

## 1.1: Crawford Case

---

### Problem-Solving Case Study Intro Video (2 min 22 s)

Play the video below to listen to an introduction from the coach.

One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://ecampusontario.pressbooks.pub/crawfordcase/?p=51#oembed-1>

Conestoga OLC. (2023, January 25). *Problem solving case study intro* [Online video]. YouTube. Licensed for reuse [CC BY-NC-SA](#).

### The New Supply Chain Manager

It was early Monday morning, October 2, 2022, and Priyanka Kaur was starting her second week as the new Supply Chain Manager at Crawford Automation in Barrie, Ontario, Canada. She was thrilled when the company offered her the job and still couldn't believe her good fortune. Before leaving India to pursue an opportunity as an international student in Canada, with a chance to find a full-time job, she had already completed a degree in Mechanical Engineering. In addition, she had several years of experience in the fabrication industry in her hometown of Kolkata, India, including supervisory experience, so she was ready for the role of Supply Chain Manager with Crawford Automation. Still, she couldn't help but notice the culture at Crawford was almost exclusively male-dominated, which explained her response when HR called to offer her the job, "Really? Oh my, I can't believe it! Yes, yes, I accept the position. Thank you, I am very grateful."

However, those concerns faded into the background as Kaur immersed herself in the onboarding process at Crawford. The first week had been reserved for "new hire" orientation comprising the usual Human Resources onboarding processes, touring the office area, meeting administrative employees, and training on the company's ERP system (see [Appendix A for the organizational chart](#)). She also had an opportunity to spend time with the company's General Manager, Hugh Robertson, who explained the company's history, competitive marketing position, and strategic plans for the coming year.

Her overall responsibilities included purchasing, logistics, and inventory management, and towards the end of the week, she finally got a chance to meet her staff. Kaur has a small team of two-to-three employees in each area, but it was clear they had their hands full and were pleased the company had hired a new Supply Chain Manager.

### Purchasing at Crawford Automation

Kaur had previous experience in logistics and inventory control and was comfortable with those responsibilities. However, she had little direct experience in purchasing and was unsure in that role. This became more evident when her Purchasing Supervisor, Kevin MacDonald, described the scope of their department's operations, including the number of domestic and international suppliers involved, the sophistication of the parts they ordered, and the logistics requirements related to ensuring supplier deliveries were on time for production. Kaur realized the importance of that relationship when MacDonald mentioned that supplier on-time delivery had been declining in recent months: it was currently 75% but the company requirement is 95% on-time delivery.

Kaur was determined to get down to business, and her first meeting was with Harvey Morrison, the Plant Manager. Morrison had been with the company for over ten years and proved to be a wealth of knowledge about everything and everyone.

Morrison took Kaur on a tour of the Plant, explaining the various production processes underway. "Do you have any experience in the automation business, Priyanka?" Morrison asked as they made their way between several workstations. "A little," Kaur replied. "I worked in a metal fabrication company for several years before coming to Canada. We specialized in the airline industry, fabricating wing and fuselage parts from high-density composite materials for some of the largest airlines in the world."

"Sounds interesting," said Morrison. "We may not be a 'highflyer' like your previous employer, but we're pretty advanced in our own way. Our customers are manufacturing companies, mostly consumer goods producers but some industrial clients as well. When they need a new machine or automated conveyor system, they come to us and ask us to produce it, and sometimes design it too. It could be a new machine to produce a brand-new product, or a bigger machine to produce more volume of an existing product."

Kaur stopped and pushed several large boxes aside to get a better look around. "So, all the people in this area are working on the same thing?" she asked Morrison.

“Could be,” he answered. “But, keep in mind, we’re talking about highly sophisticated machinery. For example, right now we’re producing a high-volume extrusion molding machine for a large consumer beverage company. It’s only one machine, but it will produce thousands of bottles per minute that will feed into their conveyor systems and be filled with beverage products. A machine like this has to be built from scratch, hundreds of different parts, most we design and make ourselves, but some come from our suppliers.”

“I’m glad I asked,” Kaur replied. “That gives me a better idea of the role my departments play in all of this.” Morrison steered Kaur back towards the office area, saying, “Well, now that you mention it, there’s something I wanted to talk to you about your department and some problems we’ve been having.”

“Oh, are you saying my employees aren’t doing their jobs very well?” Kaur asked.

“Look, Priyanka, don’t take this the wrong way,” Morrison said. “You saw how many people I have working out there. Our customers pay up to one million dollars for some of these machines, sometimes more, therefore they demand high-quality and on-time delivery. I’m glad the company hired you, it’s no secret that we have had some significant production delays this year because the supply chain department couldn’t arrange the delivery of parts and materials to meet my production schedules.”

Kaur considered this for a moment and said, “Harvey, thank you for the tour and the insights into some of the problems in my department. I assure you this will be a top priority for me and I will look into it immediately.”

*“Thank Goodness You’re Finally Here.....!”*

Kaur knew firsthand the importance of timely supplier deliveries from her experience in the fabrication industry. Back in her department, she decided to talk to MacDonald: “Harvey Morrison just gave me a Plant tour, and from his comments, I get the impression he’s not too happy with some of your suppliers.”

“Look, Priyanka,” said Kevin defensively, “these suppliers were in place long before I got here, so they must know what they’re doing. When things don’t show up, I get phone calls from Mike Brown demanding to know where his order is. Call the suppliers, and it’s the same story every time. They tell me our orders were shipped on schedule and that I should call the trucking companies or check with Receiving. I call the carriers, and they say they don’t have it. Then I call Paul Robertson and he says he hasn’t seen it either. But between you and me, I’m not sure he would know, so thank goodness you’re finally here to help sort things out!”

“What do you mean by that?” Kaur asked.

“My team has been tracking missed on-time deliveries (OTD) for the last two months (see [Appendix B for Late PO data](#)) and we have found the main issue is incorrect data entry; however, I am unclear on how to present this data and what the next steps to improve the situation are. I know that receiving is one of the busiest areas in the company and floor space is in short supply, so maybe they are having difficulty locating the orders.”

Kaur was able to take a quick look at the Late Purchase order data the purchasing team has compiled and recommended that a Pareto diagram would be the most effective method to show the data and explained that she was going to introduce a tool called an Ishikawa diagram (commonly referred to as a “Fishbone”) to the team soon. Kaur was interested to see if anything in the data provided indicated their suppliers were performing unsatisfactorily.

## The Receiving Department

Kaur asked MacDonald to generate a supplier performance report for the company’s key suppliers, then headed back to the Plant to speak with Paul Robertson, the Shipping & Receiving Supervisor. The Shipping & Receiving department was not included in her tour with Morrison, and she was curious after hearing MacDonald’s comments.

When she arrived at the Shipping & Receiving department, she saw that MacDonald might have a point. Boxes and crates of all shapes and sizes filled the area to the point where it was difficult to find an aisle and in one of the receiving docks was a skid full of random boxes blocking access for any material handling equipment (MHE). She asked one of the staff on the floor and was told: “I think that stuff came in yesterday and it is all the receipts with discrepancies, so we are waiting for purchasing to tell us what to do with them. When a shipment arrives we have to match the purchase order, with the packing slip, and the label on the boxes. None of these boxes match.”

Finally, behind a solid wall of boxes, Kaur discovered the Shipping Office and, inside, was Paul Robertson.

An interactive H5P element has been excluded from this version of the text. You can view it online here:

<https://ecampusontario.pressbooks.pub/crawfordcase/?p=51#h5p-1>

Looking at the purchase order Robertson just showed her, Kaur realized this is exactly the same missing roller bearing MacDonald could not find (see [Appendix C – Purchase Order](#)).

## The Problem

Later that day, around 4 p.m. Kaur received an email from Morrison asking if she could come to the production area. When she arrived, Morrison waved her over to one of the workstations.

“Thanks for coming. I thought it would help if you saw this for yourself. We’re supposed to install the ball bearings on this machine today, but now we have found out we don’t have any. The inventory records say we should have two in stock, but we don’t. Kevin tells me the supplier says they shipped our order three days ago, which contained 15 sets of Part #: 9902233567 Roller Bearings required for this job. Orillia to Barrie is usually next-day delivery with the trucking company, but Robertson says he never received the order.” (see [Appendix C – Purchase Order](#))

Kaur saw that Morrison was waiting for an answer from her and asked, “What do you suggest I do?”

“I don’t know; I just thought you should see firsthand the problems we’re having with some of your suppliers,” Morrison replied as he handed Kaur a copy of the inventory record. “I could ask Paul to drive up to Orillia and pick up the part, but he won’t get there before 4:30, and since this has happened before, Orillia Components will charge us an overtime pickup penalty of \$500 for a \$60 part. And since there will be rush hour traffic on Highway 400 at this time of day, he’ll be lucky to get back here by 8 p.m. tonight, and I can’t keep my Production department on overtime waiting for him.

Kaur thought for a moment about the supplier analysis she had just completed. “Harvey, it’s too late to do anything about this today. Leave it with me, and I’ll get back to you first thing tomorrow morning.”

## The After-Hours Investigation

Before she left for home, Kaur needed to make a plan. How will she and the team determine what had happened to the missing part and figure out what the **root cause** of this recurring issue is? She knew she needed to see the issues firsthand and collect data to understand the extent of the issue and to set a baseline of performance.

One of the first things Kaur requested was a supplier performance report and the supplier performance scorecards for the top five vendors. She was informed that the accounting department creates and publishes scorecards and that the performance reports were not up to date. Furthermore, it would take accounting weeks to gather, organize, and summarize the data. She decided to ask her purchasing team to perform the analysis. Crawford’s IT department has set up an analytics self-serve where managers have direct access to download data directly from SAP (the company’s enterprise resource planning system) directly into Excel to perform analysis and data visualizations ([Download the SAP data file \[downloads an Excel file\]](#)).

Utilizing the self-serve tool, Kaur was able to download the complete Key Supplier Performance report (see [Appendix D – Key Supplier Performance Report](#)). One of the key findings she is hoping to see is whether the Crawford purchasing team is providing their vendors with the required five day lead time (time between the date *ordered* and date *required*) and whether supplier confirmation dates are consistently entered.

Kaur wanted to do one more thing before she went home and waited in her office until 7 p.m., long after the plant had closed and everyone had left for the day. Armed with a flashlight, a copy of the Purchase Order to Orillia Components (see [Appendix C – Purchase Order](#)), and the packing slip from the receipt (see [Appendix E – Packing Slip](#)) she went to see if she could find the missing roller bearings.

Can you find the box containing the missing parts in this pile? When the box is located can you identify the discrepancy between the Purchase Order, Packing Slip, and the box label?

One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://ecampusontario.pressbooks.pub/crawfordcase/?p=51>

As she walks towards the receiving area, Kaur is thinking, “The only way to solve this problem is to use the structured problem-solving approach I was taught in school and has worked in the past. It is important that I find the root cause to this issues, or else they will keep happening.”

As part of Kaur's team, you will use a structured problem-solving approach to find the root cause of Crawford's supply chain problems and help the team determine countermeasures that will improve this situation once and for all.

---

This page titled [1.1: Crawford Case](#) is shared under a [CC BY-NC-SA 4.0](#) license and was authored, remixed, and/or curated by [Stephen Thomson](#), [Kevin Hollis](#), and [Laurie Turnbull](#).