**Chapter 2**

**Soap Companies Do Battle**

The pie chart is useful in displaying the market shares in one device adjacent to each other. Many decision makers are used to viewing pie charts in connection which budgets and therefore might feel more at ease with a pie chart. On the other hand, when percentages are close such as with Dial and “Others” in 1983, it can be difficult to discern the difference using the pie chart slices. In this case, the bar chart shown above is more desirable.

1. Shown below are pie charts for the 1983, the 1991, and the latest market shares.

An examination of the pie charts from 1983 through the latest reveals that the slice

sizes of Dial and Colgate-Palmolive have grown and the sizes of the Procter & Gamble slices have shrunk substantially since 1983. Shown below are the actual percentage figures for the three time periods so that you have the option of displaying the data in different ways:

Company 1983 Share 1991 Share Latest Share

Procter & Gamble 37.1 30.5 4.3

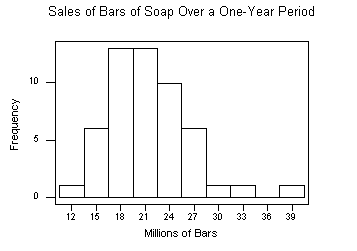
Unilever 24.0 31.5 27.5

Dial 15.0 19.0 20.6

Colgate-Palmolive 6.5 8.0 13.8

Others 17.4 11.0 33.8

2. Shown below is a histogram of the weekly sales of bars of soaps over the year. The histogram was constructed using 10 classes. In Minitab, the student has the option of trying several different values for the number of intervals. In Excel, students can explore various bin options. The shape of the histogram will somewhat change according to the number of class intervals. Note the shape of this histogram is mound shaped with some skewness to the right. The center of the distribution appears to be near to 20 million as would be expected since Procter & Gamble sells about 20 million bars per week, for the sample year selected. Note, however that some weeks actually average as much as 39 million bars per week and others only 12 million bars. What inventory, production, and human resource implications might this have? How does a company “cope” with such fluctuations?



The stem and leaf plot for these data is shown below. The advantage of the stem and leaf over histograms, pie charts, bar charts, and others is that the stem and leaf retains the original data in case the researcher wants to calculate other statistics on the numbers. Production people would likely find the histogram the most interesting because it displays to them where the bulk of production occurs and the magnitude of the unusual size runs.

Stem Leaf

12 2

13 6

14 7

15 0, 4, 4, 5

16 8

17 0, 1, 1, 4, 5

18 2, 3, 4, 5, 7

19 1, 3, 6, 9

20 0, 3, 3, 4, 4, 6, 7, 9

21 3, 4, 4

22 5, 8

23 1, 4, 8, 9

24 0, 3

25 2, 2

26 2, 2, 3, 3, 6, 9

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30 6

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32 8

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39 8

3. Following is a Minitab-produced Pareto Chart for the frequency of problems associated with defective soap bars. Note that Bar Surface is by far the most frequently occurring problem causing nearly 44% of the defects. If the organization wanted to improve the quality of the packaged bar soap, they should identify ways to reduce marring of the bar surface. Improvement in this area will greatly reduce the overall number of defects. Similarly, improvements in the seal and/ or label will reduce the overall number of defects because 23% of the defects are due to a bad seal and almost 16% of the defects are due to poor labeling. Together, marred bar surface, bad seal, and poor labeling, account for approximately 80% of all defects (83%, to be exact).

