Emerging technology

Yet, it is much more limited as to what it can recommend, as it can only recommend based on the original song or artist the user played. Furthermore, while building models from the user's profile, both systems make distinctions between implicit and explicit data collection (Parsons et al. , 2004), such as asking a user to rate an item on a sliding scale, ranking a collection of items from favorite to least favorite, giving two items to a user and asking them to choose the best one of the two, or asking the user to create a list of items that he or she likes? all of which are examples of explicit data collection.

Implicit data collection includes observing the items a user views on an online store, analyzing user or item viewing times, recording items that the user purchases online, obtaining lists of items that users may have watched or listened to, and analyzing the user's social network and analyzing similar likes and dislikes. Lastly, the recommender system then matches the collected data to both related and unrelated data collected from others and computes a list of recommended items for the user. According to Quo et al. (2005), recommender systems are a useful alternative to search algorithms.

With recommender systems, users discover items they probably would not have found by themselves, while search algorithms are elements of a search space or are items with specified properties that have to be " accessed". Algorithms were used in the design of recommender systems, the most common of them being that of the k-nearest neighborhood approach (K-AN) (Swear et al. , 2000). Another approach is the Pearson Correlation approach, where the linear dependence between two variables is computed with a +1

or a -1; a +1 denoting a similarity and a -1 denoting dissimilarity (Mocking and Brewster, 2012).

A final example of an algorithm is that of Ricoh Relevance Filtering, which dates back to the ass's. Ricoh makes use of the Vector Space Model, which is grounded in the notion that users have a basic idea as to what is relevant and not relevant (Manning et al. , 2009). Business in Recommender Systems In the book Mass Customization (Pine, 1993) B. Joseph Pine argues that, " Standardized products, homogeneous markets, and long product life and development cycles were the rule" to the new world where " variety and customization supplant standardized products. Simply put, Pine is arguing that companies need to suffices. Moreover, companies are now being charged with the task of developing products that meet the multiple needs of multiple customers (Schafer et al. , 1999). A prime example of what Pine was talking about is that of E-commerce. Schafer et al. (1999) site that recommender systems are changing from innovations used by a few E-commerce sites, to business tools that are redesigning the world of E-commerce. Many of the larger commerce websites such as COWED, Amazon. Com, and eBay use recommender systems to help their customers find products to buy.

Recommender systems verily assist E-commerce sites with sales as well as in customer relationship management. Preferences change from person to person. Companies need to be able to understand this. The movement toward E-commerce has allowed companies to provide customers with a lot more options. Being open to this new level of modification however, allows businesses to increase the amount of information that customers need to

process before they can choose which items best fit their needs? and this is where recommender systems come into play.

For E-commerce sites like COWED, the Album Advisor feature works in two ways: single album mode and multiple artist mode (Schafer et al. , 1999). In Single album mode customers can look for and locate the information page for any given album. The system will then recommend 10 additional albums that are similar to the album that is being searched. Customers using multiple album mode can enter up to three artists at a time and the system will then recommend 10 similar albums for those three artists.

Additionally, COWED uses another recommender feature called My COWED, which allows customers to customize their own music store created from both albums and artists of their choice. Customers may indicate things such as albums they currently own as well as their favorite artists. Any purchases that customers make are automatically populated into the user's " own it" list, where users can step it up a notch and further differentiate between " own it" and " love it" (Schafer et al. , 1999).

When customers indicate that they would like recommendations, the system will predict 6 additional albums the customer may like based on what items are already owned. This is much akin to Apple, Inc. Genius bar, where users can simply turn " on" or " off' the feature and it will recommend based on artists and songs found in the user's music library. Another e-commerce business that utilizes the recommender system is Amazon. Com. Amazon. Com is known best for their book section. Akin to many other E- commerce sites, Amazon. Com is designed with an information page for each book.

There are usually details listed of the text and purchase information, there on that page as well. The " Customers who Bought" feature is found on the information page for each book that Amazon carries, but has two sub lists: a list that recommendations books frequently purchased by customers who bought the selected book and another list that recommends authors whose books are regularly purchased by customers who purchased works by the author. Amazon. Mom also uses the Eyes feature, which allows users to be notified via email of new items added to the Amazon. Com catalog.

Customers can enter information based upon author, subject, title, ISBN, and publication date. Amazon. Com Delivers is a deviation of the Amazon. Com Eyes a list of specific categories and genres of their liking. A feature that I like very much that Amazon. Com uses is the Customer Comments feature. When I'm looking for products, customer reviews and price are very important slices of the pie. Usually, Amazon. Com prices are affordable and fair and sometimes, you'll even get a warranty. The Customer Comments feature allows customers like me to give direct feedback as well as the opportunity to view other's feedback.

From books, to irons, Palpitations, or shoes, someone has left a comment about price, quality, shipping time to receive the product, and their overall experience with the product. Like Amazon. Com, eBay's Feedback Profile feature is also of importance to me as a customer. The concern with eBay is that prices can be so low (or high) one wonders if products are truly authentic. Sometimes, customers bid on items, which shows intent to buy and when items are won, they do not pay. This is where eBay's Feedback

Profile feature allows both buyers and sellers to contribute to feedback profiles of other customers with whom they have done business.

The satisfaction rating that is the basis of the feature coupled with a comment about the customer (or seller) serves as a recommender system for both purchasers and sellers. In the customer or sellers profile, there is a number that is generated from positive or negative comments and star ratings. Customers can look back to the last week, month, or six months at these ratings and comments to determine whether the seller or customer s worthy of doing business with. Business Concerns in Recommender Systems A growing area of research in the arena of recommender systems is mobile recommender systems.

The increased ubiquity of internet-accessing smart phones has made recommender systems a very monogrammed and context-specific experience (Furring, 2011). As I stated earlier in this paper, " Preferences change from person to person", and this is the reason as to why there is a rising need for mobile recommender systems. However, this new area of mobile recommender systems is hardly the success story. Mobile recommender systems are a particularly difficult rear of research, as mobile data is more composite than recommender systems.

According to Ge et al. (2010), mobile recommender systems are noisy, varied, has validation and generality problems, and require spatial and temporal auto- correlation. Moreover, mobile recommender systems struggle with a transplantation issue, meaning recommendations may not be specific to the area being searched (e. G. It would not be prudent to recommend an

artist or song that is presently in the United Kingdom, but has not yet made its way here to the United States). Another concern with mobile recommender systems is privacy concerns.

Because collaborative filtering platforms collect and analyze a large amount of information on users' behaviors, activities, or preferences, it poses a major disadvantage with respect to privacy. For example, Paris asked Google to change its privacy policy outlined in an article written by the New York Times Just this year. According to Fanner and O'Brien (2012), European regulators wanted to know what Google knew about its users. Regulators wanted Google to clarify these issues and if Google did not, they were going to face punitive damages to include fines and other disciplinary action.

Furthermore, " Regulators recommended that users have a clearer understanding of what personal data is being collected and can better control how that information is recommender platforms are the privacy concerns along with the chunkiness of the system. Ongoing research is one of those solutions, obviously. Nearer Rumanians et al. (2001) continue to organize research that provides an extensive overview of the trade-offs or exchanges between personalization and privacy and found that, " The combination of weak ties and other data sources can be used to uncover identities of users in an minimized dataset" (Rumanians et al. 001). There are also some general guidelines and as to how users can better protect their information and how it is shared with others, to include better awareness of the issues and more openness in how systems operate in the marketplace and actively looking for clear statements on websites visited for policies and methodologies used for recommender systems. Rumanians et

al. (2001) also make recommendations for recommender sites so that they are better able to Justify the use of user information.

One of those recommendations is to show users a benefit and risk plot, which shows he relationship between ratings required for a given item and the benefit outcome if the required rating is achieved. This allows users to make up their own minds in terms of how involved they want to be. Conclusion Recommender systems have become important tools, not only in e-commerce but also in the lives of people as we strive to incessantly be " connected. With the rise of digital music and the increased need for companies to respond to customer needs, recommender systems are a very valuable hallmark for companies that are genuinely dedicated to customer relationship management. Companies like Last. FM, Apple, Spottily, and COWED thrive off of the recommender platform and are verily interested and enthusiastic in bringing customers to music or other desired items in new quirky ways. Yet, there is still work to be done. Privacy concerns are the new innovation's biggest threat.