International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2020): 7.803

Household Garbage - A Valuable Source of Big Data

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Abstract: ***This article talks about a new data source (Household garbage data) that most companies are currently missing to understand the customer real behavior. If the household garbage data was analyzed together with the existing data sources that companies have then it will give a completely different perspective and insights of their current and potential customers which would help the companies in designing better marketing strategies to acquire new customers and to repeat the existing customers there by increasing the revenue.***

Keywords: Data Science, Big Data, Machine Learning (ML), Artificial Intelligence (AI), Data Scientist, Advancing data science sector, Contributions to the digital analytics

1. Introduction

What is Household garbage data?

Household waste comes in many forms. There is personal food waste, which can account for as much as 40 percent of the food that is brought into the home. Things like food packaging, food scraps, beverage cans, food cans, newspapers, magazines, cigarette brands, disposables, car maintenance fluids, engine parts, home improvement products like paints and varnishes, pesticides, herbicides, furniture, appliances, batteries, e - waste, and many other items comes into the mix. Household garbage data can provide clear information on broad topics like whether total food wastage increased over time, some specific cultural behaviors such as alcohol use, condom use or correct birth control use.

Garbage does not lie

Cultural anthropologists and traditional market research companies frequently rely on interviews, observations, and questionnaires with members of the target population. Interviewees are very aware that they are being examined and may not answer completely truthfully. For example, unhealthy snacks and processed meats are repeatedly underreported and conversely produce, dairy products, and high fiber cereals are over reported. Garbage data reveals the genuine social practices regarding food wastage and consumption. These discoveries can lead to more rapid implementation of practical changes in consumer behaviors rather than waiting years for habits to evolve.

Garbage data is not limited to observing food product waste; it also gives us the complete information on household items discarded by various groups in a locality/geography. For example, items discarded by socioeconomic groups such as low - income/middle - class/wealthy etc.

How to collect the garbage data?

- Each locality has garbage truck drivers collecting the garbage of households every week; they dispose garbage according to set policies and procedures. The garbage carts will have an RFID (radio frequency identification chip) to track the address of households.
- Every week, once the garbage of all households from one locality is collected, the truck driver can capture pictures of the entire garbage of that locality before disposing it and save the garbage pictures in a folder which can be shared with the concerned authorities.
- All the garbage pictures collected from respective localities can be merged to have the complete garbage information of a geography.
- Once all the pictures are collected, they are linked to their respective localities using RFID and are analyzed to see which food items are mostly wasted by locality, e-waste by locality, cigarette brands by locality, alcohol brands by locality and many hidden facts about the households by locality which can't be captured through surveys.
- While tracking e-waste, not just the devices, all the peripherals that go with the devices should be tracked - chargers, cables, batteries, gaming controllers, earphones, and anything else that supports the devices. E-waste tracking may be a long-term, perhaps tracking for a year to understand the waste created from the entertainment and technology habits.

Detecting objects in pictures

Objects in household garbage pictures can be identified using Google Net software which can easily identify lots of objects in a picture, even if they are partly obscured. The key here is a neural network that can rapidly refine the criteria it's looking for without requiring a lot of extra computing power. The result is a far deeper scanning system that can both identify more objects and make better guesses. It can spot tons of items in a single picture and can report the object details in a Google spread sheet which can be used for analysis.

Business advantage of using household garbage data

Linking garbage data of the locality to customer demographics and motivations might showcase new areas of business improvements. Advantages of using garbage data:

- Garbage data are independent of respondent bias
- Unlike interviews and questionnaire surveys, refuse studies cause no respondent inconvenience
- Garbage data is unbiased as it can give complete information about households eating/buying patterns in a geographic location despite of age/gender/location, whereas the POS and consumer survey data samples are biased as most of the companies does not collect the POS

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data from all the retailers and does not take surveys from all the consumers (which is practically not possible even if they want to)

- Business decisions and new business insights derived from unbiased data like garbage will be more accurate than those derived from POS and survey data
- The data recorded can be very specific and quantitative. Information on packages tells specific quantities, costs, and brands, which are usually well beyond a respondent's recall
- Complete picture of the brands of different items that are used by households in a locality/geography
- Understanding of the food items that are most wasted by the households in a locality/geography
- Better understanding of e - waste like which technology is no longer interesting the customers in a locality/geography
- Comparing the waste from different localities might yield valuable insights. The localities can be grouped based on similar garbage waste
- Understanding the locality waste by ethnicity might yield good insights to marketers to create ethnic targeted messages
- We can track how many localities are participating in recycling activity monthly using RFID technology

2. Conclusion

Household garbage data has lot of potential to unhide the hidden patterns in the customer behavior which most companies fail to recognize. This article opens a new perspective for the companies relying on big data and data sciences for business improvements.

3. Future Scope

New data sources that can add real value to the businesses should always be identified and used as part of the data science projects in order the make the predictions of the Machine Learning (ML) and Artificial Intelligence (AI) algorithms more accurate.

Author Profile

Radha Krishna Siseer Mylavarapu is a well - known data scientist for his phenomenal skills in building Artificial Intelligence (AI) and Machine Learning (ML) algorithms. His contributions to the field of data science and big data are invaluable and this article is just one of the many contributions that he made to the data science sector. He is currently working as Associate Architect in digital Analytics for Virtusa Corporation.

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