The Social Shopping Platform: Final Report

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Abstract

Social marketing is a powerful tool used by online storefronts in a variety of industries. It is cost-efficient and effective by relying on viral sharing for exposure. Social and buzz marketing, however, is much more difficult to employ seamlessly in an in-store shopping environment. The Social Shopping Platform aims to improve the shopping experience for customers and provide a real-time social marketing platform for business owners.

The system allows users to save products to a mobile app as they browse by scanning QR codes registered with each product. By forming a connection between the customer and individual products, the platform provides a comprehensive product history and detailed product suggestions based on browsing patterns to the consumer. In turn, businesses owners have access to targeted browsing analytics and integrated social marketing on a product-by-product basis.

In particular, using the platform, consumers are able to share their browsing history with friends simply by saving products as they browse. The storefront has access to product views and custom demographic information. Finally, alternative
products are suggested based on learned association rules from prior browsing sessions and RGB values scraped from uploaded product images.

Problem Statement

Online storefronts have access to targeted browsing analytics via pageview quantity and length statistics. Brick-and-mortar, offline storefronts, however, only have access to the number of purchases and are missing a key piece of information that is interest in products. Further, online stores seamlessly tap into social marketing and buzz marketing, as products are easily shared on a variety of social media sites, including Facebook, Tumblr, Instagram, and Twitter. Social marketing is an extremely powerful tool, as it allows products of interest to be shared with millions of users of social media with relatively low cost and overhead. Similarly, buzz marketing relies on users themselves to share products and requires even less effort on the part of the business themselves. Both tools are essential in the modern global marketplace. Nevertheless, offline storefronts cannot easily employ these techniques to market their products.

Online shopping has also revolutionized the shopping experience for the consumers themselves. Online shoppers can bookmark products and go back and revisit these products later. Further, consumers can view product recommendations based on the products they have viewed in a browsing session. Offline shopping does
not offer these benefits. If a consumer likes a product in a store, he or she will likely forget about the specifics of the product days or even hours later, making it difficult to compare against other products. Product recommendations are also not dynamic or automatic.

The Social Shopping Platform aims to bring many of the benefits of online shopping to brick-and-mortar storefronts and shoppers via a tailored social media platform for offline browsing. The benefits to businesses include integrated social and buzz marketing, as well as targeted, product-by-product browsing analytics. The benefits to shoppers include the ability to save products and view these products later, access to friends’ browsing history to discover to brands and products, and personalized recommendations based on browsing history.

**Design Approach and Results**

The Social Shopping Platform consists of a consumer-focused native iPhone application, and a business-focused web application. At the core of the setup is a QR code system. Products can be registered on the web application and a QR with a unique product identification code will be generated. The QR code will be affixed to the product (to replace current barcodes). As a customer browses in-store, he or she, using the iPhone app., will scan the QR codes of the products he or she is interested in. These products will be saved to the customer's history, so the customer can go back
and look at the product specifics later. In addition, saved products will be broadcasted to friends’ feeds.

(1) Screenshot of Product History
(2) Screenshot of Product Feed

For each saved product, a recommended product will be presented in the product history tab of the mobile application. Product recommendations are generated using a color matching and associations mining algorithm. The mining association rules algorithm used by the system is derived from the “algorithm basic” developed by Srikant and Agrawal [1]. Each product saved in the database has an associated category tag; for
example, “handbags,” “wallets,” etc… Periodically, all browsing sessions are scanned by the web application to produce associations. Associations are product type pairings that occur frequently. For example, if a lot of customers purchase wallets and handbags together, an association between wallets and handbags would be generated by the algorithm. Further, when a product is uploaded to the database, the product image is scanned and a primary color palette is extracted. The RGB values of the color palette, along with the generated type associations are used to recommend a product that the consumer may be interested in. Continuing with the previous associations example, if a user scans a purple handbag, a purple wallet of a similar shade might be recommended.

(3) Color Scanning
Finally, an analytics dashboard is available to business owners on the web application. Currently, the dashboard displays two charts: a pie chart displaying total views by product and a multi-series line chart giving a temporal overview of product views.

![Analytics Dashboard](image)

(4) Analytics Dashboard shown for 8 products

**Privacy Implications**

Privacy is a concern with the system. The primary concerns involving user privacy include businesses having access to personal information, including but not limited to demographic information, other users having access to browsing information,
and companies and other users having access to a shopper’s location, or frequent locations. Limited demographic information is reported in the prototype of the system, but as the system continues to be developed, it will be necessary to build in settings that allow a user the ability to control how much information (such as age, gender, height, weight, race, etc…) he or she wishes to share with companies. To address the issue of location privacy, the user should be able to specify the level of location specificity that he or she is comfortable with. For example, the user should be able to select whether to broadcast information at a product level, store level, or not broadcast any information at all.

Certain benefits of the system, such as recommendation services, should only be made available if the user shares a certain baseline level of information with other shoppers and/or businesses. This might be necessary to incentivise the consumer to participate in the system to benefit other shoppers and businesses.

**Discussion and Next Steps**

As it stands, the Social Shopping Platform improves dramatically on the in-store shopping experience. It brings consumers many benefits, such as dynamic product recommendations and product bookmarking. Still, some weaknesses of the platform include limited product categories and a manual recommendation algorithm. The system is currently limited to apparel and accessories and may need to be adapted to cover a wider set of product categories. The recommendation algorithm, while very
efficient for an associations mining algorithm, still would delay the loading process of the mobile app if run every time a new product was saved. Consequently, it must be run manually on the analytics web application. Associations are then applied to individual products.

While QR codes help to form the necessary connection between the shopper and the products that he or she is interested in, the QR code system requires effort on the part of the consumer. The browsing process, therefore, is not exactly seamless. As a future improvement to the Social Shopping Platform, the QR system would be replaced by physical monitoring devices equipped with low-energy bluetooth and accelerometer capabilities. Consumer interest would be detected automatically by the consumer being within range of the product as well as by the consumer picking up the product and moving it around (detected by the accelerometer). Not only would this make the browsing process more seamless, as the customer would not have to scan individual products, but it would allow for the system to detect a range of interest levels, instead of a simple binary: interested or not interested. This level of interest could be detected by how long the consumer is in range of the product and how much he or she is moving the product around and for how long.

Brick-and-mortar storefronts benefit from the Social Shopping Platform as well. Improvements, however, could be made to the analytics dashboard. Currently, the dashboard shows total product views product-by-product and a temporal overview of consumer interest. This could be greatly expanded to leverage the unique information provided by browsing data. In particular, this data could be compared and contrasted
with purchase analytics to determine which products achieve high interest but ultimately low sales. This type of information could reveal flaws in pricing or hidden issues in products themselves.

Reference