



Drinking from a Pool of Words:

Use of a Master Lexicon for Evaluation of Spirit Categories

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Dedication to Dr. Morten Meilgaard



Genesis of the Master Spirits Lexicon



Development of a Master Spirits Lexicon using the Spectrum Descriptive Analysis Method was born simply – as an outgrowth of evaluating hundreds of spirits samples over the past decade. We have amassed a large collection of terms to describe the complete flavor experience of aroma, aromatics, tastes and chemical feeling factors for dark and light spirits.

While many papers, articles, reviews and web chatter described individual spirits or spirit types, none “put it all together” and looked at spirits flavor holistically. We found this overarching view interesting, both in nuances within types and commonalities across types.



So we thought, why not share with the sensory community?



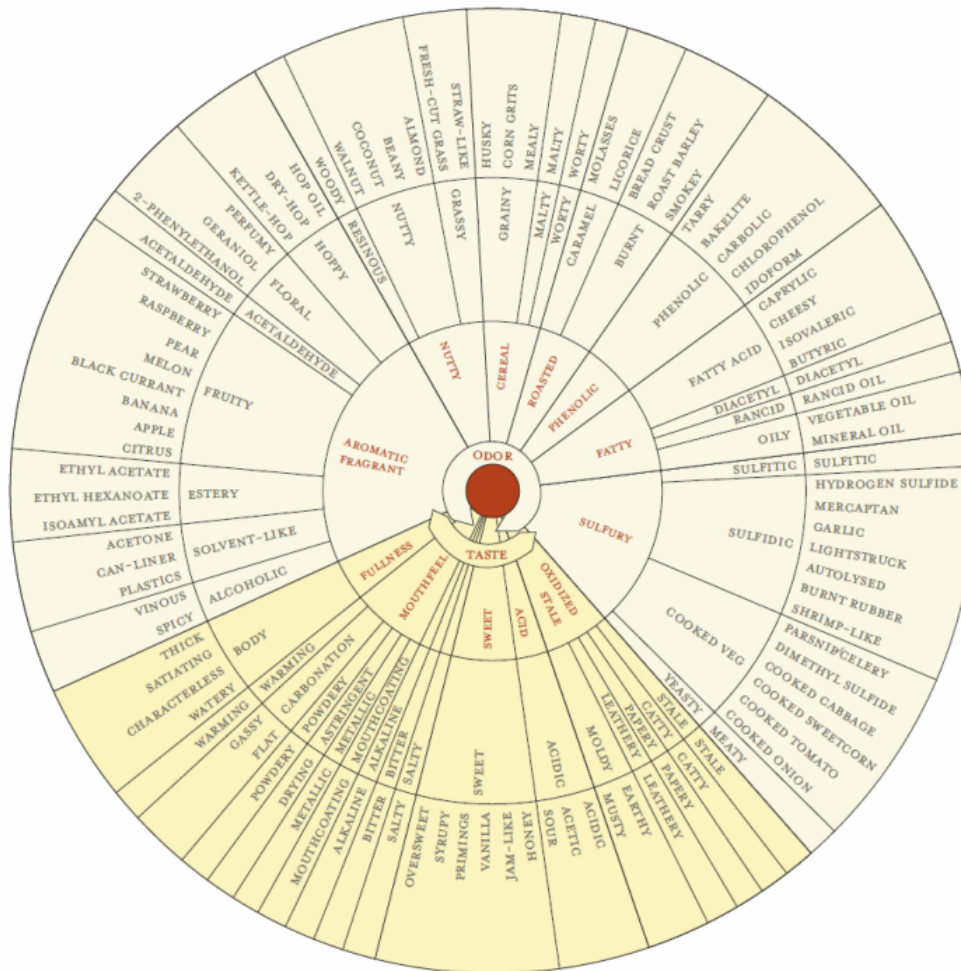
Historic Alcoholic Beverage Master Lexicons:

*Before we start, we must
remember two significant
Alcoholic Beverage Sensory
Master Lexicons*



The Meilgaard Beer Flavor Wheel

BEER FLAVOR WHEEL

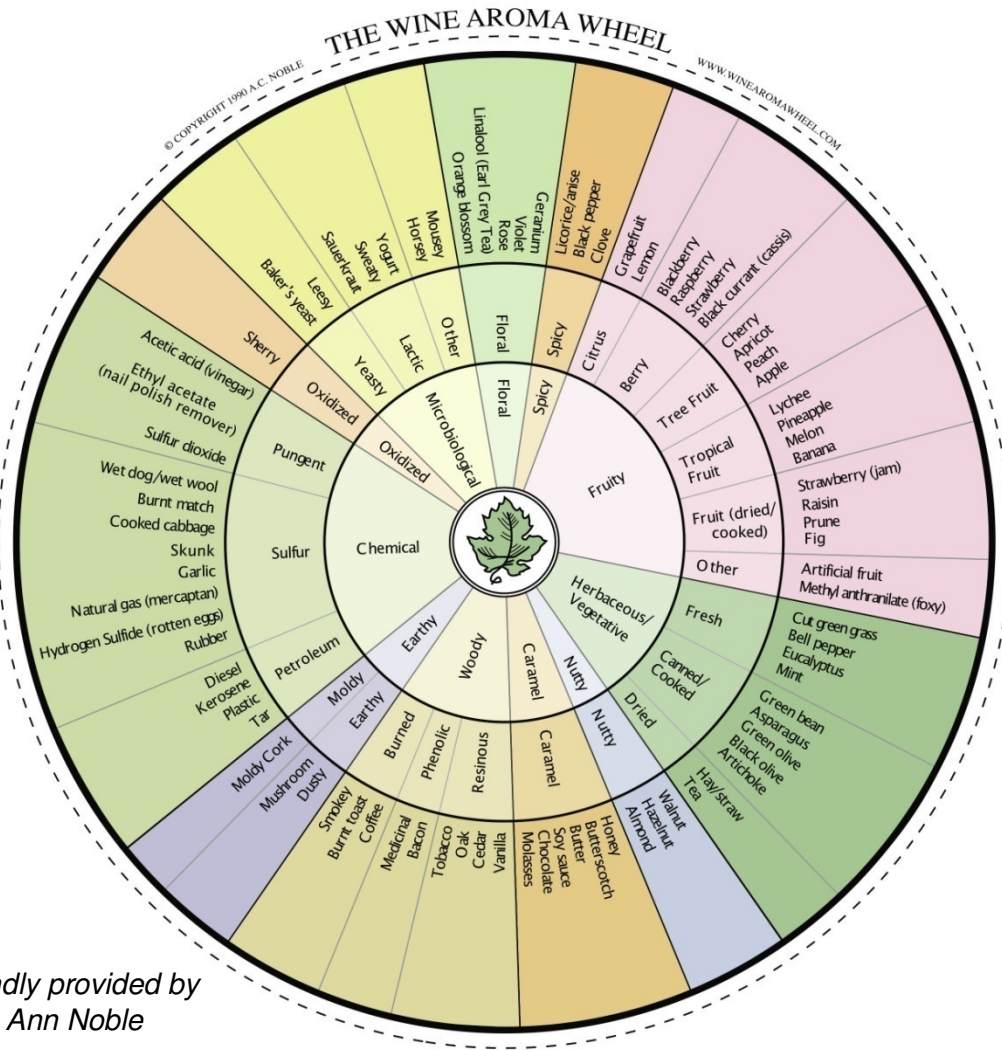


Developed by Dr. Morten Meilgaard in the 1970s, the Flavor Wheel illustrates sensory elements of beer with respect to aroma/aromatics, basic tastes, and mouthfeel. His goal was to develop an analytical tool to be used as a universal standard for describing characteristics across beer styles. The Meilgaard flavor wheel has been adopted as a reference by organizations including the European Brewing Convention, the American Society of Brewing Chemists, and the Master Brewers Association of the Americas.

It can be found in many forms and on virtually any website describing beer flavor and target characteristics by style.

Historic Alcoholic Beverage Master Lexicons:

The Wine Aroma Wheel



Developed by Dr. Ann Noble in the early 1980s during her tenure at UC Davis, the Aroma Wheel exists as an objective tool to describe a wide variety of aromas that may be present across red and white wines.

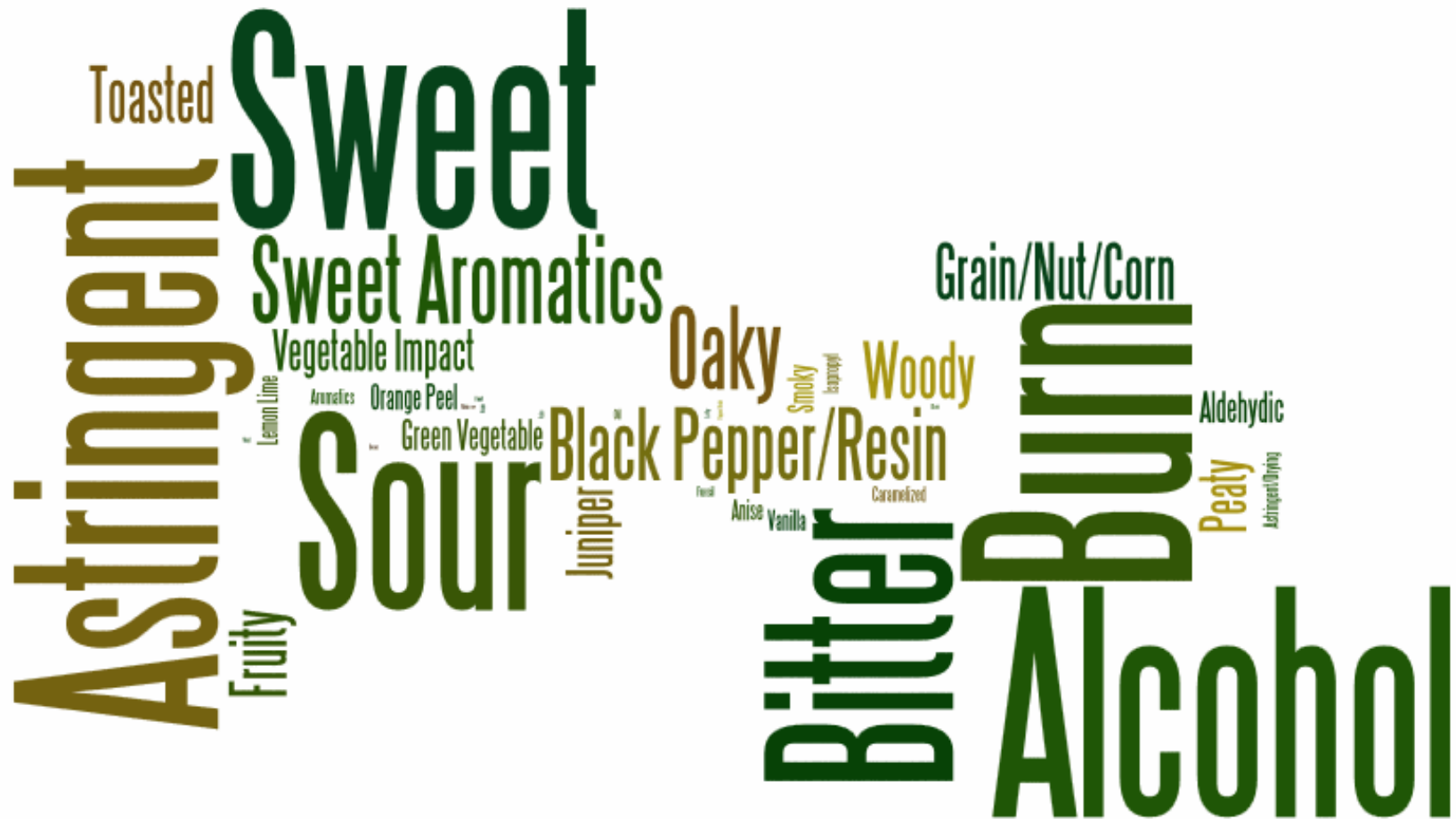
Analytical terms are used to describe not judge aromas. The Aroma Wheel has three tiers, moving from categorical terms in the center to precise reference terms.

Per winearomawheel.com, "These terms are not the only terms that can be used to describe wines, but represent ones that are often encountered."

Widely referenced and imitated, the Aroma Wheel provides sensory understanding of wine aroma to novices and experts alike.



A Possible Approach: Spirits Lexicon Word Cloud



A Possible Approach: Spirits Lexicon Word Cloud

➤ Represents incidence of descriptive flavor characteristics of 50 spirits samples, to include

Dark Spirits: Rum, Scotch, Whiskey

Light Spirits: Gin, Rum, Tequila, Vodka

➤ Indicates the flavor characteristics most common across the sample set

➤ Larger font = appears more often in set

Limitations:

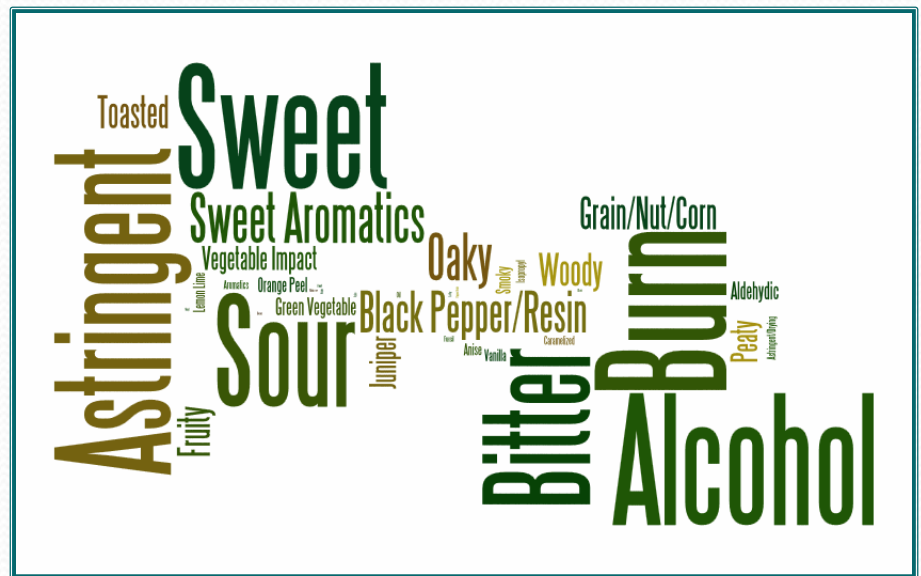
➤ Higher incidence ≠ more important (or higher intensity)

➤ Weights basic tastes and feeling factors

➤ Attributes common across spirits describe but do not discriminate them

➤ Word Cloud lacks relational aspect of attribute categories within the list

➤ Less common terms are small in graph and may be overlooked





Using the Spirits Master Lexicon - Rum

SAMPLE	Dark Rum 1	Dark Rum 2	Dark Rum 3	Dark Rum 4	Dark Rum 5
AROMATICS					
Sweet Aromatics Complex	4.5	3.0	4.0	2.5	6.5
Fruity	0.0	0.0	4.0	6.5	2.0
Toasted Grain	0.0	0.0	1.5	0.0	0.0
Woody Complex	3.5	2.0	0.0	1.2	0.0
Spicy	0.0	0.0	1.0	0.0	2.0
Aldehydic	1.2	3.0	0.0	0.0	0.0
Alcohol	3.5	3.0	2.8	2.5	2.0

Focusing **only** on Tier 1 and 2 aromatics, we learn

- Sweet aromatics are important – common feature across rums
- 3 of 5 samples have a fruity note
- Base notes vary and may be woody, spicy, or toasted grain
- 2 samples have an aldehydic (waxy/fatty) note not generally associated with rum

Case Study: Your company produces Dark Rum 3. Competitor Dark Rum 5 has the highest consumer liking. Using your descriptive data, how do you guide product development to move your product towards the Dark Rum 5?



Using the Spirits Master Lexicon - Rum

Adding Tier 3 aromatics to the data, we learn

SAMPLE	Dark Rum 1	Dark Rum 2	Dark Rum 3	Dark Rum 4	Dark Rum 5
AROMATICS					
Fruity	0.0	0.0	4.0	6.5	2.0
Orange Peel	0.0	0.0	2.0	4.5	1.0
Banana	0.0	0.0	2.2	1.5	0.0
Apricot	0.0	0.0	0.0	0.0	1.0
Toasted Grain	0.0	0.0	1.5	0.0	0.0
Sweet Aromatics Complex	4.5	3.0	4.0	2.5	6.5
Molasses	0.0	1.0	3.0	0.0	0.0
Caramelized	3.0	0.0	0.0	2.0	0.0
Buttery	1.5	0.0	0.0	0.0	0.0
Refiner's Syrup	0.0	2.0	1.0	0.0	1.5
Vanilla	0.0	0.0	0.0	0.0	5.0
Woody Complex	3.5	2.0	0.0	1.2	0.0
Dried Wood	0.0	2.0	0.0	0.0	0.0
Oaky	3.5	0.0	0.0	1.2	0.0
Black Pepper/Terpene	0.0	0.0	0.0	0.0	2.0
Brown Spice Complex	0.0	0.0	1.0	0.0	0.0
Nutmeg	0.0	0.0	1.0	0.0	0.0
Aldehydic	1.2	3.0	0.0	0.0	0.0
Alcohol	3.5	3.0	2.8	2.5	2.0

Case Study: With the complete aromatic data set, how would your recommendations to the product developer change?



Sometimes more information is better.....

Using the Spirits Master Lexicon - Tequila

SAMPLE	Tequila 1	Tequila 2	Tequila 3	Tequila 4	Tequila 6	Tequila 7
AROMATICS						
Total Aromatic Impact	11.0	6.0	9.5	9.5	10.0	9.0
Total Vegetable Impact	4.0	2.0	5.0	2.0	7.0	5.0
Green Vegetable	0.0	2.0	2.0	2.0	3.0	4.0
Woody Complex	4.0	0.0	0.0	6.0	0.0	4.5
Woody	4.0	0.0	0.0	0.0	0.0	3.5
Oaky	0.0	0.0	0.0	6.0	0.0	1.5
Black Pepper/Resiny	0.0	1.0	3.0	0.0	4.0	3.0
Smoky	0.0	0.0	0.0	0.0	0.0	0.0
Solvent	8.2	7.0	6.5	4.5	5.5	5.0
Alcohol	6.8	5.0	6.5	4.5	5.5	5.0
Fuesil Oil	2.5	2.0	0.0	0.0	0.0	0.0
BASIC TASTES						
Sweet	2.5	1.0	3.0	3.5	2.5	2.0
Sour	2.8	3.0	3.0	1.0	2.5	2.5
Bitter	1.0	2.0	2.0	1.0	1.0	0.0
CHEM FF						
Burn	6.0	4.0	5.0	3.5	5.0	4.5
Astringent/Mouthdry	2.5	5.8	5.0	2.0	3.0	2.5
Tingle	1.5	2.0	1.0	0.0	0.0	1.0
Balance Blend	5.5	4.0	5.5	8.8	8.5	8.5

Sometimes the notes are what we expect for the spirit type....

Vegetable	Woody/Oaky	Black Pepper
Alcohol	Fuesil (fuel oil)	



Using the Spirits Master Lexicon – Tequila (2)

SAMPLE	Tequila 5	Tequila 7	Tequila 10	Tequila 15	Tequila 18	Tequila 22	Tequila 26
AROMATICS							
Total Impact	7.0	7.2	6.0	7.0	7.5	7.0	11
Vegetable Complex	3.5	2.5	3.0	2.0	2.5	2.0	6.5
Woody / Vegetable	0.0	0.0	0.0	0.0	1.0	0.0	3.0
Green / Vegetable	3.5	2.5	3.0	2.0	1.5	2.0	0.0
Black Pepper	1.0	2.0	2.0	1.5	1.0	1.5	5.0
Sweet Aromatics Complex	1.5	1.3	1.0	2.0	0.8	2.5	0.0
Caramelized	0.0	0.0	0.0	0.0	0.0	1.5	0.0
Vanilla/ Vanillin	0.0	1.3	1.0	2.0	0.8	0.0	0.0
Molasses	1.5	0.0	0.0	0.0	0.0	0.0	0.0
Diacetyl	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Aldehydic	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Oaky	0.0	1.5	0.0	0.0	0.0	0.0	0.0
Smoky	0.0	0.0	0.0	0.0	0.0	0.0	3.0
Fruity Complex	2.0	0.0	0.0	0.0	0.0	1.0	0.0
Banana/ Amyl Acetate	2.0	0.0	0.0	0.0	0.0	0.0	0.0
Anise	1.0	0.0	0.0	1.5	0.0	0.0	0.0
Alcohol	2.0	1.5	2.5	3.0	3.0	3.0	5.0

And sometimes you need a lexicon that addresses notes that are less common for a spirit type....

Fruity	Anise	Sweet Aromatics	Caramelized	Molasses
Banana	Aldehydic	Vanilla/Vanillin	Diacetyl	Smoky



Using the Spirits Master Lexicon - Gin

SAMPLE	Gin 1	Gin 2	Gin 3	Gin 4	Gin 5	Gin 6	Gin 7
AROMATICS							
Fruity	2.0	1.5	1.0	0.0	2.0	2.5	4.0
Lemon Lime	1.8	1.5	0.0	0.0	0.0	2.5	0.0
Orange Peel	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Juniper	2.5	5.0	4.5	5.0	5.0	3.0	2.0
Black Pepper/Resiny	4.5	0.0	4.0	3.5	0.0	0.0	0.0
Woody	0.0	0.0	0.0	3.5	0.0	0.0	0.0
Violet	0.0	0.0	0.0	0.0	0.0	0.0	4.0
Alcohol	6.0	6.5	6.0	6.5	6.6	5.0	6.0
BASIC TASTES							
Sweet	2.5	2.0	3.5	2.0	3.5	4.0	2.0
Sour	1.5	1.0	1.0	0.0	2.0	0.0	0.0
Bitter	2.5	1.5	1.0	2.0	1.0	0.0	2.0
CHEM FF							
Burn	8.5	7.0	5.0	8.0	8.0	5.0	6.0
Astringent/Mouthdry	3.0	2.5	3.0	2.0	3.5	1.0	2.0
Harshness	6.5	5.0	3.0	7.0	6.5	2.0	5.0

Sometimes it's understanding the subtleties.....

Understanding the differences between

- Lemon-Lime (citrus and terpene)
- Juniper (piney and terpene)
- Black Pepper/Resiny (black spice and terpene)

are **critical** in discriminating between Gins



Using the Spirits Master Lexicon Across Spirits

SAMPLE	Aged Rum	Blended Whisky
AROMATICS		
Total Impact	9.0	7.5
Fruity	1.5	1.5
Toasted Grain/Nut/Corn	0.0	2.0
Sweet Aromatics	4.0	2.8
Oaky	4.0	3.0
Black Pepper/Resiny	1.5	2.8
Alcohol	3.0	4.0
BASIC TASTES		
Sweet	6.5	6.5
Sour	1.0	3.0
Bitter	1.0	0.0
CHEMICAL FEELING FACTORS		
Burn	2.5	8.0
Astringent/Mouthdry	3.0	4.0
Balance/ Blend	8.2	7.0

And sometimes it's noticing that products that seem different share common aromatic cores....

These two products don't taste the same, but they share

- Fruity
- General Sweet Aromatics
- Oaky
- Black Pepper/Resiny

In their aromatic profiles



Applying the Master Lexicon Approach: Steps for a Successful Master Lexicon

Primary

- Sample broadly from the category of interest
- Generate lists of product characteristics then eliminate redundancy
- Include the common, the unusual, the undesirable
- Use words to describe, not judge
- Develop Attribute Terms
 - Be as precise as needed
 - Define the terms

Secondary

- Group attributes according to types, categories, similarities
 - Look for commonalities
- Go Broad and Specific
- Attributes must have physical references
- Use lexicon with an intensity scaling system, preferably one that allows comparison across an array of semi-related products

Advanced

- Create a physical / easily used form of the lexicon
 - Encourages user to “try the references”
 - Emphasizes relationships within categories
 - Serves as a memory tag for users
 - Allow for revision
 - Allow for expansion



Thank you for your time – Cheers!



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