

Profiling E-Commerce Customers Using Clarifai

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Abstract—E-commerce applications are numerous nowadays. One of the keys to retain user engagement in e-commerce application is personalization. By using customers' personal data, such as their interests to products, developers can customize the application to suit the customer better. I want to explore such system using Clarifai. Clarifai is a visual recognition tool that can extract aspects from an image. By using Clarifai, we can extract aspects from any product's images. These aspects, combined with data of customers' interests, are then used to make useful application's features, such as product recommendation and market segmentation.

Keywords—Clarifai; e-commerce; image recognition; personalization; recommendation system

I. INTRODUCTION

My friends and I are currently developing an E-commerce application, called Lumino. We designed Lumino to be an application that focuses largely on customers' personal needs. However, to accomplish that, first we have to understand the customers. Ultimately, it comes to how we can get inputs/feedbacks from them, whether implicitly or explicitly.

One of Lumino's features we want to build is called Shuffler. Shuffler is our way to get a lot of feedback from customers and, at the same time, make the experience enjoyable for them. Basically, Shuffler works when customers search for a particular item. Then Lumino will display the search results, on by one, like a slideshow. To show the next search result, customer will have to press like or dislike button of the corresponding item. The pressed button represents the input/feedback of the customer regarding that particular item.

However, knowing the preference of customers on item-level is not enough. We want to know why the customers like/dislike a particular item. For example, we want to know why a customer likes a shirt. Is it because of the color, the material, or another aspect? This kind of understanding is what we want to achieve in Lumino.

Another problem to consider is how to extract the aspects of the product. One way to do this is by extracting directly from the product's image. Clarifai is one of the image recognition tool that I want to use. With Clarifai, we can

extract aspects from product's image and get a better understanding about the customer's interests.

II. CLARIFAI EXPLORATION

Clarifai^[1] is an artificial intelligence company that focuses in visual recognition. The company claims to be market leader in the area by offering powerful image and video recognition technology that built on top of advanced machine learning systems. Clarifai provides convenient APIs for developers. These APIs are the ones I used for building system for making profile of customers.

Figure 1 illustrates the overview of the system. First, seller will upload an image of the product they want to sell. Then, Clarifai will extract product's aspects from that image. Then a when customer use Shuffler, they will give feedback to the product.

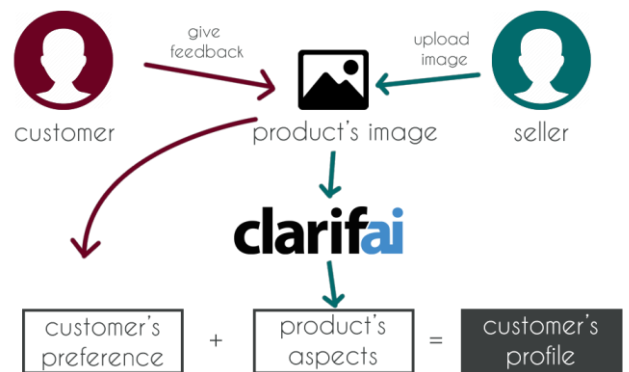


Figure 1 Overview of the Customer's Profiling System

By using these methods, we will get the profile of the customer.

Next, these profiles could be used to do a lot of things, such as market segmentation, product recommendation, and other analyses.

III. EXPLORATION RESULTS

I have implemented the prototype of this system using Python. The code can be found at https://github.com/hanmajid/socif_clarifai.

Preview of the results of the aspect extraction process can be seen in Figure 2. The first row is the product's aspects that are extracted from all the products. Each of the following rows represents a product that is processed. Each cell represents the value of the aspects found on each product. For example, cell C3 means that product 2's value of the 'display' aspect is 0.96864.

	A	B	C	D	E	F
1	screen	television	display	bike	technolog	desktop
2	0.998646	0.993707	0.992119	0.990833	0.9785	0.978026
3			0.96864		0.994425	
4					0.984891	
5	0.9607		0.937367		0.990758	
6						
7					0.933155	0.886247
8		0.889363			0.960737	0.938378
9					0.952653	
10					0.978047	

Figure 2 Results of Aspect Extraction Process

As you can see, the table could get very sparse given a lot of product's data. But for now, this is sufficient.

One example of the usage of this result is giving product recommendation. The idea is, by knowing the characteristics of the product that a customer likes, we can find other products with similar characteristics. By treating each row as a vector, finding a similarity between two products is as simple as finding cosine similarity^[2] between two vectors.

The example result of the recommendation system can be seen in Figure 3. It indicates that product 13 is the product that most similar with previous products that the customer likes.

Recommendation: 13 with distance: 3.43129983638

Figure 3 Example Result of Recommendation System

IV. CONCLUSION

Clarifai is a handy tool for visual recognition. Many applications can be made with their APIs. The prototype of this customers profiling system can be made in relatively short time thanks to Clarifai's simple and easy-to-use APIs. There are a lot of improvements that can be made to this prototype. For example, the format of result data that is too sparse can be modified to be able to handle large data.

REFERENCES

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This paper was written by me, and not a copy of someone else's works. All the statements and images are written using my own words and/or created by myself, except ones which I indicated in the references.

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