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Customer Segmentation with Machine Learning

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Abstract: *Customer segmentation is the process of dividing a company's customers into groups based on common characteristics so companies can market to each group effectively and appropriately. In business-to-consumer marketing, companies often segment customers according to demographics that include: Age, Gender, Marital status Location (urban, suburban, rural) Life stage (single, married, divorced, empty-nester, retired, etc.) Customer Segmentation helps a company Create and communicate targeted marketing messages that will resonate with specific customers, but not with others. Customer segmentation requires a company to gather specific data about customers and analayz it to identify patterns that can be used to create groupings. Some data can be gathered from purchasing information job title, geography, or products purchased, for example. Some of it might be gleaned from how the customer entered your system.*

Keywords: Smart Customer Segmentation, Data Science, Machine Learning, Python, etc.

I. INTRODUCTION

Customer segmentation analysis is the process performed when looking to discover insights that define specific segments of customers. Marketers and brands leverage this process to determine what campaigns, offers, or products to leverage when communicating with specific segments.

For example, a retail brand looking to determine how to reactivate lapsed customers might create a segment of customers who purchased in the past and haven't purchased or browsed the eCommerce store in the past 30 days. It might then analyze that segment to understand what type of products these customers have purchased in the past, what is their discount affinity and more. Using this information, the marketing team can determine the best campaign to create to reactivate these lapsed customers.

Similarly, a company can use customer segmentation analysis to determine the value of certain segments by analyzing a segment's predicted Future Value, average order value, loyalty tier distribution, and more.

II. CUSTOMER SEGMENTATION MODELS

What is a Customer Segmentation Model?

A customer segmentation model is a way of dividing a wide group of people into smaller groups based on their commonalities. How you divide your larger customer base into those smaller subgroups will vary based on what your brand does and who your customers generally are.

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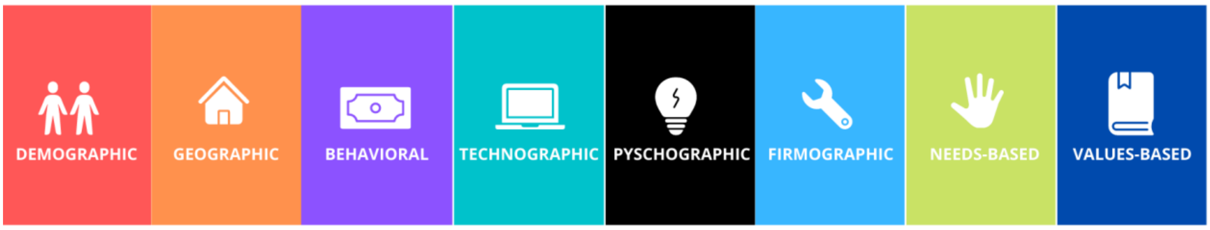
If you're a business-to-business brand providing accounting services to small and medium-sized businesses, one of your segmentation models may focus on the different industries in which your customers' businesses operate. You would be using an industry-specific segmentation model.
For a business-to-consumer brand, your customer segmentation models may focus on shared demographics like age, gender, and income level. How you divide your customer base varies on the characteristics you want to target with more personalized messaging.

What are the Types of Customer Segmentation Models?



Successful customer segmentation is not a one-size-fits-all approach. There are many different models to explore:

- **Demographic Segmentation**
  Demographics are population-related characteristics such as income, education level, gender, and age. The various demographic characteristics can be used together to create segmented customer groups, most useful to brands that sell various products.
  For example, a company that sells both mid-range and luxury bath products for women and men may segment their customers by gender as well as income. This way they can create ads that target women with an annual income of $150,000 and separate ads for men with an annual income of $70,000.

- **Behavioral Segmentation**
  Behavioral segmentation groups consumers together by habits and behaviors, rather than external demographic factors. For example, purchase history and preferred social media platform usage. You can focus ads on a certain social platform to reach and/or create reminders or sales emails to regular or repeat online buyers.

- **Psychographic Segmentation**
  Psychographic segmentation dives even deeper into the internal workings of your consumers by grouping them based on psychological characteristics, including personality, habits, beliefs, and interests.

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Psychographics are great for lifestyle brands that want to align themselves with consumers who live or aspire to live the lifestyle that the brand promotes. Brands that sell outdoor camping gear, for example, want to connect with outdoor and travel enthusiasts.

- **Geographic Segmentation**
  Geographic location is important to brands in a number of industries. Real estate agencies, for example, want to connect with homeowners selling their homes, potential buyers, and people looking to relocate to a specific area.
  Other businesses may sell products tailored to people living in particular climates. Understanding the needs and challenges of consumers living in different locations is a core element of successfully marketing your products or services in those locales.

- **Technographic Segmentation**
  Technographic segmentation, or creating subgroups and customer profiles around the technology your consumers use, is becoming increasingly popular. As more businesses have moved their operations online, this has opened the door to growth in industries like SaaS and online marketing analytics.
  Technographic segmentation lets you target consumers that use different types of software or online services in a highly personalized fashion.

- **Firmographic Segmentation**
  Millennials vs. Gen X'ers vs. Gen Z vs. Boomers – we're becoming more and more comfortable with the idea of these generational divides. So much so that firmographic segmentation, or creating subgroups simply around the decades or eras into which your consumers were born, is also on the rise.
  And it makes sense – someone born in 1980 will be at a different stage of life, with different needs and concerns, than someone born in 2000.

- **Needs-Based Segmentation**
  Needs-based segmentation begins with a simple question: Who needs what you've got?
  Dividing your consumers into groups around their needs is a great way to keep your marketing messages focused tightly on your products or services and how they meet those needs. A clothing company can market office casual wear to business professionals, athletic gear to yoga enthusiasts, and kids' clothing to families.

- **Value-Based Segmentation**
  This model takes the lens and focuses it more directly on what serves your brand. Which group or groups of customers are currently providing the most value – the most return business, the highest return on your ROI?

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Using lifetime value as your measuring stick, you can target marketing messages to the consumers who are biggest supporters and focus on continuing to build that loyalty and trust.

III. LITERATURE REVIEW

Paper 1: "Customer Segmentation in the Age of Big Data:
Author: Zhang, Z., & Zhao, S.
Year of Publication: 2018
Three disciplines are merged to create a new approach to decades-old marketing method – segmentation. Marketing practitioners and decision-makers need to understand the concept of predictive modelling and have an understanding of how to use big data for segmentation purposes. In this research, the literature of segmentation, predictive modelling and big data are analysed and all three dimensions are connected into one process that is described and performed on company data. The study is performed on data provided by nonbank lending company AS 4finance. The study aims to create a predictive model that will segment customers into the ones that most likely will not become inactive and other customers. The outcome of segmentation is tested in sales activity and results are described in this research paper. Results show that there is an economic benefit for the company to create such customer segmentation.

Paper 2: "Customer Segmentation in E-commerce: A Comparative Study of Methods and Applications"
Authors: Sarah Johnson and Mark Anderson
Year of Publication: 2019
With millions of competing commercial websites, attracting and retaining high-quality customers is critical for success. To gain an edge over competitors, these websites adopt different marketing methods, many of which are based on updated, Internet-oriented versions of traditional marketing strategies (Libai et al., 2003, Rapp et al., 2010). Hoffman and Novak (2000) define working out what customers need and how to satisfy them as a "work in process." New theoretical and empirical applications continually enrich the literature. Zhang, Hu, Guo, and Liu (2017) and Hair, Hult, Ringle, Sarstedt, and Thiele (2017) focused on applying traditional methods to e-commerce sites and extending these methods. In studies of cashback sites, such applications are yielding promising results. The principal objective of this paper is to provide countermeasures against possible security breaches at several stages. This design will eliminate the possibility of scams to an admirable extent and ensure that the account holders know the schemes they can apply.

IV. CONCLUSION

Customer segmentation using machine learning techniques offers significant benefits for businesses in understanding their customer base and tailoring marketing strategies. Through this approach, businesses can identify distinct customer groups based on their behavior, preferences, and characteristics, allowing for more targeted and personalized marketing campaigns. By leveraging ML algorithms such as clustering, classification, and association, businesses can extract valuable insights from large volumes of data, leading to improved customer satisfaction, retention, and profitability.

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