The internet's advertising power

Science, Computer Science

First, technology was used to make basic tasks easier to do; like using graphite pencils instead of feather and ink. Then, technology evolved and started doing that that we were not capable of doing; like computing large mathematical equations. Today, technology is being used to make decisions for us, for example: within our shopping and music choices. Previously, research has been done on these preference algorithms, but only with respect to how they affect advertisements on websites like Facebook. It is important to understand that these algorithms play a large part in other aspects as well. The most prominent one is in music and music choices; programs like Pandora and iHeartRadio are known for their intricate preference algorithms that analyze choices and come up with the next song to play. Consequently, there has been much rigidity toward using these kinds of programs because they take away from the authenticity of finding and enjoying music on your own. Using synthetic means to discover new music is viewed as impersonal; it dehumanizes the whole experience of listening to music. Despite rigidity toward preference algorithms used by social apps such as Facebook and music apps such as a Pandora, these programs have revolutionized the world of advertisements and helped many artists find fame.

In the past, finding a target market meant researching which group would be the most receptive to your advertising techniques and then putting your ads where that target group would be exposed to it. This was done by surveying and wasting a lot of time on the wrong target market before finally finding the right one. This process involved ample wasted time and wasted money. Algorithms, and internet advertising changed all of this; therefore, saving

artists and businesses a lot of time and money that can be relocated for other endeavors. Before the internet, finding the target market was difficult because a company or artist had limited control over where their advertising efforts were going. Information travelled mainly through word of mouth, freebies, and radio play.

Word of mouth was probably the best and most affective form of advertising because if one person loves their music, they are most likely prone to tell someone else; that person will then tell another, and so on and so forth. Giving out freebies, be that copies of a band's demo or free pens for a specific company, was a way to get more people aware of a band or product. This kind of advertising forces one to go out and find their market. Unlike advertising on the internet where an algorithm will do all the work or finding and displaying the ad itself. Lastly, radio play is a good way to get music heard or ads played but there is little interaction between the listener and the advertiser. The advertiser cannot choose who listens to the ad in order to ensure the ad is reaching the target market. Unlike advertising on the internet where an algorithm will do all the work or finding and displaying the ad itself.

The diagram belowshows how the majority of sales profit comes from internet marketing. Internet marketing trumps radio, television, outdoor, magazine, and newspaper ads.

Facebook is the first thing most people think of when it comes to advertising based on the user's characteristics. Simple recommendation algorithms do not perform well enough, because they do not learn and adapt to users

behavior. Facebook is an almost perfect platform to test out preference algorithms because most Facebook users have already defined what they like and what they do not like with their likes, shares, and comments. Facebook uses a combination of Reinforcement Learning (goal orientation) and Unsupervised Learning (for scalability and tricks humans do not understand). A goal oriented algorithm has a set path to follow and will continue to loop through the code until the " goal" is reached. This includes calculations: a code will continue to loop until it obtains an answer. Unsupervised Learning deals more with what humans cannot do themselves, so codes are developed to do it for them. The Facebook user interface has various goals with different priorities: user stops browsing the feed and reads a post / follows a link / watches a video; user likes / comments / shares something; user joins a group / likes a page (in Facebook) / adds a new friend; user writes content that others consume. Without the user even knowing, Facebook will sell this information to advertisers so that they can tailor their ads for their target market. Similar programs are used on search engine sites such as Google and Yahoo; user preferences are defined by what a user searches and clicks on and ads that are supposed to be enticing for the user are displayed as click bait.

Using Facebook as a means for advertising comes with many benefits including creative control, enhanced audience targeting, and greater video reach and views. Advertisers are able to try new creative ads every week because advertising algorithms call for quick and easy to understand ads that change frequently to avoid " ad fatigue." The point of advertising on Facebook is so that you can use the algorithm to find your target market.

The ad will only to shown to people who are perceived to be the most interest in the ad based on their other preferences that have specified on the site. Lastly, the potential reach your video ads have is likely to increase as Facebook's user base increases and as the Facebook ads' targeting improves, making advertising on Facebook more optimal than advertising on television.

The biggest difference these algorithms have made is in how easily new music can be discovered. Underground artists who do not have the means, financially or otherwise, to bring attention to their music have the opportunity to be heard because of these algorithms. Programs such as the Music Genome Project (MGP) have helped countless artists find fame without having to spend money on marketing. The MGP was first created by Pandora, then was reinvented by other music streaming applications. All of the algorithms are different because they are all patented by each individual service. Some algorithms work better than others depending on how many times they have been improved, but it is mostly up to user preference. The Music Genome Project is significant because it is an algorithm that affects millions of people every day, but no one is aware. No one really gives a thought about how the music choices come up when using music streaming software such as Pandora and iHeartRadio.

It is important to realize that today most of our music choices are not made by us, but they are made for us by algorithms and machinery. These algorithms are designed to mimic our thought process when we find songs for ourselves. A given song is defined by a set of values of approximately

450 " genes" (named after trait-determining genes in biology). Each gene corresponds to a characteristic of the music, for example, gender of lead vocalist, prevalent use of groove, level of distortion on the electric guitar, type of background vocals, etc.

" Each song in the Music Genome Project is analyzed using up to 400 distinct musical characteristics by a trained music analyst. These attributes capture not only the musical identity of a song, but also the many significant qualities that are relevant to understanding the musical preferences of listeners. The typical music analyst working on the Music Genome Project has a four-year degree in music theory, composition or performance, has passed through a selective screening process and has completed intensive training in the Music Genome's rigorous and precise methodology. To qualify for the work, analysts must have a firm grounding in music theory, including familiarity with a wide range of styles and sounds. All analysis is done on location…By utilizing the wealth of musicological information stored in the Music Genome Project, Pandora recognizes and responds to each individual's tastes. The result is a much more personalized radio experience – stations that play music you'll love – and nothing else."

Even with all of these " genes," that are being analyzed, the MGP does not always make the best decisions. Sometimes a user created station can become overly specific, making every song that is played very similar to the one played before. In times like these it is important to understand that, as hard as a programmer may try, a program cannot completely replace the process of finding music ourselves. Sometimes the " synthetic-ness" of the

program will shine through the cracks and detract from the listener's interests.

Pandora Radio states: " We believe that each individual has a unique relationship with music – no one else has tastes exactly like yours. So delivering a great radio experience to each and every listener requires an incredibly broad and deep understanding of music. That's why Pandora is based on the Music Genome Project, the most sophisticated taxonomy of musical information ever collected. It represents over eight years of analysis by our trained team of musicologists, and spans everything from this past Tuesday's new releases all the way back to the Renaissance and Classical music."

What sets the Music Genome Project apart from most other " big data" these days is that music experts are hired by Pandora to fill in those parameters, making the Music Genome Projectpotentially the most sophisticated and precisely catalogued library of music the world has ever known. In addition, interpreters of user data are every minute responding to user input, tweaking and refining the song lists in the hopes of making the listener experience a perfect fit for every individual. User data tempered by direct and deep human involvement is the future for this industry. Pandora has that right. The problems lie mostly in the shape of that involvement. Direct human involvement is what preserves the authenticity of discovering music. Thus, programs such as the Music Genome Project do not make listening to music a synthetic experience; rather, it makes the listener more involved in the process of choosing the next song.

In addition to playing songs that the listener has specified, the Music Genome Project will also throw in some of its own suggestions based on the listener's preferences. This kind of technology opens up a new door to lesser known songs and artists. It gives underfunded and underrepresented artists a chance to be heard by the public without depleting their financial reserves. A recent study done on the use of social networking sites and folksonomies to discover if social tagging and folksonomies, within the area of independent music, aid in its information retrieval and discovery. Three groups of participants were surveyed using questionnaires. These groups were music concert attendees, people who responded to online postings to social networking sites, and independent record companies. In addition interviews were held with digital music experts. The four record labels unanimously agreed that social networking sites are having a major impact on independent music discovery.

This study shows that even representatives from major record labels – the people whose job it is to find new artist – agree that apps like Pandora provide a huge advantage for lesser known artists or artists that are trying to get there music to the public. It was found that there is a 28% increase in popularity for artist that release their music on these services versus artists that do not. The increase comes from how often their songs come up in the rotation depending on how the listener's preferences are set up.

For example: Canadian pop-R&B singer and songwriter Alessia Cara made her recorded debut in 2015, though she started racking up YouTube views – with acoustic covers of popular songs across several genres – four years

earlier. Upon graduating from high school in her native Brampton, a suburb of Toronto, Ontario, Cara opted to devote a year to music rather than go straight to college. She continued to upload YouTube clips regularly and was discovered by Jimmy Fallon on SoundCloud. She finally landed a major-label recording contract with Def Jam and she released her debut album in November 2015. Other artists that have gained fame because of preference algorithms on YouTube and other internet radios are: Greyson Chance, Rebecca Black, Soulja Boy, Psy, Karmin, Lana Del Rey, Gotye, Macklemore and Ryan Lewis, Katy Perry, and Justin Bieber. All of the fore mentioned artists had little to no following before they were discovered online; without the aid of the algorithms that brought their videos into the public eye, they may never have been discovered. In some ways algorithms act very stealthily, they can hand you a video or song that you may never have come across otherwise, without you even knowing.

Regardless of some adversaries of using preference algorithms, it is proven that they come with more benefits than disadvantages. These algorithms allow for more publicity for both businesses and emerging artists who are unable to market themselves on their own. They also help us find new music for ourselves and have revolutionized how we listen to music. It is important to understand how these algorithms work so that we ourselves can find new ways to contribute to the new discoveries in music streaming. Also, knowing how these programs function will make reviewing and improving already existing programs easier and more efficient. Without these preference algorithms, today's advertisements would be at a standstill, making no progress while still costing a lot of money. Using these algorithms are

effective and economical, the perfect combination for rising artists and small businesses.