Objectives

- **Understand the role of Segmentation**
- **Familiarize with the Segmentation process**
- **Learn about Cluster Analysis**
- **Familiarize with the ADT Cluster Analysis process**

What is Segmentation?

- **Involves division of cases into homogeneous groups for Niche Marketing purposes.**
- **This method helps to optimize specific product/service offerings**
- **Segments are created to minimize inherent differences between cases within each segment and maximize differences between each segment.**
- **These segments will respond differently to promotions, communications and advertising.**

Customer Based Segmentation

stribution of customers mature market

e high

low
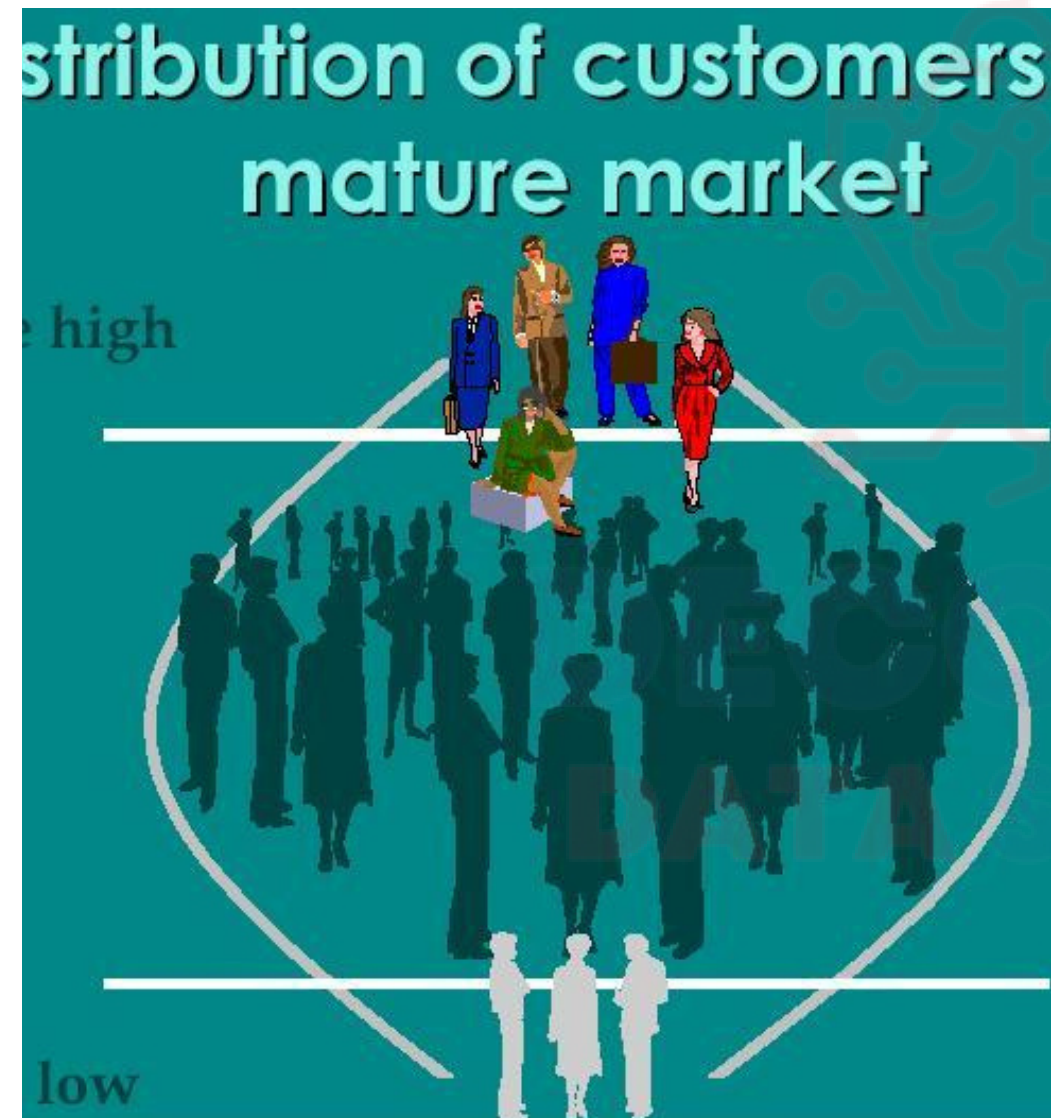
- Customers at one extreme are largely insensitive to price and customers at the other extreme are very sensitive to price
- In the middle is a large group of customers for whom competitors will all too readily assume that price is their main requirement – but this is not the case
- A lack of understanding by suppliers about real needs of customers forces them to trade on price
- Through Market Segmentation, they can avoid the commodity trap by understanding the real needs of customers at an earlier stage and develop their offers accordingly

Segments – To Be Identified

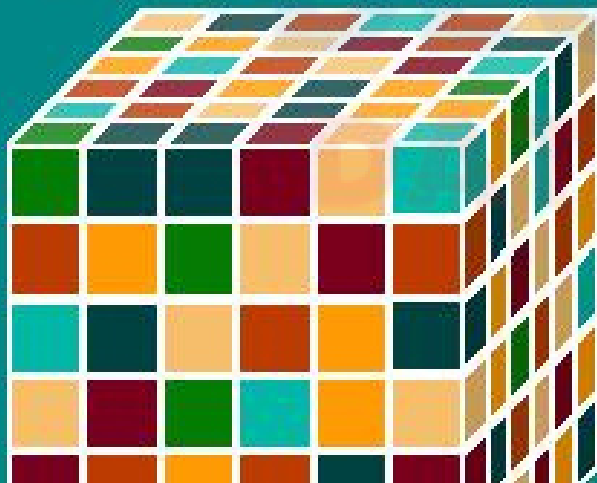1. No market is totally homogeneous
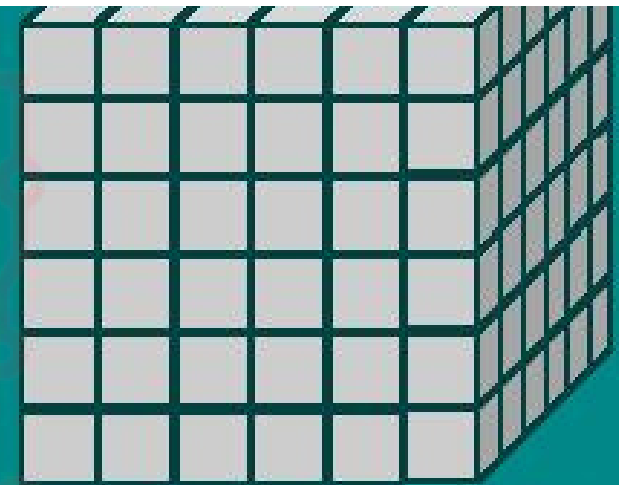
2. The reality is, markets consist of a number of purchase combinations

3. And by understanding the benefits being sought we can explain different
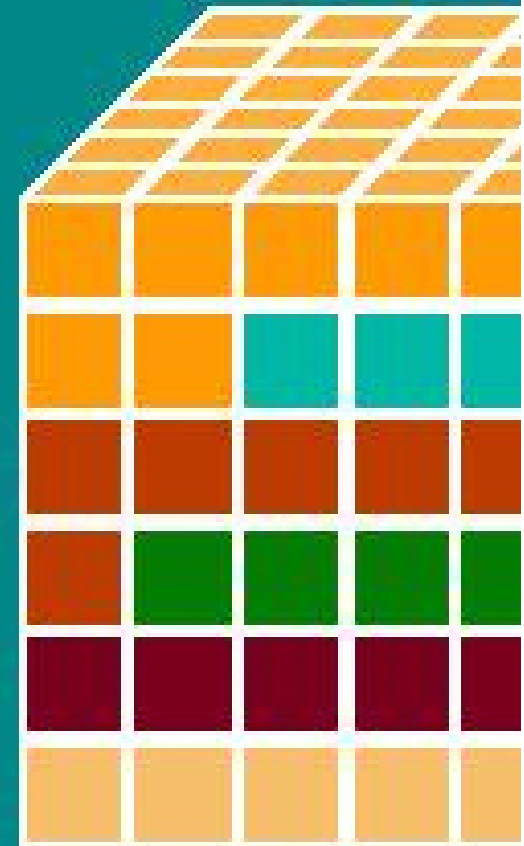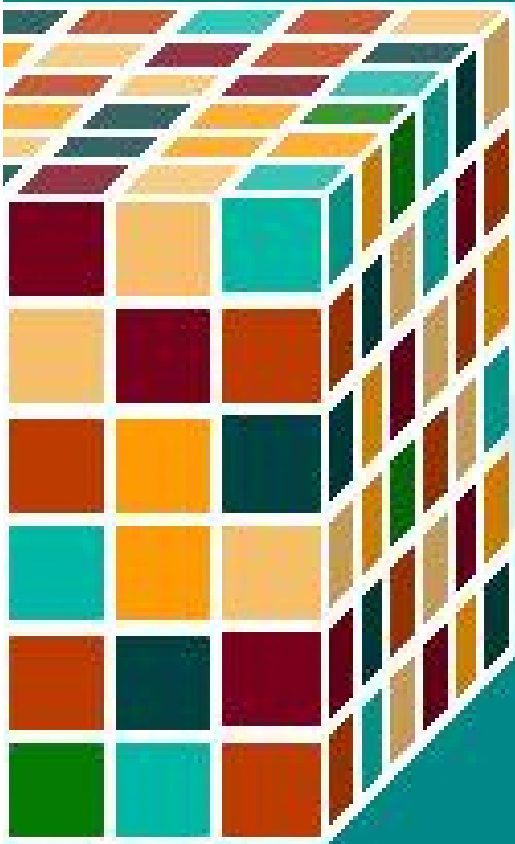
Market Segmentation Techniques

- **Cross-Tabulations**

- **Objective Segmentation - CHAID/CART Methods**

- **Subjective Segmentation - Cluster Analysis**

- **Discriminant Factor Analysis (Predictive Segmentation)**

Advantages of Segmentation

- **Easier Marketing**
  - **It is easier to identify and address the needs of smaller groups of customers, particularly if they have many characteristics in common.**
- **Find Niches**
  - **Identify under-served or un-served groups.**
- **Efficient**
  - **Allows more efficient use of marketing resources by focusing the best strategies on the best segments for your offering in terms of product, price, promotion, and place**

Segmentation Analysis Steps

i. **Data Analysis (DA)**
   1. **Data Discovery**
   2. **Data Cleaning**
   3. **Exploratory Analysis**

ii. **Segmentation Model Plan (SMP)**
   1. **Variable Selection/Creation (For Segmentation/Profiling)**
   2. **Outlier Treatment**
   3. **Value Standardization**
   4. **Factor Analysis**
   5. **Cluster Analysis**
      i. **Hierarchical - Agglomerative & Divisive Methods (SPSS/SAS)**
      ii. **K-Means Algorithm (SPSS/SAS)**
      iii. **Two-Step Clustering (SPSS)**
      iv. **Expectation Maximization Algorithm (Latent Gold)**
   6. **Segments Evaluation**
      i. **Clustering Solutions**
      ii. **Profiling/Descriptive Reports**
      iii. **Cross-Tabulations/Graphic Insights**

SMP – Cluster Analysis (Overview)

- **Description**
  - **A multivariate process by which objects in the data are classified into different groups based on a pre-determined selection criterion**
  - **The idea is to obtain well formed groups that are actionable from a business perspective ⬜ They should inform the supplier about how to build/modify a marketing strategy to cater to the needs of each identified segment of the population**
- **Factors Affecting Goodness of Clusters**
  - **Variables used for clustering**
  - **Type of clustering method used**
  - **Number of clusters formed**
  - **Size of clusters**
  - **Homogeneity within each cluster**
  - **Heterogeneity between clusters**

SMP – Sample Clustering Algorithm (K-Means)

Description:

- **A non-hierarchical process following combined methods of parallel threshold and optimization techniques**

Process:

- **Assume some number of clusters K in the data**
- **Initialize the clusters by assigning each an initial mean value (the centroid of the cluster)**
- **Using these cluster means, classify each example in the data set according to which cluster it is closest to (has with the closest mean)**
- **Using these classifications, compute a new mean value for each cluster by simply averaging the data currently in that cluster**
- **Repeat last 2 steps until convergence (classifications and mean stop changing)**

SMP – CHAID Analysis

Description:

- **CHAID - Chi-Square Automatic Interaction Detector**
- **Exploratory/Objective method - Used to study the relationship between a dependent variable and a series of predictor variables**

Process:

- **CHAID modeling selects a set of predictors and their interactions that optimally predict the dependent measure.**
- **The developed model is a Classification Tree (CF Tree), or Data Partitioning Tree**
  - **Shows how major "types" formed from the independent variables differentially predict a criterion or dependent variable.**

SMP – Sample CHAID Result

Credit ranking (1=default)

Cat.	%	n
Bad	52.01	168
Good	47.99	155
Total	(100.00)	323

Paid Weekly/Monthly
P-value=0.0000; Chi-square=179.6665; df=1

Weekly pay

Cat.	%	n
Bad	86.67	143
Good	13.33	22
Total	(51.08)	165

Age Categorical
P-value=0.0000; Chi-square=30.1113; df=1

Monthly salary

Cat.	%	n
Bad	15.82	25
Good	84.18	133
Total	(48.92)	158

Age Categorical
P-value=0.0000; Chi-square=58.7255; df=1

Young (< 25);Middle (25-35)

Cat.	%	n
Bad	90.51	143
Good	9.49	15
Total	(48.92)	158

Old (> 35)

Cat.	%	n
Bad	0.00	0
Good	100.00	7
Total	(2.17)	7

Young (< 25)

Cat.	%	n
Bad	48.98	24
Good	51.02	25
Total	(15.17)	49

Middle (25-35);Old (> 35)

Cat.	%	n
Bad	0.92	1
Good	99.08	108
Total	(33.75)	109

Social Class
P-value=0.0016; Chi-square=12.0388; df=1

Management;Clerical

Cat.	%	n
Bad	0.00	0
Good	100.00	8
Total	(2.48)	8

Professional

Cat.	%	n
Bad	58.54	24
Good	41.46	17
Total	(12.69)	41

What Next? Join the Free AI Community

Artificial Intelligence

2,810 members

SCAN ME

https://nas.io/artificialintelligence

Free

BENEFITS

- Three weekly events
- Live workshops
- Knowledge Shorts 50+ Videos
- Basic AI & DS courses
- DS & AI materials
- Webinar recording
- Guidance from experts
- 24 by 7 Whatsapp & Discord
- Latest ai Discussion & More...

nas.io/artificialintelligence

DECODING DATA SCIENCE

Community Profile

DECODING DATA SCIENCE

What Does The Community Provide?

Gen AI Courses

✅ **Generative AI (chatGPT) for Business**
✅ **Prompt Engineering for Developers**
✅ **Langchain for AI App Development**

Recordings

✅ **Outcome-based Workshops**
✅ **AI Community Meetup Recordings**
✅ **Python Projects Videos**
✅ **AI & DS Career & Learning Webinar Series**

Data Science Courses

✅ **Basic Excel For Data Science**
✅ **Basic SQL For AI/Data Science**
✅ **Basic Python for AI/Data Jobs**
✅ **Advanced Python for AI/DS Jobs**
✅ **Basic PowerBI for AI/Data Science**
✅ **Machine Learning**
✅ **Knowledge Shorts**

Resources

✅ **Generative AI Resources**
✅ **Sample Datasets & Projects**
✅ **Sample Reviewed Resume**
✅ **Ready to use Resume Template**
✅ **Linkedin Profile Optimization**
✅ **Essential SQL Documents**
✅ **Essential Python Documents**
✅ **Machine Learning Documents**

Every week we have live Zoom calls, Physical Meetups and LinkedIn Audio events and WhatsApp discussions. All calls are recorded and archived.

🌐 nas.io/artificialintelligence