. Camilo realized that the best thing to do was to act first and seek answers for his questions later. So, he went to Tanque CEO Office and explained her crisis situation.

The CEO gave the order to activate the crisis management protocol they had designed and established three years ago. Thirty minutes later, the crisis management team met with Camilo, who explained them how critical the situation was. The team members recalled the crisis manual, looking for what action to take for this crisis. The written action in the manual was: *"To use the for-coin-bags when there is a shortage in for-bill-bags".* Surprisingly, the COO opposed to that solution, as the coin bags were transparent, he said: *"There is no way I would allow to use for-coin-bags to transport bills that would be the same as putting a lighthouse to attract thieves"*. The conclusion that the crisis management team arrived, after spending two more hour in a fruitless discussion, was that Camilo had to resolve the problem the best way he could.

The first thing that Camilo did, then, was to verify the bill-bags' stock, realizing that it was about to last only four days, one less than what he was informed. Tanque served its customers seven days a week and the situation sparked on Friday, so it was necessary to resolve the problem before even thinking in enjoying the Weekend. The next thing that Camilo did, at about midday, was to phone call the CEO of the Columbian bag supplier. After Camilo explained him, with all detail, how critical the situation was, the supplier's manager said that he could dismantle their production lines that were manufacturing products for other clients, start producing the bags for Tanque and embark the first minimum production lot as soon as possible. The manager said:

"My dear friend, there is a God in heaven and, because of that we are able to have this conversation. If you had called only five minutes later, my cell phone would have been off, and I would have been in my way to enjoy the Weekend. The first production lot would be ready in one week, and then it will be necessary one more week for you to receive the product in your warehouse. We will use air freight; and the additional costs will be on you. I will take care of the delays with my other clients that are why we are strategic partners, aren't we?"

Camilo felt a sort of relieved, but the problem was not resolved yet, as the import from the Columbian supplier would arrive in 14 days yet, but the stock would last for only four more days. So, he urged the purchasing area to do two things: The first one was to put a usual purchase order (PO) to the Columbian supplier that will be received in two months, sea freight, and two more small POs, air freight. In that way, the crisis would not last more than two months.

Those latter POs would be for small quantities, one of them been the one that he had already agreed with the Columbian factory and, the other one, to assure supply for one more week, after the first one had arrived. Camilo thought that they would have to continue purchasing small quantities air freight until they receive the big PO, sea freight. Small quantities order allowed the Columbian supplier to deliver the products faster, although at a higher cost.

The second thing that Camilo ordered to the purchase area was to ask the Columbian supplier for its remnants on bags they might have in stock from previous POs. This was likely to occur because large lots production was not usually programmed for the exact quantity ordered, but for a little more amount. This was because there were always defective products and it was expensive to run again the machines to replenish those defective products. In the afternoon, Camilo received the confirmation that the Columbian supplier had remnants in quantity enough to assure four more days for Tanque to operate. With this good news, Camilo asked for Rolando, the employee who was supposed to oversee the bags inventory and omitted to put the PO when he was supposed to. He had already gone home, and he would not come back to the office until Monday. Camilo gave instructions to find Rolando and urged him to come back to the office because he had a critical task in mind for him. That was to travel to the Columbian factory, in Bogota, and bring the bags to Tanque using a commercial flight. Camilo knew that the quantity of bags weighed almost 120 kilos and Customs could observe it. For that reason, he asked the Legal Department at Tanque to prepare a letterhead for Customs stating the reason why Rolando was bringing that product and made the logistics personnel prepare the bill of landing and other import documents, just in case they would needed to be presented at the customs office when Rolando arrived back, otherwise, Customs could retain the product to follow the regular process of importation. Rolando took the letterhead and had nothing to say but goodbye to his family and flew Saturday morning to Bogota. Rolando went to the supplier facilities, picked-up the bags and went back to the airport, coming back on Sunday evening. As Camilo had thought, Customs asked Rolando why he was bringing the product in that way and intended to put it in custody because of such unusual quantity of bags arriving in the luggage of one person.

Rolando showed the documents prepared by Tanque and his credentials as an employee and explained the situation. The Customs agent understood the situation and verified if Tanque was a regular importer of this product and finally allowed Rolando to continue but only after paying the corresponding taxes. Without the letter, Rolando could not have entered the product. Fortunately, even when the company was going through a crisis stage, Camilo remained calm to take good decisions.

Monday, the following day, without having enjoyed any free time in the Weekend, Camilo called each Tanque office in every region of the country to ask them to deliver to the company headquarters the stock of for-bill-bags that they would not going to use for the next two weeks. He had to explain to each responsible manager, one by one, the urgency of the situation, and he had to send, also, personnel from Buenos Aires to pick the bags up. He had to be sure that those bags arrive without damage to the main warehouse. Finally, in that way, the crisis was resolved.

Two weeks later, being calmed after the stress produced by the bags shortage supply, Camilo reflected in the extra costs that Tanque had incurred to resolve the situation and, also, in the risk that the company had passed through until the problem was, finally, resolved. *"This was one of the most critical situations I had faced in my entire career"* he told in the interview, but also there was a thought running around his head: *"Evidently, Rolando did not performed well in the crisis situation and put the company in a danger situation. What should I do with him?"* So now there was time to think in the actions he had to take to prevent Tanque to pass through a situation like that in the future.

Camilo had a long conversation with Rolando, who showed Camilo the past demand for for-bill-bags (Table 1) and described him the replenishment process as follows: Each end of the week, he reviewed the stock level of the inputs to find the ones that required replenishment. This review was done product by product, manually, according to the minimum quantity order established. He remembered that the week in that he missed the revision was because that day he was sick and the same day next week was holiday and then he went on vacations and the person who replaced him was not familiar with the system, he thought that those bags were not important for the company so he decided to wait until Rolando returned from vacation and handle the PO by himself. Another problem was that the last shipment that arrived was rejected because it failed in one of the quality tests. So, it seemed to Camilo that the situation described was the perfect storm. Rolando used to meet with Linda, Rolando's boss, every other week. Linda was in charge of showing the replenishment order to the CEO and wait for his approval. While listening to the explanation, Camilo thought he had now a clear picture of why the problem had occurred.

Camilo was not so sure whether the steps he followed to resolve the crisis had been the best ones. After all, the emergency had ended, but not without a huge cost to the company.

There were several paths to improve the situation: They could outsource the bags acquisition, in that way, they could transfer to others the risk of failure. They could establish a frequent purchasing program, but the unit cost per bag would increase. They could establish a fix point of replenishment, for example the same day every other week, but that would increase the inventory level, etc.

Regarding crisis management, Camilo wandered why he had succeeded resolving the problem and not Rolando nor Linda did it. He needed to find a way to transfer his decision-making process to others in the company, whether he expected to find time to think on implementing improvement projects in Tanque. Moreover, the crisis protocol needed a full revision to become a useful document.

TABLE 1
BAGS USED PER QUARTER AND PER REGION, IN THOUSANDS

Year	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
Q1 2018	1,128	184	92	89	84	62	38
Q2	1,223	175	86	83	77	56	43
Q3	1,068	161	82	82	79	51	41
Q4	1,190	193	95	89	85	54	43
Q1 2017	1,060	173	84	81	76	55	33
Q2	1,094	166	79	77	71	51	26
Q3	998	157	79	78	73	50	27
Q4	1,093	181	88	84	76	53	28
Q1 2016	992	168	79	76	71	52	29
Q2	1,025	172	82	79	73	53	29
Q3	990	149	71	72	68	44	26
Q4	1,048	175	80	77	70	47	23

TEACHING NOTE

Main Topics Related to the Case:

1. Inventory management.
2. Crisis management

Teaching Objectives:

1. How to handle crisis situations.
2. Differences between crisis management and risk management.
3. Convenience of keeping Good relationships with suppliers.
4. Stock replenishment systems.

Discussion Questions and Suggested Answers:

1. How inventory could be handled to avoid a situation as the one described in the case?

Inventory management could be used for deterministic or probabilistic scenarios. When the variability of the demand is not significant, a deterministic model for replenishment could be established (Niemi et al., 2009). There are two main systems to handle inventory replenishment: Fixed time systems and fixed quantity systems. In a fixed-time system, POs are reviewed and put in a previously established timeframe. A system like this allows an easier control, as a report could be elaborated including all products to be purchased and the person in charge could use less time to figure out the order quantities. By its side, in a fixed quantity system, that uses pre-defined minimum and maximum stock quantities, only the logistics personnel responsible could detect the problem. However, in this fixed quantity system, the inventory level is lower, this is because as soon as the inventory level is below the minimum quantity defined, the PO would be put. Aro-Gordon & Gupte (2016) stated that *"Inventory management is the supervision of supply, storage and accessibility of items in order to ensure an adequate supply without excessive oversupply"*. *"Having established a proper monitoring / inventory control system, the next thing is to prepare realistic inventory budgets".* Inventory management should help companies to wisely decide the level of products to keep in stock, maintaining a balance between handling costs and availability of products. Not always having stockout is bad news. That occurs especially when the cost of keeping inventory is high, or risky, and the supplier can deliver promptly every day of the week. Besides the inventory management techniques used, the control systems must be set properly, as the system could fail because of human error, as it is supposed to be the case at Tanque. A system should be reviewed periodically but not by the same person.

The problem for Tanque do not seem to be that they lack a mathematical model, but a management problem. What led to the crisis was that the employee in charged was the sole responsible. Inventory control should prevent the company from short supply, as well as oversupply. Automatic controls are better than manual controls. In that way, the software used could detect a variation above the regular results. For example, if it is common to replenish the inventory level every month, an alarm could ring after 45 days without a reposition, or when the minimum acceptable quantity has been reached. Regarding oversupply, the same alarm could be set when quantity has not diminished at the expected rate every other week.

The model used for inventory control should be adjusted automatically, that is, the inventory level should be defined in a mathematical, dynamic model. However, mathematical models are, usually, fed with past data, so the forecast will not match reality is there are changing conditions that move the parameters the model was fed with. In those cases, it is better to use a qualitative model. For example, meeting with the users could lead to new information related on how to replace the products in stock.

The risk taken by the company is that saving money through stock reduction could lead to stockout. There are, basically, two types of product to analyze, those products for which not having stock is not a problem are treated with minimum quantities in stock.

Any good system would handle the main variables to decide how much to keep at stock:

1. Lead time, supplier.
2. Purchase order time, client.
3. Lead time variation.
4. Purchase order time variation.

5. Demand, average and variation.
6. Demand forecast.
7. Product model variation.
8. Defects rate.
9. Destruction rate, user.

2. What are the main important considerations when a crisis occurs?

Crises affect organizations as they appear with short notice. A crisis can affect customers and reputation, but also employees and resources (Nizamidou, et al., 2019). Crises have short term as well as long-term impact in the results. Even organizational culture could be affected as a result of a crisis. In the case analyzed, the crisis mainly affected the survival of the company as losing customers would have been the expected outcome of the stockout.

Crisis management requires strong leadership but also well-trained employees. There is no possibility to react promptly to a crisis unless one is aware of the potential damage the situation will produce. Several authors have analyzed crisis management through the lenses of total quality management (Fener & Cevik, 2015; Nizamidou et al. 2019) as an excellent company should have developed ways to react effectively to unforeseen situations. Crisis management requires the establishment of a process, starting with defining who, in each situation will assume leadership, it is unlikely that the one-size-fit-all concept could be applied in this situation, so leadership should come through expertise instead of seniority. The next step is defining a team, inside the employees of the company. The third step should be to establish communication, both inside and outside the team members.

3. How a company could prepare itself to successfully pass through a crisis?

According to the situational leadership theory the leader adopts a different leadership style according to the situation, being *"the leader tells"* the best style for crisis management. This is because in crisis there is no time to conciliate, delegate or teach. It becomes necessary to define a crisis management framework: According to Fener & Cevik (2015) to face a crisis a manager needs, first, to be aware of the main problem, to frame it according to the company's goal, to realize which actions would render, more likely and easily with the minimum solution acceptable and to implement them in an iterative way, to learn by doing.

Fener & Cevik (2015) mentioned that leadership reflects the relationship among group members. It is not enough to have the formal authority to become a leader. Leaders and managers perform different functions. Common solutions become useless in a state of crisis. *"Crisis management is the whole of activities applied in a planned, systematic and rational way in order to eliminate the state defined as a crisis"*. Because of the multiple points of view to resolve a problem, crisis should be handled by teams. *"The most significant burden regarding crisis management is the fact that some manager can rather stick to regulations."*

Managers are needed to make things happen, and managers instill processes that run smoothly. Leaders, however, set visions and move people towards a goal, managers need leaders to tell them where to go. During a crisis, a leader will set up the course of action, as it is an unexpected situation. When the process to react to a crisis is established by the leader, the manager could take charge. Leaders must be able to move people towards the unknown. Crisis situations are opportunities for leaders to develop a trust environment with her followers. One thing is to set out the fire and other is to be proactive and prevent the organization to face a crisis. People need to feel psychologically safe to speak up and tell that something is not going well in the company they work for.

Crisis management is necessary for a company as there is no way one company could keep free from having it from time to time. Crises management could not be left to chance.

Crises are triggered by the identification of threats that could affect dramatically the normal operation of the system in the short run. In a crisis there is a strong need to open a communication channel, to avoid gossip and misunderstanding of the situation. A quick response and communication could prevent the company from having more damage.

However, before a communication could be established, facts needed to be collected. According to Nizamidou & Wisittigars (2019). *"The employees are in the most suitable position to detect a near miss or a malfunction in the operating system"*.

4. What other things could Camilo have done to handle the crisis?

Camilo could have had prepared a list of the main customers of Tanque and prioritized the attention to them, as well as tried to delay the attention for the other group of customers.

He could also could have used the crisis to prepare Linda and Rolando to act by themselves, asking them for suggestions before he made his decisions. Although this is difficult to do in the middle of the crisis, there is also true that there is no best opportunity to learn than in a real situation. Finally, he could have asked a competitor for help, as it is not strange that, sometimes, competitors cooperate, as in competitive relationships.

5. How could Tanque avoid situations like the one described in the case in the future?

Nakhoda et al. (2018) stated that crisis management can be grouped into three different phases: (a) pre-crisis, (b) crisis, and (c) post-crisis. In the pre-crisis phase, a prevention system must be established. It is mandatory to have a crisis management plan, as well as to have defined the crisis management team. To exercise on how to react to a crisis would help too. In the crisis phase the initial response should be quick, accurate and specific. Finally, in the post-crisis phase the company is returning to the point where everything is normal again. The crisis must be investigated in order to prevent it to happen again.

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