

Question 3: Answer the questions at the end of this case.

Aprons “R” Us*

Company Background

Aprons “R” Us (ARU) is a third generation, family-owned company with annual sales of about \$3 million. It has a solid reputation for quality, building long-term personal relationships, and customer service. The company produces vinyl aprons (primary product) that eliminate cloth apron laundering costs for the supermarket industry in four countries. While ARU has six primary customers and offers a variety of products including rain coats, vinyl aprons, signage and corporate apparel, this case will be focused specifically on vinyl aprons for its largest customer, V-Mart.

Currently, V-Mart has a need for 36,000 aprons per month from ARU, but its ordering quantity is lower than that because of the production bottleneck at ARU. ARU’s management is considering increasing its production capacity to capture more of V-Mart’s demand, but it is unsure where to invest. Moreover, ARU has investigated the option of outsourcing the whole production. They have already received a bid of \$3.60 per apron from a reliable Chinese manufacturer. This figure includes all the costs (labor, material, shipping, etc.).

The Production Process

V-Mart orders aprons of three different colors – red, blue, and white – from ARU. ARU purchases vinyl material of these three colors, cuts it into the shape of apron, and then adds the V-Mart name and logo to the front of the apron. Additionally, ARU reinforces the apron ties using a stitching process known as bar-tacking. The production flow is given in Figure 1.

In performing your analysis, assume that all equipments have been fully paid for (i.e., consider only the variable labor, material, freight, and contract costs). Moreover, assume that each worker is paid \$14/hour. ARU is running one shift of 8 hours each day (i.e., ignore breaks), and there are 22 work days in each month.

* Professor ██████████ prepared this case for discussion only. The company identities as well as the operational data have been disguised.

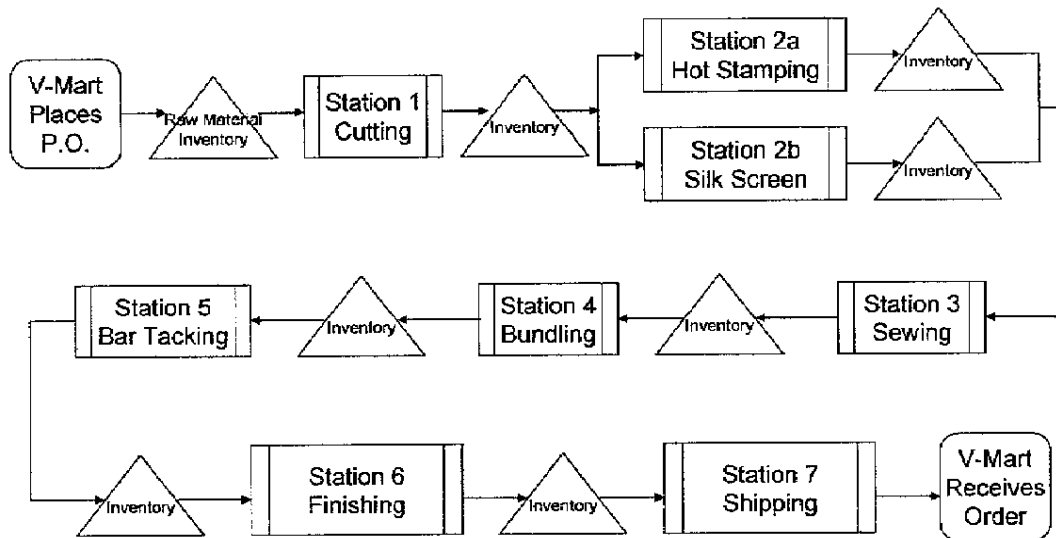


Figure 1: V-Mart Apron Manufacturing Work Flow Diagram

Raw Material

Red, blue, and white vinyl material is purchased from an outside vendor at a cost of \$1.38 per apron. The supplier is very reliable and has ample capacity to satisfy ARU's demand even if it increases significantly.

Station 1 - Cutting

Vinyl material is cut on a forty-foot long table into the form of an apron. One worker is employed and on average he can cut and stack 300 aprons each hour. Material cost is negligible.

Once the aprons are cut on the table, they are placed on a rolling cart and sent to the next station for labeling. Depending on the color of the apron, one of two labeling processes is used: the red and blue aprons can be hot stamped (Station 2a), and the white apron requires silk screening (Station 2b). V-Mart's orders always consist of 38.7% red, 17.3% blue, and 44% white aprons.

Station 2a - Hot Stamping

The carts containing the red and blue cut aprons are rolled over to the hot stamp area and each apron is pulled from the cart. As the aprons are hot stamped, they are stacked on the table in the

hot stamp area. Once one cart has been hot stamped and is empty, the aprons are stacked back onto the cart and stored until the sewing contractors come to pick them up (see Station 3).

There is one worker in the hot stamping area that can stamp 150 aprons each hour. The material cost of the foil used is \$0.03/apron.

Station 2b – Silk Screening

The white aprons are silkscreened because they do not hold the hot stamp very well. The aprons are stacked as they come down the drying belt and placed onto another cart. Once the aprons are screened, they are also stored until the sewing contractors come to pick them up (see Station 3).

While hot stamping only requires one worker, silk screening uses two workers – a screener and a puller to stack the aprons. Together they can process 200 aprons each hour. Ink cost for the silk screening is approximately \$0.05/apron.

Station 3 – Contract Sewing

Once hot stamping or silk screening is completed, the aprons are stored and wait for sewing contractors to pick them up. Six different contract sewing operations are used (their pickup dates are staggered). Three of the contractors are large enough to produce approximately 10,000 per month (each) of the V-Mart style aprons while the remaining three contractors are capable of approximately 6,000 per month (each). The cost for the contract sewing is approximately \$0.45 per apron. Along with the aprons, the neckbands, ties, and thread are provided with each batch that is picked up. The cost of this material is approximately \$0.26 per apron.

Station 4 - Bundling

The contractors return the aprons in quantities of twenty rolled-up aprons. The contractors unload the rolled-up aprons onto a cart and then the bundler unties and unrolls the aprons. In preparation for bar tacking, the bundler stacks up the aprons in pallets of 1,728. There is one bundler, and it takes approximately 2 hours to bundle each pallet for the bar tacker. The material cost is negligible.

Station 5 – Bar tacking

Bar tacking introduces additional tie stitching to add strength to the ties. There is one bar tacker who takes approximately 18 hours to complete a pallet of product. The material cost is negligible.

Station 6 – Quality Check (folding), Finishing, and Bagging

The step to follow bar tacking is folding. The folder stacks up the aprons onto the table and begins the folding process. The folder stacks the aprons in a large stack if they are bagged individually, or she offset stacks them into three's, six's or twelve's, whichever way they are bagged. After that, a bagger physically takes the aprons to the bagging table and does the bagging. At the same table, one other person places the bagged aprons into the shipping boxes, attaches the shipping labels, and stacks them on the pallet. Once the pallet is loaded, an automatic shrink wrap machine wraps the skid. The skid is then ready for the truck to pick it up.

Working together, it takes all three people approximately 7 hours to finish a pallet of V-Mart aprons in this station. The box and bag costs are roughly \$0.04 for each apron.

Station 7 - Shipping

There is one shipper at this station and it takes him roughly half an hour to process each pallet. The freight cost per apron is approximately \$0.25.

Questions: You have been asked to analyze the two options for ARU (increase in-house production capacity and outsource production) and to make a recommendation to the owner. Specifically, you need to answer the following questions:

1. What is ARU's current production capacity?
2. With the current production rate, what is ARU's total cost per apron? To do this you need to include material, freight, contractor, and the labor cost per apron*.
3. Based purely on this cost comparison, how attractive is the option of outsourcing?
4. If ARU is to increase its in-house capacity, where should it invest? What is the impact on the cost? Will this change the cost comparison with outsourcing to China?

* Throughout your analysis, assume that workers are not cross-trained so they can only work at their own stations. Also, assume that all the workers are working on ARU orders exclusively.