An aerial photograph of a port area, showing a large ship docked at a pier, stacks of shipping containers, and various port infrastructure. The image is overlaid with a semi-transparent blue filter.

Toward an Intuitive HS: Structural and Semantic Impediments to Easy, Accurate HS Classification

Randy Rotchin, 3CE Technologies

Background

Established in 1999, 3CE is a Montreal-based software development company specializing in automated HS Classification and HS Code verification.

Core Competencies

- Information Retrieval, Machine/Deep Learning
- Computational Linguistics, Lexicography
- Industrial Taxonomy, Subject Matter Expertise

HS Classification Assistance Tool

- Artificial intelligence-based decision support system
- Reads and interprets readily-available, commercial product information
- Reasons its way through the HS classification process



Named **Best Content Search & Discovery Solution** by US Software & Information Industry Association



HS Errors – Observations

- **Commercial Descriptions vs. HS Terminology**

- E.g. “Blow Dryer” = “Electrothermic Hair Dressing Apparatus”

- **GRI’s, Legal (Section, Chapter) Notes**

- E.g. “Woven ladies blazer, 50% wool, 50% acetate” [GRI 3(c)]
- E.g. “Tomato juice, 8% dry weight content” [Chapter 20, Note 4]

- **Complex Items**

- E.g. Sets/Kits, Parts

- **Knowledge Management**

- Scarcity of specialized domain expertise
- Costs associated with training, turnover

- **Gaps in the Supply Chain**

- Lack of collaboration between declarants and service providers
- Customs requirements not part of procurement process

- **Reliance on Ineffective / Inappropriate Tools**

“Through its compliance verifications on specific goods, the Agency established that importers misclassified about 20 percent of those goods coming into Canada .

In targeted verifications conducted in the 2015–16 fiscal year, the Agency identified that the importers should have paid \$42 million more, of which approximately half was due to misclassification”

(Auditor General of Canada, 2017)

“91 percent of respondents report having a challenge with product classification.”

(Thomson Reuters & KPMG, 2016)

Over-reliance on Flawed Tools



The Keyword Problem

- Searches indiscriminately
- Overwhelming number of mostly irrelevant, often erroneous “potential” matches returned.
- Requires the user to know HS terminology.
- Frequently displayed without essential hierarchical structure

Contains any ▼

paper shredder

SEARCH

Search Results

The search returned more than the maximum number of rows (200). Please refine your search criteria.

Section 10

Pulp of wood or of other fibrous cellulosic material; waste and scrap of paper or paperboard; paper and paperboard and articles thereof

19 05

Bread, pastry, cakes, biscuits and other bakers' wares, whether or not containing cocoa; communion wafers, empty cachets of a kind suitable for pharmaceutical use, sealing wafers, rice paper and similar products

34 01

Soap; organic surface-active products and preparations for use as soap, in the form of bars, cakes, moulded pieces or shapes, whether or not containing soap; organic surface-active products and preparations for washing the skin, in the form of liquid or cream and put up for retail sale, whether or not containing soap; paper, wadding, felt and nonwovens, impregnated, coated or covered with soap or detergent

<http://jets.jacustoms.gov.jm/portal/services/tariff/sections.jsf>

Over-reliance on Flawed Tools

The screenshot shows the Jamaica Customs Agency website. At the top, there is a navigation bar with 'Home', 'ASYCUDA', and 'Mobile' links. Below this is a search bar with the text 'Search..' and a 'SEARCH' button. The main content area features a search filter set to 'Contains all' and a search input field containing 'paper shredder'. Below the search bar, the text 'Search Results' is displayed, followed by '0 results returned' in red. A large grey box below this text contains the message 'No records found.'

<http://jets.jacustoms.gov.jm/portal/services/tariff/sections.jsf>

The Keyword Problem

- If a search term is not explicitly described in the Tariff Schedule, the user is out of luck.
- Explicit term matches do not always lead to correct HS codes.

HS-Real World Gap: Structure and Meaning

Should an HS user need to have explicit knowledge of where a particular commodity is located (structure) and/or how it is described (meaning) in the nomenclature to easily and accurately classify it?

Structural

- Juices are not considered beverages (Chapter 22), but as “preparations of vegetables, fruit, nuts or other parts of plants” (Chapter 20);
- Car seats are not parts of a cars (Chapter 87), but articles of furniture (Chapter 94);
- Electric toothbrushes are not actually toothbrushes (Chapter 96), but “Electro-mechanical domestic appliances, with self-contained electric motor, other than vacuum cleaners of heading 85.08. (Chapter 85).

Semantic

- Computer = “Automatic data processing machine”
- Baby food = “Homogenized composite food preparations”
- Wheelchair = “Carriage for disabled persons”
- Salad spinner = “Centrifuge”
- Blow drier = “Electrothermic hair dressing apparatus”
- GPS device = “Radio navigational aid apparatus”

Addressing gaps of common expectation and understanding within the HS would help ensure that concepts are clearly defined, mutually exclusive and collectively exhaustive – the ultimate objective of any categorization system.

HS-Real World Gap: Exceptions

Commercial considerations have played a major role in determining how commodities should be provided for in the HS. However, we note that such considerations have often been expressed in the form of confounding exceptions and exclusions.

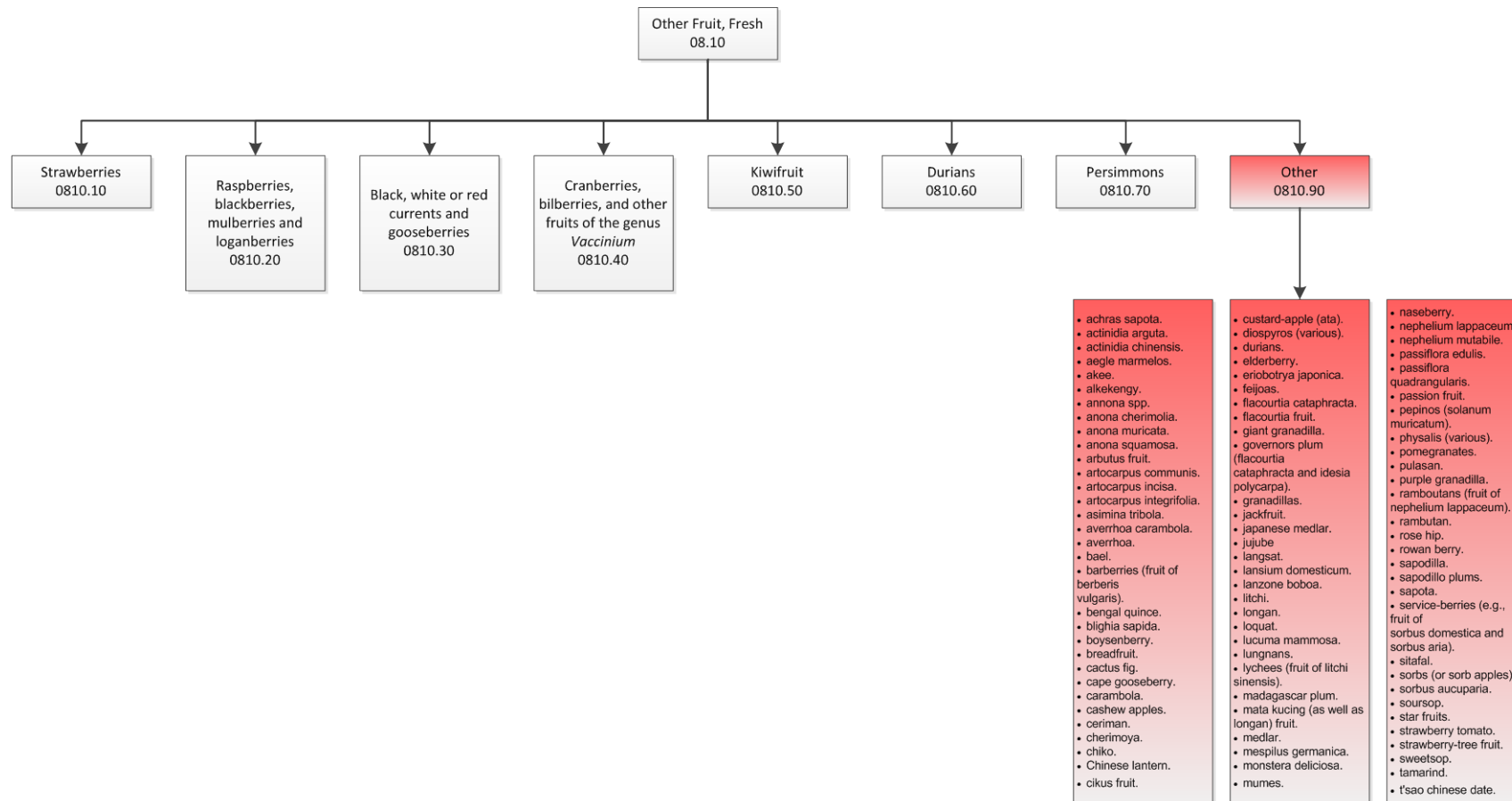
Chapter 45 "CORK and ARTICLES OF CORK"		
Item	Principle criteria	HS Code
Bottle stopper	Material composition	4504.10
Bulletin board	Material composition	4504.90
Insole	Function / Purpose	6406.99
Fishing bobber	Function / Purpose	9507.90



An HS taxonomy that attempts to classify all items primarily according to one unique and unwavering principle, be it MATERIAL or PURPOSE (or some other attribute) would make the HS more intuitive for users, and would eliminate a significant amount – but not all – of the complexity-heightening, error-inducing exceptions.

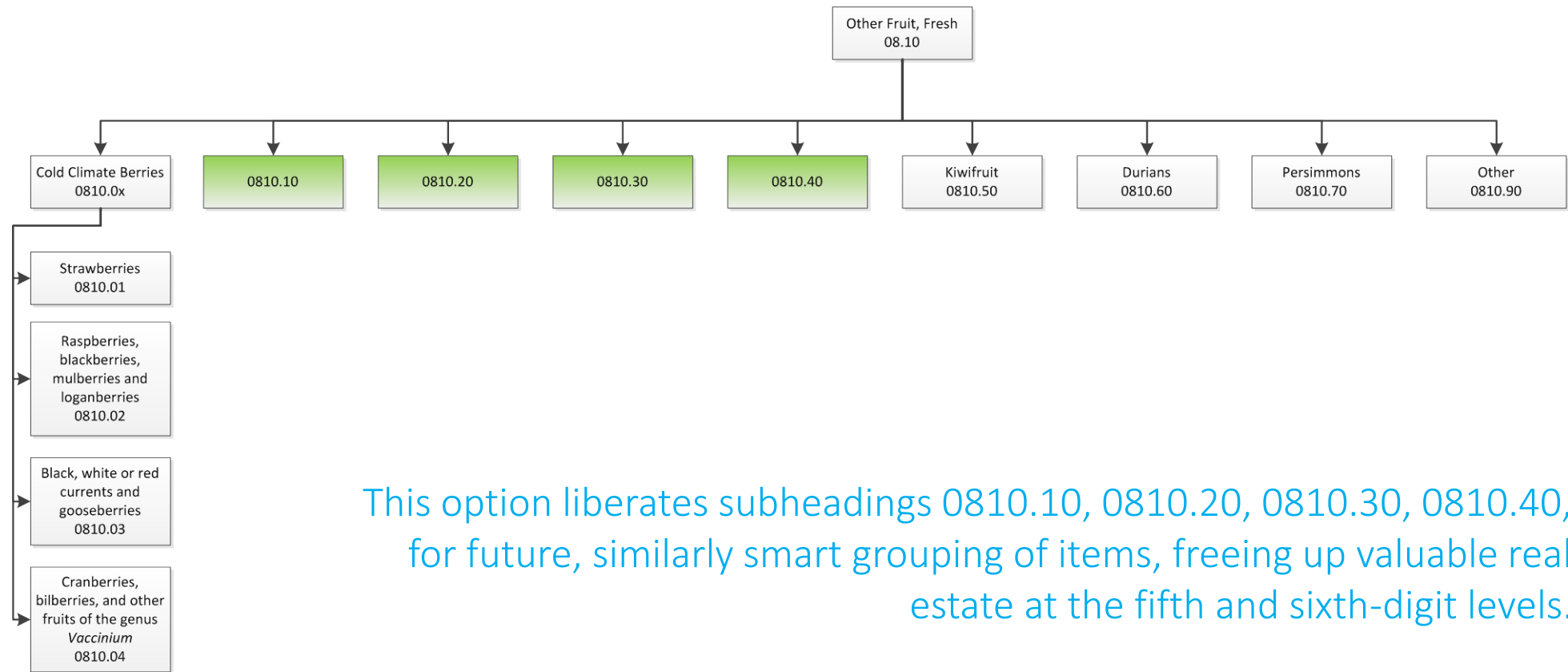
HS-Real World Gap: Western Bias

The strong Western orientation of the HS has resulted in an uneven granularity of concepts for certain domains - particularly animals, plants and their products, and especially food products.



HS-Real World Gap: Western Bias

Consideration of the relevance of commodities by some criteria other than commercial (e.g. cultural) would allow for a more even distribution of concepts .



This option liberates subheadings 0810.10, 0810.20, 0810.30, 0810.40, for future, similarly smart grouping of items, freeing up valuable real estate at the fifth and sixth-digit levels.

HS Application in Practice

Expanding links between the HS and other commercial and industrial standards, although oriented toward a particular industry or HS area, would provide more certainty in the definition of concepts and more commercially relevant examples of commodities that users are trying to classify.

Existing Maps

- SITC
- UNSPSC
- OECD (Environment, Waste)
- INCB (Narcotics)
- UNEP (Ozone, Waste)
- CITES
- CAS

Potential Maps

- GS1- Global Product Classification
- ANSI/ASHRAE Refrigerant numbers (e.g. “R41” = “Fluoromethane” = 2903.39)
- Taxonomic Serial Numbers (e.g. “TSN 161073” = “Danube sturgeon”)
- ISRI (e.g. “ISRI Birch” = “unalloyed copper wire >=96% copper content”)
- ASTM /SAE Unified Numbering System (e.g. “UNS K11547” = “tool steel”)
- MITI (e.g. “MITI 9-990” = “Nicotine” = 2939.79)
- ISO /DIN (e.g. “ISO 4014” = “Hexagon head bolt, threaded”)

HS Application in Practice

Consistent application of the HS among all members is not a certainty. The consequences of divergent nomenclatures at the 6-digit level make proper classification impossible.

Case Pen Knife Yellow Synthetic, 81090, 32087 SS pocket knife



ASEAN HARMONIZED TARIFF NOMENCLATURE (AHTN)

82.11	Knives with cutting blades, serrated or not (including pruning knives), other than knives of heading 82.08, and blades therefor.	
8211.10.00	- Sets of assorted articles	TEN
	- Other:	
8211.91.00	-- Table knives having fixed blades	TEN
8211.92	-- Other knives <u>having fixed blades:</u>	
8211.92.50	--- Of a kind used for agriculture, horticulture or forestry	TEN
	--- Other:	
8211.92.91	---- Flick knives or spring knives; hunting knives, diving knives and scouts' knives; <u>penknives</u> with blades of 15 cm or more in length	TEN
8211.92.99	---- Other	TEN
8211.93	-- Knives <u>having other than fixed blades:</u>	
	--- Of a kind used for agriculture, horticulture or forestry:	
8211.93.21	---- With handle of base metal	TEN
8211.93.29	---- Other	TEN
8211.93.90	--- Other	TEN

Conclusion

“The supreme goal of all theory is to make the irreducible basic elements as simple and as few as possible without having to surrender the adequate representation of a simple datum of experience.”

— Albert Einstein

(Everything should be made as simple as possible, but not simpler.)

Thank You!