

Part I

1. Sleepy Industries Warranty Cards are characterized by 8 criteria in which only three central variables are valuable: Postal Code (First 3 Digits), Line and Income level (dense data). The other variables (Province, Serial #, Return Customer, Why Buy? and Buy Again) neither have sufficient information (sparse data) to be classifiable into unique groups (each data entry is unique) to produce significant insights or value. Clustering the data wouldn't necessarily produce clusters due to the uniqueness of each entry. The last three digits of the Postal Codes were removed to minimize postal code uniqueness. The data contained both numeric information and categorical data. The data was also refined to remove outliers and invalid items that would skew the data.

Using batchgeo.com, the furniture is located across 5 main regions in Canada:

- a. Niagara
 - b. Hamilton
 - c. Greater Toronto Area (GTA)
 - d. Northern Ontario
 - e. Southwest Ontario (London, Waterloo etc.)
2. The raw data was slightly transformed to add additional value during the J48 classification and clustering experiments. The postal code was divided into two additional categories: (first letter in postal code, first three digits in postal code). Furthermore, some of the data was refined in order to maintain consistency. Due to the sparseness of some data categories, they provided little to no insight. Removal of these categories helped remove outliers and misleading clusters that contain minimal value. Some of the classification tree were poor at predicting due to its simplicity.

The following are distinct clusters located within the dataset.

Cluster 1: Income Bracket vs. Product Line

People earning over 75K are favouring the HiHeel, Flash, and Canadian furniture line

People earning below 50k are favouring the Whimsy, Artisan, and Barebones furniture line

Cluster 2: Income vs Postal Code

Wealthier people live in Southwest Ontario and the GTA

The poorer people predominantly live in Niagara Hamilton region

Clustering under Weka are characterized by a visualized aggregation of values that are very close in proximity.

3. **Segment 1:** The Hiheel furniture segment caters to audiences that are searching for furniture that encompasses a hip, chic and modern appeal. Analysis of past customers, whom have purchased from the Hiheel line, have revealed that these customers have an income that is significantly higher than the Canadian average. Over 72% of past customers had an income of over 150k while the remaining 28% had an income between 75K and 150K per year. Furthermore, majority of these customers reside in the Greater Toronto Area.

Contemporary furniture for your living, dining and bedroom needs. The Hiheel furniture series was designed to create everyday comfort for extraordinary people. Sleepy's most premium furniture line caters to the bold; those who understand that comfort and

aesthetics are never compromised in the constant pursuit to achieve the chic and modern. The handcrafted minimalist designs of each Hiheel furniture piece embodies forward thinking without any sacrifice. Stores imitate us... consumers choose us... furniture is us.

Segment 2: The Barebones furniture segment caters to consumers whom are looking for cheap affordable furniture. Barebones customers have resided primarily in North Western Ontario, Hamilton and Niagara region. These customers have a low annual income, either below 30K or between 30K and 50K.

Simple, functional, quality, durable furniture nothing more, nothing less. The Barebones furniture caters for the simple... no frills, no excess but aesthetically pleasing. Just like this advertisement.

Segment 3: The Artisan Line spans across the Ontario region as consumers are searching for furniture that are refined with attention to detail in which each piece is slightly unique in some way. An analysis of the customer demographics whom have purchased from the Artisan line have revealed that majority of these customers have an income between 50K and 150K.

Our designs are dedicated to creating furniture styles that will complement any of your decorating styles. Each furniture is produced carefully, piece by piece, ensuring quality constructing and workmanship. With each piece slightly unique, every piece of furniture that comes from the Artisan line will be one of a kind. We have a vast selection of wood and fabric to ensure that you bring home state-of-the-art furniture that is unparalleled in home quality and design. Each piece undergoes extensive critical evaluation before they are labelled as finished.

Part II

1.

	Internal	External	Free/Not Free	Easy or Hard to Get	Importance
1. Sales by SKU	X		Free	Easy	Identify main revenue drivers and underperforming revenue drivers.
2. In store customer traffic	X		Free	Medium	Understand if any correlation exists between customer traffic and sales (low and high traffic volume)
3. Online customer traffic	X		Free	Easy	Online impact in improving sales
4. Digital Impressions	X		Free	Easy	Identify online user engagement (website and social media)
5. Customer registry	X		Free	Easy	Identifying if people are interested in knowing about sales, promotions and company updates
6. 3 rd party audit		X	Not Free	Medium	Unbiased review of corporate threats opportunities, strengths and weaknesses
7. Promotional Campaign	X		Free	Easy	Review the impact of promotions have on sales.
8. Customer Satisfaction	X		Free	Easy	Link sales against client satisfaction
9. Returns	X		Free	Easy	Monitor sales against returns to understand true ROI over time
10. Competitive Stance / Market Share		X	Not Free	Hard	Understand the competitive nature and Sleep's position in the market (leader / trailer) and how it is evolving over time
11. Price elasticity	X		Free	Medium	Understand how vulnerable each product line is against fluctuations in pricing. What happens to profitability if prices increase / decrease by x%
12. Sales / Profit by channel	X		Free	Easy	Understand which sales channels (direct, online, indirect) is most profitable
13. Impact of R&D	X		Free	Medium	Understand impact of investing \$ in product development and the effect on ROI
14. Client complaints	X		Free	Easy	Monitor complaints by product line over time, and impact of any rebates on relative ROI

15. Supply Chain	X		Free	Easy	Understand supply chain relationships in order to cut down costs and increase sales margin. Potential opportunities to pass on savings onto consumers to increase traffic flow and sales volume. Supply chain improvements are the best cost reduction initiatives.
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2. Data Analysis Plan:

- i) **Web Marketing Analysis:** Obtain insight on online consumer purchases, interests, metadata (view count, bookmarked pages, search queries etc.). Identify if furniture lines with higher view count have higher sales. Is there
 - Hope to obtain insight on online consumer buying behaviours and insight.
- ii) **Marketplace Competitive Analysis:** Understand the competitive landscape and who are Sleepy's main competitors. Is the high level of competition driving sales down? If there is low level of competition, why is sales low?
 - Understand the company's strengths and weaknesses in various markets, how they fair against the competitors and brand awareness.
- iii) **Consumer Analysis:** Are consumers content and satisfied about the various furniture lines and what can be done to improve customer satisfaction and retention. Do satisfied customers purchase more furniture and are they inclined to refer customers to your store. Additional insights can be drawn from customer review and focus groups.
- iv) **Sales/Profitability Analysis:** Review the operating and overhead expenses associated with Sleepy Industries. Understand what sales volume is required to break even and what operations are unnecessary.
- v) **Traffic Analysis:** Is there an association between costs, traffic and shipment times? Are goods being transported during high traffic, causing expenses to increase? Increase in freight size or frequency may reduce transport costs and transport time.
- vi) **Complexity:** Is there a correlation between product complexity and associated costs? What initiatives can be undertaken to minimize expenses. Will customers purchase products that are less complex?
- vii) **Quality vs. Quantity:** Are all product lines contributing positively towards Sleepy's bottom line? Should removal of low performing furniture to focus on high performing furniture a necessity to boost sales volume? Which sales channels are the most essential to the company?
- viii) **Seasons:** Does the season affect sales volume? Do customers purchase more furniture during one season compared to another?
- ix) **Comparative Purchases:** If customers purchase one piece of furniture, do they often purchase another type of furniture? Identify the potential to cross sale furniture products (i.e. bundling).

- x) **Operations and Supply Chain Analysis:** Review of the furniture supply chain and operations to identify cost saving initiatives and improve average gross margin per unit.

- 3. The top three analytics exercises that would be essential to meet the needs of the company are the following:
 - a. **Sales/Profitability Analysis:** remove redundancies and focus on high yielding revenue sources
 - b. **Operations and Supply Chain Analysis:** highest probability of reducing costs and expenses
 - c. **Marketplace Competitive Analysis:** finding how to achieve maximum ROI through gaining competitive market place advantage
- 4. Cut down product lines and focus on highest yielding products. Streamline sales operations and focus on most profitable customer. Paetos principle states that 80% revenue stems from 20% of the customer base. Focusing on that 20% customer base and expand on it is essential.