21st Century Public Service Announcements: Leveraging Network Analytics and AI created content to Reach a Modern Audience

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Abstract—**Advertising has proven to be a powerful force in world history. Changes in advertising techniques have contributed to worldwide conflicts. Advertising has undergone significant changes in the 21st century as well as experiencing considerable growth. Advances in marketing have led to a 'black hole' for high level messaging regarding issues concerning the public in general.**

Keywords—MarTech, digital advertising, marketing, Artificial Intelligence, Social Media, Automation

I. INTRODUCTION

The online advertising space has grown considerably over the last 10 years. While some of this growth is attributed to the natural growth of the economy, much of it is due to tectonic shifts in the way consumers are encountering and interacting with advertising materials. 21st century consumer preferences for emotion driven, non-overt advertisements are enhanced through the greater adoption of social media and mobile internet. Developments in the marketing industry, coupled with advances in technology have led to massive increases in the efficiency of advertising. The relative power of new marketing practices has created a 'black hole' where traditional advertising was dominant. At particular risk are public entities whose limited budgets are further hampered by an unwillingness to invest in new marketing strategies. Outside actors have capitalized on the lack of investment. This paper outlines the context surrounding the problem and possible solutions already partially implemented and how they will grow.

II. CONTEXT

A. Growth of Mass Marketing

Mass marketing has a relatively short history as it is a consequence of industrialization. During pre-industrial times the concept of mass advertising didn't exist as we know it, because there was not a large surplus of goods that could be sold at a profit. Now the idea of mass marketing is ingrained in the public psyche. Individuals advertise for themselves on social media even though they have no brand, nor sell any single product. Advertising has changed considerably in its brief time around.

In the early days of mass marketing, advertisements relied on facts and figures. Industrialization first occurred in England in the eighteenth century and spread to the United States and France in the early 19th century. Advertisements in the early 1800s normally relied on words and appealed to Consumers logic and reason. Early advertisements would not try to emotionally persuade consumers but rather would appeal to their logic and reason. By the late nineteenth century and the expansion of mass market industrial consumer advertising began to change form. Instead of focusing on logic and reason advertisers learned to appeal to peoples base emotions.

When advertisers began appealing to emotion rather than reason the world changed. The creation of propaganda and nationalism led to war in Europe and East Asia. On Madison Avenue in New York early advertisers like Edward Bernays were using the same emotional advertising techniques to sell things like cigarettes, bras and deodorant to people that previously didn't know those products existed. [3] By appealing to consumers base emotions such as being afraid of

smelling bad, not being left advertisers were able to truly change the world.

These large-scale mass media advertising campaigns enabled large government programs like the New Deal or the second world or going to War II happen in countries. Without these large-scale sentiment changing campaigns the climate of the would be much different. Large mass media campaigns made some of the most influential movements of the twentieth century possible.

B. Changes in Mass Marketing

The world of traditional advertising, which capitalized on human emotions and was characterized by large scale distribution campaigns, dominated the advertising industry for almost a hundred years. From the early 1900's to early 2000s advertising was completely dominated by the same advertising techniques. Something interesting happened around the turn of the 21st century. Consumer preferences changed.

Consumers became more aware of advertising practices; they became aware that there were million-dollar campaigns being conducted to change their mind, and in consequence consumers became more sophisticated. Many consumers began to resent commercials. Some advertisers reacted by making commercials funnier or more entertaining, but in general the effectiveness of advertisements diminished.

In order to recapture the attention of consumers marketers changed their advertisements. Traditional advertisements themselves do not provide any intrinsic value to the consumer. Virtually all consumers do not enjoy watching advertisements. Advertisers have found that most consumers think advertisements are annoying, intrusive and useless. Average consumers don't like watching advertisements.

C. Development of InBound Marketing

New advertisers have learned to create their advertisements to be more subtle: advertisers learned that their advertisements had to provide some sort of value to the consumer. Traditional advertisements do not provide value to the consumer. Traditional advertisements are meant only to persuade a consumer.

Outbound marketing practices are when a firm creates marketing assets (advertisements) and then delivers those assets to customers in the hopes of converting potential leads into customers or retaining existing customers. Advertising as it existed from the nineteenth to the turn of the 21st century was focused on outbound advertising models. Advertising assets were created and then distributed in the hopes of bringing customers into the business. Inbound marketing is different in that the advertising assets are supposed to deliver some sort of intrinsic value to the consumer. For example they could be interesting, or it could be useful information.

An example of a good inbound marketing practice is a blog for pool maintenance that features articles about how to keep a pool clean. The blog would have all sorts of useful information on what type of chemicals to add and when to add them and what to do if things go wrong. If that blog was made by a pool cleaning company, then consumers who go to the blog as an informational resource and need a pool company

will naturally go to that company. Since all the information needed to make the blog (except from IT info) is already known to the pool service company, writing the articles is not difficult. This is a classic inbound marketing model.

A typical inbound advertising asset could also be a social media account. People follow accounts for a variety of reasons such as the account has many followers or the account has content the user enjoys. Since the advertiser does not have to pay extra for more views to a social media account, this type of advertising is non-rivalrous. Non-rivalrous advertising means that one consumer viewing the advertisement does not diminish the likelihood of another viewing the same advertisement (as if it were set to a fixed budget.)

The shift from old marketing practices to new types of marketing practices will create new niche markets in the advertising space catering to customers that otherwise would have been priced out of the traditional advertising model. Pre-existing actors in these spaces will see their power increase as the entire market increases in size due to increased productivity. Large social media accounts can advertise at scale for a low cost, and those savings compound over time. These trends indicate a continued growth in inbound advertising methods.
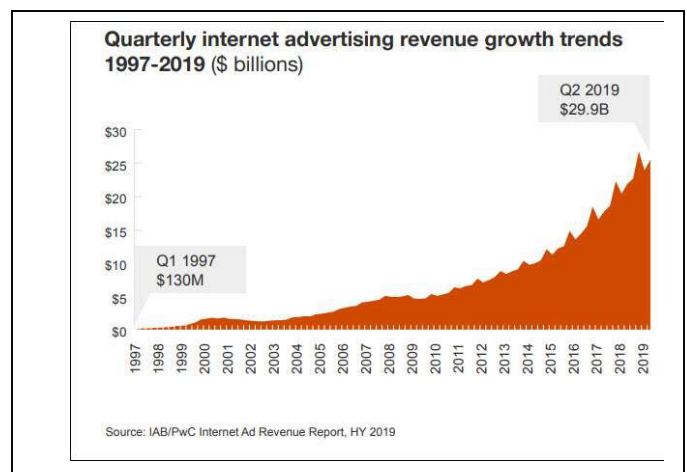

a.

Fig. 1. Global Internet Advertising Revenue [4]

While the growth of traditional social media is well known, the growth of key sectors within social media is particularly noteworthy. Areas where content directly affects sales such as reviews for kids toys or technology has outpaced other sectors. PQ Media's "Global Advertising & Marketing Revenue Forecast 2019-23" tracked 40 digital & alternative media channels. Of those 40, 28 posted double-digit growth in 2018. The top ad & marketing segments worldwide were mobile smart tech, coupons, social media, video, audio, gaming, and email.[2]

Contrasting markets for disposable consumer goods, industries that are not directly marketable have a more difficult time breaking into inbound advertising. For example public health, education, and environmental issues may require large investment before noticeable gains are achieved. This lack of

investment in effective messaging has led to large negative externalities for these industries. If a firm were to develop a influencer(s) to promote a certain public topic it would be cost effective to use them to cross promote other public interest topics. This is an underserved market with tremendous growth potential.

D. Advertising Assets Generated by Artificial Intelligence

As artificial intelligence's capabilities increases it is not far fetched to think advertisements in the future will be generated by AI and particularly tailored to a specific audience. Chatbots can already create almost human-like articles from a just a few key words. DeepFake image algorithms can create lifelike images from a collection of real images[10].

As AI increases its capabilities those who are not already investing in AI will be left behind. Marketers and advertisers leveraging AI to create custom advertisements will be at an advantage both in the quality of the advertisements they can create as well as the quantity and price with which they can be generated.

E. MicroTargeting and Network Analytics

The development of inbound marketing practices have already greatly increased the sophistication of modern advertising. Advertisements have become cheaper and are distributed to larger audiences. The development of microtargeting has greatly increased the efficacy of all marketing assets, both inbound and traditional.

The core element of a microtargeting campaign is network analytics. This analysis is broken into three processes. First one must create a map of 'interest communities' based on followership or liking. Next is to track related content (hashtags, links, phrases) within each of these mapped communities. Finally is to measure every instance a metric occurs (a tweet, like or follow). These measurements are used to track exposure across communities.

After each network is mapped, tracked and measured, the advertiser must target each community through the same identified influencers specific to that community. Finally those influencers can send out messages that are then tracked to measure impact in the mapped community.

The use of microtargeting has proven to be highly effective however due to the technical requirements to conduct such a campaign it's use has been limited to large entities with large advertising budgets. Just as public entities or causes are falling victim to lack of investment in inbound marketing practices, these problems are compounded by the lack of implementation of microtargeting and enhanced distribution techniques.

Traditionally key opinion leader (KOL) identification relied on expert opinion or brute-force bibliometrics. Those metrics varied depending on reputation, visibility and publishing frequency. By mapping out communities leaders are easier to identify, and sometimes can even be identified visually. For example, below is a map of healthcare industry KOLs on LinkedIn. Through the use of mapping the best KOLs are identified. This analysis is of tremendous benefit to

advertisers who will then leverage the influencers followers to distribute their message 'organically'.
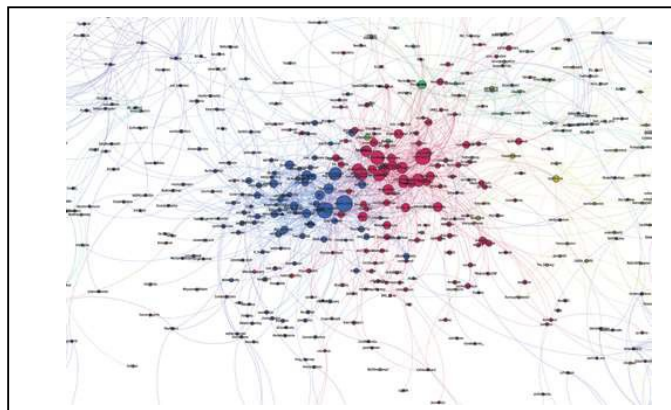

Fig. 2. Mapping Influencers in healthcare on LinkedIn [5]

F. Collective Action Problem

"innumerable interests . . . could show that particular measures would confer immediate and obvious benefits on some, the harm they caused [on others] was much more indirect and difficult to see" (Hayek) [1].

The collective action problem is something that has been well-known to Economist and philosophers for a long time. In the 20th century it was also brought to light by Austrian economists in the United States at the University of Chicago. Mansur Olsen and a Friedrich Hayek both talked about the idea that collective special interests would lead to a certain type of market failure for public goods. The reason why these public goods would have a market failure when it comes to lobbying the government is because there are concentrated benefits and distributed costs. An example would be a football stadium that may cost each homeowner a thousand or $10,000 but there's only two hundred homeowners. Meanwhile the stadium owner may stand to make tens or hundreds of millions of dollars from TV rights and ticket sales over an extended period of time.

Many public sector government agencies, public causes are susceptible to this economic situation. The environment (EPA), the food and drugs (FDA), and the stock market (SEC), or any sort of regulatory body is subject to this problem of distributed costs and concentrated benefits. The collective action problem is not a new problem for public sector entities in the United States.

The problem of not being able to adequately combat other non public entities has always been around. What's different now is that the level of sophistication and complexity required to achieve a high-level marketing campaign is completely out of reach of an average public entity or medium size non-profit. One issue is there aren't many influencers or media companies making content that directly serves the

government or the public sector. This is an area of growth that will be addressed later in the paper.

There are not many people making content that's directed to help further the United States natural resources. For example not many entities except the Sierra Club and other smaller conservation groups are lobbying to protect US wilderness or public lands. Meanwhile other much larger entities such as large energy, agriculture or forestry companies may spend millions of dollars to convince locals to agree with development of the land.

III. WHAT IS THE PROBELM

Currently there is no concerted effort to organize and promote clear messaging for public entities and public service issues. Authoritarian regimes can only manipulate their population in two ways: through violence or propaganda. The widespread adoption of mobile video violence has become less feasible as the risk of videos and news leaking increases. This means authoritarian regimes have been growing their cyber capabilities in digital marketing. Western governments do not condone the use of duplicitous advertising methods, and are effectively 'out gunned' in the realm of cyber mass marketing.

Public sector entities and causes should be aware of this reality and plan accordingly. A large scale, unaddressed messaging campaign to strike against the US public interest (for example to create mass social discord) could cost innumerable dollars. Since Western governments by principle will not engage in concerted public messaging campaigns, non-profit organizations and charities must step in to fill the void.

Public causes such as environmental or public health issues are particularly underserved by online marketing due to concentrated benefits and distributed costs. The underserving of these causes by adequate mass messaging is not arbitrary but a structural consequence and market failure. Therefore there is a need for concerted messaging for public issues. This concerted public messaging is in no form propaganda, but rather is intended to accurately portray important factual information relevant to the public interest.

IV. EARLY EXAMPLES

A. Voter Education

The Voter Education through Network Analytics project from the MIT Media Lab was led by Russell Stevens, a Master in Public Policy from Harvard who has a career in communication strategy. He led a team that leveraged network analytics to create an outreach campaign designed to lessen voter confusion regarding the upcoming election. Questions regarding registration, absentee vs. mail-in vs. in-person voting, and what actually happens at the polls are answered by specifically identified influencers from key communities that have been mapped and measured.

B. #BeatTheVirus

The #BeatTheVirus is another large scale messaging campaign that was created in part by MIT Media Lab. The idea of the project was to address widespread misinformation and lack of information regarding the COVID-19 pandemic. Researchers at MIT identified key public health individuals from Tuft's University Hospital and used them for medical information, as well as Susan Blumenthal former US Assistant Surgeon General.

After getting expert medical advice, the researchers used McKinsey & Company for network analytics to identify key influencers to target. With the help professional graphic designers from CAA, the team built a suite of advertising assets that they sent to influencers. Using this system the #beatTheVirus was able to gain 100 million views from 20,000 posts. Most importantly the campaign did not pay for each of those views directly like a traditional pay per click advertising model. This method is highly scalable and particularly suited to public sector interests. Only because of lack of coordination between various public sector entities has the growth of large scale sophisticated public sector messaging campaigns been hindered.

C. PBS for the Internet

In February of 2019 Erik Martin, a graduate student at Oxford's Internet Institute, wrote an Op-Ed in the Washington Post titled "We need a PBS for the Internet age" [6]. In the article he highlights how in 1967, President Lyndon B. Johnson signed the Public Broadcasting Act into law to spur the development of noncommercial radio and TV programming "that will be responsive to the interests of people," and "that addresses the needs of unserved and underserved audiences, particularly children and minorities."

Public Broadcasting created shows such as "Sesame Street" and "Mr. Rogers' Neighborhood," as well as investigative news such as "Frontline" and educational programs such as "Nova". Many people still enjoy PBS however it's role has become dated and antiquated. The reach of PBS is limited.

D. Corporate Investment

Large technology companies are investing in public sector messaging campaigns. Google has recently pledged $300 million towards an "Google News Initative" aimed at funding local news producers. Local news creators will be the future influencers who will help distribute the key messages of the future. These influencers will be cultivated through large programs like this [7].

Facebook has also recently invested $300m to support 'local news'[8]. While both of these initiatives help combat misinformation, they also serve a larger purpose of generating a new crop of social media influencers sympathetic to the public interest. Ideally these same influencers can be relied upon in the future to spread more factual information if needed.

V. The Future of public Sector marketing

Public sector marketing has an exciting future ahead. All of digital marketing is projected to continue to grow. Growth in online shopping as well as increased adoption of social media and mobile video will undoubtedly translate to growth in online advertising.

The public sector marketing industry is much smaller than other industries, however due to the reasons outlined in this paper this industry is underserved and projected to grow.
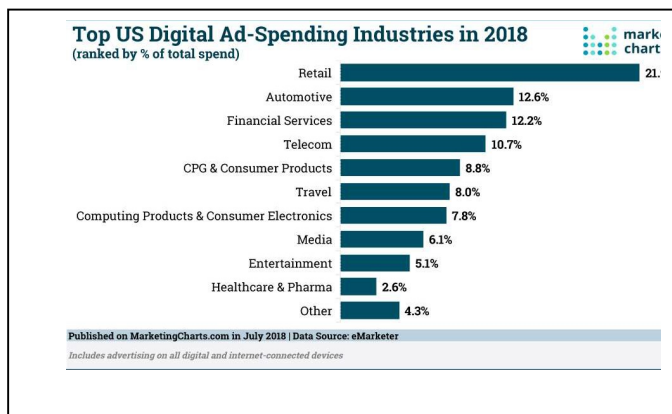
Public Sector Ad expenditure is low compared to other industries [9]

There is a tremendous need in the public sector for clear consistent messaging to advance the public interest. Just as PBS was created to help serve underserved communities, there may be a future government organization tasked with implementing clear messaging campaigns on behalf of the public interest.

Undoubtedly even if Federal or State government do not fund more communications investment, charities and donations will continue to grow. The need for these type of communication practices are clearly established and only expected to grow. The only truly unknown is who will step into this void in public sector communications and how will they profit from it.

If an organization were to contract with public entities but retain the ability to advertise privately as well, that group could earn substantial sums from economies or scale. By leveraging AI generated content large scale campaigns could be created at low cost. By using microtargeting those assets could be optimized to be their most effective. Through the use of inbound marketing practices consumers would have difficulty identifying advertisements and their power would be magnified.

The opportunity for a mal-actor to attempt to use this public sector messaging system for ill exists and must be guarded against. Truly only the future will tell what is to come.

Acknowledgment

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