

## Case Study: **Wobbly Wheels (WW) Distribution Company**

### **Overview**

WW is a regional transportation and distribution company in operation for over 60 years. The company serves major cities in the Mid-Atlantic region. They are headquartered in Wilmington, Delaware and have a staff of 400 employees including truck drivers. There are 6 distribution terminals (Philadelphia PA, Baltimore MD, New York City, Washington DC, Newark NJ and Wilmington DE) for consolidating freight, and 100 delivery vehicles including 20 tractor/semi-trailer units, 40 box trucks and 40 panel vans.

The company operates in a highly competitive business environment. Growth has been stagnant because of a slow economy. John, the president of the company, would like to see growth at 5% per year. He would also like to see expenses cut by 5% to help fund new initiatives. Current revenue is about \$39 million a year with profit running at 4%.

### **Current Business Operations**

WW operates 24 hours a day, 7 days a week. Sales personnel (12 people, two per terminal) visit prospective customers to outline company capability, services provided and costs. When a customer decides to use WW they call the dispatch office with shipment information. Usually they FAX a copy of the bill (s) of lading to a terminal with information such as origin, destination, product description, weight and number of packages.

A dispatcher at a terminal makes a list of freight pickups and sends a truck to get the freight. To do this they use the routing system to determine the sequence of pickups by zip code. They use local maps within a zip code to map out the specific order of pickups since there may be several in a zip code area. They have a performance goal of 98% of freight picked up within 24 hours of availability.

A driver follows the dispatch order for pickups. Many of the drivers complain that the pickup order is not efficient. When they pick up an order they sign for receipt and either load the freight or guide the customer's forklift operators to arrange it properly in the truck.

After freight is picked up it is brought to the terminal where it is unloaded and sorted by destination. A dispatcher then prepares a delivery ticket (again using the routing system) that is used to load a truck in the proper sequence for delivery. Some trucks take freight from one terminal to another while others make local deliveries. About half of a terminal's space is used on any given night. Dispatchers have a goal to turn freight around in the terminal overnight for next day delivery.

When freight is sent out for delivery, the driver follows the delivery ticket order. Often they are held up at a delivery destination by traffic or by lack of available unloading space. This can cause the driver to be late trying to make the day's deliveries. Sometimes they get to a destination and the facility is closed and they bring the freight back to the terminal for delivery the next day. It is unloaded and re-sorted by destination. The dispatchers then add it to the next day's delivery tickets.

The major freight volumes are between New York, Philadelphia and Baltimore (about 70% of total volume). Trucks run at about 70% of capacity between terminals overall. Local delivery volume is heaviest in New York, followed by Baltimore and then Philadelphia. Local delivery trucks operate at about 80% full while pickups fill about half of the vehicles space. Some customers pickup and/or drop freight at a terminal with their own equipment.

Truck drivers communicate with the dispatchers using two-way commercial radios. Some also carry personal cell phones and use them if the radio is out of range. A few drivers also carry GPS devices to help locate addresses. In general the drivers are content with the company. Pay and benefits are good and they get overtime pay when deliveries run late. Complaints are few and mostly center around either the sequence of pickup and delivery of shipments or vehicle maintenance.

The fleet is maintained at the main Wilmington maintenance shop and at a smaller shop in Washington. Either one can handle minor maintenance and preventative work. Only Wilmington can perform major engine and transmission work. Overall the fleet is in good operating condition. All vehicles are on a preventative maintenance schedule which places them out of service two days a month, usually on weekends. Maintenance scheduling is a challenge because it can interfere with the steady flow of shipments both between terminals and for local delivery. There are no "extra" vehicles in the fleet.

### **Administration**

The company management team consists of the President, Vice President of Operations, Chief Financial Officer (CFO), Chief Information Officer (CIO), Sales Manager, and a Fleet Manager who is in charge of maintenance and safety. They meet weekly to discuss opportunities and issues and to plan for the future. Except for the CIO, the management team has been in place for many years

The president of the company just hired its first Chief Information Officer (CIO), Carol, after the previous IT Director retired. She comes from a nearby manufacturer who is also a major customer. At that company she was Deputy CIO and primarily responsible for network operations and security.

At a recent meeting the management team decided to change the strategic plan for the business in order to meet growth and cost goals. They highlighted three new strategies they want to employ to increase profitability and grow the business. First, they desire to provide warehousing services for customers who want to reduce delivery time to their customers by having product available locally. Second, they want to improve the percent of loaded miles in their fleet to reduce costs by coordinating the pickup and delivery of freight at the same time in the same geographic area. Third, they want to track the whereabouts of freight both in the terminals and on the trucks to provide customers with accurate delivery dates and times.

In addition, the management team wants to ensure that the company remains in compliance with all applicable federal and state regulations. The ones they are most concerned about are: (1) the Sarbanes Oxley financial audit and reporting requirements; (2) a new federal requirement to conduct a vehicle safety check every 10,000; and (3) an FCC reporting requirement on the number hours per day for each driver (or max per week, etc.). The CFO has been charged with the overall project. He has asked Carol to

help with this effort by modernizing information systems to support the new strategies. She has decided her first step is to update the IT strategic plan to link to the new strategies in the corporate plan. Second, she wants to engage her customers in a proactive way to first, identify and prioritize IT projects that will help meet the new goals, and then develop a set of requirements for each project. Third, she wants to decide on the best approach to modernize the information systems that will meet requirements at a reasonable cost, and for this she will need to make some changes to the IT organization.

---

## **Technology**

WW is using a mix of older technology products for finance and accounting, route optimization, freight tracking and fleet maintenance. There are several projects already in the IT portfolio competing for resources. The CIO sees a major challenge in balancing available funding, IT staff workload and project prioritization. The project nearest completion is the adoption of the Accurate Financials System to replace the aging finance and accounting system. It will be completed in six months. There are two other projects under way, one for management reporting and one for a mobile application that sales staff can use to show potential customers information on the fleet, distribution services available and freight rates, including a comparison to the competition.

The route optimization and freight tracking system is very important to the operations manager and dispatchers. The current system allows the input of freight origin and destination information. This is taken from a bill of lading which contains a plethora of specific information. When the dispatchers enter the origins and destinations into the system they are grouped by zip code. The dispatchers then decide which zip codes will be loaded in a truck and in what sequence for delivery. This takes several hours at night to accomplish and must be done as quickly as possible so trucks can be loaded and sent out in the morning for delivery. Arranging shipment sequence within a zip code is done by locating each address on a map and entering it into the system in the best order. Pickups are handled in a similar manner.

The fleet maintenance system contains information on each vehicle in the fleet. It includes all vehicle specifications, a summary of all repairs, a preventive maintenance schedule and an inventory of parts on hand. This information is entered by accounting clerks, mechanics, purchasing clerks and anyone else who has time to do data entry. It is not as time consuming as the routing system but it contains information critical to fleet reliability. The greatest challenge is scheduling preventative maintenance since it requires vehicles to be down for two days. The dispatchers do not want the equipment taken out of service because it causes planning headaches. The relationship between dispatchers and maintenance personnel is strained.

## **IT Organization**

When Carol was hired as CIO last month she took a close look at the current staffing. The IT staff consists of 22 people, seven of whom are programmers. The programmers are charged with all systems development and integration work for the company. They have three projects in their current portfolio. Their skill sets include SQL, .Net and C+ programming, and Web design.

There are six helpdesk personnel who support the six distribution terminals (one at each terminal). The remaining staff includes 2 network engineers, a financial systems specialist (an expert in Accurate Financials), a computer security expert, two shift supervisors and the CIO and her two personal assistants.

The IT staff supports multiple locations. At the Wilmington headquarters/terminal there are 15 servers (they contain all software and data; one stores a backup copy of the data) and 30 PCs for accounting, marketing, IT, administration and management. The terminal operations office has 5 PCs for dispatchers, one for the maintenance office, one for parts and one for drivers in the driver lounge. The other 5 terminals have 10 PCs each and connect to headquarters by a virtual private network (VPN).

### **IT Portfolio**

Accurate Financials- This new system will replace the current finance and accounting system. It is an off-the-shelf product that requires the owner to make modifications to interface with other systems they may own. Two programmers are working on the project. One is setting up the database and loading the software on servers. The other is learning about the system in order to write an interface with the routing system. A representative of Accurate will train the accounting staff in its use. This will take about two weeks.

Management Reporting System- Senior management wanted to know financial information on a daily basis. Two programmers have been working on a system to compile the data in a format they can use. They plan to extract information from Accurate Financials when it is ready but for now have focused on the current system. They will be done in two months.

Mobile Marketing App- The marketing manager asked for an app that sales staff could use to show potential customers information. This would include things like fleet photos and specifications; pictures of the six terminals and information about the distribution services WW can provide; and a comparison of their costs using sample shipments with rates from competitors compared to WW costs. A programmer and the web designer are working on the project. It will take two more months to complete.

The current design and development process is best described by the way it worked in the selection and integration of Accurate Financials. The CFO asked the (former) CIO to develop a new finance and accounting system. The CIO interviewed large, respected companies and, after comparing their capability to the current system, chose Accurate Financials. Two programmers were assigned and an Accurate Financials specialist was hired to work between IT and the finance office. The CIO receives progress reports every two weeks.

---

### **Situation**

When Carol was hired she toured each terminal to see the IT setup and understand local business operations. It was important to her to know just how each person used the systems. She spent time with bookkeepers and accountants, dispatchers, drivers and terminal management. Since she came from one

of WW's customers she knew that customers could offer insight into business improvements that would be good for both companies. She visited one large customer in each of the terminal's area of service to get feedback on how operations between them and WW could be improved. Her goal was to see how she could translate what she learned into systems improvements.

Interestingly the most complaints came from bookkeepers and accountants. They said the system was slow and data entry was tedious because accuracy was very important. If they entered wrong information, it could cause incorrect billing (rates are based on weight and size), improper loading (the wrong zip code could mean sending freight in the wrong direction unless a dispatcher caught the error), and more. They estimated current accuracy at about 95% but they had no way of knowing for sure. Further, they complained about financial reporting and their ability to meet compliance requirements. Reporting was mostly a manual process and data they needed from the system was not easily accessed. Most of them had resorted to keeping small ledgers at their desk to track information they knew they would need for reporting.

The dispatchers explained that routing wasn't all that hard, just time consuming. The routing system grouped all of the shipments by zip code. They would take all of the shipments in a zip code and look at the weight and size (how much cubic space each one needed in a truck), plot them on a map and then put them in delivery sequence. They thought most trucks left the loading dock full and that that the drivers made adjustments in delivery sequence when needed. Pickups were a bit more challenging. Sometimes they sent a truck out just to pick up freight and bring it back to the terminal. Other times they contacted a driver to ask them to stop at a customer to pick up a shipment while they were making deliveries. Since they didn't know exactly how much space was available on the truck this was a hit or miss situation. Drivers were left to decide if they could make it work.

Drivers were the most outspoken, probably because no one ever asked for their opinion. They were also the happiest of employees (this might explain why they were non-union). They liked being able to make decisions on the go and they knew the customers very well. In fact they could call some of them if they were running late and the customer would stay open so they could deliver or pick up a shipment. They seemed to have favorite customers and often spent extra time with them talking about common interests. Generally they were good ambassadors for the company.

Terminal managers were under constant pressure. Their main goal was to get shipments into and out of the terminal as quickly as possible. Delivery times were measured and part of their performance plan. They knew the company had established three new strategies because they were explained in an email they just got. Carol asked how they might provide warehousing services. Most felt they had extra space and could take on some storage but keeping track of the shipments might be a problem. They had to do this manually and the bookkeepers were the ones to keep the records. They felt more bookkeepers would be needed but they didn't know how many.

Carol also met with the maintenance and safety staff at the Washington terminal. The maintenance folks had a large workload and complained that they had a hard time getting equipment in the shop for preventative work. They did not know when equipment would be available until the last minute so

scheduling was always a scramble because they needed to make sure mechanics were available to do the work. They had a lot of complaints about shifting work hours and the effect it had on their personal lives.

The safety manager expressed concerns over driver hours of service. There are federal regulations that limit drivers to 10 hours of driving at a time. Then they need to take an 8 hour break. The problem was tracking the driver's hours to make sure they stayed within the law. Dispatchers tried to help with this when they scheduled pickups and deliveries but there was no easy way to do it and the results were often based on best guess. The safety manager who was ultimately responsible for compliance had drivers turn in their hours each day but this was always after the fact.

Carol's customer visits were eye-opening. Most of the customers had automated inventory systems and could easily track products from raw material to finished goods. They knew exactly what they would ship and when, usually several days ahead of time. Some customers however needed near instantaneous shipping. They wanted same-day pickup in a lot of cases and fast delivery. In most cases they were all able to produce electronic documents such as the bill of lading and email or FAX it to WW.

During her interview for the CIO position, Carol was told that the previous IT Director had left a good foundation and that the staff seemed sufficient in number and appeared to be very capable. However, since WW is developing its strategies for the future, the staff must be able to support the business strategies as well as the IT strategies that Carol would develop. One of the first things Carol did was to interview each member of her staff. She discovered that the roles and responsibilities tended to overlap and that morale among her staff was very low. Carol also interviewed the senior leadership of WW and learned that her staff was not meeting their expectations for service. The help desk was perceived as being only somewhat competent and took much too long to respond to problems. Application developers were very slow in delivering systems, and when the systems were finally delivered, they did not reflect what the customers needed or wanted. Network outages occurred too often from the users' perspective. Finally, the Chief Financial Officer told Carol that the IT costs need to be reduced.

Carol knew she had many challenges. She was determined to identify essential projects and then prioritize them for management review. The outcomes would affect almost every aspect of the business. Her IT portfolio was about to grow and her organization will need to change to meet the challenges.

---