Think Like an Information Scientist: Technology & Big Data and Its Place in Cannabis

Introduction: Cannabis and its Place In Big Data

If you haven't considered how data can inform your sales strategy and approach to cannabis retail, you could be missing out on insights that could bring tremendous growth to your bottom line.

"Big Data" has emerged as a [common part of corporate jargon](#) particularly over the last decade as large-scale corporations recognized that the data sets that they had available were beyond human abilities for analysis, requiring a blend of the intricacy of Information Science with advanced computing. Through Big Data, new insights, trends, and forms of value emerge, and corporations can more clearly and accurately understand the implications of their strategies.

The modern cannabis retail industry is driven by Big Data. Operations for successful cannabis businesses are decided upon through extensive data analytics that track and monitor the entire cannabis supply chain from seed to sale. Big Data in the cannabis industry employs advanced principles of Information Science to bring information into the hands of cannabis retailers that provide valuable insights for their business operations through the data that's uncovered through analytics.

This is an exploration of the place of Big Data in the retail space, with a goal to demonstrate just some of what's possible in cannabis retail when you integrate Big Data, as well as an exploration of some principles of Information Science that can be applied in cannabis retail.

Origin of Big Data in Cannabis

In 2010, Eric Schmidt, then-chairman of Google [revealed](#) that as much data is now being created every two days, as was created from the beginning of time to 2003. Data is being generated at rapid rates in this information and knowledge-based economy. With this volume of data, it was estimated that there would be an extreme shortage of Information and Data Scientists as the information available greatly exceeds the human's ability to analyze it.

Simply, there is more data available for almost everything on this planet that we know what to do with. Learning how to make use of the data and information that is constantly being generated, revised, reproduced, replicated, and regenerated in meaningful ways became the new challenge of the century.

As the potential for Big Data became realized, it began making its way into commodities, some of which would be considered controversial. From weapons, to precious gems, data became an important way of tracking, and monitoring, the sale and distribution of goods that require knowledge to understand the implications of an industry.

For the pharmaceutical industry, Big Data met [Big Pharma](#), as the industry as a whole understood how data collection of the whole manufacturing, distribution, and prescribing process began to reveal new directions on health care. Big Data helped with research and development, assessing the efficiency of research and clinical trials, and finding new tools to help physicians take individualized approaches to their patients. Big Data began to reveal more about health care than what was available to the individual assessor.

Soon, cannabis and industry leaders grasped onto Big Data and the processes involved in Information Science to provide seed to sale data for some of the industry's leading brands.

Through leveraging the possibilities of what Big Data can reveal to the cannabis industry, cannabis tech firms began to uncover information and insights regarding market intelligence, sales and inventory management, and sales trends that helped big cannabis companies drive their supply chain.

Applying Information Science to the Retail Space

Information Science involves using evidence and data to help drive decision-making. While "evidence-based" has been a recently scorned term at the federal level, the cannabis industry knows better in that we can derive a great deal of profitable insight from evidence.

Until now, the use of data in the retail sector hasn't been all that prevalent, and it's spelled lost profits. A 2013 study reported on in *Harvard Business Review* looked at 51 companies' use of data on a consistent basis and concluded that the use of data in decision making is "few and far between." The reason? They don't know how to manage the information they have in order to reveal proper insights that lead to evidence-based decision-making. The ones that implemented evidence-based decision making saw a marked improvement in their business performance. This concluded that those retailers who use data are far more profitable than those who do not.

This article noted four main practices of companies who use evidence-based decision-making:

- The establishment of an undisputed source of performance data;
- Decision makers at all levels are given real-time feedback;
- They consciously articulate their business rules and regularly update them in response to the data and facts they generate;
- They provide high-quality coaching to employees who make daily decisions that affect the data and bottom line

For businesses who rely on data, Big Data isn't only having access to the data and its analysis, but it is integral for retailers to make their data actionable, with a commitment to being nimble, reflexive and driven by what the data reveals. **Data drives change. Data drives business growth.**

The following principles of data management and analysis are critical for retailers to keep in mind when choosing a platform to monitor their retail and market positions:

- **Infrastructure:** Having an infrastructure in place allows adequate data collection and storage;
- **Protection of Data:** When data is stored, it needs to be able to be manipulated for analysis, but remain accurate and free from human error. Any data stored and generated must also abide by state regulations regarding consumer privacy and data security;
- **Accessibility:** In order to make an organization impact, data should be accessible and viewable for everyone within the organization as it's pertinent to their roles;
- **Integration:** Sometimes you have to manage data across many platforms. Data that can interface with other systems, or be integrated into the systems of retail partners (i.e. growers, distributors) will ensure tracking and integrity of data from seed to sale.

How can these principles of data management and information science be applied directly to your cannabis space? Your data can reveal insights about the who, what, when, why and how, that you may not see on the surface until you delve into data through its proper and meaningful analysis.

FEATURES OF BIG DATA THAT HAVE SHAPED CANNABIS RETAIL

Advanced cannabis retail dispensaries that use data in their inventory and sales strategy gain a competitive edge because they understand critical information about their business, and their consumer, when they let the data do the talking rather than relying wholly on human perceptions.

Here are some of the processes and features of Big Data that has been brought into the cannabis retail space:

- Identifying critical data points, indicators, and benchmarks along with relevant opportunities for data collection;
- Building a technical and systems-based infrastructure to support data collection;
- Developing a methodology for data collection, taking into account privacy, ethics, and obligations to keep data secure;
- Building a reporting structure that answers critical questions surrounding the effectiveness of current retail strategies;
- Generating relevant reports, statistics, and supporting data in order to engage in an effective analysis of what the data reveals;
- Implementing a plan of action so to adjust cannabis retail strategies based on what is revealed through the data

This intricate work and dedication to letting data do the taking requires cannabis companies to think like Information Scientists, to help drive sales through data and gain a competitive edge.

SPECIFIC WAYS TO BLEND TECHNOLOGY AND CANNABIS TO CREATE INTEL

When you think like an Information Scientist, cannabis retail locations can proactively use data to develop retail strategies based on insights they don't receive by looking at things at face value, or only looking inward towards sales figures.

The following are some data points collected by industry leaders in cannabis retail. These data points have been extracted by first thinking through the principles of Big Data, then focusing on collecting data that will help drive actionable results. The examples of data points are accompanied by just a few examples of the way data can give you direction on many aspects of your sales and operations.
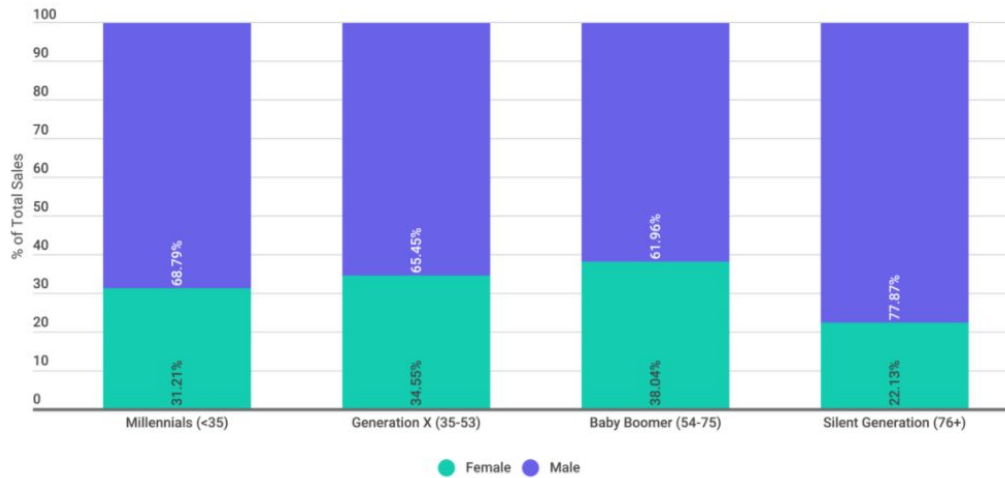
DEMOGRAPHICS

Collecting demographic data helps the cannabis retailer understand more about the WHO in your cannabis retail operations so that you can be sure that you're bringing in the right products that appeal to different generations as well as genders.

#### EXAMPLES OF DEMOGRAPHIC DATA FOR ANALYSIS

PERCENTAGE OF TOTAL SALES FOR EACH GENERATION PER GENDER

Big Data trends are able to look at what generations are leading and sales, and break those generations down to gender. For instance, the above chart demonstrates that women users are greater within the Generation X (34.55%) and Baby Boomer Generations (38.04%), while males make up the majority of cannabis purchasers of the Silent Generation (77.87%). What can this information help you uncover and adjust the sales promotions, merchandising, and cannabis education opportunities within your retail location?

CATEGORY SALES TRENDS BY GENERATION

PERCENTAGE OF TOTAL SALES ACROSS EACH PRODUCT CATEGORY PER GENERATION
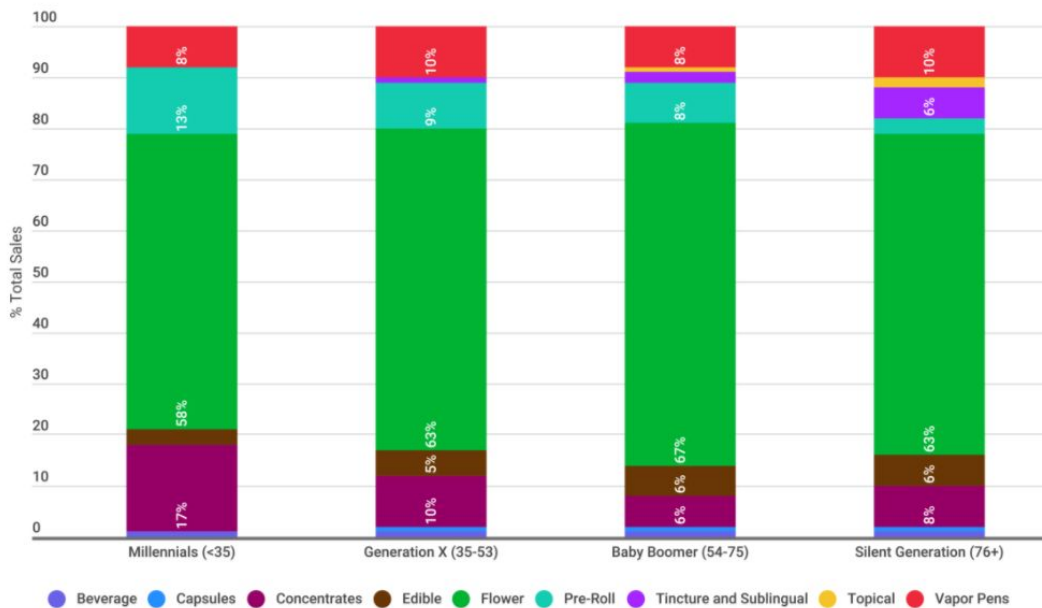
The above chart helps dispensaries see what age groups are using what cannabis products. From the above data, it's clear that the use of concentrates are most common amongst millennials or the under 35 group, with 17% of users reaching for the concentrates as compared to just 6% in their parents' generation.

Flower is leading as the cannabis product of choice for all generation, with the preference being most prevalent within the Baby Boomer generation, who most likely have carried their exposure to and appreciation for dry cannabis flower through from the 60s and 70s to modern day. Topical creams are not so popular among Millennials and Generation X, but has increased needs for use in later life with Baby Boomers and the Silent Generation, which when you think about it, these are the ages where later-life medical conditions like arthritis make themselves more prevalent.

LOCATION DATA

See the differences between rural and urban locations, and understand who your visitors are, what people are buying, and how much at each type of location.

EXAMPLES OF LOCATION DATA

CATEGORY SALES TRENDS BY LOCATION – RURAL, URBAN & SUBURBAN

AVERAGE ITEM PRICE BY STORE TYPE AND CATEGORY

Category	Rural	Suburban	Urban
Beverage	$12.95	$13.47	$12.72
Capsules	$14.88	$16.71	$15.85
Concentrates	$17.09	$20.26	$18.91
Edible	$12.54	$13.51	$13.28
Flower	$18.70	$18.56	$18.74
Pre-Roll	$5.57	$6.12	$5.58
Tincture and Sublingual	$21.67	$20.29	$21.01
Topical	$14.79	$22.39	$21.63
Vapor Pens	$24.58	$25.94	$23.97

● Rural ● Suburban ● Urban

Location matters, and where your cannabis retail store is does affect how much people are willing to pay for their various cannabis product. The above chart, for instance shows important price variances of different products when contextualized into their rural, urban, or suburban locations.

With a generalization, you'll see that those in suburban areas are willing to pay a bit more for their cannabis products, with rural areas paying a bit less than their urban counterparts. Vapor pens are the most expensive cannabis product on the market within suburban locations, while pre-roll joints represent the lowest-price product you can find in cannabis retail locations if you acquire them in rural settings.

Location does matter, and using this type of data ensures you're meeting your customer where they are, providing them accessible pricing in line with the cost of living and economic trends of their specific residential areas.

Understanding current, real-time as well as historical price data will ensure you're giving customers who shop around the best price, and will show you the opportunities where you can raise your prices for certain products for maximum profit on your wholesale prices;

EXAMPLES OF PRICE DATA

PRICE DISPERSION BY PRODUCT

PRICE DISPERSION OF NORTH WEST CANNABIS SOLUTIONS BLUE DREAM (EIGHTH)
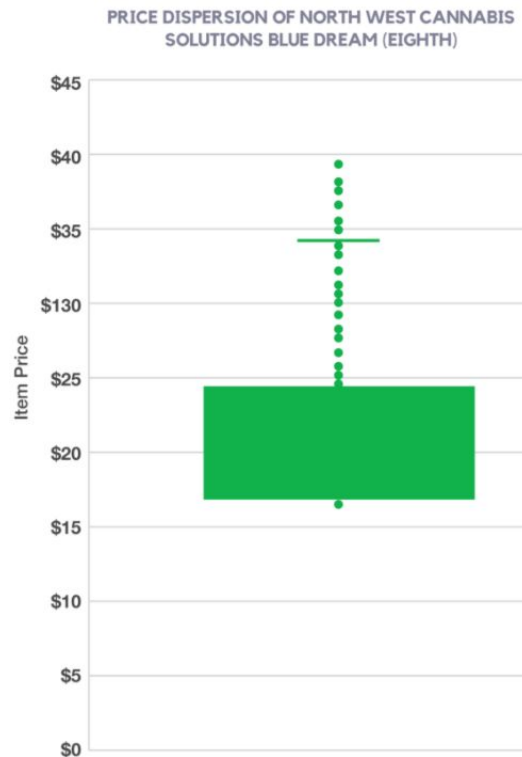

Price dispersion data like the chart above helps you see where your pricing of a specific product falls within the greater market. The above chart demonstrates the spectrum of market-wide pricing of an eighth of Blue Dream.

The price dispersion is concentrated within the $16-24 range, while certain dispensaries choose to go way above (another concentration at $34) while few choosing to discount this particular strain and brand.

This data helps you benchmark your deviance from the average market price, and will help you gain insights into why customers shop around for particular products, ensuring you keep your pricing competitive.

DISTRIBUTION OF PRODUCTS BY AVERAGE ITEM PRICE
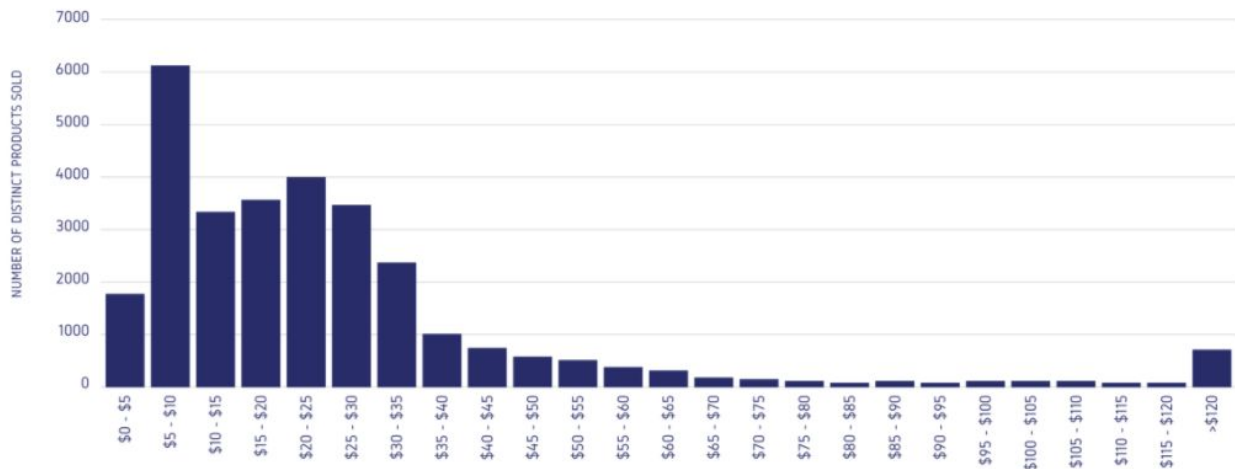
Looking at Distribution Pricing can show you the price points that most products within cannabis dispensaries are being sold at. The above graph shows that most products distributed and sold were within the $5-10 price range, representing greater than 6,000 available products at that price point. Your sales goals can be built around charts like the above, which allow you target sales strategies the market you want to target. Do you want to be the dispensary that offers the products you can scrape together change for, or do you want to offer a more high-end product, that can bring a greater profit when sold to the right demographic, like the 4000 products that fall within the $20-25 range.

AVERAGE PRICING OF ITEMS OVER TIME

AVERAGE PRICE PER GRAM (OR MG) OVER TIME

Average pricing over time helps you see where there can be a potential for something that was once of high price and value to drop in value, and vice versa. They help you see product trends to look out for so you don't find yourself at a loss during a time where prices tend to drop, and you don't adjust your pricing accordingly.

For instance, the above chart shows that the average retail price per gram has declined in just over a 2 year period between 2015 and 2017. When you see these numbers fall, this is where your cannabis retail location will want to compensate by viewing trends over time for other types of products as distribution and consumer trends change.
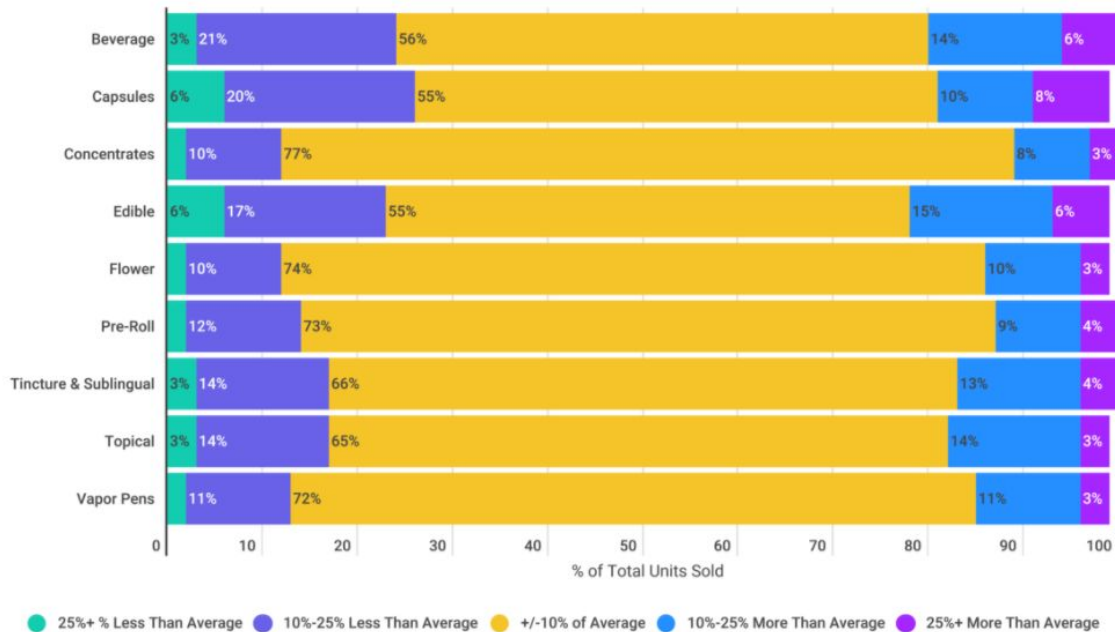
AVERAGE ITEM PRICING OVER TIME

AVERAGE ITEM PRICE

■ JANUARY   ■ JULY

Product	January	July
FLOWER	$17.74	$18.54
PRE-ROLL	$7.29	$6.85
VAPOR PENS	$34.09	$29.25
CONCENTRATES	$23.61	$21.54
EDIBLE	$12.77	$13.11
OTHER	$18.57	$17.97

$0.00 $5.00 $10.00 $15.00 $20.00 $25.00 $30.00 $35.00 $40.00

Use longitudinal data to see pricing trends over a period of a few months within just one year. For example, in this chart examining concentrates, vapor pens were more expensive in January, but fell in price in July where the price of flower slightly rose.

Looking at the data over smaller periods of time allow you to notice intricacies in trends that dictate seasonal purchases, and pricing levels, for certain products. This helps cannabis retailers be as nimble as possible in their pricing, where complacency is not an option to ensure the best return on your inventory.

Legend: 25%+ % Less Than Average · 10%-25% Less Than Average · +/-10% of Average · 10%-25% More Than Average · 25%+ More Than Average

Are you charging as much as you can for a product? Charts like the above allow you to see the spectrum of price variances and markups on specific product categories. For instance, cannabis capsules have the highest number of stores charging 25% more than the average price, while vapor pens, pre-rolls, and concentrates are the least to be sold at less than 25% of the average.
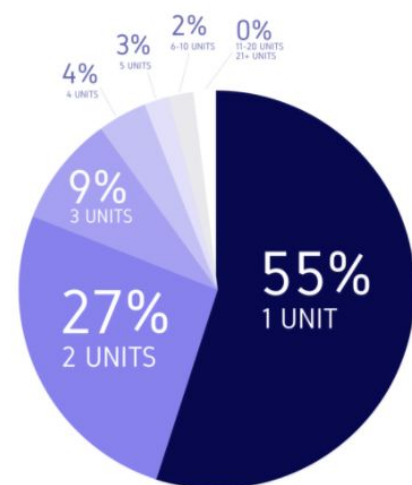
MARKET BASKET ANALYSIS

A market basket analysis is a specific type of retail analysis that brings together the products that consumers will purchase within one visit. This helps retailers organize their stories in a way that drives sales and connects customers with the products they are seeking.
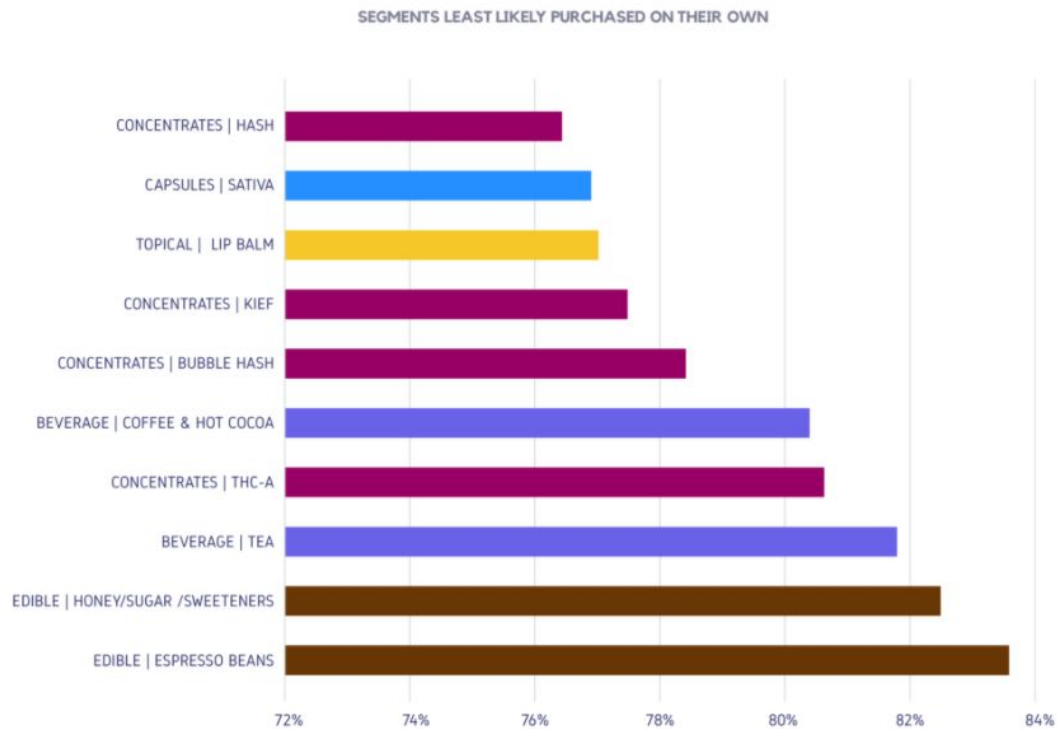
EXAMPLES OF MARKET BASKET ANALYSIS DATA

MARKET BASKET PERCENTAGES BY UNITS

PERCENTAGE OF TOTAL BASKETS BY NUMBER OF UNITS

55% of customers are purchasing only 1 unit in their basket size, but an upselling opportunity is available with the 27% of people who purchase 2 units and the 9% of people who purchase three. What products can you place beside bestsellers to intrigue customers to purchase more products within one visit?

2% 6-10 UNITS
0% 11-20 UNITS 21+ UNITS
3% 5 UNITS
4% 4 UNITS
9% 3 UNITS
27% 2 UNITS
55% 1 UNIT

Product Segments Not Common for Primary Purchase

SEGMENTS LEAST LIKELY PURCHASED ON THEIR OWN

It's important to see what items in your store aren't likely to be items that customers will not go into the store to specifically purchase, but would be added as add-on items or upsold items. Items like edible sweeteners and beverages are products that constitute a secondary purchase other than what a customer came into the store for. Using this data, you can create product pairings that may encourage the sales of complimentary items that wouldn't likely be purchased on their own.

Basket Size by Day of the Week

AVERAGE BASKET SIZE BY DAY OF THE WEEK
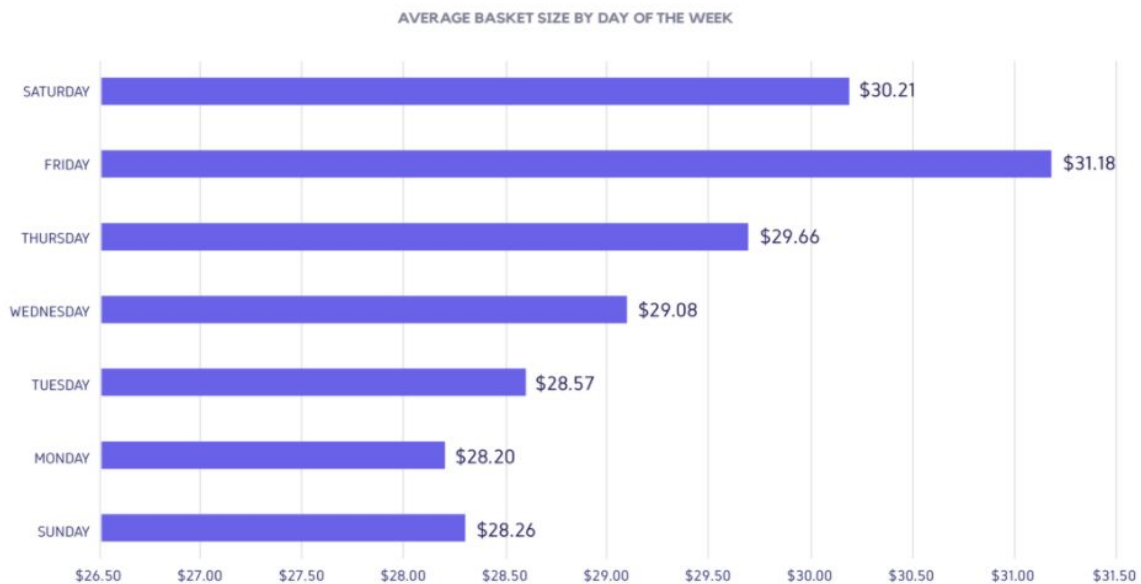
Day of the week data can show which specific days of the week people will be likely to increase their market basket size. As demonstrated by the above chart, people usually go into the weekend with an excitement to stock up on their cannabis supplies for the weekend. On Mondays, they still have purchasing power, but it's greatly reduced when you compare to over the weekend, gradually ramping up again throughout the week. Adjusting your displays or store layout on the days of the week where market basket values are greater can ensure you maximize market basket value potential.

INTEGRATING INFORMATION SCIENCE INTO YOUR CANNABIS RETAIL STRATEGY

Integrating these critical data points into your cannabis retail, the way that advanced tech companies like Headset do for cannabis retail clients, brings together the who, what, where, why, when, and how down to an art and science. These data points, and their interpretation, can reveal through trends, reports, and real-time updates where cannabis retail strategies have exceeded, and where improvement is needed.

A commitment to Big Data means that cannabis retailers let data do the talking, but take measures in ensuring that evaluating your performance doesn't stop there.

Making strategic decisions based on data requires a commitment on the user's end to blend what the data is saying (the quantitative data), with pieces of data that simply can't be collected in a chart, statistic or a point on a graph.

Cannabis retailers should remain dedicated to blending a quantitative approach with qualitative methodologies that help evaluate the specific nuances of a cannabis retail location that makes it unique. Qualitative research methods go beyond the numbers and can help you get more insight into the emotions, feelings, and responses of your clients to assess the quality of their experience.

Here are some simple, yet effective, ways that cannabis retailers can blend the cannabis intelligence provided by Big Data with qualitative approaches that provide a full-bodied picture of performance:

- Conducting focus groups based on collecting customer testimonials and experiences on specific retail strategies;
- Engaging in "shop alongs" with willing customers who will give you insights on their path to purchase through a commentary, allowing you to collect data similar to an ethnography in qualitative research approaches;
- Asking a few customers to provide "shopper diaries" to help them communicate qualitative information about their experience that isn't collected in the POS system;
- Finding opportunities to engage with customers using the products offered by the cannabis retailer in situations where they happen (i.e. outside the cannabis retail space, in social use settings, or in more private settings)

Finding qualitative methods to supplement your quantitative data requires creativity, and a willingness to think outside the box about the ways you assess and evaluate the impact of your cannabis retail operations on your consumer. It also requires you to develop a certain rapport and trust with your cannabis retail customer so that they're open to helping you evaluate your approaches to making cannabis retail a pleasurable experience.

CONCLUSION: APPROACH CANNABIS RETAIL LIKE AN INFORMATION SCIENTIST

Being a cannabis retailer isn't about simply being the place where people get their legal cannabis. It's about applying a proactive, scientific approach to evaluating the consumer experience, and working to stand out amongst a potentially-oversaturated market.

Big Data allows cannabis retailers to stay above the competition by allowing data to identify opportunities for growth. When you embrace Big Data, and the products available on the market that allow you to think like an Information Scientist, you can ensure you are not only meeting the needs of your cannabis retail customer based on market intel, but exceeding within the market in sales, making your cannabis retail destination a stand-out industry leader.