

A Review of challenges and opportunities in adopting DOOH Technology for Advertising: A Business Perspective through TAM

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Abstract

This research aimed to provide an extended version of the “Technology acceptance model” (TAM) with an assessment of the difficulties and possibilities in adopting DOOH technology for advertising from a business perspective. The goal is to determine the intent to use DOOH advertising in the modern world. Furthermore, the influence of different individual characteristics on the creation of customers' attitudes toward the benefits and drawbacks of the new technology is investigated. The efficacy of DOOH advertising has grown more critical to brand marketers as reaching today's customers in the fragmented media environment becomes more difficult. Several digital marketing approaches may be combined with a DOOH campaign to increase the campaign's reach and effectiveness. This will help drive quantifiable behaviours like app downloads, social involvement, and content development nearly entirely through consumers' mobile devices.

Keywords: Digital out-of-home advertising,

Introduction:

Advertising has led to considerable development potential in new media and rapid growth of advertising's market share. Digitalisation, informatisation, and virtualisation technologies, has passed through time, reach, cost and space limitations. Solutions helping users to come out of these challenges will significantly increase viewership, better striving, brand recognition, and to achieve marketing and promotion goals. As technology advances, advertisers' ability to communicate with audiences has grown. Consumers now have more options for consuming

information. Burdette Ketchum's content and social media account executive Halli Bruton observed, "Internet advertising has become a double-edged sword. There are more outlets and places to market than ever before. Consumers are bombarded with so much advertising daily that it takes something remarkable to get their attention. Webpages, video platforms, social networking, on-demand broadcast, and audio have all exploded in popularity during the last ten years.

Literature Review:

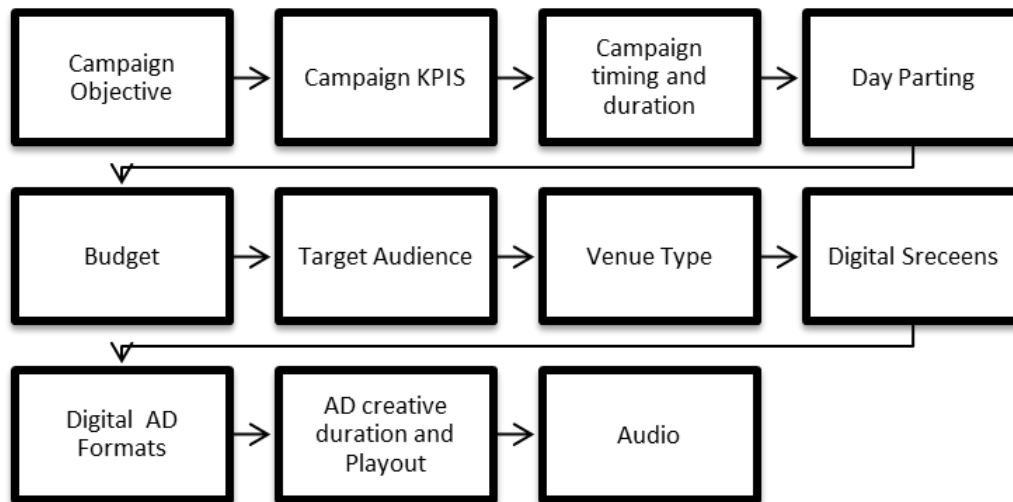
New media advertising research is likewise in the early stages of development. There are many instances of new media advertising design justifying that the further study on the visual dynamic design theory of new media advertising is required. The conclusions of the study are largely concerned with the definition, meaning, and feature evolution of new methods of media advertising. Over the forecast period, digital out-of-home (DOOH) advertising market is expected to increase at 10.35% compound yearly growth rate from US\$16.750 billion in 2019 to US\$33.372 billion in 2026.

“Digital out-of-home advertising” (DOOHA) is a new type of marketing and advertising that uses digital screens and electronic displays to reach out to customers at any point of time and at any location. It can be used to show advertisements and communication messages to people while they are in transit, waiting, such as a store. DOOHA is found on almost every bus, rail, airport, stadium, and shopping mall. Unlike other kinds of advertising, DOOHA revenues are expected to expand faster in 2012, with a forecast growth of 19 per cent. ([BusinessWire, 2012](#)).

DOOH (Digital Out of Home) is a term that refers to advertising that is displayed outside of a physical, although it may sound like digital signage. DOOH advertising displays can alter their advertising content remotely by utilising digital technology. It's the display at the airport that tells you what gate your flight is leaving from. This includes digital billboards, outdoor signs, and screen networks in areas like malls and hospitals. DOOH may be found almost anywhere because it is such a broad category. In the local business sector, large digital billboards, tiny digital signboards, and even small TV screens used to display material can all be found. The movement also has a considerably easier time catching people's attention, implying that DOOH has a greater chance of making an impact. Each new ad on a traditional billboard incurs printing and installation charges. Displaying new content on digital billboards can be automated and completed in seconds. Setting up a digital screen costs more upfront, but it's an investment that returns for it quickly. A static image on a typical billboard can be up for weeks, whereas a digital ad can update every 15 seconds.

Programmatic advertising platforms have made automating selling and buying DOOH advertising feasible on both sides. To make their DOOH advertising inventory available to various purchasers, sellers employ a Supply Side Platform (SSP). A Demand Side Platform (DSP) allows buyers to place ads simultaneously across multiple media owners and environments. An ad exchange, essentially an auction-driven marketplace for digital advertising inventory, sits in the middle of these platforms. DOOH advertisements can now be bought and sold on a wide scale alongside mobile commercials, Internet display ads, paid social media, and other digital ad space on ad exchanges that sell several types of digital ad space. Because the capacity to understand the value of audiences reached by DOOH in the context of all other digital audiences an advertiser wishes to go to allows the DOOH market to expand and scale, cross-platform integration is critical. Steps to build a DOOH campaign:

Fig. 1- Steps to build a DOOH campaign



Source: Proposed by researcher based on review of literature

“Technology Acceptance Model” (TAM) proposed by Davis (1989) assumes that people will be interested to adopt and use a technology if they find it easy to access and trustworthy. The more likely they are to believe that the systems would make their jobs simpler higher are the chances of accepting and adopting the technology. (Dillon & Morris, 1996). The TAM model is derived using an idea based on the principle of reasoned action. This theory asserts that individual’s social activity is motivated by an its attitude intended to foresee information utilisation. (Lin 2007). However, this study contends that Fishbein and Ajzen's argument may be important for personal technology use. Friends, coworkers, or an expert advice via marketing may persuade people to purchase and use a system. In contrast, an employee's friends cannot influence office technology, but business regulations regulate employee behaviour. As a result, when utilising the system, there is monitored conduct at individual work. The model is the most widely used approach of measuring consumer’s acceptance of technology, it has limitations. (King and He 2006). The key findings of the study have concluded that both perceived utility and perceived ease of using DOOH advertising platforms are directly influenced by user behavioural intention, Venkatesh and Davis (1996) which is developed as the final version of the “Technology Acceptance Model”. TAM consists of two parts: Perceived ease of use (PEOU), Perceived usefulness (PU) are fundamental predictors of the adoption and use of technology (Davis, 1989). Davis defined PU as “the degree to which a person believes that using a particular system would enhance his or her job performance” (1989, p. 320). PEOU means “the degree to which a person believes that using a particular system would be free of effort” (1989, p. 320).

DOOH Technology Acceptance Model (DTAM)

As technology advances, we must adapt as well. Out-of-home advertising has given way to digital out-of-home advertising. Perceived ease of use (PEU) and Perceived utility (PU) and are different but related criteria. External influences can impact perceived utility (PU) without considering the ease of use (EoU).

External Variable

External factors include all the variables discussed in Porter's five-force model. Porter's model (1985) which is based on the impact of microeconomic environment on businesses. Despite the criticism from Mintzberg is still one of the most widely used strategic frameworks even today (1994). According to Porter, strategy is a form of competition and has direct impact on profit characterised by five main factors described as: **New Entrants as a Threat:** Additional entrants into a business sector provide additional production capacity and a competitive market drive, placing downward pressure on prices, manufacturing and other costs, and the investment rate to compete with each other. If entry barriers to new companies remain at high level, the threat of new entrants is low. DOOH advertising is unusual, yet it has the potential to be effective. **Supplier Power:** When a few suppliers serve many consumers with few substitutes, provider power is high, and the supplier may capture the value and charge premium pricing. As there are fewer suppliers in DOOH advertising, you can quote the price according to your wish. **Buyer Power:** Buyer power is the inverse of supplier power, allowing consumers to extract more value by bringing down costs payable by consumers and demanding greater quality of goods and services. This authority of buyers enables industry providers to compete more fiercely against one another, often compromising the expense of industry profits. **The Threat of Substitutes:** DOOH advertising has no replacement since it is far more effective than OOH advertising. A replacement product in DOOH employs an alternative way to provide the similar purpose as an industry product. **Industry rivalry:** Price reductions, advertising campaigns, new product debuts, and service upgrades are all examples of how this shows competition. Fierce rivalry may be helpful to improve an industry's profitability with constructive competition.

Perceived Utility

Reach, persuasion, cost, and effect are all factors that cause commercial organisations to stand out in the market. By DOOH advertising, you can reach the target audience with one click on a silver screen. According to science, the human brain is more attracted to digital or visual things. That's why we can make a higher impact on the consumer with persuasion to purchase. That's why we can make a higher impact on the consumer with influence to purchase. Media buyers may easily browse a network's inventory and reserve the screens they want, when they want, based on predetermined pricing and criteria. DOOH inventory can be sold via programmatic in the following ways:

- Real-Time Bidding
- Programmatic Guaranteed
- Private Market Places (PMPs)

Perceived Ease of use

"Perceived ease of use" (E) refers to the simplicity with which it is possible to transform the future with growth and success. The variables that enable this include flexibility, targeting, increased ad interaction, and accessibility from anywhere. DOOH advertising allows advertisers to change commercials on to go, saving time and money on printing. Interactive Ad plays a crucial role in connecting with the consumer on a high impact. In a world where everything is upgrading, we should also upgrade ourselves with accessibility. Marketers will soon be able to take advantage of DOOH trials that use AI and machine learning as data collection and analysis

improve. Data from DOOH campaigns are already being merged with data from other advertising technologies to help target, measure, and optimise ads.

Subjective Norms

The individual's drive to align their experience with others' opinions and their perception of social pressure from others to behave in a specific way is known as the subjective norms. The impact of the surrounding environment, social groups, friends and family on individual conduct is referred to as a subject norm. You must adapt to new technology to compete in a rapidly growing industry. That new technology is DOOH advertising, which will be valuable to your business.

Trend Audience's Interest

Trend audience interest refers to the audience's substantial shift from conventional advertising to current thinking. As the world expands, the market undergoes significant adjustments. We must also develop something novel to pique the audience's interest quickly.

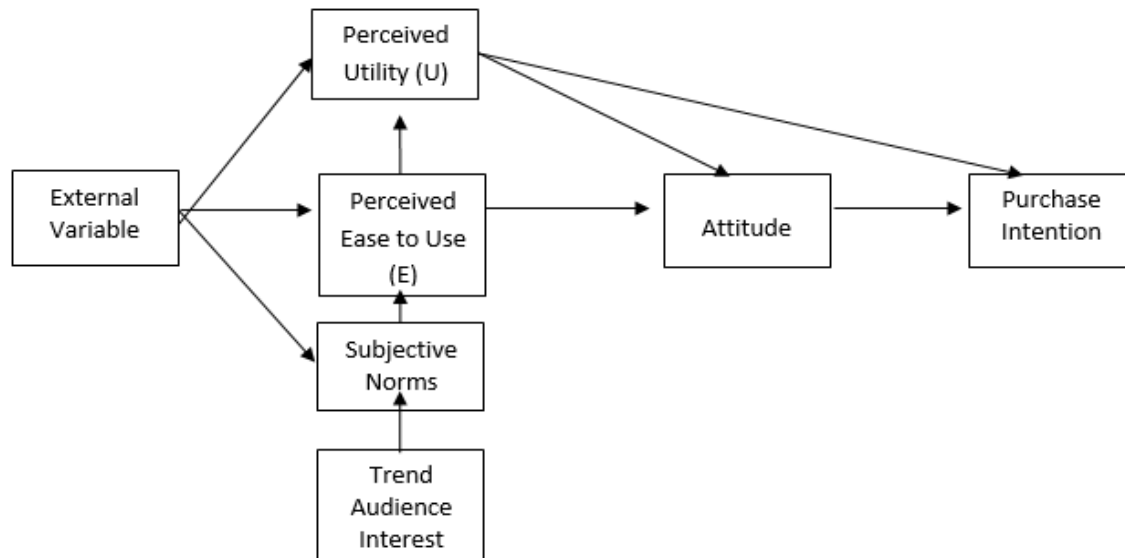
Attitude

Five most powerful moderators that makes buyers believable are attitude, accessibility, specificity, social pressures and whether a person has direct experience of the experience towards advertisement Robbins and Judge (2007:78). According to Dawes and Smith (in Kruger, Smit, & Le Roux, 2005:151), psychologists have struggled to appropriately describe an attitude since it is still determined whether it should be regarded as single or numerous phenomena. TAM claims that U has a good influence on A and that E significantly impacts A. E affects Attitude through various processes (A). "The stronger the user's perception of effectiveness regarding his or her abilities to run the system, the easier the system is to interact with" (Davis, 1989, S. 987). Improvements in E might also help you perform better. As a result, a person may be able to "do more work with the same effort." (Davis, 1989 S. 987). Nonetheless, E has a direct impact on usefulness (U).

Purchase intent

The final selection is based on the consumer's intention in combination with several external circumstances though many elements influence a consumer's purpose when choosing a product, and services (Keller, 2001). Purchase intention is understood as The desire of a customer to acquire a product or service. In other words, buying intent includes the likelihood of a customer buying a product after completing an assessment. In choosing a brand for well-known items, the group influences buying decisions. The choice of a brand is based on the company's ability to unite a group of people (Witt & Bruce, 1972).

Fig. 2- Conceptual framework of Purchase Intent Based on DOOH



Source: Proposed by researcher based on review of literature

Opportunities of DTAM

This year, digital out-of-home (DOOH) advertising is expected to account for 40% of OOH ad spending, amounting to \$16 billion in worldwide advertising spend, making OOH the only traditional advertising sector still increasing. DOOH allows marketers to do something increasingly difficult for them: capture busy consumers' attention during noisy, media-cluttered days. Advertisers may create an emotional and engaging experience for millions by combining advanced technology with creative content. Because DOOH is now marketed programmatically, the extra benefit of mixing it with more extensive campaigns will make it the industry standard. To get there, the market will have to improve significantly.

- **Composition Of the Audience**

DOOH viewers are typically younger, more challenging to reach, and less interested in TV than other potential target segments. For example, those exposed to DOOH screens outperform the average population in terms of income, youth, education, and employment in Europe.

- **Creative Speed, Flexibility**

DOOH artwork can be developed and implemented as rapidly as technology allows — typically as quickly as 15 minutes — compared to conventional billboards, which can take days at most. Ads can be triggered by events such as a team's victory or the weather.

- **Screening**

DOOH enables in-market message testing that is rapid and cost-effective because of the restricted screen applications, scheduling, and control.

- **Targeted Marketing**

DOOH technologies provide media buyers with various opportunities to target the right people at the right moment with the appropriate message selectively and effectively. Brands may personalise communications based on consumer behaviour in the real world. Messages to fans of specific sports can be placed in gyms, pubs, and on appropriate billboards.

- **Omnichannel**

According to Nielsen, Analytic Partners, and On Device Research studies, it may increase reach by up to 303 per cent when used with mobile or online messaging. It generates 4x more online engagements per ad dollar invested than TV, radio, or print alone. Consumers are 46 per cent more likely to engage with a brand on mobile. Increases online activations by 4x the predicted rate based on proportional ad expenditure in search and social media. When used with social media messages, foot traffic is increased by an average of 68 per cent. According to a Nielsen survey, 19% of OOH viewers visit their local store or company after seeing an OOH ad.

Challenges of DTAM

- **Measurement**

The impression multiplier is among the essential wrinkles in targeting and programmatic platforms for DOOH. Since before the general use of digital out-of-home purchases, the impression multiplier, created for planning purposes, has served as a helpful proxy for impressions. It has enabled DSPs and third-party partners to compute, measure, and buy equivalent audiences across all digital displays, including DOOH.

- **Fragmentation**

Most major OOH companies have begun to provide DOOH prospects via programmatic connections with DSPs and other service providers. However, the industry remains highly fragmented, with different networks available through various platforms and providers, and some networks are only partially open even when they participate in programmatic purchasing.

Conclusion

Based on the literature research, it is concluded that the technology acceptance models and various theories related to incubation of new technology contain a variety of perspectives and interpretations from different researchers. For marketers, DOOH is better than ever, and it's only getting better. More platforms are adding DOOH into their programmatic buying processes and measuring schemes, allowing them to track anything from brand lift to footfall to additional charges from DOOH combined with mobile messaging. Marketers who employ DOOH for cross-channel amplification improve the effectiveness of their other budgets and expenditures. In the foreseeable future, marketers' expectations are likely to evolve. TAM provided a fresh viewpoint on the applicability of technology applications enabling future academics to conceptualise, discern, and grasp the underlying technology models and theories that may influence technology adoption in the past, present, and future.

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