

## Approach

### Statement of Purpose :

The main objective of the project's sponsor (Starbucks Coffee Company) is to facilitate people with various cultural backgrounds finding the bakery products they want in Starbucks US.

This objective has two folds. Firstly, it should provide international populations better understandings of the bakery products they are going to buy before they pay. Despite its western/ American heritage, Starbucks is now a company with global presence. Its global presence and fame also gives it a large international customer base in the United States. Limited understanding of American bakery culture could either give customers a hard time making decisions about what to buy or increase the possibilities of making bad decisions. Both of these two consequences will negatively affect customers' shopping experiences in Starbucks.

The project should also help customers find bakeries that are most suitable for their health/ physical conditions. It should help people find products free of specific allergens like peanut. It should also cover people's basic need in choosing healthy products according to certain index such as calories.

### Audience Analysis:

The audience should be the people who want to buy bakery products in Starbucks US. There are 4 groups of them, and they are ranked according to their priority as following:

1. Customers that concern about calorie intake

Primary Need: finding yummy bakery products (according to personal preference) that does not gain extra burden in terms of their weight control

2. Customers with limited knowledge of the taste of bakery products served in Starbucks.

Primary Needs: finding yummy bakery products without previous tasting experience of Starbuck's Bakery products

3. Customers with special allergy conditions

Primary Needs: finding yummy bakery products without the risk of getting allergy

4. Customers with different cultural background

Primary Need: finding bakery products that match their expectations (for example: sometimes the same product names may be associated with products with different tastes in different countries/regions)

The priority of different audience groups largely depends on the number of customers inside each group. Although customers with different cultural background is ranked relatively low currently, its ranking has potential to increase with the growing number of foreigners coming into US and enlarging influence of other cultures on Starbucks' products (e.g.: Chai-tea Latte).

**Current Practice:**

After reaching the Bakery page on Starbucks US's website, users can find the bakery products they need both visually (the image of the product) and according to nutrition information of the products. However, these two search-refine-methods are limited in terms of findability of certain content. The visual impression of the product may provide some ideas of the taste of the product, but it can also leads to wrong impressions about the taste. Also it does not help users narrow down the result. In other words, users have to scroll down the page, and observe each result one by one. On the "View Nutrition Info" page, Users can sort their search result of "bakery product" according to "Calorie", "Fat", "Carb", "Fiber" and "Protein". Sorting results makes it easier for users to find certain products with single criterion (or index, such as Calorie). However it becomes less helpful when user have several criteria for their targets.

The current practice is designed for relatively narrow scope of audience under the increasingly globalized context. It does not take cultural influence into consideration.

**Content Audit:**

Based on previous analysis, the new taxonomy will include both derived-term and assigned-term. The categories will be developed through the combination of domain-centered approach and document centered approach. The major sources of the derived-terms include the descriptions on Starbucks' websites, the websites of other bakery stores, the blog of foodies, the website of grocery stores that have bakery sections such as QFC, and also websites that give suggestions about healthy lifestyles and weight-loss. Some categories and the terms inside, such as the "Taste", are made based on the interview of some international students in UW.

Based on the content audit and audience analysis, 8 descriptive metadata are developed for the taxonomy.

In order to help customers that concern about calorie intake, “Calorie” is added to describe the information object and facilitate customers to find the bakery products they want in a shorter amount of time, without much concerns in calorie intake. “Fat” and “Fiber” are also included in the taxonomy as they are related factors people always consider when they think about calories. “Fat” and “Fiber” category both include two terms. For “Fat”, they are “Low Fat” and “Average Fat”. For “Fiber”, they are “High Fiber” and “Average Fiber”. The high and low are depend on the approach Starbucks make on its website. And average is adopted, instead of further classifying to “High Fat” and “Low Fiber”, because the average approach is enough to serve customers’ special need. Over classification might not help customers make good decisions and meanwhile reducing the amount of customers of Starbucks.

In order to help customers who are not familiar with Starbucks products to make informed choices (including the international populations), “Type”, “Taste”, “Flavor” and “Mouth-feel” are created. These four categories are all trying to help customers obtain an idea of the information object with the terms, ideas that they are familiar with, quickly filter out those objects the customers do not want, narrow down the choices they have to make, and finally help them locate to the products with the highest possibility that they would enjoy.

In order to meet the needs of people with special allergy conditions, the category “Allergen” is created. The terms included in this category are based on the information in the Starbucks’ website.

### **Authority Control:**

#### For Taxonomy

**Name:**

Short description of bakery products determined by Starbucks Coffee Company.

Example: “Banana Walnut Bread”

**Type:**

Common categories for bakery product, adapted from “Google Product Taxonomy --- Food, Beverages & Tobacco --- Food Items --- Bakery”

Select at least one from: Bagel, Cake, Donut, Bread, Bar, Scone, Muffin, Croissant, Brownie

**Taste:**

The fundamental/basic feelings people perceive from the bakery products with the sense of taste.

Select from: Sweet, Salty

*Note: when the variety of Starbuck’s bakery products increase, the terms may also expand to spicy, bitter, umami etc.*

**Flavor:**

The smell and fragrance that people obtained from the product before they eat it/ when they eat it/ after they eat it

Select at least one from: Nuts, Raisins, Apple, Banana, Blueberry, Buttery, Chocolate, Cinnamon, Cranberry, Maple Syrup, Vanilla, Cheesecake, Raspberry, Pumpkin, Blackberry

**Mouth-feel:**

The feeling people get when they eat the food

Select at least one from: Chewy, Crunchy, Moist and Fluffy, Flaky, Fudgy

**Calorie:**

Range of total calorie inside the food according to Starbucks’ estimation

Select from one of the range:

100-200

200-300

300-400

400-500

**Fat:**

Qualitative classification of quantitative values of the fat content inside the food (the fiber content data is based on Starbucks' estimation)

Select one from: Low Fat, Average Fat

**Fiber:**

Qualitative classification of quantitative values of the fiber content inside the food (the fiber content data is based on Starbucks' estimation)

Select one from: Average Fiber, High Fiber

**Allergen:**

Element(s) inside the product that can cause allergic reactions of certain groups of customers (User can exclude those products associated with selected Allergen)

Empty, or select one or more from: Milk, Soy, Wheat, Treenuts, Egg, Gluten

**Publisher:**

Person who first put the content on to the Starbucks Website

Format: (First Name) + (space) + (Last Name)

**Date Published:**

Date of the first time the item was put onto Starbucks US website.

Format: mm/dd/yy

**Date Modified:**

Date of the most recent modification

Format: mm/dd/yy

**Image Location:**

Complete URL where the image can be downloaded.

Format: <http://website.com/path/filename.filetype>

**Format:**

File type of the image:

Choose from: jpg, tif, png

For Ontology/ Term Relationship Type (TRT): (ranked alphabetically)

**contains: (is contained in)**

- include something as one of the component  
*e.g.: Blackberry in Reduced-Fat Very Berry Coffee Cake*
- include something as the nutrition content  
*e.g.: Low Fat in Reduced-Fat Very Berry Coffee Cake*

**creates: (is created by)**

- bring out (the feeling/ conceptual sense), make people feel  
*e.g.: the song "I'm Yours" brings out/ creates the Fresh Feeling for people*

**has the flavor of: (is the flavor of)**

- the flavor people senses when eating the product (the flavor can be artificial)

**is the product type of: (belongs to the product type)**

- the reflection of "Type" (Taxonomy) in Ontology, describes the relationship between the information object and a type of bakery product, a product can belong to multiple types, and a type can be applied to multiple products

**io:**

- instance of

**is rich in: (appear abundantly in)**

- relatively large amount of some elements (e.g.: nutrition elements) exist inside the product/ food

**is the choice of:**

- the decision made based on certain life style

**pairs well with:**

- better (eating) experience is created when the two products are consumed together

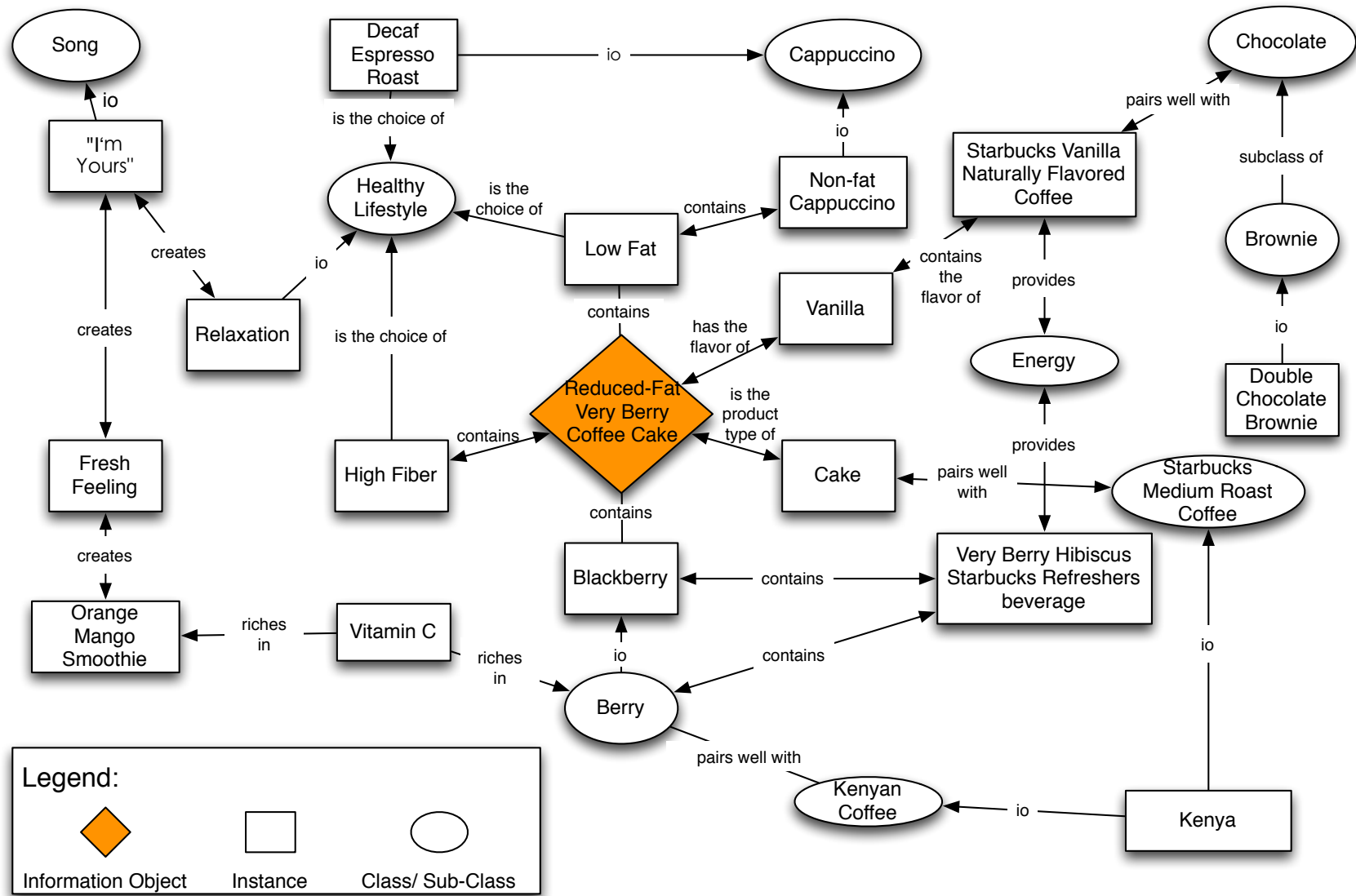
**provides: (is provided by)**

- supply/ make available of something when people consume the products

**subclass of:**

- exist as lower level class, inherit all the properties of the higher level class

**Ontology:**



Reference for Pairing: <http://coffeetea.about.com/od/foodmeetsdrinks/a/ClassicCoffeePairings.htm>



## Scenario

### #1:

Catherine is enthusiastic about living in a healthy way and is an active member of LOHAS group online. In order to control her weight, she usually eats little for dinner and does not take in any solid food after 7:30 pm.

She just experienced an extremely busy day and finished her work in the office at 8:00pm. Because she only had little food for dinner as usual and worked really hard for the whole day, she was hungry and exhausted. She really wanted to have some food but not sure whether that was good for her weight control. There was a Starbucks' store near her company. "Maybe I can find some light snack there", Catherine thought. As she did not visit Starbucks that often, she decided to look it up on Starbuck's website first. In the bakery section, the "low fat" filter immediately caught her attention. On the result page, she saw the "High Fiber" check box on the side bar, which reminded her that she forgot to bring apple to the workplace and eat it. She immediately selected the High Fiber. There were several items on the result page. All of them looked good *and were available at the store she planned to visit*<sup>1</sup>. Catherine decided to look into the detail of the Reduced Fat Very Berry Coffee Cake as she really wanted to have some food that brought her refreshment after a day-long exhausting work. The Reduced Fat Very Berry Coffee Cake seemed to be exactly what she wanted: not adding burden to her health plan, fruity. As she was about to close the web page, she noticed on the bottom of the page, there was a section named "You may also like". "The Orange Mango Smoothie! Well, only the cake might be a little bit dry. I need something to drink. The smoothie sounds yummy together with the cake, and a healthy choice because it is fruit and full of vitamin C", Catherine decided also to take the smoothie. In the "You may also like section", there is also a picture of an album and a play button. It is Jason Mraz's "I'm yours". The album cover looks refreshing, seems to be a song that I would like to listen. And the relaxing tones and sweet voice quickly caught her heart. It made her really comfortable as if she felt a breath fresh air. A hunger feeling struck her again and called her back from the enjoyable music journey. "I should go and get the food now, maybe I can listen to the song on my way home." Catherine clicked the link that led her to the song page in the apple store, and downloaded the song, which immediately synchronized to her iPhone.

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<sup>1</sup> This feature exceeds the scope of this project and needs to be added as additional function

#2:

Ming is an international student in UW. It was his first year. The new study life is struggling for him, because of the language issues, cultural difference and brand new environment. In order to keep up with his American classmates, he had to study really late at night and got up early in the morning for class. He needed coffee or other energy drink to keep him awake in class. And usually he would purchase some brownie in the café. For him, life was boring and he had brownie and brewed coffee everyday due to his limited knowledge of them.

In a rainy Sunday morning, he felt extremely bored and stressful at home and thought he need some change in life. He decided to explore some different bakery food as his breakfast. He went to Starbucks website as it was the only coffee shop he had heard about, and there was a branch on his way to school. He first checked the double chocolate brownie because it seemed to be different from the brownie he ate everyday. He found a section on the page under the title of “best together with”. It was Starbucks Vanilla Naturally Flavored Coffee. “Vanilla Flavored Coffee, sounds tasty”, Ming decided to take a look at it. Although he really loved vanilla, the Vanilla Flavored Coffee seemed not what he might like. But there were two recommendations that attracted Ming’s attention: “Reduced-Fat Very Berry Coffee Cake” and “Very Berry Hibiscus Starbucks Refreshers beverage”. Ming was trilled when he saw the cake of “Reduced-Fat Very Berry Coffee Cake” was vanilla flavored. He decided to try it out the next morning when he go to school. He also wanted to try the “Very Berry Hibiscus Starbucks Refreshers beverage” someday, because Ming was kind of sick of coffee and needed some substitute to serve his need of energy. “I have never heard of the refresher before, but it seems to be healthier according to the description and much more refreshing than coffee”, Ming thought.

### **Implementation:**

Users’ needs are more addressed and considered when preparing the taxonomy this time compared to in mid-term. More categories are added to the taxonomy this time from the user’s perspective. For example, “Fat” and “Fiber” are added as additional categories. “Price” is omitted from the taxonomy. In order to write the final, more extensive exploration and research about the terms are included. The exploration results are updated and put into one document in time. The exploration trial is also recorded as log in one document for the future reference. In order to prevent using same terms in different CVs/ categories, the terms are more specified and

contain more details. For example, instead of using “Average” in the CV “Fat”, “Average Fat” is used to differentiate with “Average Fiber”. Although DCMI laid the foundation for this project, the future development is much beyond it. The understanding of content is more addressed in later development.

## **Impact:**

With this taxonomy, users experienced could be improved by more accurately locate to the information object/ product they want:

The new taxonomy includes more subjective but related description of the bakery products as the descriptive metadata. The four categories are based on common terms used in other websites and incorporate the needs and understandings of customers. It provides a comprehensive description of the target bakery products and creates intuitive clues to the customers regardless of the customer’s cultural background and their knowledge of Starbucks bakery products. Two basic common health concerns are also encoded in this new taxonomy. For example, customers can easily filter the products that contain the allergens they need to avoid and the products with high calories.

The terms adopted in this taxonomy are more global friendly.

This taxonomy excludes those terms that are highly cultural sensitive. All of the terms used in this taxonomy are understandable by international populations with proper English levels. According to user test, these terms successfully help customers associate the information object they do not really know and remind them of certain taste based their exiting knowledge. User’s experience will be largely enhanced, because users will experience fewer frustrations by frequently bumping into unknown words and the products are more familiar to them now.

## Business Value

As illustrated in the scenario, improved findability and better customer experience will help Starbucks attract new customers and turn rare customers to frequent customers. It provides customers personalized solution to their needs with relative low cost, without the large

investment in data-mining. It also creates planned serendipity, and improved the bundled sales, which could also be selling point for cooperation opportunities with other companies such as Apple. Starbucks could use this global friendly solution to standardize their global websites. Admittedly customization and localization are still needed in order to adapt to the special needs in different market, a relative standardized solution could still greatly reduce the cost of website developing and administration. It will also help give customers more consistent experience about Starbucks around globe.

This taxonomy facilitates the management of the product information on the websites.

From the administrative side, this taxonomy includes the name of the person who publishes the information and also the person who conducts the most recent modification. This information will enhance the management of content publishing and updating process by associating specific editor with the accuracy of certain piece of information.

## **Problem:**

### Sacrifice and Tough Decisions:

The biggest challenge comes from defining terms inside “Taste”, “Flavor” and “Mouth-feel” Categories. These terms can be quite tacit, so that it is hard to find a word to define them accurately. Also one product may contain a complex mixture of different flavors, and determining which one is most dominant and most descriptive is an extremely subjective process. Also there are tradeoffs between the accuracy and the scope of populations who can understand the terms. Although global friendly approach of terms could enhance the experience of international populations, the experience of American customers might be sacrificed.

Tradeoffs also appear when selecting terms for the “Fat” and “Fiber” Categories. A more precisely defined range series could enhance the accuracy of filtering, which could serve the needs of customers who have detailed demand for the fat or fiber content. However after considering the issues more thoroughly, this accuracy is not necessary for most of the customers, even most of the customers who concern about their health. Also “High Fat” and “Low Fiber” have the potential to scare customers away from purchasing the products, which does not fit into the business purpose of Starbucks.

Choosing the terms under “Type” category is another issue that I encounter when making this taxonomy. These terms can be derived from the name of the products. However, some terms, Fritter for example, will only include few information objects inside, which is ineffective in enhancing the findability. When I use the taxonomy provided by Google Merchant Center, it does not fit into Starbucks situation well. Some products like scones can be more findable when separating them as an independent list instead of putting them under the bigger term “cake”. I tried to make balance between these two approaches so that both existing and potential customers will benefit from it.

The taxonomy is previously also designed to address customer’s concerns about the price. However, it proves to be redundant and not useful, because the price range of Starbucks bakery products is not significant. The difference between \$2 and \$3, for example, is not significant enough to influence customer’s decisions according to user interview.

#### Potential Problems of the Taxonomy

Even though a lot efforts are made to enhance the description of the information objects to fit into the users’ needs, the subjectivity of description could not be totally eliminated. People may perceive the same word of taste differently based on their previous experiences, leading to wrong perceptions about the bakery products. Also the taste of specific information product tend to vary among different Starbucks branches, and the variation cannot be accurately reflected on the website. This problem might not be so serious as it seems to be. The taste variance in different locations could be offset by people’s different perceptions of taste in different locations.

#### Characteristics of ontology that does not work for this taxonomy

The scope of the domain included in the ontology is limited/ restricted by the scope of this taxonomy and the business considerations of Starbucks websites. Some links across domains does not apply to the development of this ontology. However, the restrictions help me focus on a narrow range of possibilities, instead of finding ways in overwhelmingly broad range of ideas.

### The maintenance of ontology

The creation of ontology requires huge amount of efforts, especially when designing large amount of individual ontologies manually. However, some relationships described in the ontology, such as the “song” and the selected information object, are due to change as time flows. For example, the cooperation between Apple and Starbucks might cease. The ontology needs to be updated accordingly.

### **Resources:**

Stewart, Darin L. Building Enterprise Taxonomies, 2nd eds. Mokita Press, 2011.

*Used as fundamental reference for the whole project. For example, it helps clarify some definitions and help me generate ideas of some processes, for example, how to conduct content audit.*

DCMI Metadata Terms. (2006). Available from <http://dublincore.org/documents/dcmi-terms/>

*Used to generate some of the categories.*

Magee, Harrison. "Talking About Taste: How the Description of Food Means and Does". 2009.

Retrieved from <http://hdl.handle.net/10066/10174>.

*Used to gain understandings about how people describe tastes across culture.*

Starbucks Corporation. 2011. Retrieved from

<http://www.starbucks.com/menu/catalog/product?food=bakery>.

*The selected product website that I used to build my taxonomy.*

Burnett, K. (1999). A Comparison of the Two Traditions of Metadata Development. Journal of the American Society for Information Science, 50(13), 1209-1217.

*Both of the traditions are important in terms of taxonomy development. Based on the structure derived from data management approach, I use the librarian approach to incorporate a lot descriptive data to enhance findability.*

Miller, George. (1956). The magical number seven plus or minus two: some limits on our capacity for processing information. <http://www.musanim.com/miller1956/>

*The rule of seven numbers helps me revise my approach in ontology and delete some ideas that are redundant or not so useful.*

Noy, N. & McGuinness, D. (n.d.). Ontology development 101: A guide to creating your first ontology. Retrieved December 16, 2005 from Stanford University, Deborah L. McGuinness web site:  
<http://www.ksl.stanford.edu/people/dlm/papers/ontology101/ontology101-noy-mcguinness.html>

*As a comprehensive and understandable introduction of ontology, this greatly enhances my understanding of ontology.*

Kim, Hak-Lae, Decker, Stefan, & Breslin, John. (2009). Representing and Sharing Folksonomies with Semantics. *Journal of Information Science*, 36: 57-72.

*This helps me better understand Folksonomies.*

Ayres. (2001). Authority Control Simply Does Not Work. *Cataloging & Classification Quarterly*

*Authority control is the foundation of this whole project. It makes realize some of its limitations and incorporate more practical consideration when working on the whole project.*