Requirements Document

Overview

Packwood Ski Company (PSC) manufactures and distributes premium alpine skis under the "Pack Ski" brand to specialty retailers in the United States and Canada. While the company remains small, it has already outgrown its current data processes and would like to adopt a database system to unify recording and reporting of its processes (e.g., sales, invoicing, inventory, etc.). As part of the company's commitment to community outreach, we have asked teams of database-savvy students from the University of Oklahoma to complete the project, thus strengthening their understanding of and acumen for resolving real-world business problems.

To enable these teams to begin working on the project, we have assembled this requirements document. The document offers background on the company, details on some of its current practices and processes, and a set of capabilities expected to be included in the final database deliverable. In addition, PSC anticipates facilitating one-on-one meetings between its COO, Ms. Sheryl Sandberg and student teams early in the project to address any questions or needs for clarification that the student teams may have.

Company Background

PSC is headquartered in Packwood, Washington, a former logging town located in the heart of the Cascade mountains between Mt. Rainier and Mt. Adams and just a few miles down Highway 12 from the White Pass ski area where Olympic champions Phil and Steve Mahre learned to ski. The company manufactures premium skis, currently sold primarily at specialty ski shops throughout the US and Canada.

Last year, company revenues topped $2.5 million for the first time, representing 15.5% year-over-year growth. PSC expects revenue growth to continue accelerating in the near-

term and is in negotiation to have products stocked by larger chain stores soon. To facilitate this continued growth, the company needs to address its data issues.

Products and Production

PSC manufactures exclusively alpine skis. While most of these skis are sold flat (without bindings), we also have special production runs in which we will attach bundled bindings as well. These bindings come pre-built from binding manufacturers (e.g., Marker, Salomon).

While all final production is carried out in our Packwood manufacturing facility, parts and manufacturing supplies are sourced from third parties. Some of these raw materials come ready to include in assembly (e.g., resins used in component lamination), but most come unfinished to some degree and need to be finished prior to use (e.g., maple and bamboo boards must be cut to length, fiberglass sheets must be cut to proper shape, etc.). Top-sheet designs are sourced from third-party artist vendors and, thus, are considered a component to be included in the manufacture of a pair of skis.

For each ski model, each size has a unique bill of materials. Further, to speed manufacture, many components are pre-assembled and stored to await final assembly (e.g., ski cores may be preassembled and stored).

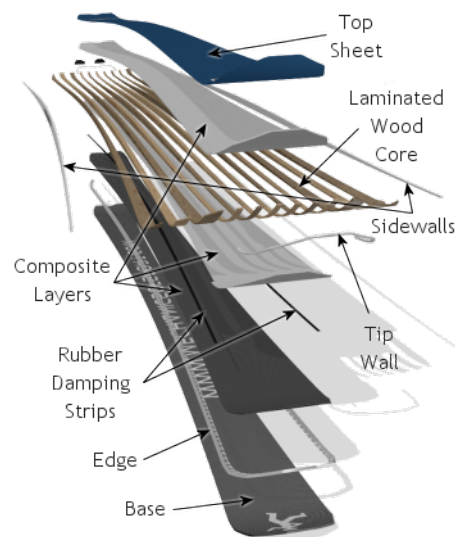See Figure 1 for a diagram showing components that go into building a single pair of skis.

Figure 1. Ski construction diagram.

Product Categories

PSC products are assigned to one or more categories. Skis come in multiple sizes (in centimeters based on length); most ski models are manufactured in three or four lengths (e.g., a given model may be built in lengths of 170, 177, 184, and 191). Further, a given ski model is categorized in terms of intended gender, ski terrain type (e.g., powder, racing, all-mountain), and user proficiency (beginner, intermediate, advanced). Currently, PSC has assigned product managers to skis of each ski terrain type (e.g., one product manager manages all powder skis; another product manager manages all all-mountain skis).

Because of their role in the manufacturing and sales and marketing processes, it is important to know which employee manages which product category (and, thereby, which product models).

We are providing a sample product list with information regarding our 2015-16 product line, which we hope will provide a better understanding of what we sell. This sample data might also be useful in populating at least part of the database.

Customers and Sales

PSC's customers are retailers and wholesalers. We do not sell our products directly to consumers. Each of our customers has a sales rep who is responsible for completing all sales with the given customer. These orders are placed over the phone or in person (where the salesperson visits the customer). Further, we accommodate customer invoice payment preferences (whether open invoice or balance forward) and offer a variety of payment terms to our customers based on customer size and the length of our relationship.

For each sale, the company tracks the items ordered and the quantity of each item ordered. In this context, an "item" refers to a particular model in a particular length. To incentivize larger orders, we offer a 1.5% discount on all orders over $20,000 and a 2.5% discount on all orders over $40,000. We may add additional discounts at additional sales levels in the future.

Orders must then be shipped to customers. While most orders are shipped via freight, certain rush orders may be overnighted or sent via two-day shipping. Since actual shipping cost is passed on to the customer (except when waived or altered by decision of upper management), it is important to track the actual cost of each shipping type and each shipment sent. Note that, especially for local customers (i.e., those customers within about a two-hour drive of Packwood), sometimes salespeople will hand-deliver orders to customers.

Raw Materials Ordering

The company needs to track its raw materials needed for manufacturing. In addition to tracking inventory quantities and descriptions, the process for raw material ordering should be tracked and recorded. PSC uses a purchase order system in which a product manager will create a purchase order document (currently done in Excel). This document is then denied, approved, or approved with changes by a member of the purchasing

department. It is important to track (a) which product manager created the original purchase request and (b) which purchasing employee approved/denied the request and on what date. Note that, for the foreseeable future, we do not need to track requisitions separately from purchase orders; to us, these are the same document used in one continuous process.

Raw materials are purchased from various vendors. As our raw materials tend to be undifferentiated commodities, the same raw material may be purchased from different approved vendors and the vendor decision is primarily based on the price offered. We note, however, that the top sheet designs are *not* commodities and, thus, not all top sheet designs are the same, but instead vary by model.

When raw materials are received at our factory, it is important to note the date of receipt, and the name of the employee who received and, separately, inspected the shipment.

Consumers

PSC does not sell directly to consumers, but, instead, works with two major wholesalers and nearly 100 different (generally small) retailers to distribute products. While we produce a significant amount of advertising and marketing collateral, we have no need to integrate related information into the database at this time.

Project Expectations

We expect that the finished database project will provide PSC the following benefits:

- Better track and maintain inventory to minimize stock-outs and optimize ordering quantities. Due to our lack of centralized data and reporting, we have often lost time and effort engaging in physical counts and have nevertheless frequently been left with excess or insufficient inventory, both of raw materials and finished products.
- Understand which of our customers are our biggest as well as those that are exhibiting signs of growth.
- Better control product receiving to ensure accurate shipments by vendors. Our current, paper-based receiving process has sometimes resulted in acceptance of incorrect shipments without leaving us much evidence to determine responsibility.
- Systematically control purchasing processes.
- Enable employee success to be measured for salespeople.
- Easily, flexibly, and accurately understand the strength and penetration of our brand based on regions. These regions correspond with the primary ski locations throughout North America (Pacific Northwest, Inland Northwest, Canadian Rockies, Northern Rockies, Southern Rockies, Sierras, etc.). We have also recently begun marketing our products in Australia and Japan and track each of those countries as separate regions.
- Provide data to help in making decisions about possible expansion and/or additional business opportunities.

In addition, we expect to be able to use the database to run the reports listed below. Each report should include all the information necessary for the employee viewing the report to

understand its meaning and thereby be able to make effective decisions. Further, please provide "dummy data" where necessary, including some to represent skis to be sold as part of our 2016-17 model year line; this will enable us to verify the quality of the reports.

1. Total sales (in dollars) by region in a given month (note that we would like to be able to input the month to be calculated).
2. Total sales (in dollars) by customer in a given year as well as total expenditure by vendor in a given year. (This should be two separate reports.)
3. The ten highest selling (a) models, (b) terrain ski types, and (c) model-sizes.
4. The ten *most profitable* products (i.e., the products that have earned PSC the greatest profits) in a given year.
5. The number of distinct products managed by each product manager.
6. Total shipping costs for a given month by shipping type (freight, two-day, overnight).
7. Purchase order requests (product manager name, purchase req number, item, quantity) that have been rejected by purchasing within a given year.
8. Invoice lines for a given sales invoice number (i.e., the quantity, product number, product name, price, and line total for each product sold as part of a given order).
9. All model-sizes (regardless of whether a model-size has been sold) and, for those that *have* been sold, how many sales of each has taken place.
10. Defect rate (i.e., number of units rejected after manufacturing) for a given model.
11. A display of all ski products separated into short (under 150 cm), medium (150-175 cm), and long (over 175 cm) lengths.
12. List of all customers that have not made a purchase within the last 3 months from the current date.
13. List of customers whose average sales is less than the average of all sales. This will help us to find customers whom we should target to get a higher volume of sales.

Finally, we are hopeful that student teams, after getting to know our business and our data needs, will be able to recommend at least three additional reports that could be useful in providing value to our customers and/or increasing our company's operational efficiency. For each of these, please also let us know how you feel this report would be helpful to the company.

Conclusion

We are excited to be partnering with the University of Oklahoma and its students for this project, which comes at a very important time in our company's history. We look forward to interacting with the student teams and to seeing the possibilities opened up by the completion of this database.

Students completing this project on our behalf should coordinate all communication with us through their instructor.