Clustering for Taxonomy Evolution

In various shopping portals like Ebay or Amazon, products are categorized in a catalogue and they appear in the form of a tree. When a customer wants to browse for a particular product, he can traverse the tree structure until he reaches his desired product category. For example if a customer is looking for a Digital SLR Camera he will browse through the following tree structure:

![Tree Structure Diagram]

Companies like Amazon use machine learning techniques to place products for sale into these categories. From the above example, we can see Digital Cameras can further be divided into 3 product sub categories. However with time there could be a case where a product from a new sub-category is coming up but due to lack of a sub-category they are being placed into one of the given 3 sub-categories. We call this case as Taxonomy Evolution. There is no way to determine if the taxonomy is evolving without human supervision. We propose use of Clustering mechanism to detect taxonomy evolution in an unsupervised way. We could take products from all the sub-categories together and apply Clustering Algorithms to categorize them. After clustering if we find that more sub-categories are derived, it means our taxonomy has evolved and there is a need of introducing a new sub-category.

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