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IST 3050

Problem Solving and Decision Making

Case Assignment 1

How to perform these analyses in Excel

1. Frequency Distribution and Histogram for Customer Survey Data:
- Finding the lowest and highest grade
- Finding the width of the interval , range = max-min, woi = width of interval = range/ class groupings
- Set up the table (Class limit + Frequency)
- Frequency distribution (Data analysis)

2. Descriptive Statistical Measures for Engine Production Time:
- Data Analysis toolpak
- Performing the descriptive statistics

3. Frequency Distribution and Histogram for Blade Weight Samples:
- Finding the lowest and highest grade
- Finding the width of the interval , range = max-min, woi = width of interval = range/ class groupings
- Set up the table (Class limit + Frequency)
- Frequency distribution (Data analysis)

Brief report that shows these results and explains the key insights

Elizabeth Burke, PLE Manager, aimed to extract valuable insights from the Performance Lawn Equipment Database by employing statistical tools and analysis.

 The first analysis focused on the Customer Survey worksheet, yielding a frequency distribution and histogram showcasing customer perceptions across various categories. Key insights revealed a substantial number of customers expressing moderate to high satisfaction levels, highlighting areas for improvement in ease of use and pricing.
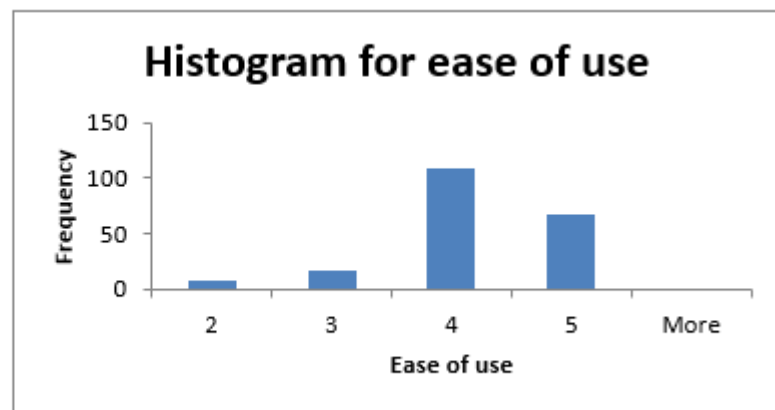
Customers generally expressed high satisfaction with Quality, indicating a positive perception of the product or service.

Quality	Frequency
1_2	4
2_3	16
3_4	75
4_5	105
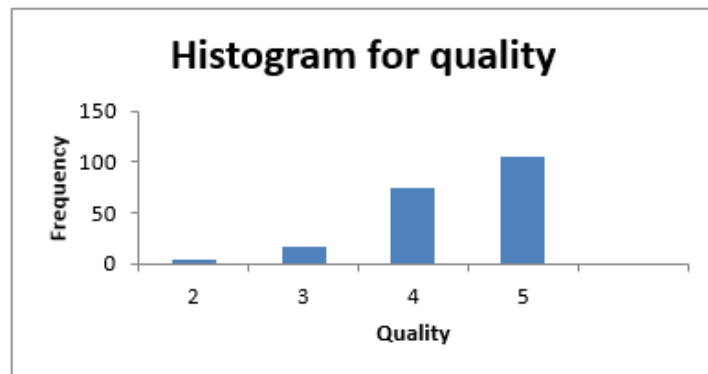
In terms of Ease of Use, the majority found the system fairly user-friendly, highlighting room for enhancements.

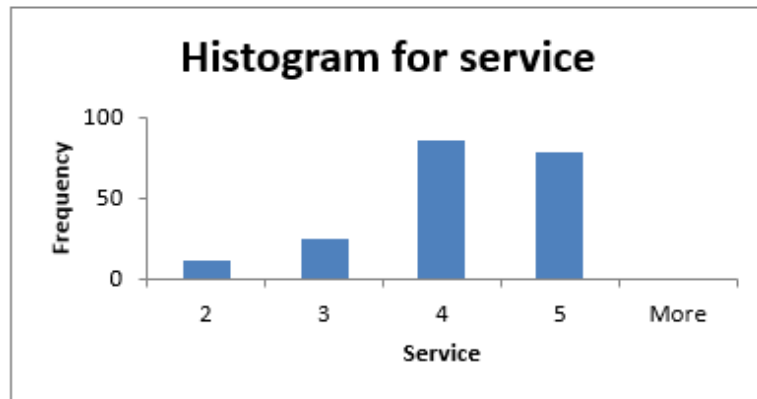| Ease of use	Frequency
1_2	7
2_3	17
3_4	109
4_5	67

Pricing was perceived neutrally to positively, emphasizing the need to address concerns in lower intervals for better alignment.

Price	Frequency
1_2	30
2_3	40
3_4	87
4_5	43

Regarding Service, customers viewed it as moderate to good, signifying areas for improvement to enhance overall service quality.

Service	Frequency
1_2	11
2_3	25
3_4	86
4_5	78

Histogram for service

(Bar chart: Frequency vs Service, with bars at Service values 2, 3, 4, 5, and "More")

The second analysis delved into engine production time in the Engines worksheet, presenting descriptive statistical measures. Insights indicated a diverse range of production times with an average of approximately 50.72 minutes, pinpointing the need for streamlining manufacturing processes. With a slight deviation indicated by a standard error of 0.6547. The median production time is slightly lower at 49.35 minutes, portraying the central value in the dataset. Notably, positive kurtosis and skewness values (1.169 and 1.262, respectively) suggest a non-normal distribution with potential outliers towards longer production times. Addressing these outliers is crucial for process optimization, potentially reducing production time and enhancing overall manufacturing efficiency.

Production Time engine (min)	
Mean	50.722
Standard Error	0.65473
Median	49.35
Mode	46.5
Standard Deviation	4.629642
Sample Variance	21.43359
Kurtosis	1.168985
Skewness	1.262181
Range	19.5
Minimum	45.6
Maximum	65.1
Sum	2536.1
Count	50
Largest(1)	65.1
Smallest(1)	45.6
Confidence Level(95.0%)	1.31573

Lastly, the analysis of blade weight samples in the Blade Weight worksheet depicted a predominant weight range of 4.93-5.03, crucial for blade performance optimization. These insights provide a

valuable foundation for informed decision-making to enhance customer experience, optimize manufacturing processes, and improve product performance at Performance Lawn Equipment.

Blade Weight	Frequency
4.73	2
4.83	16
4.93	91
5.03	131
5.13	88
5.23	20
5.33	1
5.43	0
5.53	0
5.63	0
5.73	0
5.87	1
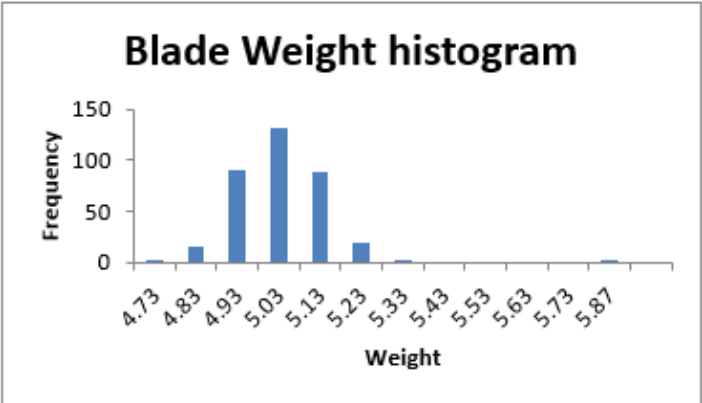
 Recommendations include refining the product/service for improved user experience, aligning pricing with customer expectations, and enhancing service quality to elevate customer satisfaction and loyalty.