JYU DISSERTATIONS 494

Bilal Aslam

An Exploration of the World of Digital Advertising and Artificial Intelligence

JYVÄSKYLÄ UNIVERSITY
SCHOOL OF BUSINESS AND ECONOMICS

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ABSTRACT

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In recent decades, digital advertising and artificial intelligence (AI) have deeply influenced the overall business landscape. This dissertation is divided into two distinctive phases. Phase 1 discusses how the current literature on digital advertising lacks a holistic picture, especially from the industry's perspective. Managers and stakeholders need clear, actionable information regarding the various digital advertising domains or tools and their effective deployment methods to optimally market their products and services. Furthermore, the current literature related to digital advertising is also indifferent to mobile and desktop distinctions. For effective utilization of digital advertising budgets, it is important to understand the uniqueness of mobile advertising as compared to desktop advertising. Phase 2 studies AI, highlighting its important implications and discussing factors that can hinder its effective utilization in any project. This dissertation also elaborates on how the AI-based chatbot represents a crucial tool in the AI marketing and advertising domains. However, the current literature lacks a conceptual foundation regarding the efficient use of the chatbot and its effective adoption in a company's existing marketing operations. Furthermore, while the industry considers AI a revolutionary technology that has the ability to improve existing business functions to a new level, which will eventually result in higher profits and efficiency, not all AI projects will have the desired outcome. The current literature themes required further investigation to uncover various factors that can impact the effective utilization of AI in different projects, especially those related to marketing or advertising functions. This dissertation presents that herding behavior in AI technology, issues related to data management practices, and new legal privacy frameworks, such as the General Data Protection Regulation (GDPR), are the most pressing issues related to AI that require further investigation. No existing literature has tried to measure the effects of herding behavior in AI, and the related knowledge streams are limited in terms of a firm's preparedness regarding data collection and management practices and related new legal privacy frameworks, such as the GDPR.

Therefore, the objectives of this dissertation are as follows: (1) developing a framework for understanding the digital advertising ecosystem, methods, and tools, with the sub-objective of developing a separate framework to highlight the difference between digital advertising in mobiles and desktops, and (2) determining the most important implications of AI in marketing and highlighting factors that can impact the effective utilization of AI in different projects. The motivation behind this dissertation is to identify the research gaps

in the current literature in a manner that has practical relevance. For phase 1, the dissertation employs a literature review to drive suitable answers by collecting and analyzing secondary forms of data. In phase 2, the dissertation employs the semi-structured qualitative interview method. In other words, the objective of the first phase of this dissertation, deals with the solid comprehension of digital advertising. Overall, our objective was simply to develop a well-rounded literature manual, which might give complete details about digital advertising and its effective practical implementation, in order to market any product or service in the best way possible. For more acute understanding, it was also necessary to understand the difference of digital advertising on mobiles as compared to desktop. The objective was to clearly distinguish mobile digital advertising from desktop digital advertising, so that marketing budgets can be allocated to these devices systematically, which will leads to better optimization of digital marketing budgets. The objectives related to second phase of this dissertation was mainly to uncover and address important implication of AI in marketing and uncovering factors, which might directly or indirectly affect the successful implementation of AI in marketing related projects. The objective was to explain important direct implication of AI and give details about the diverse factors that might directly impact the successful integration of AI in various companies or projects.

The results of phase 1 reveal that most digital advertising is organized in the form of Internet advertising paid spots and spaces (IAPS). There are three main advertising domains that operate under the IAPS: search engine advertising, social media advertising, and display advertising. Furthermore, the dissertation finds that location and context are the unique elements of mobile advertising that distinguish between mobiles and desktops. This dissertation also identifies advertising domains that can only be deployed on mobiles: short messaging service (SMS) , in-application advertising, location-based advertising, mobile social media, and search engine advertising.

Phase 2 identifies the chatbot as a primary tool of AI in marketing and offers details about conceptual models of the front and back ends of a chatbot, which represent how chatbots can replace human agents and help chatbot adoption in the marketing function. The results in phase 2 support the claim that there is a herding trend in terms of investing in AI technology, which suggests that companies are currently following what others are doing. This is because AI is a complicated yet promising technology, and the industry currently lacks a complete understanding of it. The confusion that has followed has led to the herding trend. However, herding should not be considered a negative investment signal but rather an opportunity to understand AI technology in more detail to reach more informed decisions. The results also show that companies are currently lacking in the needed structures and systems for the collection and management of data that are required to support AI projects. New privacy frameworks, such as the GDPR, will support the industry in cultivating more responsible use of AI technology.

There are many theoretical implications in this dissertation. Phase 1 synthesizes the previous literature and develops a theoretical model that covers and explains most of the digital advertising landscape. The dissertation also contributes unique insights by explaining that the most distinguishable factor of mobile advertising versus desktop advertising is that mobile advertising messages can be tailored according to location and context. Phase 1 also includes a theoretical model that incorporates the simultaneous working of the mobile advertising domain, context, and location to improve its effectiveness without breaching any privacy fences.

Phase 2 shows that the theoretical model presented in this dissertation can be considered one of the earliest efforts to examine how chatbots can be integrated into a firm's existing marketing and customer service areas; hence, it represents a novel contribution to the existing literature. Phase 2 also enriches the existing literature by offering two theoretical models: one that identifies why there is herding behavior in the AI space, and one that discusses important data-related problems that have the potential to negatively affect the successful implementation of AI in various projects.

This dissertation has vital practical implications. Phase 1 provides managers and stakeholders with a complete manual that will give them a solid understanding of existing digital advertising tools and how these domains can be deployed effectively to reach their marketing goals. Phase 1 also clarifies that digital advertising on mobiles can differ from that on desktops, which can help with the creation of a separate strategy for mobiles to yield better results. Phase 2 presents details about the most important implications of AI by creating theoretical conceptual models that display the suitable working of the front and back ends of the chatbot interface. The dissertation also builds unique theoretical frameworks for important issues related to AI and explains how investors, stakeholders, CEOs, and managers can best utilize AI by developing the right mental model and taking appropriate actions to build a strong foundation for successful AI implementation.

The results of this dissertation are limited due to a lack of related data in both the digital advertising and AI fields. Future research opportunities exist in terms of more specific contemporary trends in a related field (e.g., programmatic buying), which will promote automation of the marketing field.

Keywords: digital advertising, digital marketing, artificial intelligence, chatbots, herding behavior in AI, data issues in AI, digital privacy, GDPR

TIIVISTELMÄ (ABSTRACT IN FINNISH)

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Digitaalisella mainonnalla ja tekoälyllä on ollut hyvin merkittävä vaikutus liiketoimintaympäristöön edeltävien vuosikymmenten aikana. Tämä väitöskirja jakautuu kahteen osaan. Ensimmäisessä osassa kuvaillaan, miten digitaalisen mainonnan vallitsevassa tutkimuskirjallisuudessa jää huomiotta kokonaisvaltainen kuva, erityisesti yritysten näkökulmasta. Johtajat ja sidosryhmät tarvitsevat selkeää ja käyttökelpoista tietoa digitaalisen mainonnan eri osa-alueista ja työkaluista sekä niiden tehokkaista käyttöönottotavoista markkinoidakseen parhaalla mahdollisella tavalla tuotteitaan ja palveluitaan. Lisäksi vallitseva digitaalista mainontaa koskeva kirjallisuus ei tee eroa mobiililaitteiden ja tietokoneiden välille. Digitaalisten mainontabudjettien tehokkaan hyödyntämisen kannalta on tärkeää ymmärtää mobiilimainonnan erityislaatuisuus muuhun verkkomainontaan verrattuna. Väitöskirjan toisessa osassa tarkastellaan tekoälyä: osiossa tuodaan esiin tekoälyn tärkeät seuraamukset ja käydään läpi tekijöitä, jotka voivat hankaloittaa sen tehokasta käyttöönottoa erilaisissa projekteissa. Väitöskirjassa käydään myös yksityiskohtaisesti läpi, miten tekoälyyn perustuvat automaattisesti toimivat chatit, niin sanotut chatbotit, muodostavat tärkeän työkalun tekoälymarkkinoinnin ja -mainonnan aloilla. Tämänhetkisestä kirjallisuudesta puuttuu kuitenkin käsitteellinen perusta siitä, miten chatbotteja voidaan hyödyntää tehokkaasti ja miten se voidaan tehokkaasti sisällyttää osaksi yrityksen olemassa olevassa markkinointia. Vaikka tekoäly saatetaan yrityksissä nähdä vallankumouksellisena teknologiana, jonka avulla toiminta kyetään nostamaan uudelle tasolle ja saavuttamaan näin suurempia voittoja ja korkeampi tehokkuus, niin kaikki tekoälyprojektit eivät kuitenkaan tuota toivottuja lopputuloksia. Vallitsevan tutkimuskirjallisuuden teemojen rinnalle tarvitaan lisätarkasteluita niiden tekijöiden paljastamiseksi, jotka voivat vaikuttaa tekoälyn tehokkaaseen hyödyntämiseen erilaisissa projekteissa, erityisesti liittyen markkinointi- ja mainontatoimintaan. Tässä väitöskirjassa esitetään, että tekoälyteknologiaan liittyvä laumakäyttäytyminen, tiedonhallintatapoihin liittyvät seikat sekä uudet tietosuojaa koskevat lainsäädännöt kuten yleinen tietosuoja-asetus (GDPR) ovat niitä tekoälyyn liittyviä asioita, joista kaivataan kiireellisimmin lisätutkimusta. Aiemmassa kirjallisuudessa ei ole yritetty mitata tekoälyyn liittyvän laumakäyttäytymisen vaikutuksia, ja aiheeseen liittyvä tieto on rajoittunutta sen suhteen, millainen valmius yrityksillä on tiedonkeruuseen ja tiedonhallintatapoihin, sekä niihin liittyviin uusiin tietosuojasäännöksiin kuten yleiseen tietosuoja-asetukseen (GDPR).

Edellä läpikäydyistä syistä johtuen tämän väitöskirjan tavoitteena on 1) kehittää viitekehys digitaalisen mainonnan ekosysteemin, menetelmien ja työkalujen ymmärtämiseksi, sekä kehittää lisäksi erillinen viitekehys mobiililaitteissa ja tietokoneissa tapahtuvan digitaalimainonnan erojen selventämiseksi, ja 2) määrittää tekoälyn tärkeimmät seuraamukset markkinoinnin kannalta, ja tuoda esiin erilaisia tekijöitä, jotka voivat vaikuttaa tekoälyn tehokkaaseen hyödyntämiseen erilaisissa projekteissa. Väitöskirjan motivaationa on tunnistaa vallitsevaan kirjallisuuteen sisältyvät tutkimusaukot käytännön kannalta merkityksellisellä tavalla. Väitöskirjan ensimmäinen osa perustuu kirjallisuuskatsaukseen, jossa esitettyihin tutkimuskysymyksiin vastataan analysoimalla toissijaisista lähteistä kerättyä aineistoa. Väitöskirjan toisessa osassa hyödynnetään puolistrukturoitua laadullista haastattelumenetelmää.

Ensimmäisen osan tulokset paljastavat, että suurin osa digitaalisesta mainonnasta tapahtuu internetin maksettuja mainospaikkoja hyödyntämällä. Kolme keskeistä tähän liittyvää mainontatapaa ovat hakukonemainonta, sosiaalisessa mediassa tapahtuva mainonta ja bannerimainonta (display-mainonta). Väitöskirjan tulokset osoittavat myös, että sijainti ja konteksti ovat sellaisia mobiilimainontaan liittyviä erityistekijöitä, jotka tekevät eron mobiililaitteiden ja tietokoneen käytön välille. Väitöskirjassa tunnistetaan lisäksi mainontatapoja, joita voidaan hyödyntää ainoastaan mobiililaitteissa: tekstiviestimainonta, sovellusten sisällä tapahtuva mainonta, sijaintiin perustuva mainonta, mobiilipohjainen sosiaalisen median mainonta ja hakukonemainonta.

Kaikkinensa, väitöskirja esittää näistä teemoista kattavan kirjallisuuskatsauksen digitaalisesta mainonnasta ja sen käytännön sovellutuksesta. Tärkeänä keskusteluna väitöskirja tutkii digitaalisen mainonnan eroja mobiililaitteiden ja tietokoneiden välillä. Tämän keskustelun perusteella mainostajat kykenevät tehokkaammin allokoimaan markkinointibudjettejaan mobiiliin ja tietokoneisiin. Väitöskirjan toisen osion tavoitteet liittyivät tekoälyn hyödyntämiseen markkinoinnissa. Toinen osio keskittyi identifioimaan ja analysoidaan tekijöitä, jotka joko suoraan tai epäsuorasti vaikuttavat tekoälyä hyödyntävien projektin onnistumiseen markkinoinnin saralla.

Toisessa osassa osoitetaan, että väitöskirjassa esitelty teoreettinen malli voidaan nähdä erääksi ensimmäisistä yrityksistä tarkastella sitä, miten 'chatbotit' on integroitavissa osaksi yritysten olemassa olevaa markkinointia ja asiakaspalvelua; tämän myötä se täydentää tärkeällä tavalla olemassa olevaa kirjallisuutta. Toinen osa täydentää tutkimuskirjallisuutta myös kahden teoreettisen mallin myötä: niistä ensimmäinen tarkastelee sitä, miksi tekoälyn kohdalla esiintyy laumakäyttäytymistä, ja jälkimmäinen käy läpi niitä aineistoihin liittyviä ongelmia, jotka voivat haitata tekoälyn onnistunutta käyttöönottoa erilaisissa projekteissa.

Tämä väitöskirja tuottaa myös tärkeitä käytännöllisiä johtopäätöksiä. Ensimmäinen osa tarjoaa johtajille ja sidosryhmille käsikirjan, jonka pohjalta heille muodostuu selkeä ymmärrys olemassa olevista digitaalisen mainonnan työkaluista, sekä siitä miten niitä voidaan ottaa tehokkaasti käyttöön asetettujen markkinointitavoitteiden saavuttamiseksi. Ensimmäisessä osassa selvennetään myös sitä, miten mobiilipohjainen digitaalinen mainonta voi erota tietokonepohjaisesta

digitaalisesta mainonnasta, mikä voi auttaa luomaan erillisen strategian mobiililaitteille parempien tulosten saavuttamiseksi. Toisessa osiossa esitellään tekoälyn tärkeimpien seuraamusten yksityiskohtia käsitteellisten mallien avulla, jotka kuvaavat front- ja back-end asioita chatbotteihin liittyen. Väitöskirjassa kehitetään myös uusia teoreettisia malleja kuvaamaan tekoälyyn liittyviä tärkeitä näkökohtia, ja selitetään miten sijoittajat, sidosryhmien jäsenet, toimitusjohtajat ja muut johtajat voivat parhaiten hyödyntää tekoälyä kehittämällä oikeanlaisen mentaalisen mallin ja tekemällä oikeat toimenpiteet rakentaakseen vahvan perustan tekoälyn onnistuneelle käyttöönotolle.

Tämän väitöskirjan tuloksia rajoittaa digitaaliseen mainontaan ja tekoälyyn liittyvien aineistojen puute. Eräs mahdollinen tutkimuskohde myöhemmälle tutkimukselle on tarkastella yksityiskohtaisia kehityskulkuja aihepiiriin liittyvillä aloilla (esimerkiksi ohjelmallisen ostamisen osalta), mikä edistäisi edelleen markkinointikentän automatisointia.

Asiasanat: digitaalinen mainonta, digitaalinen markkinointi, tekoäly (keinoäly), chatbot, tekoälyyn liittyvä laumakäyttäytyminen, tekoälyyn liittyvät aineisto-ongelmat, digitaalinen yksityisyydensuoja (tietosuoja), yleinen tietosuoja-asetus (GDPR)

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I have imagined writing these lines since I began my doctoral journey. Humans' inquisitive nature about what the future holds is a powerful yet exhausting force. When humans look eagerly into their future, it leads to new developments, ideas, and innovations. After spending nearly a decade in the marketing and advertising industry, I was eager to know how the marketing world would shift and what the future would look like in my field. These questions launched my doctoral studies.

My dissertation is dedicated to my father, Dr. M. Aslam, who passed away while I was away completing my studies. I am extremely thankful to my supervisor, Heikki Karjaluoto, for guiding me in this process and ensuring that I had the finances and the right attitude to successfully complete this long project. I am also thankful to the entire faculty of the Jyvaskyla School of Business and Economics and my friends, colleagues, and teachers for their kind support. I am extremely thankful to Jenny ja Antti Wihurin rahasto, the Foundation for Economic Education, CIMO, and the University of Jyvaskyla for their generous grants toward this dissertation.

I am also extremely thankful to my wife, Faryal Bilal, and my son, Eesa Bilal, who stood patiently with me and supported me during this process.

Finally, I give thanks to God for giving me this opportunity and the courage to complete my journey.

The Story is now concluded, with its ups and downs,
Like lovers' musings, without beginning or ending.
It has no beginning, even as eternity,
Nor ending, for tis akin to world without end.
Or like water, each drop whereof is at once
Beginning and end, and also has no beginning or end.

Rumi

Jyväskylä 1.2.2021
Bilal Aslam

FIGURES

TABLES

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TABLE 1 Author's contributions

Manuscript	Research design and data collection	Literature review	Data analysis, results, and writing
Article 1: "Digital Advertising in Paid Spaces; the e-Advertising Industry's Revenue Engine: A Review and Research Agenda"	The author was responsible for both the research design and the data collection.	The author was responsible for the literature review.	The author was responsible for writing the analysis and results.
Article 2: "Mobile Advertising Framework: Location and Context, Business Intelligence, and Analytics in Small and Medium Enterprises"	The author was responsible for both the research design and the data collection.	The author was responsible for the literature review	The author was responsible for writing the analysis and results.
Article 3: "Chatbot Adoption in Tourism Services: A Conceptual Exploration"	The author was responsible for the creation and conceptualization of the paper.	The author was partly responsible for the literature review. Other authors contributed.	The author was responsible for conceptual development of the front and backends of the chatbot.
Article 4: "The Implication of Herding Behavior in Artificial Intelligence: A Marketing Perspective"	The author was responsible for both the research design and the data collection.	The author was responsible for the literature review.	The author was responsible for writing the analysis and results.
Article 5: "Data Obstacles and Privacy Concerns in Artificial Intelligence Initiatives"	The author was responsible for both the research design and the data collection.	The author was partly responsible for the literature review	The author was partly responsible for writing the analysis and results.

1 INTRODUCTION

1.1 Research context

Bostrom (2014) attempted to show the impact of technological developments on the world's gross domestic product (GDP) (Figure 1). It might have seemed strange to earlier investigators that the world economy could double itself in a short period, primarily because of the effects of "technological singularity." According to Bostrom (2014, p. 3), "the idea of interest here is the possibility of an intelligence explosion."

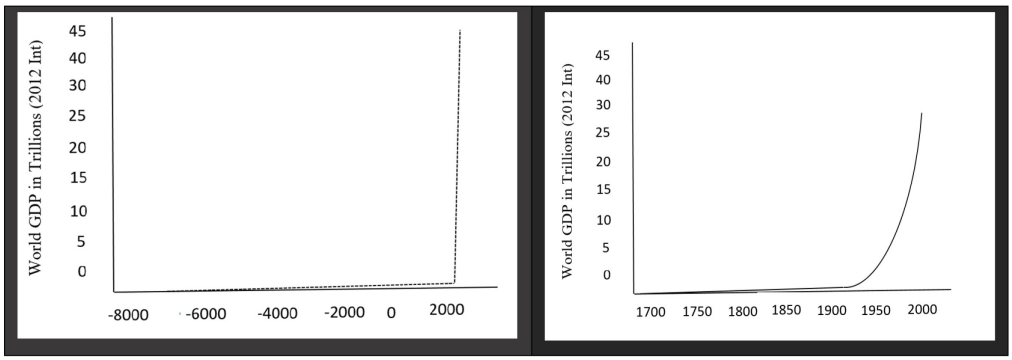

FIGURE 1 The historical development of the world's GDP (redrawn from Bostrom, 2014)

The development of the Internet and other digital technologies has played a major part in the exponential growth of the world's GDP. The Internet makes information available, supports greater communication, and has caused a digital revolution that is rooted in digital business. Before the formal start of the Internet, research teams at UCLA and Stanford worked on the idea of networking between two computers (Britannica, 2020). Today, almost 60% of the world's population uses the Internet (Statista, 2020), with e-commerce sales hitting US $25.6 trillion

globally in 2018 (UNCTAD, 2020). This trillion-dollar ecommerce industry is strongly supported through digital marketing and advertising. It is not an exaggeration to say that most of their revenues were generated through digital advertising, which started in the 1990s. Notably, almost 70% of related research in this domain was published in the last decade (Nadia et al., 2013).

By the end of 2019, revenues allocated to digital advertising were around 333.25 billion USD, and they are trending toward 500 billion USD by 2023 (Emarketer, 2019b). Managers now rely heavily on digital advertising for building their brands, which also helps them analyze negative market reactions (Tiago & Veríssimo, 2014). Digital advertising offers extraordinary innovations to marketers, such as the ability to target specific locations with customized messages and users in a variety of formats. According to Gordon et al. (2020), there are many benefits to digital advertising over other conventional marketing mediums. For example, it offers precise targeting options and the ability to customize content according to the user's preference on the basis of previously available data (real-time bidding [RTB]). Thus, it was imperative to investigate the future and contemporary elements of the modern digital landscape in the researcher's areas of expertise (marketing, advertising, and communication).

Klaus Schwad introduced the term the "Fourth Industrial Revolution" (4IR), which allows users to move in both the digital and the offline worlds with the help of connected technology. This might affect how users will manage their lives (Opus Research Report, 2016). Its exponential nature and mass disruption effects are the main factors from which 4IR will distinguish itself from the previous industrial revolutions (Schwab, 2015). 4IR will rely heavily on artificial intelligence (AI) and will affect how we live and conduct business; we expect mass adoption of self-driven cars and robots taking care of the elderly in the near future (World Economic Forum, 2020). AI's impact has the power to create an additional $13 trillion USD by the end of this decade (McKinsey, 2018). AI has already become part of our lives, whether we are aware of it or not. For example, Google utilizes AI for more accurate and precise search results; Amazon uses it for product recommendations; and Netflix uses it to suggest relevant movies based on a user's previous watch history. AI is also poised to play a major role in marketing and advertising. It can be used to predict user behavior, and new products can be recommended accordingly. Further, it can easily analyze large amounts of data, which was not possible to do manually. It can also analyze how users perceive a brand and their general sentiments about a new brand or a product (Shankar, 2018). Hence, AI represents a research path that is worth exploring because of its many economic impact factors.

Digital advertising and AI collect data (e.g., user data). In many cases, users are unaware of when or why their data are being collected and shared, and such technologies can undermine users' digital privacy rights. Motivated by this concern, the European Union (EU) enacted the General Data Privacy Regulation (GDPR) in 2018, and the State of California in the United States enacted the California Consumer Privacy Act in 2020 (Liu, 2020). Overall, these laws are designed to provide transparency and give users control over their

information/data. Explicit permission must be obtained from a user before using their data/information for other purposes, such as digital advertising or AI (Krafft et al., 2017). The ethical considerations of AI, data, and digital advertising are important aspects of this dissertation.

This research, which aims to study contemporary and future trends/elements/technologies that are linked to digital businesses, mainly in the digital marketing and advertising domains, and mediate the discussion regarding the latest trends in the field, comprises two phases. Phase 1 (articles 1 and 2) considers the complete digital advertising domains, including their formats, mechanisms, and deployment methods, and explains the latest trends in digital advertising. This dissertation also includes a theoretical framework that was specifically designed for mobile advertising to offer a more comprehensive understanding of the concept when analyzing digital advertising on desktops and mobile devices separately. Phase 1 primarily addresses paid promotion (i.e., advertising).

Phase 1 directs Phase 2 but from a different perspective. In Phase 2, AI is explored as a future technology that will profoundly impact every area of business, including digital advertising and marketing. Phase 2 identifies the most important implications of AI for the marketing and communication industry (i.e., AI-based chatbots [article 3]). It was also necessary to determine which factors impact the effective utilization of AI (detailed in section 4) and will eventually result in a better return on investment (ROI) for AI projects. Figure 2 details the development process of this dissertation and explains its focus.

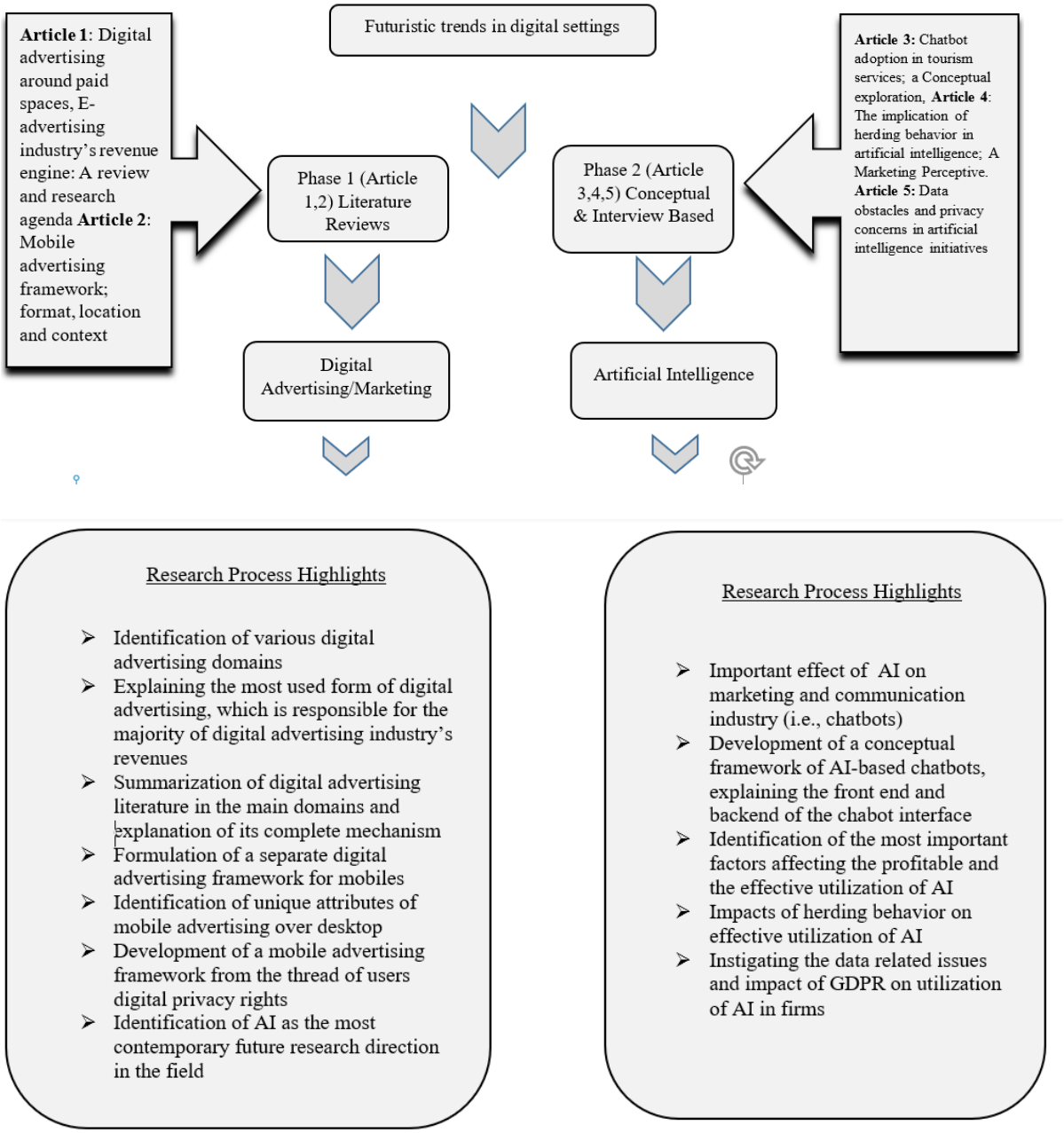

FIGURE 2 The dissertation workflow, involved concepts, articles, and research process highlights

1.2 Research gap (Phase 1)

Corley et al. (2013) identified the most important themes of Internet marketing discussed in the literature as the overall digital advertising background, ecommerce uses of the web, performance and analytics, customer relationship management systems, and Internet marketing structure. Similarly, Nadia et al. (2013) discussed different topics around which Internet marketing is built, including consumer behavior, social media networks, Internet strategy, communication, pricing, etc. However, the existing literature lacks industry-oriented investigation (e.g., the revenue-generating mechanism for the digital advertising industry must be discerned). A new perspective was required to arrange the previous literature within the domains that generate most of the industry's revenues. This was done in Phase 1 (articles 1 and 2).

There was also a need to study the subject from the advertising perspective, given that advertising is a paid form of promotion. Not all forms of digital marketing are paid (e.g., organic search listings on search engines). Many previous studies have discussed important elements of paid digital advertising, with some experimenting with ad positions in search engines (i.e., Google, Bing, etc.) when a handler enters an inquiry and the best possible positions for advertisers (Agarwal et al., 2011; Chan & Park, 2015).

To advertise via a search engine, advertisers bid against targeted keywords. The search engine will then analyze different bids, ad relevance, ad structure, and ad content and assign an ad position or ad ranking. The ad with the highest ranking will appear at the top of the listed advertising. Top-ranked ads generally get the most clicks from users (Nadia, 2015; Nadia et al., 2012; Jerath et al., 2014; Shin, 2015; Luo et al., 2010). Previous studies have discussed speed, animation, timing, ad placement, and the content of ads that yield better performance (Andrea, 2011; Jacques et al., 2015; Rosenkrans, 2009; Li et al., 2015; Brown, 2002).

With the literature on digital advertising spread among many dimensions, the complexity of the terminology, and the complicated digital advertising ecosystem, further clarity in the literature was required. A new investigation was needed to summarize the complete digital advertising landscape. From the industry perspective, it was necessary to identify the diverse digital advertising dimensions in which most of the industry's revenue is generated. This led to the development of a manual that details the core of digital advertising, its main domains, their deployment methods, and future trends. This manual will greatly help industry and business managers and will bring clarity to the existing literature.

Further, most of the digital advertising literature has discussed various related advertising domains from the desktop or laptop perspectives. However, since the inception of smartphones, people have begun spending equal time on mobiles. More users prefer to check emails, read news, utilize social media, and browse search engines through mobile devices than on desktops. They also prefer mobiles for navigating, ordering food and taxis, and doing even more

important tasks, such as banking. To obtain a comprehensive view (both desktop and mobile) of digital advertising, it was necessary to study this area from the mobile/smartphone perspective. It was observed that there was no accepted framework for mobile advertising. This is partly because there has been rapid technological advancement in mobile technology, and it is subject to continuous change (Park et al., 2008; Varnali & Toker, 2010). Leppäniemi et al. (2004) stated that most of the previous studies focused on mobile user behavior and acceptance of mobile advertising and its effectiveness.

Figure 3 summarizes the above discussion and lists literature on digital advertising and mobile advertising and consequently points to the intended contribution. Most of the studies (as given in Figure 3) tried to measure different characteristics and success parameters of search engine advertising. These parameters might include understanding bidding phenomena against different keywords, the placement of ads, location or ordering effect of ads on profits and click-through rates, effects of sponsored search advertising on brand recall and recognition, and user click behavior to sponsored and organic searches (Nadia, 2015; Agarwal et al., 2011; Luo et al., 2010; Jerath et al., 2014). Other studies in the digital advertising field researched general display advertising in terms of measuring the effects of placements and different types of banner ads, measuring the effectiveness of display and banner advertising, and how privacy links to display advertising (Andrea, 2011; Li et al., 2015). After analyzing the important literature on the digital advertising field, it was difficult to develop a comprehensive, holistic, and practical understanding of the entire digital advertising landscape. The current literature has to be shaped in a way that it covers all the important sub-domains and diverse tools of digital advertising, including details of the operational mechanism of each domain. The current literature also did not highlight any possible difference between mobile and desktop advertising. Figure 3 shows all the relevant studies done on mobile advertising and the represented gap in the given literature. Industry-oriented advertising domains and other features that distinguish mobile from other devices and media remain unclear. Managers need to understand the basic pillars and unique selling propositions of mobile advertising that cannot be attained via any other device or medium. Additionally, companies and advertisers cannot ignore the privacy aspect of mobile advertising, which has become an important issue for all stakeholders, especially after the implementation of the GDPR.

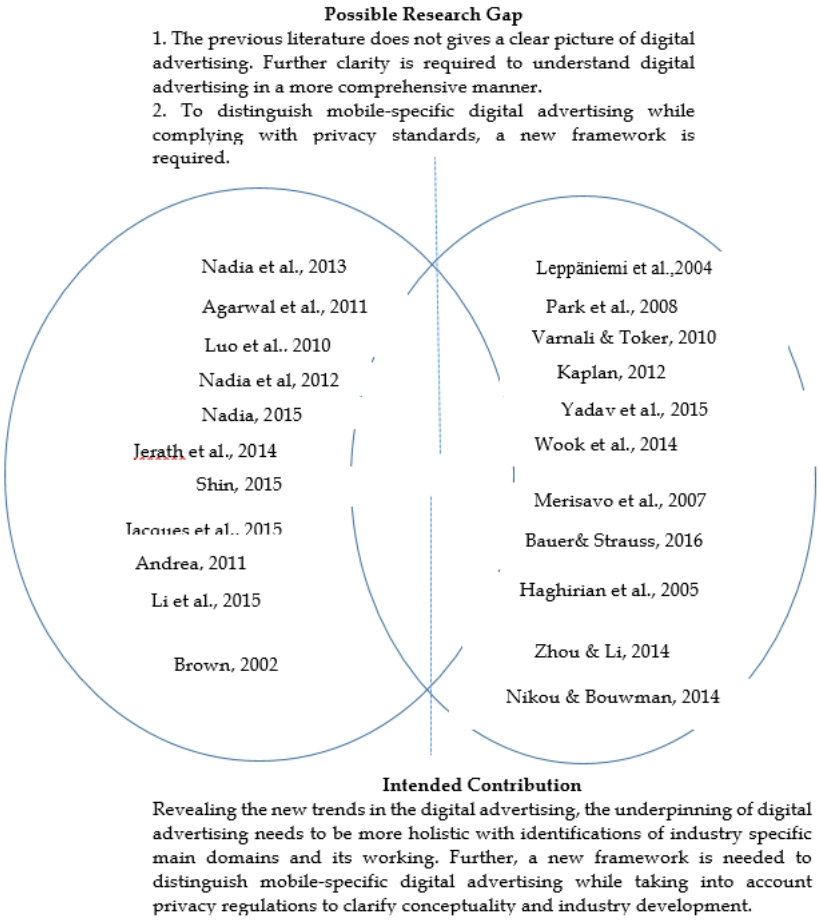

FIGURE 3 The literature on digital and mobile advertising and the intended contribution.

1.3 Research gap (Phase 2)

Phase 1 of this dissertation indicates the vast potential impact of AI. Importantly, AI is still running the marketing stage in the background, and it can be used in many marketing-related functions. For example, advertisers can customize their content according to different customer groups to optimize different digital advertising measurement tools, such as cost-per-acquisition or cost-per-click data (Rai, 2019). In the future, AI will be used more frequently in different marketing functions. It will be included in different customer service functions and sales progressions, and by analyzing customer behavioral data, AI can provide significant insight (Davenport et al., 2020).

AI applications in retail are also used for predicting shopper behavior, making product recommendations, and analyzing customers' in-store behavior through camera and visual analytics (Shankar, 2018). AI can also help analyze millions of emails, tweets, and online comments (textual analysis of big data). Many past researchers have discussed general ways of using AI to create

valuable insights. However, if things are analyzed from practical/industry perspectives, there are undiscussed anomalies in the world of AI.

While AI is a revolutionary technology, its true benefits will only be realized when it is put into practice in a gainful and strategic way. For example, AI-based chatbots (article 3) will have a clear, distinct, and resourceful impact on the marketing and communication industry. However, it is also true that there is no one perfect practical example of a chatbot in the real world that has already saved most of a firm's expenditures on communication or customer services. There are many practical factors that might hinder the successful implementation of AI in firms and/or could affect the ROI of an AI project. For example, AI implementation could be stalled if a company's culture does not recognize the need for it. There are still many factors to be addressed before we realize the full-scale benefits of AI (e.g., there is a lack of skilled people who specialize in AI) (Lorica & Nathan, 2019). More importantly, most companies do not understand how AI can be successfully integrated into their firms, and they are also unaware of factors that might jeopardize the adoption of AI in their firms (Pumplun et al., 2019). Most companies have failed to develop a proper AI strategy because they lack a solid organizational foundation (Ransbotham, 2017). Therefore, this dissertation aims to investigate factors that might affect the effective utilization of an AI project. AI should be conceptually transformed from an idealistic state to a practical state. Therefore, this research identifies which factors impact the effective utilization of AI projects by building theoretical contributions that address issues that might directly or indirectly affect the beneficial utilization of AI in firms/industry.

The theoretical contribution developed in articles 4 and 5 emphasizes issues that can hinder successful AI implementation in firms. The focus is on the effects of herding behavior, the role of effective data collection and management, and AI data privacy concerns. This research also aims to understand AI as a concept, determine its implications, and develop a discussion that helps stakeholders understand AI from a mass-regular business perspective to avoid investment losses due to failed AI experiments. Table 2 offers a summary of the identified research gaps for this dissertation.

Figure 4 lists important literature on AI, herding behavior, data, and privacy. Important literature has tried to cover different aspects related to AI. For example, Bryun et al. (2020) discussed which factors managers should be aware of before implementation of AI in their organization, including poorly defined objective functions, an unsafe learning environment, and biased AI. Moreno and Redondo (2016) demonstrated that AI could be used to analyze millions of emails, tweets, and comments through text analytics. Xu et al. (2016) tried to understand the relationship between the most commonly used marketing analytical matrixes and analytics used in large data. Figure 4 lists important studies done on herding behavior. Previous literature has indicated herding effects in many related fields, such as financial investment, technology, and political voting (Duan et al., 2015). Further, Kauffman and Li (2003) found strong traces of herding in IT investment decision making, and Huang and Chen (2006)

demonstrated traces of herding in negative comments in the online environment. No previous study has tried to measure herding behavior in the AI industry (Figure 4). Hence, this represents a gray area that requires further development. Similarly, previous literature on data and privacy is also diverse. Wright et al. (2019) demonstrated that organizations are currently receiving large amounts of data, and their innovation depends on how they analyze these data to respond to market opportunities. Aguirre et al. (2015) showed that retailers collect data to use in different ways, such as for personalization, but the results suggested that users demonstrated a drastic decrease in click-through rates when they thought that their data had been compromised without their permission. However, few previous studies have tried to determine the best data collection and management practices to ensure that AI would give the best results. Data privacy has now become a core goal of data collection practices, especially since the implementation of the GDPR. Further investigation is required to determine whether new privacy governmental frameworks, such as the GDPR, are considered a hurdle to the successful implementation of AI in different projects or a favorable way to support AI initiatives, per the industry perspective.

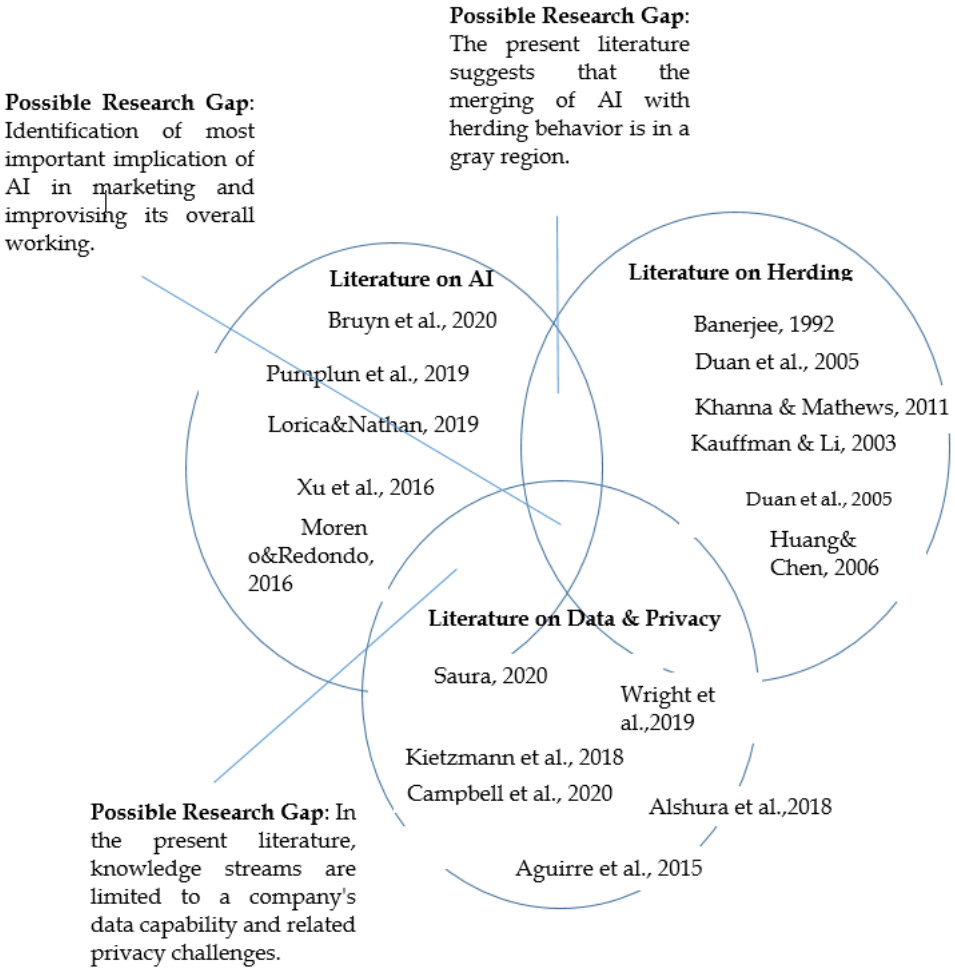

FIGURE 4 Previous important studies on AI, herding behavior, data, and privacy

1.4 Institutional theory

The essence of institutional theory is how businesses deal with the dynamics of the business ecosystem. Businesses must adapt to changing forces and circumstances to remain relevant and legitimate and to obtain optimal results (Meyer & Rowan, 1977). One of the strongest arguments for institutional theory is that it forces organizations to adapt to recent trends and developments in the industry that continue to experience a scarcity of resources, competition for customers, political forces, and legitimacy and social support among their stakeholders. Institutional theory is particularly helpful when companies are focusing on the adoption of new trends or technologies. Because of the rapid changes in technology, companies' existing business practices and structures should be flexible enough to adopt new trends, concepts, and structures. This dissertation discusses one of the two most important related topics of today: digital advertising and AI. More companies are seeking to digitalize and automate their marketing functions through AI, and digital advertising promises an almost borderless approach to reaching people. Thus, the adoption of these technologies should be facilitated either directly or indirectly for companies to realize the numerous associated benefits. Therefore, this dissertation uses and capitalizes on the previous findings related to institutional theory to facilitate the adoption of digital advertising and AI in firms. There are three types of isomorphism: (1) mimetic, (2) coercive, and (3) normative (Dimaggio & Powell, 1983). The concept of mimetic isomorphism, which is widely discussed in institutional theory, helps this dissertation in many ways. Mimetic isomorphism discusses a firm's capacity to copy the structures of other firms that seem beneficial. This concept is helpful for investigating herding behavior in AI technology because herding behavior is also based on doing what others are doing. Through mimetic isomorphism, we can analyze herding behavior to decide whether firms should follow such behavior and, if not, what alternatives are appropriate. The goal is to remove distractions that might affect the successful adoption of such technologies in firms. Institutional theory considers the constructions, rules, and practices of firms as guidelines for standardizing social or corporate behavior. This was important when this dissertation sought the best data collection and management practices for the successful execution of AI projects so that stakeholders could fully harness the benefits of AI. Institutional theory was also helpful for the discussion on chatbot adoption in the tourism sector. Teo et al. (2003) argued that internal connection and organizational parity are isomeric in their competing environment. In the tourism industry, many types of businesses are dependent on one another. As a result, the use of chatbots by leading companies is likely to spread rapidly in the ecosystem.

1.5 Organizational theory

According to organizational learning theory, to be competitive in a changing environment, organizations need to change their actions to achieve their goals. Various organizations respond to changing situations according to their capacity and circumstances. By and large, it has been seen that companies with a stronger knowledge culture can implement new trends and directions faster than those that do not (Murray & Donegan, 2003). Companies operate in a variety of environments and ensure the ability of internal and external forces to learn. The first part of the learning process involves obtaining data. A company will acquire a "memory" of valid action–return relationships, the environmental conditions in which they are valid, the probability of returns, and the uncertainties surrounding that probability. The second part of the process is interpretation. Organizations compare the truth with the results expected to update or add to their "memory." If necessary, the specified reasons should be assessed for unexpected effect results for adapted action or new action–return relationships and increased learning. Gaining new knowledge by developing strong learning cultures within organizations is at the heart of organizational learning theory. This theory effectively supported the development of this dissertation, especially the discussion of AI and important factors that can affect the successful adoption of AI in firms. For example, for the discussion on herding behavior in AI, organizational theory helped show how an organization can develop an internal learning culture surrounding AI to prevent the negative effects of herding. Herding itself is not a bad thing, and it might lead to better efficiency and performance. However, to start any new AI project, it is imperative to understand AI technology as well as to know how and where AI will be used and what efficiencies it might bring to the organization. Without the proper knowledge of AI, if an organization starts to follow what others are doing, it might impact the effective utilization of AI in different projects. Further, it is also critical to understand firms' existing internal data management and collection mechanisms. If organizations have not implemented solid data collection and management practices, then their initiatives in AI might not be as effective as they could be. Detienne and Thompson (1996) found organizational learning theory to be extremely beneficial when companies are forming their databases to set a foundation for future marketing practices. They stated that if companies neither carefully design a database nor determine how it will be maintained and used, then they will not reap its full benefits (Detienne & Thompson, 1996). Organizational learning theory particularly helps this dissertation present how organizations should develop knowledge centers within their organizations to teach new trends, data management practices, and privacy issues in AI to ensure that they are structurally ready to reap full its benefits. The author particularly applied organizational learning theory in article 3, where the aim was to conceptualize the best version of AI-based chatbots in the tourism industry. Again, the perfect version of AI-based chatbots is still to come. Chatbots in their current settings are not fully ready to replace humans because they lack

the technological sophistication needed to mimic human intelligence. This again calls for developing knowledge centers within organizations to ponder how to overcome the inherent AI challenges. Article 3 presents a conceptual model for an AI-based chatbot that can mostly overcome these challenges. Organizational theory helps this discussion flourish in the right direction.

TABLE 2 Identification of research gaps

Dissertation Phase	Serial no #	Research Gap	Methodology	Article No.
1 (Digital advertising and marketing: A comprehensive view across all digital devices)	1	The current literature lacks a holistic picture of digital advertising (especially from the industry perspective). The digital advertising ecosystem is complex and involves many players. Further clarity is required to understand digital advertising in a more holistic way by uncovering the latest trends in the digital advertising/marketing sector.	Literature review comprising 75 publications	Article 1
	2	The existing literature is unable to clearly distinguish the uniqueness of digital advertising on mobile devices (smartphones). For conceptual clarification and industry relevance, a new framework is needed to distinguish mobile-specific digital advertising while considering privacy regulations.	Literature review comprising 95 publications	Article 2
2 (AI implications and important factors affecting it)	3	The existing literature needs to meditate discussion on the most important implications of AI (i.e., AI-based	Conceptual study	Article 3

	chatbots) and explain its dynamics.		
4	The existing literature needs to uncover factors that might impact the effective utilization of an AI project. High expectations might be responsible for herding behavior toward AI technology.	Interview-based studies (4, 4a, 4b)	Articles 4 and 5
4a	The existing literature hints at a neutral area regarding the fusion of AI and herding behavior. Data and privacy issues are some of the most important elements of running a successful AI project.		
4b	Knowledge streams in the existing literature are limited to a firm's preparedness regarding data and its related privacy issues.		

1.6 Research questions and links between articles

Phase 1 of this dissertation (articles 1 and 2) addresses digital advertising. The existing literature on digital advertising is diverse. From the industry perspective, the existing literature needs to be shaped such that it summarizes all the important digital advertising domains or tools and simultaneously explains how these domains can be used to market any product or service in the most effective way. To arrange information in a similar manner, it was also important to determine the most common format of advertising from which most of the industry's revenues are allocated. Once that particular format was identified, it was then comparatively easy to arrange the findings of previous literature around that particular format. Therefore, research questions 1.1 and 1.2 address this issue. The author also found no clear distinction between mobile and desktop

advertising. Most of the existing literature on digital advertising achieved findings by using the desktop as the default device. This required further investigation to discern the possible differences in digital advertising when we changed the device used and the identification of the mobile-only digital advertising domain. For example, such domains will only be applicable to mobile devices but not desktops. Thus, it was also important to determine other important factors that can conceptually distinguish mobile advertising from desktop advertising. Research question 1.3 addresses this problem. This conceptual clarification can particularly help the industry allocate their advertising budget to the mobile and desktop formats separately.

The findings of Phase 1 (articles 1 and 2) identify AI as a crucial technology that will affect an organization's overall business outlook and operations, especially in the marketing and communication sector. The remaining investigation of this thesis was directed toward AI because the aim was to study contemporary and future digital technologies that are linked to marketing or advertising. The author felt that AI would be a digital technology that could disrupt future businesses drastically, which prompted moving forward in this direction. The aim of the dissertation was thus to determine the most relevant implications of AI in marketing/advertising and then address those elements that impact the effective utilization of AI projects in firms. In the initial research, the importance of the chatbot and its tendency to change the marketing and communication sector seemed imperative. Chatbots are AI-based computer-generated programs that produce answers and guide users on specific topics in place of human customer service representatives. It is expected that most companies will implement chatbots by the end of 2019 (*Forbes*, 2018a). While chatbots can decrease costs substantially in various business functions, it is also clear that no current chatbot model can replace the human element with 100% accuracy. Therefore, it was important to develop a conceptual model that might be considered the best version of a chatbot to produce such results and eventually replace humans in the long run. All communication with the bot and the user is managed in the front and back ends of the chatbot interface. For example, the frontend interface is a place where the user will enter the query and receive an answer from the bot, and the backend interface converts the questions into machine language and produces an answer. Therefore, it was important to craft the best possible front and backend chatbot interface conceptually. Replacing humans will only be possible if the chatbot can mimic human intelligence in the most realistic way and produce answers that might be similar to those generated by humans to solve users' problems. For this purpose, the tourism industry was chosen to determine how chatbots can be integrated into business and improve efficiency. In Table 3, research questions 2.1 and 2.2 address the previously discussed problems related to chatbots.

The dissertation also considers the most important factors that can impact the effective utilization of AI in various projects. Currently, there are large investments in AI projects, but it is unknown whether these investments will also result in better ROI (*Forbes*, 2020a). These factors can reduce the chances of

successful adoption of AI in firms and adversely affect the ROI side of an AI project. For example, a recent wave of new information regarding AI has created significant hype and curiosity about this technology. More companies now want to integrate AI into their business functions because their competition is often also thinking and acting similarly. This particular situation might create healthy competition between companies, but it might also trigger herding behavior, where one company follows the trend and starts doing things based on what others are doing. Herding behavior has never been investigated in AI before, and this behavior can affect the successful adoption of AI in firms. If there is herding behavior in AI, then the factors that are triggering this behavior should also be identified. Further data are what the success of AI is largely dependent on. Data are like raw material for different forms of AI, but without good quality data, the functioning of AI will largely be marginalized. Therefore, this dissertation evaluates industry readiness regarding data-related issues to determine whether the industry's current data collection and management practices are strong enough to support the successful integration of AI in firms. It is important to know whether this new framework is supportive of AI initiatives or perceived as a hurdle in the successful implementation of AI, especially given the introduction of new legal frameworks, such as the GDPR. Research questions 3.1–3.4 summarize this discussion.

TABLE 3 Main research questions and sub-questions

SR #	Main Research Question	Sub-research Question	Target Article	Article #
1	Given the available literature, what is the main theoretical framework for digital advertising research?	**RQ 1.1**: What are the main advertising domains in which most digital advertising is utilized? **RQ 1.2:** What is the main revenue stream for digital advertising? **RQ 1.3:** What is the digital advertising framework for mobile advertising? How is mobile (smartphone) advertising different from that of desktop advertising?	Literature review	Articles 1 and 2

2	What are the relevant implications of AI in marketing in recent years?	**RQ 2.1**: How can AI-based chatbots be integrated into marketing/customer services in the tourism industry? **R.Q 2.2** What is the conceptual framework for front and backend chatbot interfaces?	Conceptual	Article 3
3	Which factors impact the effective utilization of AI projects in firms?	**RQ 3.1:** Is there herding behavior in firms when it comes to AI technology? What are the main reasons behind organizational herding behavior when it comes to investing in AI in marketing? **RQ 3.2:** How does herding behavior impact the effective utilization of AI projects, especially in terms of the ROI?	Interview-based	Article 4
		RQ 3.3: Which data-related issues most impact the effective utilization of AI projects in firms? **R.Q 3.4:** How might new official regulations regarding the GDPR affect successful AI initiatives in firms?		Article 5

2 LITERATURE REVIEW

This chapter delivers a full evaluation of the published works in the context of digital marketing/advertising on desktop and mobile devices, important applications of AI, and factors that affect its successful utilization in organizations. This section relates to the author's particular niche of research in relation to the wider field of related discussions.

2.1 Digital marketing/advertising

The use of digital advertising, also referred to as web advertising, initially started when AT&T displayed its first banner ad on hotwire.com in 1994 (Holis, 2005). While marketing in general has a long history, digital marketing is a relatively new practice that includes both free and paid instruments; by contrast, digital advertising only involves paid promotion on the Internet. Today's digital marketing ecosystem is extremely complex, with advertisers who are using intricate advertising instruments and platforms on one side, users on the other, and various intermediaries in between (Evans, 2009). Previous studies have explored different aspects of web advertising (digital advertising) and shoppers' overall response to it (Almendros & García, 2014; Sokolik et al., 2014). Li et al. (2015) ran experiments to learn the effects of animation speed, advertising presentation style, and format on banner ad effectiveness. Advertisers have many platform options for digital advertising, but they typically use a combination of text and a photo that has the advertising link embedded in it. Search engines are one of the largest platforms for hosting such digital advertising formats. Many studies have explored this type of advertising. For example, Agarwal et al. (2011), Feng et al. (2007), and Ghose and Yang (2009) searched for a link between the position of banner ads on search engine networks and performance (i.e., higher ads receive more clicks) (Liye et al., 2011).

Another popular advertising option is social media platforms, which allow companies to attract consumers' attention and customize their needs (Dehghani

& Tumer, 2015). While other research has shown that users might not trust information retrieved from social media sites (Kelly et al., 2010), Boateng and Okoe (2015) found evidence of a user's acceptability of social media advertising. Another important revenue-generating domain of digital advertising is display advertising, which is considered the root of Internet advertising. Previous literature has discussed its effectiveness in different ways (Kuisma et al., 2010; Lee et al., 2016; Brown, 2002). According to Aslam and Karjaluoto (2017), in Internet marketing, the oldest domain of digital advertising is display advertising. Because modern display advertising has gone through many stages of development, it is a complex ecosystem with many players operating on various levels of operations. The most recent development in display advertising is RTB (or programmatic buying). Before RTB, the display advertising landscape primarily consisted of ad exchanges and quality pacts (Yuan et al., 2013). RTB is quite different from other digital advertising domains, such as sponsored search advertising, in which bidders bid against selected keywords. (Zhang et al., 2014).

The existing literature on digital advertising is fragmented into many digital advertising domains, making it difficult to have a complete understanding of the field. For example, one topic is often addressed by different names (e.g., web advertising, banner advertising, display advertising, which is also part of sponsored search advertising, social media advertising, etc.). It is also difficult to determine the most common form of digital advertising, how this form is connected to advertising platforms (e.g., Facebook or Google), and which formats and/or platforms generate the most digital advertising revenues. Additionally, there is a need to synthesize the literature to clearly explain digital marketing/advertising sub-domains, the mechanisms of each domain, and how these domains are organized.

2.2 Digital advertising's mobile specificity

Digital advertising—any paid promotion methods used on electronic devices—is conducted on many devices, from smart televisions and laptops to tablets and smartphones. Most of the digital advertising discussed in the literature either directly or indirectly refers to desktops or laptops. Therefore, most of the studies that discuss the characteristics or effectiveness of digital advertising are pertinent to these devices (desktops and laptops). In the past, the Internet was primarily accessed through desktop computers, but the last decade has seen tremendous growth in the use of mobile handsets, tablets, and smartphones. Companies might be ignoring the changing impact of advertising in our multiscreen world (Phalen & Ducey, 2012). How is mobile advertising different from that of desktops? For example, will social media advertising, display ads, and search engine advertising be the same? These questions show that it is important to discuss the unique selling points of mobile advertising.

Mobile social media is another domain of mobile advertising. According to Kaplan (2012), mobile social media allows the transfer of content that has been

produced by users. Mobile social network advertising combines an easy-to-use and appropriate platform with the ability to control advertising on small screens. Given the increased risk of becoming irritated when using small screens, advertising should be fun, and users should be given clear options regarding what kind of advertising they want to see (Wook et al., 2014). Firms that are using mobile channels should always consider how users perceive the usefulness of that particular channel (Merisavo et al., 2007).

Another important dimension of mobile-based advertising that is attracting attention is location-based advertising (LBA). With this service, it is possible to track a user's location and provide tailored messages according to their location (Dao et al., 2012). According to Bauer and Strauss (2016), there are 10 sub-topics of LBA: (1) exploration of capabilities, (2) user acceptance, (3) privacy, (4) effectiveness of LBA, (5) location technique, (6) the business model, (7) cultural market difference, (8) usability, (9) presentation style, and (10) adoption on the market. Further, research shows that location-congruent ads, whether they are on mobile or at the point of sale (print ad on location), yield better results than desktop. However, it was also noted that ads that are tailored to a user's location are more effective than ads presented at the point of sale (Ketelaar et al., 2017).

The short messaging service (SMS) domain also represents the peculiarity of mobile advertising. SMS advertising allows for the flow of advertising messages on mobiles in the form of short textual communication (Haghirian et al., 2005). Managers are interested in this medium because consumers generally have positive attitudes toward it, its role in location-based services, and its effectiveness with low-involvement products (Drossos et al., 2007; Okazaki & Taylor, 2008). SMS advertising is one of the most discussed topics in the mobile advertising literature (Barwise & Strong, 2002). Mobile social media and mobile search engine advertising are sub-domains of mobile advertising. Consumers' interest in mobile social media lies primarily in social influence and a feeling of belonging, which create a bandwagon effect; in such cases, a consumer will continue using mobile social media, even if they are not interested in it (Zhou & Li, 2014). Users' behavioral intention toward using mobile social networking sites is strongly determined by social influence, mobility, habitual behavior, and critical mass (Nikou & Bouwman, 2014). Interestingly, the set-up of mobile search engine ads is similar to that of desktops. Ghose et al. (2012) also showed that links and ads that appear on the top of the mobile screen are more likely to be clicked than ads appearing down low on the mobile screen. This increased cost can be justified by managers who are advertising local content, given that a link to a store located close to a user's home is highly likely to be clicked on a mobile phone. It was also found that the text should be informative and entertaining and should not cause irritation (Murillo, 2017).

The existing literature points to some unclear areas that require further research. For example, from the industry perspective, how can researchers develop a unique model or framework for mobile advertising that will explain all the functions, domains, and sub-domains of mobile advertising? More importantly, what is the primary differentiating factor between digital

advertising on mobile devices compared to digital advertising on desktops? If we can arrive at the appropriate answers, business managers will have a clear conceptual understanding of digital advertising on mobile devices versus desktops. This will allow them to clearly align these devices according to their campaign objectives, which will in turn improve their advertising effectiveness and reduce costs. In this way, this dissertation takes a novel academic approach to that of the previous literature. Table 4 summarizes important studies regarding mobile advertising.

TABLE 4 Literature on mobile advertising

SR# Authors & publication year	Article Name	Research Focus	Key Results
1 Kim et al., 2008	"A case study of mobile advertising in South Korea: Personalization and digital multimedia broadcasting"	This research's main focus was measuring South Korean's digital marketing effectives.	Foreign marketers often advertise in South Korea using many mobile advertising formats.
2 Tussyadiah, 2012	"The concept of location-based social network marketing"	This study examined the use of location-based social network (LSN) applications and how they influence users' behavior.	Effective LSN marketing is relevant and compelling, which triggers user loyalty.

3 Ha et al., 2017	"A framework for mobile SNS advertising effectiveness: User perceptions and the behavioral perspective"	This article developed a framework for SNS advertising effectiveness.	Mobile advertising is perceived as convenient in the SNS format; it also provides informative and entertaining information but may also irritate users.
4 Islam et al., 2013	"Research that identifies the relationship between consumers' attitudes and mobile advertising"	This article discussed the relationship between mobile advertising and how users respond to it (user attitude).	Users highly regard the credibility of the advertiser that sends mobile advertising. Other factors, such as irritation and entertainment, were not empirically important.

5 Leppäniemi et al., 2006	"A review of mobile marketing research"	This literature review focused on mobile apps that are developed for marketing and management.	There is significant research attention on mobile marketing but less of a focus on mobile marketing's role in branding and the value chain.
6 Nadeem et al., 2015	"A scale of hindrance in mobile in-app advertising"	This study tried to measure the hindrances to mobile in-app advertising by developing a scale.	Focus groups identified four factors that generate hindrance: (1) distraction, (2) interruption, (3) delay, and (4) stoppage.

7 Lamberton & Stephen, 2016	"A thematic exploration of digital, social media, and mobile marketing: The research's evolution from 2000 to 2015 and an agenda for future inquiry"	This article discussed different scholarly research studies on digital social media and mobile marketing.	The three main themes included the following: (1) how related technologies are impacting user's own expression and communication; (2) digital social media and mobile marketing help with decision making; and (3) digital and social media and mobile marketing can be a source of market intelligence.
8 Li et al., 2015	"AdAttester: Secure online mobile advertisement attestation using a trust zone"	This article developed a system that will prevent ad fraud in mobile apps. .	Their recommended system can effectively check the legality of advertising on mobile platforms and prevent advertising fraud.

9 Zhaa et al., 2014	"Advertising value and credibility transfer: Attitude toward web advertising and online information acquisition"	This study investigated and measured customer attitudes toward web advertising.	Customers' attitudes depend on whether they perceive the advertising as useful, entertaining, and credible.
10 2007 Merisavo et al., 2007	"An empirical study of the drivers of consumer acceptance of mobile advertising"	This paper examined the drivers of consumer acceptance of SMS-based mobile advertising.	This article proved that the most important factors for customers in mobile advertising are utility and context. Trust and control are not as important to consumers of mobile advertising.

2.3 Artificial intelligence

There is currently no official definition of AI. Early investigations defined AI as human mind-imitating technology. Thus, AI is related to science that will enable machines to do things that were previously done by humans (Bolter, 1984). According to Bruyn et al. (2020), AI is primarily related to machines that can copy human intelligence in routine tasks. These tasks might include planning, learning, and finding solutions. Human intelligence requires previous information, experience, memory, knowledge, etc. to process information and drive results. By contrast, machines utilize data, and computer-generated algorithms help them extract answers from that data. In the future, AI will

continue changing the marketing and advertising landscape. As time passes, the impact of AI will only increase. Companies will be able to closely target their customers and predict consumer behavior based on data (*Forbes*, 2019). Netflix already uses AI to analyze extensive real-time data and identify themes to make decisions on new projects (Xu et al., 2016). It can help analyze millions of emails or any other textual form (Moreno & Redondo, 2016). Advanced AI will also be able to recognize images that run in the human brain, although with some limitations. This application will better predict products according to consumer thinking patterns (Shankar, 2018). Marketers can now generate more accurate results for a variety of marketing intelligence tasks using AI, such as driving marketing related insights from data. It can also be used for better segmentation and outlining diverse customer groups and will be extremely helpful in competitor analysis and location-based advertising (Fana et al., 2015). The intelligence of machines is increasing at a rapid pace, and the current state of AI is enabling machines to achieve better decision making in complex and diverse environments (Davenport & Kirby, 2016).

AI-made machines and humans can work together to solve business problems in their own capacities by bringing unique contributions to tasks. AI can be especially useful in complex situations, whereas humans excel at tasks that require an intuitive approach (Jarrahi, 2018). The terms "machine leaning," "deep learning," and "AI" are often used interchangeably. According to Hao (2018), machine learning is based on statistical solutions that find patterns in large amounts of digital data. The data can be a combination of text, numeric, or pictures. By contrast, deep learning is computer-generated software that acts like neurons in the human brain. We can confidently say that machine learning falls under the umbrella of AI, so machine learning is directly linked with AI, but we cannot assume that all AI will be machine learning (Tiwari et al., 2018).

While AI is a promising technology that will create new avenues in the future, it can also undermine consumers' sense of autonomy, the absence of which can be detrimental to consumer wellbeing (Elish & Boyd, 2018; Brynjolfsson et al., 2017). It seems that the race toward AI has begun, with larger companies being most likely to integrate AI in marketing functions (Adobe, 2018). However, there are no guarantees that any company that invests in AI initiatives will cultivate large returns; many challenges must be addressed. It is also important to determine whether companies have installed the proper structures for harnessing the benefits of AI (Pumplun et al., 2019). Despite the importance of AI, it has been observed that only a few companies have developed a proper strategy for AI implementation (Ransbotham, 2017).

If companies understand the diverse factors that can affect the adoption process of AI in marketing, it will bring clarity to their investment decisions and better prepare them for AI adoption. AI research in marketing should forge in two directions. We must firstly determine in which sector of marketing, advertising, or a related business field AI will have the most impact. Chatbots are no exception because they have the potential to revolutionize the marketing and customer service industries and realize huge cost savings. Many companies have

already deployed chatbots, which mimic human intelligence so that their responses are intelligent and humanlike. Secondly, it is important to determine which factors impact the effective utilization of AI in firms. It is vital to understand these factors because AI still has many challenges related to biased algorithms, privacy concerns, and the unethical use of data (World Economic Forum, 2020). Many companies are investing heavily in AI, but there is no clarity regarding how AI will drive benefits for a business and which approach is best for integrating AI into existing functions (McKinsey, 2017).

2.4 The impact of herding behavior on AI

AI could potentially have a trillion-dollar impact in terms of revenues in the coming decade. It is disrupting almost every type of business process and affecting industries on a large scale. More companies are either investing or seeking to invest in AI technology than ever before. The interest of venture capitalists and general investors is also significant. However, AI is still a complex technology involving multiple sub-concepts and complex algorithms. AI use is also accompanied by significant ethical concerns. Many opinions about AI exist in the market, and Makridakis (2017) divided these opinions into four groups: optimists, pessimists, pragmatists, and doubters. Confused signals might trigger herding behavior if managers and stakeholders know little about this new phenomenon, yet market buzz and competitive pressures can force them to make a decision. According to Banerjee (1992), herding behavior is based on what others are doing, and it becomes more prominent when companies or individuals are strongly influenced by decisions taken by other groups, stakeholders, or competitors. These decisions might be related to new investments or which technology to incorporate, and they are sometimes more related to lifestyles (Duan et al., 2005). Herding behavior especially intensifies when there is no clear direction of the future and a general level of uncertainty in the market. In this situation, early movers typically pass the information to companies that are still considering the situation and uncertain about what to do (Khanna & Mathews, 2011). Herding is particularly prominent in the IT industry, where managers are known to follow one another regarding IT investment decisions (Kauffman & Li, 2003). While not all herding will negatively affect the overall industry, it might affect the adoption expectations of a promising technology in a single firm. Manager herding and investor herding have been significantly studied, especially in the field of finance. While fewer studies have explored IT adoption herding that stems from corporate decision makers' investment decisions (Duan et al., 2005), many studies have researched digital marketing and other online solutions' perspectives. For example, it was observed that the effects of herding could be minimized if there is a trend of negative comments from others in the digital world (Huang & Chen, 2006). Lenders (investors) in the online loan market also tend to follow herding behavior (Herzenstein et al., 2011). Research has shown that buyers in digital auctions are also susceptible to herding bias

(Dholakia et al., 2002), and book sales/star ratings influence online book buying (Chen, 2008). Ding and Li (2019) found a strong presence of herding in the consumption of digital books and purchases on websites. Similarly, on eBay, new bidders usually herd to existing bids (Simonsohn & Ariely, 2008). To the best of the author's knowledge, no study has presented a fusion between AI and herding behavior. To promote the effective utilization of AI, it was necessary to measure any herding phenomenon's impact on AI technology, analyze what factors triggered the herding, and determine the effects on the overall AI industry.

2.5 The role of data and privacy in the effective implementation of AI

Data are fundamental to running successful AI projects, and as the foundation of all advanced analytics and machine learning, data represent the most strategic assets a company can possess. Recent developments in AI are creating new possibilities for analyzing all types of data, including pictures, videos, and voice data. AI is primarily based on data; the more data a company can feed into its AI system, the better the system will become (SPD, 2020). Firms can use their own data (internal) and third-party data (external). Third-party data include any type of data that can be found/bought outside the organization. Major digital data-generating platforms include online discussion forums, video data, social media data, search engine data, login data, location data, cookies, etc. Table 5 shows the most common forms of data used in digital marketing (Saura, 2021, p. 94).

TABLE 5 Categorization of data (Saura, 2021, p. 94)

Type of Data	Data Description
Transactional	Information regarding sales, invoices, receipts, shipments, payments, insurance, rentals, etc.
Non-transactional	Demographic, psychographic, behavioral, life-style, etc.
Operational	Strategies and actions related to logistics and business operations
Online (sources)	User-generated content, emails, photos, tweets, likes, shares, websites, web searches, videos, online purchases, music, etc.

According to Kietzmann et al. (2018), Internet users create a vast amount of data every day; a rough estimation is that 2.5 billion gigabytes of data are shared daily on the Internet. These data have become as important as oil was in the past because they can be analyzed in a way that offers extremely valuable insights, which can help us better understand our customers' needs and can be applied to almost any business area (Campbell et al., 2020). Innovation can advance through data analysis because companies can predict strategies' success and determine which new products will perform better (Wright et al., 2019). Due to its huge impact, Alshura et al. (2018) considered data the core foundation on which to build data-driven marketing. However, where there are opportunities, there are challenges of equal size. For example, to run better AI systems, companies must install proper data ecosystems to ensure that data collection and management practices are strong enough to support a robust AI system (McKinsey, 2017). This is a vital step because there were many previous problems in assembling and labeling data, which required improvements in existing data structures (Roh et al., 2019). The existing literature requires clarity in terms of whether firms are creating a sound foundation for their data-related issues (i.e., data collection, management, the role of third-party data, etc.).

Digital privacy is important because it can impact the effective utilization of AI projects; when users are concerned about data privacy, they do not trust the associated firm or brand (Martin et al., 2017). Data privacy also represents the ethical side of AI. For example, users might be uncomfortable and show negative behavior toward database targeted advertising once they realize how much of their data are collected and analyzed (Aguirre et al., 2015). According to Wedel and Kannan (2016), most users assume that most websites do not take privacy seriously. AI can interfere in a user's privacy when it tries to analyze their data without their consent.

There is new official legislation coming out in Europe and elsewhere, such as the GDPR, because privacy is important when data are stored, collected, or used for further purposes, especially marketing and advertising. Companies (especially in Europe) must now modify their existing data collection and data use strategies or be subject to fines (maximum fine €20 million). The literature needs to expand to note the impact of the GDPR on companies' data-related activities. Further research is needed to discern whether the GDPR is a help or a hindrance to the successful implementation of AI projects, which might use different data streams.

Figure 5 outlines the dissertation journey and sub-topics.

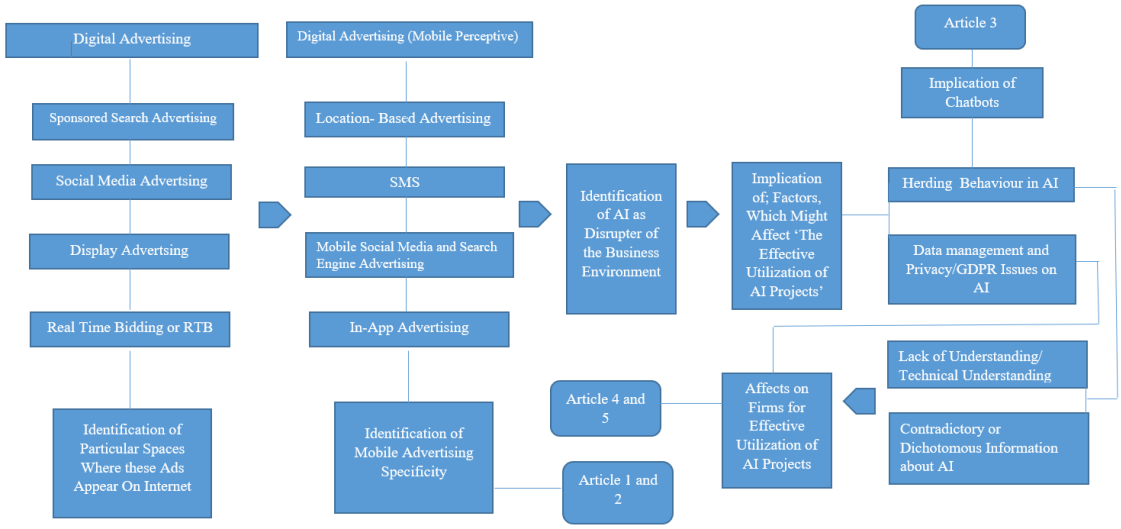

FIGURE 5 The dissertation journey and sub-topics

3 METHODOLOGY

3.1 Ontological assumptions

A paradigm represents a larger worldview that explains the nature of the world and how an individual can relate to it. This might also include the range of possible attachments or connections to that worldview and its parts. Every research study begins with an inquiry, and any inquiry paradigm validates itself by answering three questions: 'the ontological question, the epistemological question, and the methodological question' (Guba & Lincoln, 1994, pp. 107–108). On a general and basic level, ontological standpoints vastly consider the notion of reality and how people interact and behave with one another in society and in the world. Ontological assumptions may be relative and differ from individual to individual because they are based on the perception and experience of each person and subject to change over time. Meanings might vary when studied in another context (Eriksson & Kovalainen, 2008). Ontological views are established by taking either a subjectivist or an objectivist position. For example, realism is an ontological position that assumes that the true nature of reality is independent of the human mind, so it objectively explains the structure of the real world. By contrast, subjectivist ontology assumes that reality is projected by the human mind, and the meaning derived from this reality is inherently social (Coghlan & Miller, 2014). In other words, the subjective approach of ontological assumption takes reality as a projection of human imagination. Such reality is created by creative imagination. The objective approach of ontological assumption takes reality as a concrete structure. Therefore, any aspect of the world that is concretely unobservable will hold a questionable status, and its existence will be uncertain (Morgan & Smircich, 1980). This dissertation takes neither an objective nor a subjective ontological stance in full; hence, it lies in the middle of these two extremes. The first part of this dissertation discusses digital advertising and mobile advertising; here, it takes a more objective ontological stance. The prime reason behind this strategy is that in this part of the dissertation, the structures, procedures, and relationships are relatively concrete and measurable regarding

the existing realities of digital and mobile advertising. They are solid structures and processes with predefined operational mechanisms that represent one measurable view of reality. This section of the dissertation develops literature review studies to map and understand the existing reality through analyzing secondary data. When this dissertation discusses phenomena related to AI (articles 3, 4, and 5), most of the discussion takes a more subjective ontological stance. The goal here is to project or mimic reality by analyzing the creative imagination of the participants through semi-structured interviews. Therefore, the discussed issues, such as the acknowledgment of herding behavior in AI, aligning data practices to support AI initiatives, and the conceptual framework of a chatbot, will take a subjective ontological assumption, which takes reality as a projection of the human imagination.

Asper (2015) stated that the root of ontology is in philosophy, and the ontological comportment will be quite distinctive when a science or technology researcher tries to apply the ontological stance in their studies. Digital entities are more modifiable, collaborative, solderable, and distributable because they are rooted in larger and constantly changing networks; hence, the surrounding discussion might contain ambiguous or ambivalent ontological arguments (Kallinikos et al., 2013).

3.2 Epistemological assumptions

Epistemology is a vast topic, and the central question that it tries to answer is, "What constitutes knowledge?" (Klein, 1998, p. 129). On a general level, epistemology relates to how knowledge can be created and the reasoning for it; it also creates an edifice for the availability and limits of knowledge (Eriksson & Kovalainen, 2008).

There are many diverse points of view regarding the fundamental paradigms of social research. Burrell and Morgan (1979) debated four models: (1) positivist, (2) interpretive, (3) critical, and (4) radical structuralist. The positivist paradigm believes that the setting of the world is solid and measurable, and connections can be defined and analyzed. The ontological position taken by the interpretive paradigm believes that reality is socially built and thus fluid and fragile. Therefore, what we know is always agreed upon within traditions, social situations, and connections with other people. The radical humanistic paradigm is based on the idea that a person constructs their own world. Finally, the radical structuralist paradigm takes an objectivist viewpoint and is dedicated to drastic shifts, freedom, and capability. Guba and Lincoln (1994, p. 110) also defined four types of paradigms: (1) dualist and objectivist, (2) post-positivist, (3) critical theory, and (4) constructivist. The objectivist paradigm assumes that the examiner and the examined entity are autonomous and simultaneously believe in researchers' capability to study the object without exerting or receiving any influence in the process. Post-positivism, which takes its ontological stance on the basis of critical realism, acknowledges the difficulty in understanding the

nature of the phenomena because of defective human rational mechanisms. The ontology in critical theory assumes that the study of the world is subjective. Finally, constructivism, which stands on relativists' ontological foundation, defines reality in the form of multiple, subtle mental structures that cannot be taken as true or false in the absolute sense but rather could be more or less informed (Guba & Lincoln, 1994, pp. 108–111). The philosophical–ontological basis of this dissertation will be positivist, interpretative, and constructionist in forming argumentative stances. According to Orlikowski and Baroudi (1990), positivists' knowledge streams are based on the physical world's objectivity; reality can be comprehendible and measured without conceptual ambiguities. Further, the positivist reality follows a single interest and describes a chosen facet of the underdiscussed trend. The positivist viewpoint is often similar to objectivist epistemology, which develops arguments about a phenomenon by searching for symmetries and pivotal connections with its principal attributes (Burrell & Morgan, 1979, 5). In the first part of this dissertation (articles 1 and 2), the worldview is structured more from a positivist lens. The corporate settings for digital and mobile advertising are established and concrete in their mechanics. Relationships in the digital and mobile advertising ecosystem are complex yet evident and traceable. The phenomenon's objectivity was easy to develop; hence, a positivist framework suited this part of the dissertation well. Further, all the articles included in this dissertation are qualitative studies. According to Su (2018), although the positivist paradigm and qualitative research methods might travel in different directions, positivism has historically been mainly linked with qualitative methods, and both concepts can be synchronized together well. Positivist qualitative research is also quite suitable for the new dynamic contemporary and less understood trends created by the recent wave of digitization and "offers holistic depictions of realities" (Rynes & Gephart, 2004, p. 455).

This dissertation also takes the interpretive and constructivist ontological approaches in the second phase (articles 3, 4, and 5), where the author discusses AI and important factors that impact its effective utilization in projects. According to Orlikowski and Baroudi (1990), in the interpretive paradigm, societal affairs are not theorized as steady and methodical, but elements stay in a constant state of development and are subject to continuous change. The related attributes impact each other in opposite directions, which eventually leads to discord and transformation. Similarly, the constructionism research paradigm illustrates that individuals build and "negotiate" meaning to make sense of "experiences" (Lincoln & Guba, 2000, cited in Grandy, 2018). The interpretive paradigm and constructionism are similar in the way that elements or attributes remain in a continuous journey of development. Given that topics like AI are in their evolutionary phase, many related experiments are underway to determine how AI can enhance business processes. In other words, AI is in a constant state of development, and stakeholders are accessing various options to make this technology practical. Hence, the interpretive and constructivism paradigm is well suited to this part of the dissertation.

3.3 Crystalizing the foundation of the methodology

The methodological question puts the inquisitor in a position where they reflect on finding the appropriate way to extract information. In this process, the objective inquisitor tries to track "real" reality by prescribing control of possible puzzling factors (e.g., whether the methods should be qualitative or quantitative, etc.) (Guba & Lincoln, 1994, p. 108). The answer to the methodological questions depends on the epistemological and ontological questions. In other words, a methodology is a research strategy that transforms ontological and epistemological philosophies into a practical plan for organizing research (Sarantakos, 2005).

Summarizing the discussion in previous sections, this dissertation is built on the basis of objective epistemology and takes a positivist ontological stance in the first part (articles 1 and 2). The dissertation investigates the bases of digital advertising and its current industrial structure, mechanisms, and domains and summarizes the industry-oriented digital advertising domains and their deployment methods. It also investigates the differences between digital mobile advertising and digital desktop advertising. The investigated elements or attributes in this part of the dissertation are subtle, the processes are established, and the mechanisms are essentially defined. Hence, objective epistemology helps shape a good mental model for pondering related elements. In this part of the dissertation, the world as a setting seems more solid, measurable, and (to some extent) well suited to the positivist ontological stance. The author needed to create a new direction for the existing literature to answer the primary research questions. Here, the author used the literature review method to drive suitable answers by collecting and analyzing secondary forms of data. Literature review studies, which are crucial and recommended for doctoral students, are a prerequisite for comprehensive and advanced study (Boote & Beile, 2005). The literature review studies helped the author understand the state-of-the-art developments in the digital advertising field and its ecosystem. The detailed analysis of previous studies helped identify digital advertising domains, both in desktops and in mobiles. It also helped with understanding and forming the operation mechanism in each domain and with differentiating mobile advertising from desktop advertising.

When investigating AI (articles 3, 4, and 5) in the latter part of the dissertation, the author uses a subjective epistemology foundation and an interpretive and constructivist ontological approach. The reason for assuming these stances was that the concept of AI is fluid in terms of how well it is understood, and it is on a continuous journey of development. The subjective approach of ontological assumption takes reality as a projection of human imagination. Therefore, article 3 conceptually develops a framework for the front and back ends of AI-based chatbot interfaces and investigates the integration and adoption of chatbots into marketing/customer services in the tourism industry.

In articles 4 and 5, the dissertation investigates the factors that impact the effective utilization of AI projects in firms. For this part, the author considered the semi-structured qualitative interview method for collecting data as the most

appropriate. This type of qualitative interview is commonly used across many disciplines, where the investigator aligns the questions in an open environment, and the interview is extended based on what the participants have to say (Roulston & Choi, 2018). The participants were selected based on their expertise and knowledge of AI and data science. Most had worked in the corporate sector in top-tier positions (e.g., chief executive officer).

3.4 Data collection, sampling, and analysis

For articles 4 and 5, the author conducted semi-structured interviews in Finland, the USA, the UK, Switzerland, and Peru. The participants were selected for their knowledge, expertise, and experience with AI, machine learning, and data-based technologies. Table 6 details the selected participants who were interviewed. Their real names and places of work are not disclosed to ensure confidentiality.

TABLE 6 Description of the selected participants for the interview

Serial no#	Name (Confidential)	Designation	Country	Brief description/study relevance
1	Participant 1	CEO	UK	The participant is a tech public speaker who is ranked as a global cloud tech influencer and leading independent analyst as well as a program manager, business troubleshooter, and consultant to hundreds of technical organizations.
2	Participant 2	Chief Growth Officer	Finland	The participant is an expert in AI and working with companies every day to help them apply AI.
3	Participant 3	Head of Data	Finland	The participant has worked 15+ years in the data and intelligence domains.
4	Participant 4	CEO, Co-Founder	Bulgaria	The participant is passionate about AI and machine learning and has more than 30 years of related experience,

				especially in analytics and data mining.
5	Participant 5	CEO, Co-Founder	Finland	The participant has significant insight and hands-on experience in accelerating the benefits of machine learning and AI.
6	Participant 6	CEO	Finland	The participant is passionate about and AI data based-businesses.
7	Participant 7	Previous Digital Director, Adjunct Professor	USA	The participant is an expert in creating and driving AI automation, condition monitoring, and predictive maintenance programs with technology, analytics, and business models to drive added value and digital transformation
8	Participant 8	Lead Data Scientist	Finland	The participant is a technologist and design and machine-learning professional who designs, develops, and manages teams to produce Internet-related products, with a focus on creating added value via machine learning and AI.
9	Participant 9	Business Lead AI	Finland	The participants bridges business and technology in strategic initiatives in AI.
10	Participant 10	Director, Analytics	Finland	The participant is an AI and data-based technology expert.
11	Participant 11	CEO at Ultimate AI	Finland	The participant is the CEO of an AI-based company selling AI-based solutions.

12	Participant 12	Lead AI Solution Architect	Finland	The participant is an AI and data-based technologies expert.
13	Participant 13	AI expert	Switzerland	The participant was previously a brand manager for a famous multinational corporation and currently CEO of two technology-driven startups.
14	Participant 14	Founder and Chairmen Head AI	Finland	The participant is an entrepreneur with 20 years of experience in AI, cognitive sciences, computational intelligence, complex adaptive systems, and game development. He is also actively participating in academic research.
15	Participant 15	Director of Thought Leadership	Peru	The participant has more than 12 years of international experience in technology and business services, particularly in Europe and Latin America.

In total, 15 interviews were conducted from Nov 2019 to Mar 2020. In articles 3 and 4, the data were used with different interview themes put in front of the same participants. In semi-structured interviews, there are general sets of questions, and the same structure is followed with all participants. While the general structure remains the same, the interviewer can change the questions according to the situation (Lichtman, 2014). Following this guideline, Table 7 details the briefing that was given to the participants before the interviews and describes how the interviews were staged around different questions for article 4.

TABLE 7 Interview theme and structure for analyzing herding behavior in AI (article 4)

Details given to the participants before the interview	The purpose of this theme is to find out whether managers or stakeholders are developing herding behavior when it comes to the application of AI in marketing. We have seen a new wave of information (in both the academic and the corporate worlds) that portrays a very optimistic future for AI. Overall, the industry environment and competitor pressure can cause organizations to make arbitrary decisions without educating themselves on AI technology. There is also confusion and contradictory information available on AI. This overall situation might cause an organization to herd in one particular direction (i.e., do things based on what others are doing). We need to find out if there is veiled herding behavior, and if there is such behavior, what triggers it and whether it is good for companies and/or the industry.
Discussion around different questions	Analyzing whether organizations have sufficient technical knowledge regarding AI and how it can change and add value to their existing marketing activities.
	Analyzing competitor/industry pressure and the new wave of information regarding AI is forcing organizations to incorporate and invest in AI for marketing purposes.
	Discussing the existence of complex and contradictory information out there for AI that can confuse organizations and managers.
	Is current information about AI is creating lucrative conditions for organizations, even though they understand little about how AI can change their existing marketing activities?
	Have organizations already or are they currently developing herding behavior (doing things based on what others are doing) in terms of investing in AI in marketing?
	If there is herding behavior in terms of adopting AI in marketing practices by firms, what factors are triggering this behavior?
	Is herding in AI good or bad for firms and the industry?

For article 5, the author has again followed the above process. Before the start of a new theme, a brief introduction was given regarding the investigated theme, and the process was steered toward the research objectives via semi-structured questions. Table 8 details the briefings that were given before the interviews and describes how the interviews were staged around different questions for article 5.

TABLE 8 Interview theme and structure for measuring better data management practices in AI (Article 5)

Details given to the participants before the interview	The main idea behind this theme is to understand data and data-related issues that can affect the adoption process. AI requires clean and reliable data to run. In this section, we will try to understand data-related problems.
Discussion around different questions	General discussion regarding what is meant by "clean" or "reliable' data.
	The effects of the GDPR and other privacy regulations on the adoption of AI in firms.
	The most important forms or types of data that a company can collect.
	Do firms' current data collection and management systems support AI projects?
	If current data collection and management systems are not sound enough to support AI initiatives, then what can be done to solve this issue?
	What kind of data should a company use to run effective AI projects? Is a company's internal data enough, or should they look for other sources, such as external or secondary data?

It has been stated that qualitative research has not developed a methodical approach for the selection of appropriate samples (Koerber & McMichael, 2008, cited in Lichtman, 2014). In qualitative research, the researcher usually considers what kind of participants will be best for the intended study (Mayan, 2009, cited in Lichtman, 2014). This was valid for the current research as well (articles 4 and 5). To investigate the subject of AI in depth and in a relevant context, the author needed people with extensive practical experience in the field rather than only theoretical knowledge, and ideally people with both. It was difficult to find such participants because AI is a rather new development. However, people working in other related fields, such as data science and machine learning, were found to be suitable for this study. AI stands on the foundation of data and other related technologies, but to find specific experts, companies working in the AI field were approached in Finland and other parts of the world. A focus was placed on companies whose operations are close to the marketing and communication industry because they are actively trying to invent new trends by applying AI in the marketing field. We also included companies/individuals working with data-related technologies and machine learning.

Consultants who have helped other companies successfully implement AI in their existing operations were also approached. A list of such companies and individuals were made with their contact details, after which emails were sent and followed up with a phone call. Some individuals were directly approached

over the phone, and a follow-up email was sent with the interview proposal. More than 80 companies and individuals were approached in this process, with 15 selected for the final interview. Most of the companies did not respond because of a lack of time or other related reasons (e.g., they did not personally know the author). All interviews were conducted via telephone, which has become the dominant approach over polling and survey methods. Overall, telephone interviews provide better uniformity in the results because interviewer training can be easily managed. Telephone interviews are also cost effective and provide fast results (Shuy, 2001). A time was decided with each participant, and a request to record the interview session was approved before the interview with all the interviewees. The telephone interview method seemed appropriate for this research because the participants were from different countries and even different continents. Face-to-face interviews require significant financial resources and are quite time consuming.

All recorded interviews were transcribed into textual form. Typically, a transcript is a narrative mode transfer of oral discourses into written discourses. It should not be considered clerical work but rather an explanatory process, where oral speech should be carefully converted into textual form by understanding the interviewee's response in the right context (Kvale, 2007). Data analysis was performed by thematic analysis. When recording, strict attention to detail was ensured so that no information of value was overlooked. All interviews were systematically transcribed into English.

The next step involved searching for themes within the data. The common themes were identified to help analyze the data. This approach is similar to "interview analysis as theoretical reading" because the researcher goes through the text repeatedly and reflects theoretically on specific themes of interest (Kvale, 2007).

Furthermore, in articles 1 and 2, this dissertation used a literature review to tackle the investigated phenomenon. According to the definition given by Matheson and Lacey (2011, p. 10, cited in Tight, 2019), "A literature review is a written appraisal of what is already known—existing knowledge on a topic—with no prescribed methodology." In this dissertation, the literature review was used as a methodological tool to answer the research questions.

Jesson et al. (2011, p. 9, cited in Tight, 2019) also acknowledged that "the literature review can be a research method in its own right." According to McGregor (2018), the purpose of the literature review is to build a comprehensive view of the overall previous knowledge around a sudden topic. Literature reviews offer recent perspectives on the topic. In articles 1 and 2, the author was primarily interested in learning about all the domains of digital advertising and how they operate to distinguish mobile advertising from desktop advertising. After going through an initial search of the literature and industry sources available on the Internet, it was evident that there are established domains of mobile and digital advertising. While the industrial approach and language used to define digital and mobile advertising might be different from the terms used in academic literature, both represent the same concept. There was a need to regroup

the previous knowledge from industry point of view to develop a holistic picture of digital and mobile advertising and which factors distinguish them from each other. These studies can make a unique contribution to the existing literature and give managers a complete guide to mobile and digital advertising, including how to deploy these techniques in practical terms. Therefore, the literature review approach was deemed appropriate. These literature reviews also greatly helped the author understand the most recent developments in related fields and laid the foundation for articles 3, 4, and 5. The development of the literature review started with the identification of keywords. According to McGregor (2018), keywords or descriptors represent the internal structural thinking of the researcher. The search began with basic keywords, such as digital marketing and digital advertising, after which a rough sketch of possible domains was made through reflection. Another important task, listing all possible domains that are working under digital advertising or mobile advertising, was challenging because the main concepts and domains were overlapping, repetitive, and included different terminologies. For example, programmatic buying or RTB, which is a domain of digital advertising, seems quite similar to display advertising. Whether these two domains should be considered individually or together was an important question to answer. The literature reviews were managed such that no concept or domain of digital and mobile advertising was missed. The process required the addition of keywords in existing packs of keywords as the process progressed. Once all data were collected against each domain, literature analysis began as a way to understand each domain's mechanism and other important findings. Industry sources, Internet blogs, and transcripts of video material were considered together to synchronize the findings better with the academic literature. A balance was sought between the academic and industry knowledge streams, which were merged to elicit more comprehensive and practical meanings.

The first publication included in this dissertation examines the segment of digital advertising. This publication identifies and builds domains against the most common format of advertising on the Internet. There was no previous name for this format. Therefore, in this article, it was named Internet advertising paid slots and spaces (IAPS). Most industry revenue belongs to IAPS. Domains that are linked with IAPS include social media advertising, display advertising, and search engine advertising. Article 2 discusses the core factors responsible for making mobiles one of the most preferred advertising media and one of the main distinctive features and mobile-oriented advertising formats that help establish mobile advertising's authority over other devices and advertising media. The article also examines privacy, its influence on advertising effectiveness, and how it can be adapted such that laws are followed and no consumers are displeased. Article 2 incorporates the latest EU privacy regulations (commonly known as the GDPR) into the spectrum of governmental and official steps for safeguarding consumer privacy. Finally, it explains the mobile-deployable advertising domains, including LBA, in-application (in-app) advertising, SMS, mobile social media, and search engine advertising, the concepts of location and context, and their importance for mobile advertising.

In article 3, the author chose a conceptual research approach to answer the questions. Many companies are trying to develop AI-based chatbots to replace human customer representatives in the customer services industry. The impact of chatbots will not be limited to customer services, and it could widely affect the marketing industry as well. However, the author found few real-life examples of chatbots replacing humans because chatbots have many technical problems that need to be resolved before their mass adoption would be feasible. It was important to understand how chatbots should be developed so that the industry can reap their full benefits. This phenomenon requires a conceptual investigation to develop an ideal model for chatbot adoption. According to Gilson and Goldberg (2015, cited in Jaakkola, 2020), the field of marketing research needs good conceptual papers that can find symmetrical patterns across different fields and remove the limitations in our thinking approaches. Jaakkola (2020) introduced four different methods in which a conceptual paper can be organized. Article 3 followed the "theory synthesis approach," in which the researcher seeks to build a conceptual model by using previous theories and literature streams. By using this approach, a conceptual model for ideal front and back ends of a so-called "perfect chatbot model" was introduced with the help of previous theories and literature. Table 9 summarizes the practical steps toward developing a methodology.

TABLE 9 General systematic and practical steps taken to develop a sound methodical foundation

General Research Methodology Overview		
Steps	**Phase 2 (Mostly Interview-Based)**	**Phase 1 (Literature Review)**
1	Identification of keywords	Identification of keywords
2	Database search against keywords	Database search against keywords
3	Detailed search on Google Scholar, Science Direct, and different journals' databases (e.g., *Marketing Science*, *JAMS*, etc.), Google, YouTube, blogs, industry reports, digital news media outlets (e.g., *Forbes*), reports by consulting companies (e.g., McKinsey, BCG, etc.), academic institutions' reviews (e.g., *MIT Sloan Review*), and other important digital publications)	Detailed search on Google Scholar, Science Direct, and different journals' databases, Google, YouTube, blogs, industry reports, digital news media outlets (e.g., *Forbes*, eMarketer, Statista), reports by consulting companies (e.g., McKinsey, BCG, etc.), and academic institutions' reviews (e.g., *MIT Sloan Review*, etc.)
4	Downloading relevant literature and listings	Downloading relevant literature

5	Screening articles by reading abstracts, conclusions, and important details in the main body of articles	Screening articles by reading abstracts, conclusions, and important details in the main body of articles
6	Listing the screened articles	Deleting irrelevant literature
7	Identifying important factors that can impact the effective utilization of AI projects (e.g., data, herding behavior, GDPR, ethical AI)	Identifying common themes/domains in the literature
8	Repeating steps 1–7 against each identified domain for detailed findings	Repeating steps 1–7 against each identified domain for detailed findings
9	Creating an interview theme and research foundation	Conceptually building the main research model with all domains and detailed findings against each domain
10	Developing a general plan for the research, including explanations of concepts to be explored that will grab the attention of potential interviewees	
11	Identifying relevant companies and individuals best suited to the research in terms of experience in and knowledge of AI and data sciences, marketing, and advertising	
12	Building a list of such companies and individuals with their phone numbers or emails through search engines	
13	Contacting companies and individuals via phone and email to briefly explain the interview objectives and sending invitations for telephone interviews	
	Arranging semi-structured interviews with recording software to record the conversations for future analysis, with the interviewee's permission	
14	Recording the telephone interviews	

15	Creating a transcript of the telephone interviews from the recordings	
16	Assembling the transcripts in the software against each theme	
17	Analyzing the interview transcripts and extracting meanings/knowledge	
18	Identifying common trends against each interview theme	
19	Comparing the findings with relevant literature	
20	Generalizing the results and refining the research model	

4 SUMMARY AND KEY FINDINGS

This section provides a summary and the key findings of the five articles that are included in this dissertation. As stated previously, the aim was to study contemporary and future trends, elements, and technologies that are linked with digital solutions/businesses, mainly in the digital marketing and advertising domains. Phase 1 includes articles 1 and 2, which explain digital advertising across all major devices. Phase 2 includes articles 3, 4, and 5, which build the discussion around the most important implications of AI (article 3) and determine which factors might impact the effective utilization of AI projects.

4.1 Article 1: "Digital Advertising in Paid Spaces; the e-Advertising Industry's Revenue Engine: A Review and Research Agenda"

This research article explores paid advertising slots that appear on the Internet during browsing. Importantly, most digital advertising happens in the same format. This literature review-based article is built on clearly defined borders and addresses a particular format, which consists of text and pictures. Almost every website has a dedicated space to this type of format. While there was no name for this type of format previously, article 1 terms these spaces Internet paid advertising slots and spaces or IAPS. This new term acts like a stock exchange only with advertising spaces. Most industry revenues on digital ad spend are allocated to this type of digital advertising in the form of IAPS. These slots and spaces are usually found in the upper, right, middle, or bottom of any webpage. The article reviews 75 publications, most of which were from 2016 onward.

The findings show that IAPS mostly appear in social media advertising, sponsored search advertising, and display advertising (programmatic buying), and they encompass diverse areas of Internet advertising. Notably, more than 30% of the existing literature belongs to sponsored search advertising, 25% is

dedicated to displays, and the remainder is directed toward social media advertising and other general Internet marketing topics.

4.1.1 Social media advertising

Social media advertising is an important domain of IAPS. Different companies use social media for different reasons. Some companies use it for building brands and promotions, while others might use it for information searches, building customer relationships, and other related customer services elements. The largest social media platforms include Facebook, Twitter, and LinkedIn. These platforms are all used for a specific purpose. For example, Snapchat and Facebook are often used for entertainment and socializing purposes. Instagram is generally used for personal gratification and fashion, and Twitter offers users the highest engagement with their brand community (Phua et al., 2017). All these companies and platforms offer IAPS to advertisers, with their main revenue model dependent on selling advertising spaces to advertisers and companies. Individuals can also run advertising on these platforms. While such ads are generally successful, some users might avoid social media advertising due to privacy concerns, because they consider the ads irrelevant, or because they have suspicions regarding why they were targeted for the advertisement (Hoy & Milne, 2010; Kelly et al., 2010). Therefore, advertisers and managers should be aware of this fact and should thus design their campaigns in ways that users find interesting, informative, and entertaining.

4.1.2 Sponsored search advertising

When a user enters a search query or simply types words into Google, sponsored search advertising mainly includes paid search listings in the form of IAPS. There is a systematic process for advertising a product or service on search engine platforms (e.g., Google). Advertisers typically bid against selected keywords that are most commonly used by their customers or potential customers. When a user enters these selected keywords, the search engine shows organic results and paid advertising (typically at the top of IAPS) against which an advertiser has placed a bid. These sponsored search advertisements appear in a ranked ad format, and there are typically four to five ads atop one another. The rankings are not randomly assigned but rather systematically allocated by the search engine. If the user clicks on the ad, it will take them to the advertiser's landing page, and Google is paid by the advertiser according to its offered bid. Sponsored search advertising involves diverse stakeholders. To use sponsored search advertising effectively, it has been advised to carefully select target keywords, ponder effective ad copy, and develop a relevant landing page. It has also been advised to choose multiple keywords to capture all potential customers who might use different search queries (Li et al., 2015).

4.1.3 Display advertising

Internet advertising has historically been related to display advertising, which is placed on websites where consumers regularly browse. This type of advertising can appear on blogs, videos, and websites. Banner ads, a common format of display advertising, are most commonly found at the top of webpages in a horizontal display format. Another important format is the skyscraper, which has a height greater than its width (synonymous with its vertical positioning).

4.1.4 AI-based programmatic buying or real-time bidding

In the ecosystem of digital advertising, there are billions of users and millions of advertisers wanting to show their offering to the most suitable user. To govern this system, an AI-based advertising system known as programmatic buying or RTB was introduced. This system includes demand-side platforms representing users and supply-side platforms representing advertisers. When a user clicks on a link, before the page is loaded, the demand-side platforms will analyze all previous information or data about that user and offer this user (called an impression) to a related advertiser, who might bid against that impression. If a bid occurs, that advertiser's ad, which is already stored on the supply-side platform, will appear in front of that particular user once the page has loaded. This buying and selling process might take a fraction of one second (typically when the page is loading, the relevant ad is being prepared, and it is shown when the page has completely loaded).

4.2 Article 2: "Mobile Advertising Framework: Format, Location, and Context"

Article 1 investigates various important domains of digital advertising on desktops and laptops. However, users now spend equal if not more time on mobile devices than on desktops. Therefore, this literature review explores the advertising and marketing landscape that is pertinent to mobile devices. This paper discusses the core factors responsible for making mobile devices one of the most preferred advertising media and identifies advertising domains that are deployable only on mobile devices. The article also explores privacy, its influence on advertising effectiveness, and how it can be adapted so that new digital laws are followed and no users are displeased. The incorporation of the latest EU privacy regulations (commonly known as the GDPR) into the larger spectrum of governmental and official steps for safeguarding consumer digital privacy rights shows that location and message delivery in the consumer context are unique features of mobile advertising. The article also identifies advertising domains that are only deployable on mobile devices. These domains can be categorized into four main sections: LBA, SMS, in-app advertising, and mobile social media/search engine advertising. These distinctive features and mobile-oriented

advertising formats will help establish mobile advertising's authority over other devices and advertising media.

4.2.1 Location-based advertising

LBA can be defined as information designed by a marketer to deliver messages according to a recipient's geographic positioning (Bruner & Kumar, 2007). Most definitions of LBA usually exclude the concept of context, of which location is merely a small physical part. The other parts of context include time, people, community networks, and sensor-provided data (Fanjiang & Wang, 2017). Thus, to understand location, it is advised to review the comprehensive elements that are related to this service (Kjeldskov, 2007).

4.2.2 SMS

SMS is a traditional tool in mobile advertising. Due to the increased use of smartphones and interruptible Internet connections, SMS can be tailored according to a user's location. However, current consumer preferences and attitudes as well as physical footprints can be derived from social media or through online activities, making the concept of context no longer limited to time and location.

4.2.3 In-application advertising

Gupta (2013) explained the different types of mobile applications, which can include those for games, entertainment, and virtual social interactions. There are two general ways of using mobile applications for marketing or advertising purposes: in-app advertising across various types of mobile applications and branded apps. Both can allow a company to conduct various activities, such as LBA, sales promotions, communication of important events, and tasks related to consumer engagement.

4.2.4 Mobile social media and search engine advertising

Mobile search engine advertising is similar to that of desktop ads in that advertisers bid against targeted keywords. On mobile devices, Google also ranks these ads on various factors, which are the same as those of desktop displays. These factors include expected click-through rate, the relevance of the ad to the initial user query, etc. (Aslam & Karjaluoto, 2017). However, given the small screens available with mobile devices and the increased trend of conducting local searches on them. The small screens cause users to spend more time on the first three results of search engine query retrieval pages than on later results (Kim et al., 2012). Consumers' interest in mobile social media lies primarily in social influence and a feeling of belonging. Such social influence creates a bandwagon effect; a consumer will continue using mobile social media, even if they are not interested in it (Zhou & Li, 2014). Users share information with their friends

regarding their hangout places, such as cafes, restaurants, and other important tourist locations, in one specific area (Kaplan, 2012).

4.2.5 Privacy and Implications of the GDPR

The GDPR, which is a comprehensive legal framework related to data, was introduced in Europe in 2018. This law is the first designed to safeguard consumers' digital privacy rights in Europe. This article discusses only what is directly related to mobile advertising in the GDPR. The GDPR forces companies to ensure full transparency regarding the collection and use of data, and they must do so only after receiving explicit consent from users. It is crucial for users to be aware of why their data are being collected and if/how those data will be used in the future. This article presents different practical scenarios of how mobile advertising can be effectively deployed without breaching any privacy requirements to avoid fines. For example, it is better to collaborate with companies that specialize in data collection to ensure compliance with GDPR laws. If a company wants to use internal data from a user, such as location or demographic data, users should be informed that their location/data will be tracked to give them better services. Users should also be informed that they can change privacy settings at any time. Increased monetary and other benefits should be offered to consumers who are willing to participate and interested in receiving data/location/context-based advertising. A company that is also interested in tracking customers' social media and other online activities for serving enhanced contextual messages must clearly mention this purpose immediately, followed by offering the option to unsubscribe from such an offering at any time (Aslam & Karjaluoto, 2019).

4.3 Article 3: "Chatbot Adoption in Tourism Services: A Conceptual Exploration"

What are chatbots? According to Hatwar et al. (2016), chatbots are agents generated through software that can copy human intelligence and produce answers close to a human response. Chatbots might represent a drastic change (no less than a revolution) in the customer service/marketing sector. They can dramatically decrease related costs for companies in the future. Most companies currently rely on expensive human customer service agents to reply to users' inquiries, but AI-based chatbots can mimic human intelligence and reply to users' inquiries as well. While the current technical development of chatbots has not matured enough to make them mainstream, many companies have already implemented this technology. Chatbots will eventually accept payments as well; Mastercard already provides such services through its Masterpass app. We can see that imperfect examples of chatbots are already part of the tourism industry, but few chatbots have successfully replaced human-based customer service. This could be because it is currently difficult to link chatbots to a company's database

to produce more relevant answers. The main problems with chatbots are related to their front and backend interfaces. Article 3 conceptually mediates the ideal working of front and backend interfaces of the chatbot and presents models that explain how they work. This article also develops adoption models that show how these chatbots can be integrated into the tourism industry.

4.4 Article 4: "The Implication of Herding Behavior in Artificial Intelligence: A Marketing Perspective"

This article presents a fusion between herding behavior and AI. Herding, which can impact the effective utilization of AI projects, occurs when there is a lack of understanding about a topic. In this situation, decisions by early movers give a signal that later movers imitate (Khanna & Mathews, 2011). This article investigates herding behavior toward AI technology application in marketing and finds strong traces toward herding when it comes to investing in AI. However, herding is not necessarily an unfavorable business phenomenon. Each firm must interpret its unique situation and analyze how an AI-based solution will solve a problem or help with existing processes. This will involve developing a sound understanding of AI, implementing an AI strategy, ensuring employee AI training and development, and preparing a sound structure that can harness the benefits of AI in real terms. The results of this article show that AI's potential economic impact in the future, a lack of technical knowledge/clarity about AI, and competitor pressure combined with industry hype created by the media, press, and researchers about AI are responsible for herding behavior in AI technology.

4.5 Article 5: "Data Obstacles and Privacy Concerns in Artificial Intelligence Initiatives"

Data are essential to the successful implementation of AI because most AI-powered solutions require datasets to run. If we can assume that generally, more knowledgeable and experienced individuals tend to develop smarter conclusions than less informed, less experienced people. Intelligence that is created artificially runs on the same principle. The better the quality of the input data, the better the results; thus, a project with less-than-optimal data will have poor results (Emarketer, 2019a). This article shows that companies are currently lacking in the needed structures and systems for the proper collection and management of data. The results also show that data privacy issues are extremely important, and while measures like the GDPR will support the industry in cultivating more ethical use of technology, they will not serve as a roadblock toward overall industry growth.

5 THEORETICAL AND PRACTICAL IMPLICATIONS AND FUTURE RESEARCH DIRECTION

Digital marketing, or more precisely the paid element of advertising, supports economic/business activity for most forms of Internet-based businesses. Furthermore, technological developments, such as AI, are influencing and changing the existing fabric of businesses. This dissertation reflects on related business concerns, contributes diverse elements in the form of theoretical and practical implications, and suggests future directions. This dissertation also adds distinctive new insights and literature outlines, consolidates past knowledge streams, adds relevant practical, executable information, and has the potential to serve the wider realm of practical implications. The aim was to focus on new theoretical frameworks that would have the greatest impact in practical terms.

5.1 Theoretical implications

The first research objective of this dissertation (article 1) was finding the advertising domains in which most digital advertising is occurring. These advertising domains should represent the core revenue-generating streams of digital advertising. This clarity was academically profound because the existing digital advertising system has a complex ecosystem and diverse platforms, which might create difficulty in understanding them (Aslam & Karjaluoto, 2017). Many previous studies have catered to one or the other digital advertising domain (Jerath et al., 2014; Saxena & Khanna, 2013; Yuan et al., 2013). However, there was a need to synthesize the previous literature to explore and explain most of the digital advertising landscape, segregate the literature into different domains, and explain the working mechanism of each domain. The literature review in the form of article 1 tried to build a research framework along the same lines. Previous literature reviews have summarized the methodological approaches, research topics, and research strategies used in previous digital advertising or Internet marketing literature (Corley et al., 2013; Nadia et al., 2013). Yet, the

existing literature lacked a literature review that summarized the tools and deployment methods of digital advertising. Article 1 adds new insights to the existing digital advertising literature in many ways. To answer the first research question, the author needed to find the format in which most digital advertising is arranged. This format would be responsible for most of the digital advertising spend (ad spend) in the industry. The author observed that the picture and text format is one of the most used formats in digital advertising. All webpages, including search engines, social media networking sites, blogs, media news pages, and ordinary webpages, have a designated space on their webpage for advertising purposes, typically a text and picture that is visible on either the top, right, left, or bottom of any webpage. The existing literature on digital advertising did not have a name for this type of format or space. Therefore, article 1 named it Internet paid slots and spaces or IAPS. This new terminology greatly summarizes most digital advertising domains in a more understandable and comprehensive way. Interestingly, most of the literature on digital advertising domains revolves around IAPS, which are responsible for most of the industry's revenues (i.e., companies spend most of their budgets in the form of IAPS). Article 1 also summarizes the previous literature in different domains (e.g., social media advertising, search engine advertising, and display advertising). Most of the revenues in all these domains are linked to IAPS. Article 1 not only segregates the previous literature into different domains but also offers full details about its deployment methods in each domain. Therefore, another contribution of article 1 is a summary of previous knowledge streams that are dedicated to the deployment methods of each domain. The deployment method mainly educates a reader on how a particular advertising tool (e.g., search engine advertising) can be used by any individual or company to market its product or service effectively.

The first literature review (article 1) covers digital advertising domains that use desktop computers as the default device for any related explanation and model building. Because of the rise of smartphones, users might be spending a vast amount of their online time on mobiles. This dissertation considers whether the advertising domains identified in article 1 might be equally valid for mobiles as well, which leads to another objective of this dissertation: determining the differences in digital advertising between mobile devices and desktops. This question lays the foundation for article 2—another literature review study. A literature review written by Leppäniemi et al. (2006) detailed previous studies in the mobile marketing literature, including their research foci. In another literature review, Shankar and Balasubramanian (2009) discussed previous key issues, critical questions, and different advertising approaches in mobile marketing literature. Other literature reviews have discussed how existing knowledge regarding mobile marketing can increase value for consumers and retailers and previous mobile marketing research themes (Varnali & Toker, 2010; Strom et al., 2014). To the best of the author's knowledge, no literature review has been specifically developed to cater to digital advertising domains that are explicitly valid only on mobiles and illustrate factors that distinguish mobile

advertising from desktop advertising. Hence, there are many important theoretical contributions made by article 2. First, it explains digital advertising domains, which are only deployable on mobiles. These advertising domains include SMS, in-app advertising, location-based advertising, mobile social media, and search engine advertising. These advertising domains are only applicable to mobile phones or smartphones. The literature review also synthesizes and summarizes most of the previous important literature against these domains. Another important theoretical contribution is the identification of the two most important factors for distinguishing mobile advertising from desktop advertising: context and location. Context represents the overall environment and other important factors in which the user will receive the advertising message or communication, and location represents the existing geographical presence of the user. Mobile devices are portable, and users carry them everywhere they go, while desktops remain fixed in one location. Therefore, the behavior and characteristics of digital advertising logically vary between these two formats. Advertisers can utilize a user's context and location in many creative ways and align their marketing message in a way that is not possible with desktops. Thus, domains that are deployable on mobiles only and exploitation of a user's context and location distinguish digital advertising on mobiles from that on desktops. Users carry mobiles everywhere they go, and some even place their mobile nearby when they sleep, making privacy concerns in mobile advertising extremely high as compared to desktop digital advertising. The implementation of the GDPR gave notice that the exploitation of a user's context and location and the use of other location-based advertising and other methods of mobile advertising should be done carefully. Advertisers must now develop their advertising messages such that they do not breach any privacy fences. This literature review also uniquely develops a theoretical model of how context and location can be used to better serve advertising messages by using certain mobile advertising domains or tools. This framework protects the user's privacy while allowing advertisers to market their product or service effectively. The main idea is that for any advertising campaign, the advertiser should get explicit permission from the user before sending advertising messages by exploiting location and/or context. In return, the user should receive monetary benefits for allowing the advertiser to use their data (e.g., location and context) Article 3 also uniquely adds diverse scenarios in which the right assortment of context, location, advertising tools, and privacy can be managed together in the form of practical scenarios in the theoretical implications section. These scenarios represent a novel contribution to the existing mobile advertising literature.

The next objective of the dissertation was to investigate the effective adoption or integration of chatbots into marketing/customer services in the tourism industry. To that end, a conceptual model of chatbots' operating mechanisms was developed. This model conceptually presents the front and backend processes of a chatbot. Previous literature has discussed chatbots from different perspectives. For example, according to Holtgraves and Han (2007), there is no effect on a user when they know that they are not communicating with

a human being. Hsu et al. (2017) proved the effectiveness of chatbots in the restaurant industry. It was also observed that hotels that deploy chatbots experience sales growth (Lasek & Jessa, 2013). Chatbots in the hotel industry can provide basic information, such as bookings and reservations, to users without any significant problems (Negi et al., 2009). However, the previous literature lacked a conceptual model that can explain how a chatbot can process a query effectively using AI and other supporting functions. Additionally, it was also important to give some sample communication models to explain what a chatbot interface would look like to the user (the front end of the chatbot). Therefore, the important dimensions investigated included uncovering the upfront interface of chatbots and the backend mechanism. The upfront interface includes standardized two-way communication with the bot and the basic structure of what the standard communication might look like. The backend mechanism is a technical computation that is likely in machine language. In the back end, the bot will produce relevant answers from its database. The upfront and backend theoretical explanations of a chatbot provide a clear and easy conceptualization of complicated phenomena. This was done through reshaping previous literature and adding distinctive new literary insignias. The theoretical model presented in this article can be considered one of the earliest efforts to examine how chatbots can be integrated into a firm's existing marketing and customer service domains and hence represents a novel contribution to the existing literature.

Articles 4 and 5 (interview-based studies) further extend the investigation toward AI. The goal was to build a theoretical contribution to address which issues might directly or indirectly impact the effective utilization of AI in firms/industry. The theoretical contributions developed in articles 4 and 5 highlight issues that can hinder successful AI implementation in firms. During the research process, the author felt that herding behavior might affect the successful implementation of AI in various projects. Therefore, another important objective of this dissertation was to investigate the presence of herding behavior in AI as well as to determine how herding behavior might affect the successful implementation of AI in firms. Many previous studies have investigated herding behavior, which is prominent in IT and financial markets in terms of investing. For example, Huang and Chen (2006) found strong traces of herding in terms of giving negative comments in the online environment. Ding and Li (2009) also found elements of herding in digital book consumption and purchases on websites. eBay bidders tend to herd into auctions with existing bids, even those already starting at low prices (Simonsohn & Ariely, 2008). However, to the best of the author's knowledge, no previous study has investigated herding behavior in the AI space. Article 4 adds new insights to the existing literature in many ways. First, it offers a clear indication of herding behavior in the AI space. Most of the interview participants believed that there is a strong herding trend in new AI projects. Many stakeholders want to capitalize on the recent wave of AI for its benefits, but they lack a clear understanding of the true nature of the impact of AI on their projects. Many stakeholders also do not fully grasp the concept of AI, but they want to join the herd. This behavior might affect the ROI

side of the AI project. Secondly, article 4 discusses the reasons behind herding behavior, which adds new insights to this underdeveloped area in the literature. According to article 4's findings, competitor pressure, a new wave of information, and a lack of real understanding about AI are drastically fueling herding behavior in AI. The article presents a theoretical model that outlines herding in AI. Finally, article 4 concludes that herding might not be a negative thing for the overall industry because it fuels competition, which improves efficiency. However, it is critical to understand AI technology, and the article emphasizes that the proper implementation of AI can improve existing structures and eventually realize a better ROI. These aspects of herding behavior in the AI industry are novel contributions to the existing literature. The conceptual model developed in this article uniquely relates AI and herding behavior, which is also a novel contribution to the existing literature. The theoretical contributions mainly agree with the herding phenomenon in AI technology and detail what causes this behavior. However, it is crucial to obtain a clear understanding of AI technology, consider exactly where AI can be applied, and determine what benefits it can generate rather than follow the herd. The theoretical contribution also includes that herding is not always negative because it promotes an inquisitive attitude and generates positive discussion and activity. However, herding cannot help a firm understand its unique position and the requirements needed for an abstract topic like AI. Firms with small initiatives regarding AI may find it extremely valuable.

Moving forward, another important aspect of AI technology is data. The functionality of AI depends largely on the data it will consume. McKinsey (2017) emphasized the importance of having proper data ecosystems in place to deliver successful AI campaigns. Sound data collection, management, and use protocols can ensure a profitable AI project. Therefore, the last objective of the dissertation was to understand data-related issues that might impact the effective utilization of AI projects in firms. It was also important to analyze recent governmental data regulations, such as the GDPR, and how they might impact the effective implementation of AI projects. In article 5, the theoretical discussion/model measures industry readiness in terms of developing data structures and practices within organizations. The main findings indicate that companies might be lacking the expertise required for sound data collection and management practices. This is consistent with Saura (2021), who found that relevant evidence regarding the measures needed to improve data management remains scarce. Further, new governmental regulations, such as the GDPR, are affecting data collection and management practices. Companies (especially in Europe) must now modify their existing data collection and data use strategies. Any flaws in their practices can result in heavy fines per these new regulations. The results show that the GDPR is overall a good initiative and not a barrier to the successful implementation of AI projects. It safeguards users' rights and helps address ethical concerns regarding data-related issues. Article 5 adds several new insights to the existing literature. The theoretical model presented in the article clearly identifies important data concerns that might affect the successful

implementation of AI in various projects. How data are stored and collected, new data guidelines, and other privacy concerns are important factors that could impact the success of AI. Article 5 also adds new insights regarding how these data-related problems could be solved. For example, before the implementation of AI, firms need to establish strong data collection and storage procedures. The findings also indicate that the majority of companies have not installed these data-related procedures. Finally, the industry also considers the GDPR a good initiative because it protects consumer data rights, and they do not see it as an obstacle to the implementation of successful AI projects.

5.2 Practical implications

This dissertation aimed to generate research output that aligns with strong practical implications. In theatrical terms, this situation can be considered "lying in limbo" between the worlds of academia and industry. Yet, it has the potential to create something interesting from that fusion. The aim was to maintain a robust industry orientation. There could be several important implications through relevant knowledge-derivation/extraction from this dissertation. Its two phases fall under the broader topic of contemporary developments in data-based digital business from the advertising and marketing perspectives.

Phase 1 has various practical implications, such as that it can help stakeholders understand the digital advertising ecosystem, the digital economy, digita (a combination of digital and data), and users' digital privacy obligations. Article 1 details all the digital advertising domains (present and future), including their characteristics and deployment methods, and discusses the most commonly used form of digital advertising. The article gave a very clear road map to the business managers and other stakeholders about the modern digital advertising landscape. The article not only summarized the most important domains in which most of the digital advertising is happening, but it also gave the general 'know how' about campaign management in each of the category. In each domain, a detail account of previous researches has been given which gives general guidelines about the best practices for improving campaign performances. These general guidelines are related to advertising format type, advertising content, ad placements, ad platform interface, attribution and bidding strategy. Over all these findings will help the industry to drive better advertising performance and enhanced budget optimization. Other important implication of article 1 is that it summarized all the digital advertising domains against a particular niche e.g. IAPS. Most digital advertising is happening via IAPS. Any related business (small or large) can advertise its products through IAPS and reach thousands (to millions or billions, depending on the budget) of people anywhere in the world. Digital advertising helps target people in terms of their attitudes, interests, demographics, psychographics, economic factors, location, past data, past searches, etc. Article 1 also expanded in futuristic digital advertising area i.e. progmmatic buying or real time bidding and explained its

ecosystem. This might bring a great clarity in stakeholders mind to comprehend the overall digital advertising settings

To give more holistic understanding about digital advertising, it was important to analyze behavior of different devices to digital advertising. The article 2 gives a very clear understanding to business managers that in which conditions and purposes mobile should be preferred device for digital advertising in order to drive best results. Therefore, it explained all advertising domain, which can only be deployed on mobiles. Furthermore, the article 2 also conceptually drew a line between mobile advertising and desktop advertising. It showed that 'context' and 'location' are two factors, which distinguishes mobile advertising from desktop. The article presented a unique interplay between mobile specific advertising domains, context and location. The article also took privacy and latest legal privacy framework (GDPR) in this unique model. Overall, it gave a very clear understanding to diverse stakeholders about the uniqueness of mobile advertising and how mobile specific advertising domains can be utilized by using context and location, without breaching any privacy fence. The article will help in improving overall effectiveness of digital advertising and might improve the overall ROI of marketing spend.

The phase 2 of this dissertation also added new practical insights. Article 3, gave a conceptual model for chatbot that can be integrated into various related function in any firm. The current form of chatbot, which is operational in the industry, it is not practical in a sense that it is able to cater all related needs and can replace a real human agent. The front and back end of the chatbot interface presented in this article will greatly help industry to understand the best working of chatbots. It will greatly help to understand that how chatbots should be set up in order to maximize its effectiveness which will eventually help in reduce costs.

There are also several important factors that stakeholders should be cautious of when planning to invest in AI technology, identified in phase 2. AI is not an easy concept; its technical jargon and dichotomous information can hinder complete understanding of the topic. Businesses should be clear not only about where they will apply AI and why but also what results they hope to achieve. They should also avoid any bandwagon effect. The article 4 explained the herding behavior in AI technology. Because of the recent hype regarding AI technology, many stakeholders are running to win the newly started AI race. They are ready to invest money in AI without a strong intellectual and structural foundation. Article 4, guided the business managers and other important stakeholders that they should avoid to be part of the herd when it comes to investing in the AI technology. They should understand their own business uniqueness and where AI will help them. They should educate themselves about AI technology and should clearly identify where and how it will come into play in their existing business functions. They should be clear about the objectives. Article 4 will help stakeholders to develop a right mind set to get the best out of any new AI project, before jumping into the AI race.

Finally the article 5, explained that data and privacy are two most important factors, which can effect the successful integration of AI in any new project.

Findings in the article 5 clearly indicated the stakeholders that firm's existing data collection and management structures are not adequate enough that it can support new AI projects. So in order to get best ROI in AI projects, it is important that firms should first place solid data collection and management structures before they start new AI project.

5.3 Limitations

There are important limitations to this dissertation.

1. The scope of the research is somewhat broad. In Phase 1, articles 1 and 2 discuss the digital advertising/marketing landscape. Phase 2 focuses on AI, including the advertising (paid form of promotion) dimension. The dissertation could have studied AI from the digital advertising perspective further, although this would have been difficult due to a lack of available data.

2. AI advertising systems are new and currently only developed in the most advanced and accomplished firms, such as Google and Amazon. These companies have strict policies about sharing information, especially regarding their latest projects. In Phase 2, the focus was on important elements that could impact the effective utilization of AI projects, which broadened the dissertation's overall scope.

3. The literature on digital advertising, especially on AI, is quite scarce because the intended topics are relatively new developments, especially in terms of niche areas within AI. Therefore, sound philosophical/academic debate was difficult to create.

4. It was difficult to find relevant empirical data. Digital advertising, AI, and even the Internet are mostly American inventions, with major contributions from China. Research collaboration with the USA and other countries that are highly involved in the researched topics might allow for greater access to data, especially advertising and AI-related data.

5. Articles 3 and 4 included telephone interviews. The research model looked for location diversity for a more comprehensive understanding. Telephone interviews might lack the personal element, while physical interviews can offer more flexibility. When an interview topic is complex (e.g., AI), physical interviews might help explore the studied phenomenon in more detail.

5.4 Future research directions

This dissertation aimed to capture and analyze digital advertising from the IAPS perspective—the most common format in the Internet advertising domain. This format typically involves text and images (e.g., Google-sponsored search advertising, Facebook advertising, etc.). However, no special impetus has been made toward video formats. Video has become extremely important because, with Internet speed increasing, it is becoming easier than ever to stream videos. Video advertising is now everywhere on the Internet, including YouTube, Facebook, and Google. Future research should try to measure the effectiveness of video advertising compared to text+image ads or IAPS.

Video advertising is part of mobile advertising, and this can be researched in many ways. In the future, it could be analyzed for the unique characteristics of location and context (e.g., the day and time when a defined target market shows the highest engagement rates with the advertised message).

Future research should also use location and context in mobile advertising to reach the target market at the optimal time and place based on demographics. Programmatic buying, or RTB, which is an automated AI-based buying and selling platform with a complex ecosystem, also needs further research. There are demand-side platforms, supply-side platforms, users, and advertisers. The research community needs to bring more clarity in terms of RTB's operations and ecosystem. Future research should also try to study the role of AI in the automation of these platforms.

More data are needed to study the effectiveness of chatbots, which have the potential to transform the customer service and marketing and communication industries. However, most chatbots are not considered fully operational or intelligent enough to give clear answers to complex questions. Future studies should explore the characteristics of human intelligence and compare them with current chatbot technology to analyze the difference and suggest improvements to existing chatbot structures. Further, based on the chatbot framework, this dissertation presented a model in which a chatbot is connected with the central database of a company to produce the most relevant answers, which is vital in chatbot application. Without this connection, it will be difficult to replace human customer service and/or marketing communication. Future studies should address this topic and investigate problems regarding the integration of chatbots with the central database and suggest solutions.

More studies should focus on various AI applications in marketing, such as which areas of AI will help in the automation of marketing (digital or offline) processes and how content generation in marketing can be automated using AI.

Future research should investigate how humans and AI machines can work together for more advanced and refined marketing solutions.

Voice-based solutions (voice recognition, voice search, voice command, and voice speaker) comprise another important dimension of AI. Finovate (2018) predicted that 1.83 billion consumers will use voice assistants by 2021. Future

research should try to build a link between voice recognition technology/solutions and marketing or advertising. Future research should link different aspects of brand management to AI, such as how AI can help improve a brand's online positioning or image. Augmented reality (AR) and virtual reality are other important futuristic technologies that might affect the future of advertising and marketing. Recently, Facebook has started to test advertising in virtual environments. AR can be considered one of the most contemporary topics in the world of advertising and marketing. Future research should focus on how AR, AI, and digital advertising can be mixed to design better advertising campaigns.

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ORIGINAL PAPERS

I

DIGITAL ADVERTISING AROUND PAID SPACES, E-ADVERTISING INDUSTRY'S REVENUE ENGINE: A REVIEW AND RESEARCH AGENDA

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Digital advertising around paid spaces, E-advertising industry's revenue engine: A review and research agenda ☆

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ABSTRACT

We develop and describe a framework for research in a particular segment of digital advertising. Internet Advertising Paid Slots and Spaces (IAPS) is a neologism and work almost like a stock exchange for buying and selling advertising in various formats on designated spaces around web and make a significant contribution to Internet advertising revenues. These paid spaces were found to encompass diverse areas of Internet advertising that include search engine marketing, social media advertising and display advertising. Given the complexity of the modern digital advertising eco system, this literature review seeks to provide clarity, up-to-date knowledge and ongoing insights into Internet advertising channels, for managers making investment decisions in this context.

Contents

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1. Introduction

With the creation of the World Wide Web and the Internet perhaps the most influential inventions since the printing press, the world has entered a new era (Hoffman, 2000). These technologies have radically transformed how companies do business, and especially the methods they use to increase awareness of their product and services. The advertising paradigm is now shifting from traditional advertising medium (TV, outdoor, direct marketing etc.) to more a digital-centric approach and advertisers are investing increasingly in digital at the expense of those traditional formats. The latest data show that this shift is accelerating more rapidly than expected, in the US where digital will takeover TV ad spending for the first time this year (eMarketer, 2016). Online video platforms have relative advantage in compatibility and ease of use, which decrease the likelihood of using television (Cha, 2013).

But what accounts for this mass shift of paradigm? Internet advertising offers precise location-based targeting, and data-driven user's profiling, segmenting the target market according to preferences, likes and hobbies, as well as retargeting, easy interpretation of results, and more reasonable pricing models. These are unique attributes that are not offered by traditional media before; according to (Scott, 2010), companies that previously bought expensive advertising media like TV or outdoor advertising can now achieve more precise targeting at relatively lower cost.

Today, managers rely heavily on digital marketing to build their brand, taking the view that this approach also helps them to get to know their customers and to detect or anticipate negative client or market reactions (Tiago and Verı'ssimo, 2014). Other benefits of digital marketing include the ease with which results can be tracked and monitored; rather than conducting expensive user research, managers can quickly view user response rates and measure the success of a marketing campaign in real-time, enabling more effective planning for the next campaign (Business Zone, 2015).

However, it is important for managers to maintain an overview of this ever-changing field based on up-to-date knowledge of the relevant literature. Digital advertising deploys different technologies, and diverse digital platforms in a convoluted eco-system of network players and new digital trends, which can hinder understanding. While existing literature reviews important digital technologies such as social media or search engine seeks to augment knowledge across broad subject area, it lacks clear boundaries to distinguishing different stream of relevant research.

The objective of the present literature review, then, is to attempt a synthesis of previous studies of digital advertising. In the interests of clarity, the review is built on well-defined boundaries and addresses only paid advertised web spaces appearing on laptops or desktops. This paid form of advertising, usually found in the upper, lower, or left side of a given webpage. By definition, this relates more to advertising than to marketing, as marketing can also include unpaid elements such as friend referrals or search engine optimization. To set these boundaries, the review summarizes the literature as a whole in different categories and then further expands on the results in each category to help managers to comprehend the complex ecosystem of digital advertising.

On this boundary when Authors expanded, they interestingly found that mostly paid digital advertising components consist of digital advertising spaces (IAPS) found around different areas of websites. IAPS on websites comprehensively covers almost all sections of digital advertising like e.g. search engine advertising, social media advertising or display advertising. From industry point of view; it's important because most of the digital advertising is happening in this paid form. For an example, social media giant Facebook, earns most of its revenues from digital display ads. According to (eMarketer, 2016) Facebook will capture $10.29 billion in display ad revenues in 2016.

2. Theoretical background

Within the more generic and broader term *Internet marketing*, this paper deals exclusively with *Internet advertising*—that is, any paid form of non-personal presentation or promotion of goods, services, or ideas by an identified sponsor (Kotler, 1984). Usually found in the upper, lower, or left side of a webpage, IAPS should not be confused with banner advertising, which is a domain within this broader category. This particular niche is an appropriate focus for research, as most of the academic literature centers on this particular area without naming it; from an advertising perspective, IAPS currently account for most of the industry's revenues.

3. Research on digital advertising

Since its inception in the 1990s, digital advertising (DA) has only recently attracted wide academic interest, with almost 68.5% of the relevant research published in the last eight years (Nadia et al., 2013). No previous literature review has covered IAPS beyond generally discussing Internet marketing as a whole. Some industries are built on academic research; in the case of DA, it is the other way around.

In a review of the relevant literature from 1987 to 2000, Ngai (2003) identified 270 articles on Internet marketing, averaging 19 articles per year. From 2001 to 2004, an additional 639 such articles were published, representing an 843% increase over the period 1987–2000 (Schibrowsky et al., 2007; Nadia et al., 2013). In another review, Corley et al. (2013) analyzed and classified a total of 411 articles and found that business models of internet marketing appeared in 41% of these. Other categories included the future of research strategies (4%), the Internet advertising landscape (80%), commercial exploitation of web 2.0 (16%), and evaluation of online performance (9%). Other important topics include online ethics, auction fraud, piracy,

Table 1
Two decades of internet marketing research 1993–2012 (Source: Nadia et al., 2013).

Topic Area	1993–2004	2005–2012	Total Articles Published
Consumer Behavior	218(24%)	520 (27%)	738 (26%)
Social Media Networks	9(1%)	342 (17%)	351 (12%)
Internet Strategy	208 (23%)	303 (15%)	511 (18%)
Communication	163 (18%)	274 (14%)	437 (15%)
Business to Business	60 (7%)	30 (2%)	90 (3%)
Product/brand	16 (2%)	61 (3%)	77 (3%)
Distribution	49(5%%)	107(5%)	156 (5%%)
Pricing	29 (3%)	90(5%)	119 (4%)
Research Issues	48(5%)	63 (3%)	111 (4%)
Political Legal	63 (7%)	96((5%)	159 (6%)
Others	39 (4%)	71 (4%)	110 (4%)
Total	902	1957	2589

Customer Relationship Management (CRM) systems, marketing initiatives and financial performance, and Internet marketing architectures. In Table 1, Nadia et al. (2013) depicted overall 75% increase in no of publications as compared to previous decade (from 1993 to 2004) among various topics of Internet marketing.

In the interests of more meaningful classification, the present review focuses specifically on Internet advertising (rather than marketing) as applied to laptops and desktops. It was decided that this kind of niche categorization is required because of the continuous inflow of new articles.

4. Research methodology

The search methodology for this review proceeds from the more general to the more specific—that is, from a broader to a more exact classification of the niche topic of Internet advertising. To this end, we searched both horizontally (e.g., Google Scholar) and vertically (e.g., ScienceDirect, SAGE, Wiley, Springer, Emerald, JSTOR, IEEE, Taylor & Francis, Inderscience). We found that each academic journal tends to target some specific topic within the literature as a whole—for example, *Marketing Science* deals more with search engine marketing while the *Journal of Interactive Marketing* focuses more on display ads or the emergence of social media. It was therefore crucial to find the right balance among all these sources because (unlike previous literature reviews that discussed all areas of IM) we are specifically targeting the IAPS-related literature. In the first stage of the research, then, horizontal searches captured a bird-eye view of the whole topic; for comprehensive coverage, each journal's official website was also searched.

As is common practice for database searches, a keyword approach was used to identify previously published Internet marketing articles (Schibrowsky et al., 2007), using a combination of relevant search terms like Digital Advertising, Internet Advertising, Social Media Advertising, Search Engine Marketing/Advertising, Pay per Click, Display Advertising, and Banner Advertising. Again following Schibrowsky, the abstract of each article was then reviewed for proximity to DA, and the article itself was reviewed for its fit to our general domain boundary (i.e., IAPS). Because of the rapid changes in this field of research, we considered mainly articles from 2009 onward and only a few articles prior to that date. In addition, because of the interdisciplinary nature of this field, we searched for articles and conference proceedings like ICDE conference, KDE conference, KDD, ACM SIGKDD, ADKDD 13, WWW 2012 companions, and IEEE. During the vertical search, a number of related journals were consulted, including the *Journal of Interactive Advertising*, *Telematics and Informatics, Marketing Science*, *Computers in Human Behavior*, *Electronic Commerce Research and Applications*, *International Journal of Advertising*, *Journal of Research in Interactive Marketing*, and *Machine Learning*.

5. Scope of the research

As mentioned previously, this study deals explicitly with IAPS. For effective and comprehensive results, it was very important to define appropriate boundaries for the research domain. The review is also device-specific, considering only advertising on desktops and laptops and ignoring other devices like mobile phones. The included paid content can appear in different areas of a website.

6. Literature classification and framework

Following analysis of the relevant literature, conference papers and other accredited streams of knowledge, certain similarities started to become evident in the content, and these informed the subsequent organization of the IAPS literature into three main categories: 1) search engine advertising, 2) display advertising, and 3) social media advertising. These three fields usually operate separately and are considered mutually independent in terms of initial set up, campaign costing and pricing,

results, and network players. While the combined outcome contributes to a firm's overall advertising objective, it is worth noting that each component of the described model may contribute differently to the overall effectiveness of an advertising campaign (Fig. 1). Because each component gives a different managerial yield, these domains can be deployed individually or collectively according to company requirements. The three essentials of these domains, then, are effectiveness diversity, mutual independence, and unique managerial yield, and their occurrence is the same for all three domains—in other words, all can be true for one specific domain. These domains comprehensively map previous work while at the same time drawing a visible boundary capturing only the relevant topic-related academic content. These background elements enhance the classification's practical viability and theoretical comprehensiveness.

The first domain (search engine advertising) deals with advertising slots that appear against targeted keywords on any search engine and is usually referred to as search engine marketing (SEM) or sponsored search advertising (SSA) (Nadia et al., 2012). In SEM, advertisers bid against targeted keywords through operational activities associated with participation in an auction: submitting the bid and ad copy, and customizing bids and ad copies according to various factors (Amaldoss et al., 2016). Much of the academic literature has been dedicated to this topic, and among the many competing search engines, Google is usually seen as the case company for research.

In the second domain (social media advertising), research on social media, and specifically on social network sites (SNS), remains at an embryonic stage (Michaelidou et al., 2011). With 1.86 billion monthly active users, Facebook has achieved huge popularity and, along with other major networks like Myspace, accounts for more than 80% of SNS ads. The managerial significance of this category is not sales or lead generation but branding attributes; indeed, many studies have noted the negative connotations of paid ads on social media.

The third domain (display advertising or banner ads) can be considered classical, having been there from the outset of Internet marketing. In this category, the publisher typically sells an ad (advertised slot on a web page) to the advertiser on the basis of impressions or clicks. Over time, the increasing number of players has made the display advertising ecosystem more complex. Key players include ad networks, demand-side platforms, supply-side platforms, and ad exchanges. All of

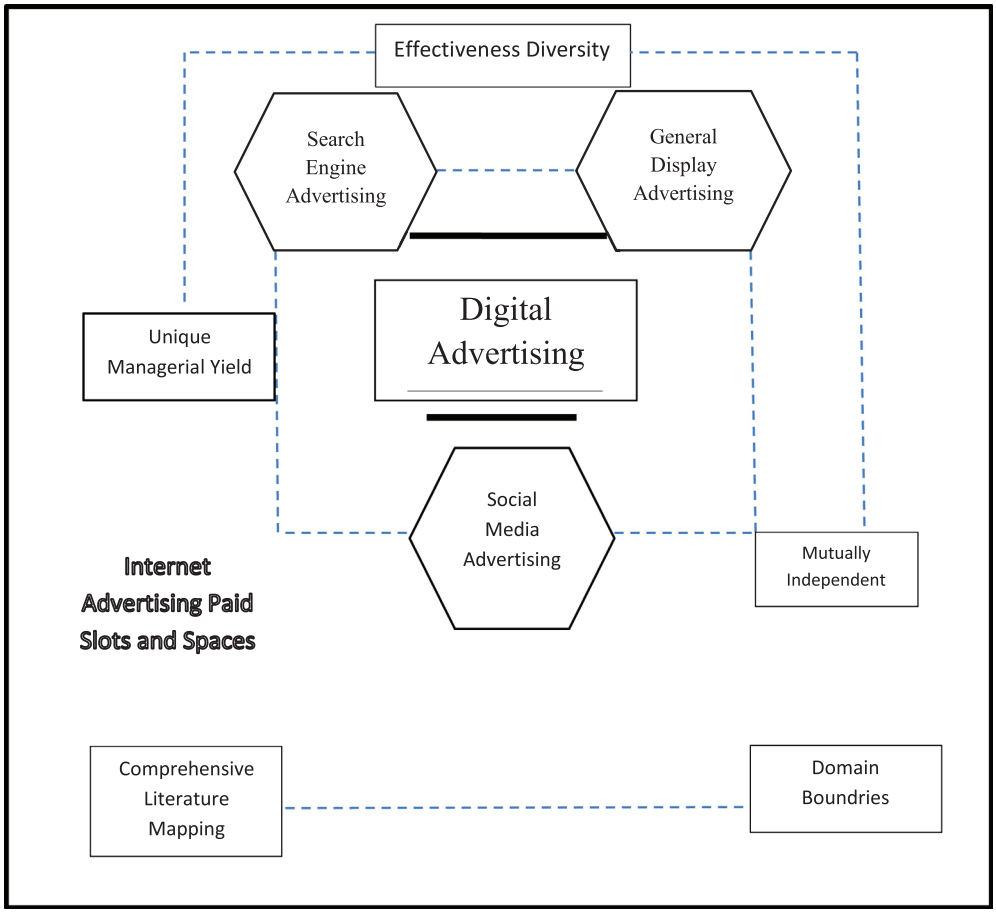

Fig. 1. IAPS, classification and details.

these network players have evolved over time in response to the increasing complexity of buying and selling advertising spaces. Real-time (a.k.a. programmatic) buying is among the most recent developments in this field.

7. Major findings

In total, 75 relevant publication (68 journal articles and 7 conference proceedings) were included in this review, sourced mainly from Elsevier and INFORMS, as well as from other key sources such as Emerald and the American Marketing Association (see Fig. 3). Among the more than 30 journals consulted, most articles were taken from *Marketing Science*, *Computers in Human Behavior*, the *Journal of Interactive Advertising*, *Telematics and Informatics* and the *International Journal of Advertising*. Most of those articles (almost 94%) were from the period 2009–2016. It was established that 30% of the literature related to sponsored search advertising, 25% related to display ads, 19% related to social media advertising, and 7% related to general Internet marketing related topics.

In the domain of sponsored search advertising, the most important academic topics were the effects of different ad positions (Agarwal et al., 2011; Chan and Park, 2015; Narayanan and Kalyanam, 2015); agency compensation plans (Nadia et al., 2012); user click behavior (Kim et al., 2014); quality returns and optimal bids (Nadia, 2015; Nabout and Skiera, 2012); and attribution strategy and other keyword studies (Li et al., 2016; Jerath et al., 2014; Amaldoss et al., 2016; Shin, 2015; Rutz et al., 2011; Ji et al., 2010; Lu and Zhao, 2014).

For display ads, the main topics discussed in the literature were types of display advert; speed, animation and timing; type and content of ads yielding better performance (Matwyshyn, 2011; Jacques et al., 2015; Rosenkrans, 2009; Kang Li et al., 2015; Brown, 2002; Wang et al., 2013); real-time bidding (Zhang et al., 2014; Yuan et al., 2013; Shalinda and Dutta, 2015); and retargeting (Bleier and Eisenbeiss, 2015; Perlich et al., 2014).

As compared to the two other domains, social media advertising was found to be one of the newest and least researched topics. Important issues discussed in this domain included ad performance and engagement (Barreto, 2013; Maurer and Wiegmann, 2011; Hensel and Deis, 2010; Soares and Pinho, 2014; Knoll, 2016; Yang et al., 2016; Duffett, 2015); measuring social media ROI and content type (Hoffman and Fodor, 2010; Kim et al., 2014); Facebook consumer studies for better engagement and consumer attitude (Hansson et al., 2013; Boateng and Okoe, 2015; Zhang and Mao, 2016); and electronic word of mouth and branding (Lee et al., 2016; Kim et al., 2015).

The distribution of articles across different domains is shown in Fig. 2. Most of the articles relate to search engine advertising and display advertising while social media advertising occurs with least frequency. This is not unexpected, given the recent emergence of studies on this topic.

8. Data collection methods

The most widely used research methods in the reviewed articles were sponsored search data, experiments, questionnaires, and surveys (Fig. 3). In general, the research methods used in each domain followed a similar pattern; studies of SEM relied mostly on data from a search engine, from an advertiser or third party website, or from an intermediary hired by the advertiser to manage campaigns on their behalf. These data would usually consist of search logs, keyword combinations, and results from previous campaigns. In the case of research on display advertising, surveys and questionnaires were the most commonly used techniques. Studies of SMA were found to use experiments, online surveys, and questionnaires. Some researchers collected data directly from category leaders such as Facebook or Google. In general, the data collection method reflects the kind of results researcher are looking for. For SEM, the most useful data are search logs, previously used keyword combinations, or results from previous campaigns, perhaps on different search engines. For display advertising or SMA research; on the other hand, experiments, surveys, and questionnaires are the more natural choice.

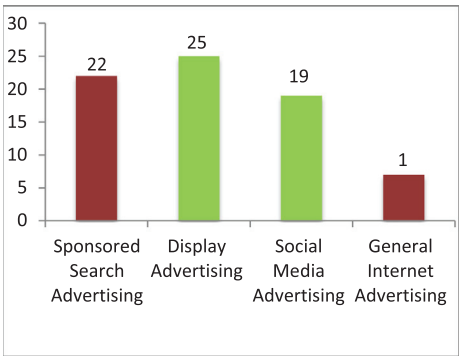

Fig. 2. Number of articles in each domain.

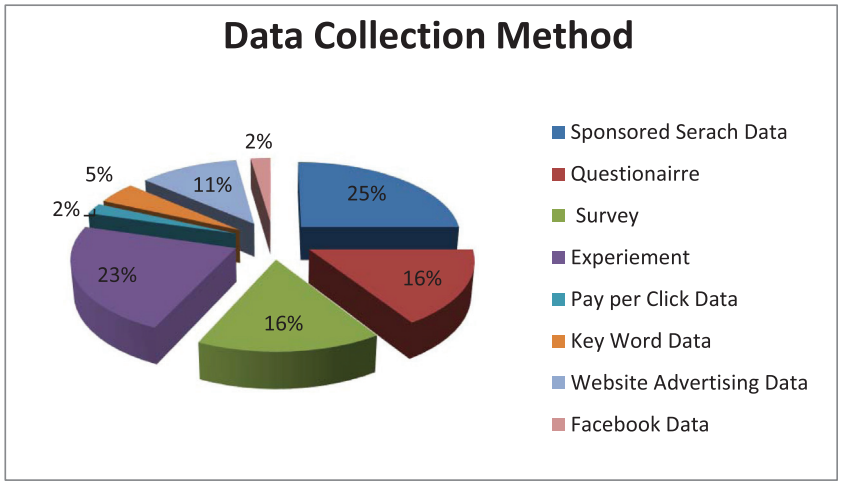

Fig. 3. Data collection methods.

9. Detail findings for each category/domain

9.1. Sponsored search advertising

Sponsored search advertising revolves around different stakeholders; including advertisers, users, and the search engine itself (see Fig. 4). In line with the existing literature, we adopted Google as the standard search engine in studying sponsored search advertising as a whole; in reality, there are many search engines operating globally, with varying advertising mechanisms. To reach potential customers through paid search advertising, an advertiser needs to select the right keywords, write effective ad copy, and choose the relevant landing page. To capture all potential customers, there are usually multiple keywords (Li et al., 2016) (see Fig. 5).

When a user enters a search query or simply types words into Google, the search engine returns organic and paid search listings or sponsored links. Unlike traditional products, digital content (e.g. organic search results) can be offered free because the marginal cost required for additional production is close to zero (Seoung Na et al., 2017). Users searching for more popular keywords are more likely to be satisfied by organic listings because they know exactly what they are looking

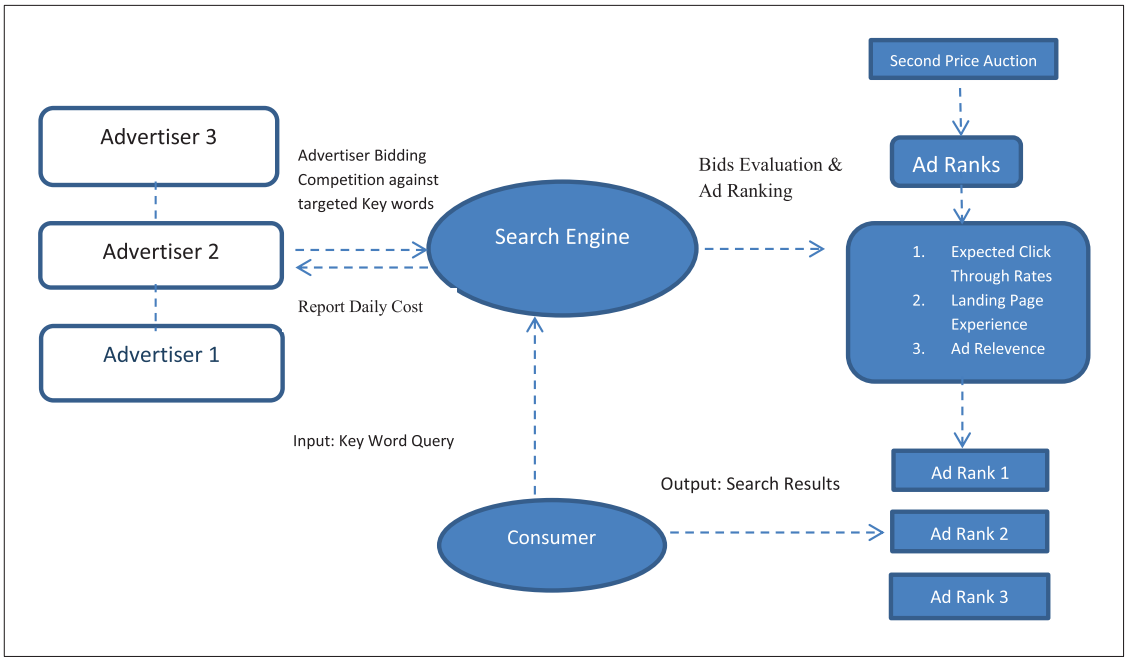

Fig. 4. Sponsored search advertising overview.

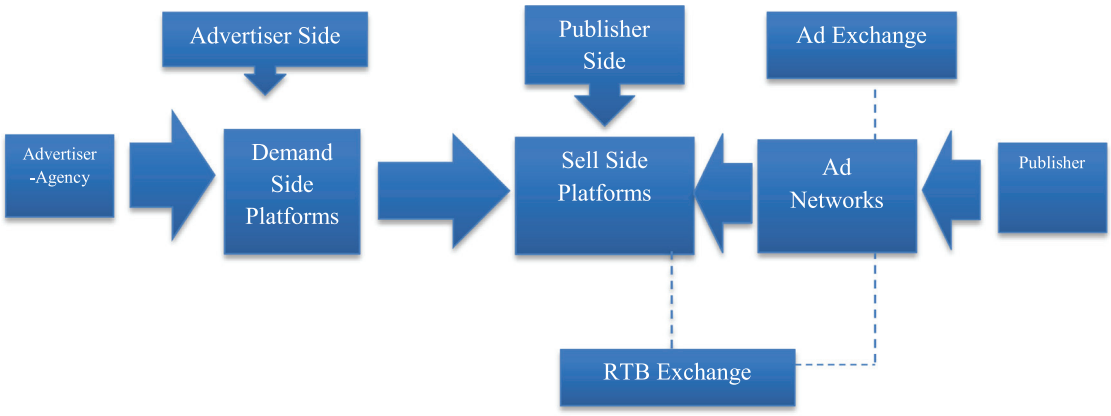

Fig. 5. Simplified ecosystem for RTB (programmatic buying) and display advertising.

for, and organic listings provide detailed information about the subject. On the other hand, those using less popular keywords are more inclined to click on sponsored search ads (Jerath et al., 2014), in which links are ranked sequentially. Fig. 4 shows the general form of this process from advertiser to end user on Google's display ad network. Several advertisers can bid simultaneously for the same keywords; typically, Google uses a variant of what is called a second price auction, in which the buyer does not have to pay their full bid amount but only that of the next highest bidder.

Google combines bids with multiple quality factors such as expected click-through rates (CTR), landing page and ad relevance, and expected impact of ad formats in calculating a score or rank for each ad. Ranking and paid price against each click is determined by the second price auction model; search engines also estimate the quality of an advertisement against each keyword for sequential ranking (Nabout and Skiera, 2012). Ad ranking is considered to be of great importance, as consumers are more likely to click on high-ranked ads than on those listed further down (Feng et al., 2007). While this is the common understanding of search ranking systems, they may work differently in practice. Sometimes, there is no difference in terms of clicks and sales even if the advertiser moves up the ranking hierarchy. Where CTR and conversion increases with higher rank, price also increase; this is a tradeoff that advertisers need to evaluate carefully, and this is only possible when advertisers have credible estimates of the causal effect of position (Narayanan and Kalyanam, 2015). In the short run, advertisers seeking to maximize transactional benefits are often better off by placing less emphasis on attaining top positions. Similar arguments were made by Nabout and Skiera (2012) that better ranks likely lead to higher prices per click and higher costs for SEM, with ambiguous consequences for profit.

Keyword selection also plays a major role in overall campaign effectiveness. Most keywords fail to generate reliable advertising impacts and exhaust the sponsor's advertising budget. Length of keyword is negatively related to CTR (Ji et al., 2010) but long-phrase keywords usually help to increase ad rankings (at least initially). As users of specific keywords are not much affected by competition as compared to those using more general keywords the use of specific keywords allows sellers to profit from consumers with concrete shopping goals by generating direct sales. On the other hand general keywords can help sellers to profit from indirect sales (Lu and Zhao, 2014). However bidding for all general keywords is not the right strategy as managers need to carefully evaluate their consumers' search behaviors in noticing the product or brand (Nottorf and Funk, 2013)

Different search engines have solutions for better utilization of keywords. One such option is *broad match*, where the search engine runs advertiser ads when consumers search either for the exact keywords specified by the advertiser or for variations of those keywords, such as synonyms, singular and plural forms, and misspellings. CTR increase is roughly 50% higher for exact match than for generic matching options (Klapdor et al., 2014). Broad match can help to reduce management costs, but interestingly, if major competitors start to use broad match, the advertiser's profits will decrease, creating a prisoner's dilemma (Amaldoss et al., 2016).

As some users begin from a more general search, most big companies and brands invest heavily in almost all related keywords. User search converts from general to branded search in what is known as the spillover effect (Rutz and Bucklin, 2011). The academic literature has only mentioned important factors like spillover and broad match, and detailed investigation is still pending; future research should investigate their exact nature and practical implications in more detail.

Longer and shorter key phrases in different ad positions can also have an effect. In this regard, Kim et al. (2014) introduced the concept of keyword attractiveness. They found that because words like *free*, *great*, and *save* are more attractive to users, advertisers can alter user click behavior in their favor by using these keywords. Their analysis also showed that attractiveness can explain user click behaviors in terms of enhanced relevance.

Advertisers commonly run many ads for the same link or website against multiple keywords or phrases. Usually, a customer will visit the website and leave but may well return by clicking another keyword link not previously clicked. If for instance on their third visit the customer actually buys the product, it is important to be able to attribute this conversion to a given keyword or phrase. This enables managers to understand which keywords provide more conversions and to

use these more frequently in future. It is attributing the initial keyword responsible for conversion, known as attribution strategy. While Li et al. (2016) identified two main attribution strategies—*first click* and *last click*—Google offers other strategies such as *last non-direct click*, *last ad words click*, *first interaction*, *linear*, *time decay*, and *position-based* (Google.com)

9.2. Social media advertising

Social media advertising is a relatively newer topic. Through social media, it is possible for companies of all sizes to achieve marketing and branding goals at lower cost. Social media is used for various purposes in organizations, such as advertising and promotion, branding, information search and especially in building customer relation and other customers service activities (Parveen et al., 2015). The main players in social media advertising include Twitter, LinkedIn, Instagram and Facebook. User use these platforms for various factors, like snapchat is more used for pastime, sharing problems, and improving social knowledge, while Instagram users like to follow fashion and have the highest brand community engagement. Twitter users had highest brand community identification and membership (Phua et al., 2017). IAPS constitute a major source of revenue for any SNS specially for Facebook. People (especially Millennials) spend a lot of time on Facebook; one survey confirmed that nearly six out of ten Millennials spent one hour or less on Facebook per log-in session, which undermines marketing communication efforts (Duffett, 2015).

Social media differs significantly from sponsor search advertising. In the latter, a user shows a strong interest in a subject by entering the appropriate keywords before encountering any paid or organic results. In social media settings, however, users often have no intention of buying a product or service, as they are more likely to be interested in connecting with their friends and family. For this reason, the typical process of buying and selling does not fit as exactly here as in the other two categories of IAPS. Some authors advocating social media advertising systems were found to emphasize the soft benefits for advertisers in terms of building an information network or brand building. Paired comparisons indicated that users more readily accept virtual brand communities than Facebook advertising and respond more favorably to them. As well as placing more trust in virtual brand communities, Facebook users also consider them less irritating. The purpose of social media should be to enhance business branding by offering preferred customers direct communication with the brand, and businesses therefore need to facilitate social media inputs (Hensel and Deis, 2010).

However, as paid listings (IAPS) are a major source of revenue for any social media site, it must be acknowledged that this is very powerful medium for marketers seeking to target people according to their preferences. A majority of users do not see Facebook as an information source, nor do they purchase products because of Facebook; users of these social sites spend time there primarily for fun or digital socialization. In this frame of mind, they are less likely to be favorably disposed to direct advertising, as one of the benefits of social networks is to escape from the overflow of ads on other sites (Maurer and Wiegmann, 2011). There is evidence that users tend to avoid advertising in SNS for a number of reasons: to protect their privacy or because they have had negative experiences, consider it irrelevant, or are skeptical about advertising persuasion in social media (Hoy and Milne, 2010; Kelly et al., 2010).

Consumers do not trust the information acquired from online social networking sites (Kelly et al., 2010). However, Facebook ads perform better when they include written or graphical content (as compared to motion video). This may be because the current Facebook interface supports pictures and text better than motion videos (Kim et al., 2015).

In contrast, studies by Boateng and Okoe (2015) have established that people have a positive view of SNS advertising and corporate or brand names play an important role in its acceptability. For managers, the best strategy is to maintain a balance, offering consumers quality information rather than quantity (Hansson et al., 2013). Barreto (2013) also found that advertising that truly engages the customer is more likely to be accepted on social media sites and is more powerful than banner ads. Advertisements displayed on SNS provide entertainment and information content or impressions, increasing the advertisements worth (Saxena and Khanna, 2013) and making it advantageous to increase the congruity of ads on social media to the customer's ongoing interests and discourse. For example, if a Facebook user is discussing buying shoes, an advertiser can monitor the newsfeed to identify the user's end purpose—if, for instance, it is for a school party, it makes sense to display fashionable, trendy shoes to this particular user. If a user employs social media for connection and relationships, the ads should be designed to capture this, displaying ads about social events, movies, and books rather than an ad that sells a product (Zhang and Mao, 2016). Advertising in online social networks (OSNs) is more useful than targeting individual persons, as group intention can create a sudden interest toward a particular product (Soares and Pinho, 2014). It is important to know how exactly to target OSNs by considering all relevant factors, including practicality, cost, price, and (most importantly) returns. OSNs can also be a double-edged sword; if a group's likes increase an ad's creditability then its dislikes will adversely affects that creditability. Research on the core advertising aspects of social media lacks an industry perspective, as studies tend to focus on user attitudes and perceptions, and there is no systematic empirical overview (Knoll, 2016). Measuring the performance of a social media campaign is also very different; the worst outcome represents is no engagement with the campaign, but this is not exactly true of social media, as the rules of engagement are very different for SNS (Hoffman and Fodor, 2010).

9.3. Display advertising

This category is considered classical, in that Internet advertising has its roots in display advertising. In this context, it is important to distinguish between sponsored search ads and display ads. The latter are placed in the websites that consumers

browse, and it does not matter from where they are linked. In contrast, search engine advertising displays on the result page when a user enters a keyword query. As discussed earlier, the user shows a prior interest in a particular subject by entering their desired keywords. Secondly, while the structure of search engine ads is normally standardized in the form of text with web links, and the advertiser has little control over its design and layout, display ads come in various sizes and may differ in content orientation (Luo et al., 2011).

Banner ads are typically found at the top of a web page in a horizontal rectangular format. Other formats include skyscraper, which refers to a rectangular-shaped ad whose height exceeds its width and is vertically positioned along the side of a webpage. These skyscrapers tend to grab more attention than horizontal banners because they are closer to the information-rich task area than horizontal banners (Kuisma et al., 2010). As display ads enable customization of ad format, duration, content, and occurrence, researchers have tried to find the appropriate balance between these key factors in the interests of better attention and therefore better results. This variety can make an ad complex or easy to comprehend; if a banner ad is difficult to process, an increase in time duration can positively affect user attitude because there is more time to process complex information. On the other hand, if an ad is easily processed, this may first enhance and then undermine respondent attitude, following a U-pattern (Wang et al., 2013). Rich formats like flash animation are considered more attractive than a static banner ad; an animated ad does not initially attract attention, but with repeated short exposure, animated ads achieve better results than static ads (Lee et al., 2013). Animation also has a positive effect on attention to skyscrapers but impacts negatively on attention to banners (Kuisma et al., 2010). Rich media interactive ads (motion video) are another type of display advertising that engages users and captures high levels of user interactivity (Rosenkrans, 2009). Some banner ads that come with a pulldown menu score better on attention than static banners primarily because this offers the user a unique format and greater information appeal (Brown, 2002).

The effectiveness of display ads is easier to understand if we also take account of the product itself, in terms of low or high involvement. While high-involvement ads fare better with rich media formats, low-involvement product ads are more successful when text-based (Flores et al., 2013). These ads should be placed according to the website's content—for example, sports-related products should be advertised in the sports pages of a newspaper.

9.4. Realtime bidding: future of display ads

As display advertising is one of the oldest Internet marketing tools, its ecosystem has become complex because many players now contribute to its different stages. It is also a challenging system because data flows (from advertiser to consumer) can involve dozens of different corporate players (Perlich et al., 2014). The introduction of real-time bidding (RTB) (a.k.a. programmatic buying), which allows bidding on a display ad impression as it is generated, means that the display advertising landscape is changing rapidly. Before the emergence of RTB, the display advertising market was mainly divided into premium contracts and ad networks (Yuan et al., 2013). RTB differs fundamentally from sponsored search auctions, which involves bidding against selected keywords (Zhang et al., 2014).

The RTB process commences when an advertiser requests a demand-side platform (DSP) to run an ad campaign that meets their requirements in terms of budget, target audience, and duration. When the user visits the publisher website, the web browser or mobile app sends the user's preferences, contact details, and location to the publisher. The publisher will check whether the contracted advertiser is available; if not, the ad request is sent to RTB exchange or supply-side platforms, which then create a bid request and send this to all DSPs. The RTB exchange will decide the bid price based on an ad agency request and sends this information to the particular RTB exchange. The RTB exchange decides the winning bid after some specified time and notifies the winning DSP, which then requests the ad from ad agency and sends to RTB exchanges to be sent to the publisher for final display to the user (Adikari and Dutta, 2015). In short, RTB allows an advertiser to buy an impression as it is created.

10. Discussion

In the IAPS literature, digital advertising around was found to be divided into three main categories: search engine advertising, display advertising, and social media advertising, all of which use and sell advertising spaces or IAPS. These categories are mutually independent; from an industry point of view, campaign mechanics, payment method, audience selection, and results differ across categories, with different managerial yield.

In the case of SEA, previous studies have focused on keyword selection**,** bidding strategy, and search engine ad ranking systems. With keywords and advertiser bidding strategy as inputs, the search engine provides output to the desired audience in terms of sequential ranking, using the second price auction model (Nabout and Skiera, 2012). From an advertiser perspective, it is crucial to bid on the right keywords. Defining the advertiser keyword strategy depends on many factors, including target market, nature of the business, and analysis of data from past campaigns. Keyword selection also plays a major role in overall campaign effectiveness, as most keywords do not generate reliable advertising impacts and exhaust advertising budgets (Ji et al., 2010). According to the literature, advertisers need to decide whether to use long-tail keywords, general keywords, or keywords with a buzz factor (e.g., attractive keywords like *sale*, *free*, or *save*) (Kim et al., 2014). Whether using broad match or exact match, they must determine the most appropriate ad rank and related keywords.

The current literature blurs the distinction between general and attractive keywords. As bidding on attractive keywords can increase CTR for exact match, advertisers can benefit from a more focused approach to keywords in terms of its target audience and its product. On the other hand, broad match can help to reduce management costs, but if major competitors start to use broad match, this reduces the advertiser's profits and creates a prisoner's dilemma (Klapdor et al., 2014). Big companies that bid for all kinds of words normally benefit from the spillover effect; the customer may start out from basic research, with no particular idea about the brand, later shifting to brand-related research because the desired product is associated with that particular brand (Rutz and Bucklin, 2011).

The scarcity of academic studies on social media in relation to IAPS hinders nuanced understanding. Much of the available literature reports unfavorable responses to social media advertising in social networks (Maurer and Wiegmann, 2011) because of privacy concerns or a lack of relevance, as well as skepticism about persuasion (Hoy and Milne, 2010; Kelly et al., 2010). Certainly, users spend time on social media for purposes other than looking at ads (Maurer and Wiegmann, 2011). However, social media networks like Facebook earn most of their revenues from advertising, and principally from IAPS, in a variety of forms that include App Engagement, App Installs, Brand Awareness, Clicks to Websites, Event Responses, Lead Generation, Local Awareness, Offer Claims, Page Likes, Page Post Engagement, Store Visits, Video Views and website conversions (Facebook.com).

It's very important to connect with user in a way that they are not offended by the advertised content, so paid content should be integrated to become part of the community, creating a connection between user needs, peer approval, and the advertisement. "Content is king;" certainly, this is true for social media. Without great and appealing content, one's voice cannot be heard above the noise of social media marketing.

The mechanics of display advertising were simple at the outset: buying and selling of spaces on different websites as a direct transaction between publisher and advertiser. But as time passed, more and more players emerged: demand-side platforms, supply-side platforms, ad exchanges, and ad networks. RTB, which facilitates bidding on a display ad impression as it is generated, is very different from Sponsored Search Advertising, where they bid on selected keywords (Zhang et al., 2014). RTB is also known as programmatic buying, which means that every online ad impression can be evaluated, bought, and sold—all individually, and all instantaneously. Enabling exchanges and buyers to work systematically together to sell and bid on ads, it means that every impression can be cost effective and placed in front of the right person at the right time (Green, 2012). This is the future of all online display advertising.

11. Limitations

The first limitation of the present study is its device specificity; as a basic research premise, we considered only Internet advertising on desktops or laptops, excluding mobile devices in the interests of clear classification of the literature. From an industry perspective, the introduction of smart phones has made it easy for users to perform the same basic functions that were previously possible only with desktops or laptops. Now, users can check and reply to email messages, and there are mobile applications for mainstream websites like Facebook and Google. As more people switch to mobile, companies are investing more in mobile advertising than ever before, and this trend will continue to grow in the years ahead. For that reason, another review on mobile advertising in future can offer a broader perspective.

Secondly, we favored the term "advertising" over "marketing," as advertising is generally taken to mean paid or consciously initiated by a company, either directly or through intermediaries. For clearer results, we have included only paid advertising spaces (IAPS) that may appear on any website, search engine, or social media site. While this has helped us to effectively segregate the literature, it also somewhat limits the view of digital advertising on the macro level. A company can adopt other important paid initiatives such as email marketing, blogging, and search engine optimization, but by considering only defined advertising spaces around the web, those other components of digital advertising were excluded from our research.

Video advertising has seen tremendous growth in recent years, and eMarketer, 2016 expects US digital video ad spending to see double-digit growth annually through to 2020. While Facebook and others can be seen as strong contenders in the video space, YouTube remains the go-to platform for about three-quarters of brands engaging in digital video advertising. Stats show that extended use of video tools has increased the online video culture in social networks (Penni, 2017)

Online video culture is on the increase as the statistics showed that the extended use of video tools have become part of the social capital and the intensity of social network use

This kind of advertising can take many forms, as for example at the start or in the middle of a YouTube video. Again, the basic premise of this research did not extend to the full range of video advertising, and further studies are needed in this niche.

Although the present study aimed to review all studies of relevance to digital advertising and searched a broad range of keywords, we cannot be sure that the selected articles represent the full range of relevant research. It is possible that some articles related to social media advertising were not captured by the search terms, and other relevant articles may not have appeared in the chosen databases.

12. Future research directions

This paper has identified many new dimensions for possible future research, either on the broad foundation of the current findings or through further investigation within each domain. At the broader level, it will be important to properly establish

the classification of domains of Internet advertising for mobile devices, as mobile advertising spend is increasing rapidly. It will also be important to see what happens when boundaries are removed and the current research is extended in scope. So far, we have studied Internet advertising only in relation to IAPS, which has helped to better classify the literature. However, removing this boundary (and others like that between marketing and advertising) should yield interesting and more comprehensive findings.

Our domain-related findings also highlight important directions for research. First of all, most of the many important studies relating to search engine advertising dealt primarily with optimal bid prices, keyword selection, and ranking priorities under various circumstances. It is intriguing to see the algorithmic effects of a search engine on SEA. For instance, Google changes its algorithm regularly, and while most of the changes directly affect organic search listings, there may also be indirect impacts on paid advertising. Indeed, any algorithmic change in organic search can also affect paid search. This becomes more important when Google changes Rank Brain—an artificial intelligence system it uses to monitor search results, making changes where necessary and ultimately guiding the development of their core search algorithm (Frobes, 2015).

Most of the existing studies related to social media advertising have neglected paid advertising content. Instead, social media is seen as more appropriate for brand building and other indirect marketing methods on the basis that because the purpose of social media is fun, interaction, and related personal elements, any direct corporate interference or commercial activity would be viewed negatively by the user. This may be logically correct, but analysis of revenue streams for social media reveals that selling paid content tops the list. In short, companies favor paid content on social media because it yields the desired results, perhaps because companies are targeting users at the right time and place, as in online social networks. As this will not necessarily be viewed negatively by users, further exploration of paid content in social media offers new avenues of research.

Real-time bidding (or programmatic buying) is a key topic in the future of display advertising, including more detailed research on improving efficiencies and optimal biddings. Retargeting is one aspect of RTB that also warrants further research to explore different retargeting methods and operational running feasibilities for different companies. In general, further empirical investigation of RTB is critical for accessing its different advertising dimensions.

13. Conclusion

Studies of Internet advertising are still in their infancy. The present research is unique in that no previous literature review has dealt specifically with IAPS (Internet Advertising Paid Slots/Spaces). This paid form of internet advertising, usually found in the upper, lower, or left side of website, social media, or search engine pages, should not be reduced to banner advertising, which is just one instance of this broader domain. No previous literature review has specifically addressed Internet advertising that includes only paid listings/content appearing only on laptop or desktop devices. It is interesting to note that IAPS comprehensively maps the academic literature primarily because most Internet advertising centers on this particular area without naming it. From an advertising industry perspective, these slots account for most of the industry's revenues. Under IAPS, we have identified three relevant domains: sponsored search advertising; 2) social media advertising; and 3) display advertising.

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II

MOBILE ADVERTISING FRAMEWORK: FORMAT, LOCATION AND CONTEXT

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Mobile Advertising Framework: Format, Location, and Context

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Abstract

Mobile advertising is one of the most preferred advertising media throughout the developed world. What factors are responsible behind this success? Marketers and managers need to understand the unique characteristics of mobile advertising. We find that location and contextual targeting is not possible in any other device or format in the same manner as it is in mobiles. Location is a small physical part of context, and context has to be examined from different perspectives, namely, technical and consumer contexts. Furthermore, we explore advertising domains that can be deployable only in mobiles. These advertising domains include location-based advertising (LBA), SMS, in-application (in-app) advertising, and mobile social media and search engine advertising. The advertising mechanism against each domain is explained for clarity. Then, we present a framework that incorporates location, context, and these advertising domains to establish the writ of mobile advertising over other devices and media. We also incorporate the possible effects of General Data Protection Regulation (GDPR) on mobile advertising. After understanding context, location, advertising domains, and the effects of GDPR, we give some practical cases for effective use of mobile advertising. This paper will enhance the understanding of managers/marketers and advertisers about mobile advertising and will give a complete road map of the most effective adoption of mobile advertising.

1 Introduction:

Since the inception of smartphones in 2007, mobile advertising has advanced considerably. Mobile advertising has already surpassed all popular traditional media, such as television (TV), radio, and print advertising. Mobile advertising was estimated to become around $93 billion in 2019, surpassing even TV advertising spending by $20 billion (eMarketer, 2019). The popularity of mobile advertising is due to many factors; for example, functions like GPS, camera, and scanner, are used more frequently in mobiles than in any other device, such as desktop computers (Mahmoud and Yu, 2006). Okazaki & Mendez (2013) attached features with mobile-like ubiquity. Mobile devices are continuously used or always turned on, and consumers can use them to search information. The Mobile Marketing Association (MMA) (2019) defines mobile marketing as a "set of practices" that includes "activities, institutions, processes, industry players, standards, advertising and media, direct response, promotions, relationship management, CRM, customer services, loyalty, social marketing, and all the many faces and facets of marketing." This definition considers mobile advertising a part of mobile marketing. Leppäniemi et al. (2004, p. 1) define mobile advertising separately as "any paid message communicated by mobile media with the intent to influence the attitudes, intentions and behavior of those addressed by the commercial messages." Meanwhile, according to Varnali & Toker (2010), there is no commonly accepted classification or framework

for mobile marketing. This is partly because of the rapid advancement of wireless technology (Park et al., 2008) and continuously occurring changes in the industry. Leppäniemi et al. (2006) state that most studies on mobile marketing focus on user behavior and attitudes towards mobile marketing and mobile marketing effectiveness.

Industry-oriented advertising domains and other features that distinguish mobile from other devices and media remain unclear. Managers need to clearly understand the basic pillars and selling propositions of mobile advertising that cannot be attained by any other device or medium. Additionally, companies and advertisers cannot ignore privacy, which has become an important issue for all stakeholders (Okazaki et al., 2009).

The paper will discuss the core factors responsible for making mobiles one of the most preferred advertising media. We will identify advertising domains that are deployable only in mobiles. These distinctive features and mobile-oriented advertising formats will help establish mobile advertising's authority over other devices and advertising media. In addition, this article will explore privacy, its influence on advertising effectiveness, and how it can be adapted such that laws are followed and no consumers are displeased. We will also incorporate the latest European Union (EU) privacy regulations (commonly known as GDPR) into the bigger spectrum of governmental and official steps to safeguarding consumer privacy.

For clarity, we will first identify and explain mobile-deployable advertising domains, including LBA, in-app advertising, SMS, and mobile social media and search engine advertising. Next, we will explain the concepts of location and context and their importance for mobile advertising. Regarding practical implications, we will discuss how companies can use location, context, and mobile-deployable domains in practice without breaching privacy regulations. Ultimately, this article aims to enlighten managers about mobile advertising and how it can be most effectively used.

2 Research method:

The scarcity of academic literature on this topic suggested that the search methodology for this review should proceed from the general to the specific—that is, from a broad to a specific classification of the niche topic of mobile and digital advertising. As is common practice for database searches, the keyword approach was used to identify previously published mobile advertising articles (Schibrowsky et al., 2007). The search began with the use of basic keywords, such as "mobile advertising" and "mobile marketing." After differences started to become apparent, we expanded our search by adding such keywords as "mobile social media," "mobile search engine advertising," "SMS advertising," "location-based advertising," "location-based services," "privacy issues in mobile marketing," and "implication of GDPR."

Scientific literature (peer-reviewed journals), related internet material (for recent development and statistics), and conference proceedings were searched for studies relevant to the topic. The search process was completed both horizontally (e.g., Google Scholar) and vertically (e.g., Science Direct, SAGE, Wiley, Springer, Emerald, JSTOR, IEEE, Taylor & Francis, Inderscience). The inclusion and exclusion criteria by Watson et al. (2017), as shown in Table 1, were adapted according to the requirement of the current paper.

Criterion	**Inclusion**	**Exclusion**
Study Type	Peer-reviewed empirical and theoretical/conceptual studies; high-quality working/conference articles; and other internet material, such as blog and video archives	
Language	English	Any other language
Sector	Private sector	
Date	2000 to 2018	Not directly relevant to mobile marketing or advertising
		Results directed towards marketing goals
		Smart TVs
Relevance	Any subdomain of digital advertising that enhances subject understanding, particularly of important related fields, such as mobile advertising, LBA, mobile social media, and privacy	Mobile Web advertising
		Mobile video advertising
	Industry-oriented information	

Table 1: Inclusion and exclusion criteria

On the basis of the inclusion and exclusion criteria (Table 1), 95 articles and conference proceedings were chosen out of 150 articles found through the search. The time frame was 2000 onward, and only a few articles prior to 2000 were selected. Important conference proceedings included the Hawaii International Conference on System Sciences (HICSS). Most of the articles obtained via the vertical search were from the Journal of Interactive Advertising, Telematics and Informatics, Marketing Science, International Journal of Mobile Communications, Electronic Commerce Research and Applications, and Journal of Research in Interactive Marketing.

3. Findings:

Results showed that location and delivering messages according to consumer context are important features of mobile advertising. Grewal et al. (2009) explained that the uniqueness of mobile advertising lies in its ability to support location-based services and in the important role of context in its effectiveness. Some advertising streams are meant for mobile advertising and mobile marketing only. These streams can be categorized into four main domains, namely, LBA, SMS, in-app advertising, and mobile social media and search engine advertising (Fig (1)).

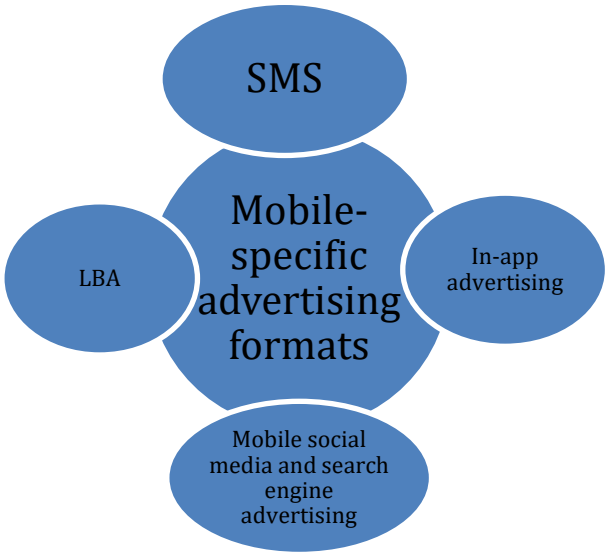

Fig 1: Classification of mobile-specific advertising media

In the case of LBA, a desktop can be tracked and served with marketing and advertising communication. However, the role of desktop computers remains limited with regard to location-related advertising, as each is fixed in one location. By contrast, mobile devices are carried everywhere. Therefore, the full scale of location-based services is possible on mobiles only. In fact, nearly all previous studies discuss LBA with respect to mobile (Ketelaar, 2017; Al Khasawneh & Shuhaiber, 2013; Unni & Harmon, 2007: Hühn et al., 2017). With regard to LBA, we will attempt to understand the concepts of location and context in detail.

Fig (2) explains the mobile advertising framework. On the left side, the concept of location is discussed, and context in diverse practical situations. We then incorporated mobile-deployable advertising domains. LBA can be deployed through SMS, in-app advertising, and mobile social media and search engine advertising. Therefore, we attempted to present different possibilities of using LBA through these domains. Meanwhile, privacy is at the heart of mobile advertising, especially for mobile advertising methods that track consumers' location and send messages accordingly. Consumers may develop negative sentiments about an advertised brand if they think their privacy is threatened or violated. The emerging personalized and location-based mobile advertising, unless carefully monitored, may become an extremely intrusive practice (Cleff, 2007). Particularly after the implementation of GDPR in the EU, it has become absolutely important to understand privacy and governmental laws for smooth execution of mobile advertising. GDPR comprises laws meant to safeguard consumer privacy and prevent data misuse in the EU. The intentions behind GDPR are simple—to keep abreast with the threat of cyber-security in relation to strategy, legislation, and operations, to be ready to respond to such threats, and to ensure future resilience (Stormshield, 2017). We will discuss GDPR in a direction pertinent to our topics of interest only, that is, mobile advertising, privacy, and regulations regarding consumer or location data.

Every mobile marketing and advertising activity has to go through the prism of privacy. Thus, the prism of digital privacy, as depicted by Fig (2), mainly consists of consumers' basic privacy rights, such as being asked for consent for sending of advertising messages, and other governmental implications, especially GDPR.

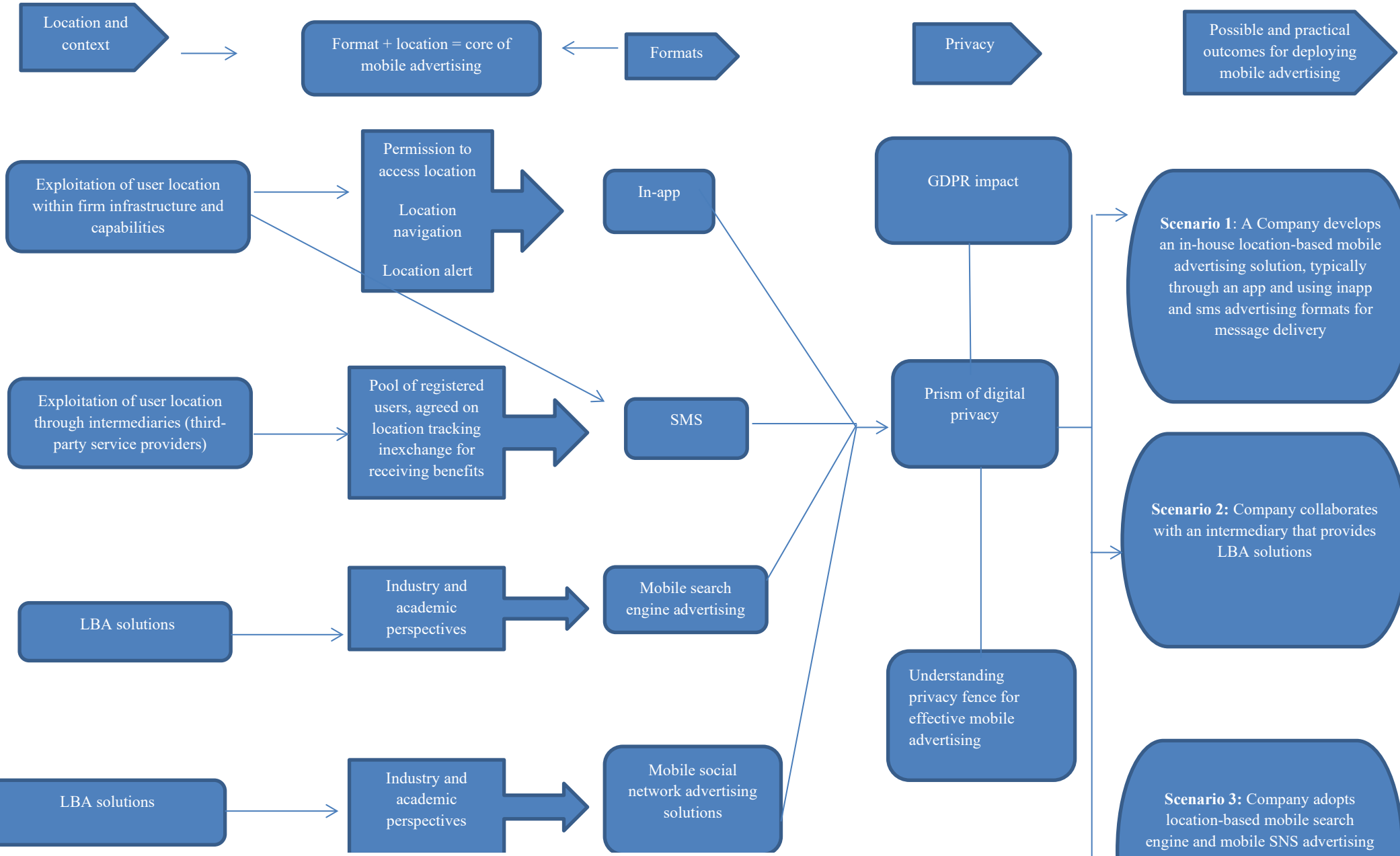

Fig 2: Mobile advertising framework, which explains the relationships between location, context, and mobile advertising formats. Then passing it through privacy regulations to come up with three practical cases that firms can consider to implement

3.1 LBA:

LBA is a location-based service. Such services primarily deal with determining user location. LBA is executed by attaching an advertising message to the determined location. Understanding the difference between context and location is very important. Context-aware LBA messages help convert prospects to actual sales. LBA messages might also create negative sentiments if they are not customized according to users' psychological and ongoing circumstances. With the adoption of contextualization data, users can receive convenient, compelling, and useful advertising (Simoes, 2009).

The basic merit of LBA lies in the fact that a user can be targeted according to his or her location (Unni & Harmon, 2007). Location congruency positively affects consumers' perceived relevance and the value of mobile advertisements (Hühn et al., 2017). Consumers exposed to LBA messages are likely to choose the advertised brands (Ketelaar, 2017). In the early days of LBA, it referred to marketer-controlled information customized for recipients' geographic positions and received via mobile communication devices (Bruner & Kumar, 2007). This definition helps in the understanding of LBA but does not include the concept of context, of which location is merely a small physical part. The other parts of context include time, people, community networks, and sensor-provided data (Fanjiang & Wang, 2017). In other words, location does not only correspond to a place in terms of its absolute location; it also needs to consider the position of other elements that are relevant to the service (Kjeldskov, 2007). Fig (3) shows that technical and consumer contexts are subparts of context. Location is at the core of all contexts, and in location, there are on-ground factors. The technical and consumer contexts were adopted from Grewal et al. (2016)'s mobile advertising effectiveness model. These factors, namely, technical, consumer context, and on-ground factors, should be considered before delivering an LBA message. When advertisers send mobile advertising messages to meet consumers' time, location, and preferences, consumer attitudes are positively affected (Al Khasawneh & Shuhaiber, 2013).

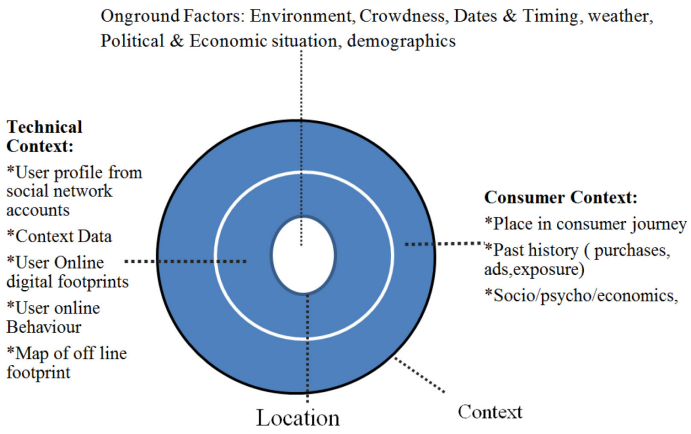

Fig (3): Relationship between location and different kinds of contexts and overall factors to be considered for improved LBA messages

Technical and consumer contexts include any information that is available on the Internet, such as a consumer's activity on social media, upcoming important events, offline/online footprint, and places in the consumer's journey or search logs and history. For an example, a user's upcoming wedding anniversary is observed on

social media. An LBA message sent prior to that event at the targeted location can increase the possibility of conversion to sales. In another example, online search logs show a consumer's interest in clothing. Sending an LBA message when the consumer is near a physical store will be more beneficial for the clothing brand than selecting random people for its LBA campaign. The final example concerns a consumer who physically visits a retail shop, such as a grocery store, during particular days of the month. Sending an LBA message from the grocery retailer on those particular days offering new promotions and discounts will be beneficial. Thus, consumers' online activity, interests, or offline footprints can help in customizing LBA messages according to these individuals' needs.

On the other hand, ground factors are small elements that advertisers should consider at the time their LBA messages are intended to be delivered. For example, area conditions should be appropriate for shopping. Thus, LBA messages about shopping should not be sent when there are strikes or other unfavorable conditions at the store location. Consumers receive their salaries either during the beginning or the end of the month. Thus, selecting the appropriate date and time is also very important. All these factors can influence consumers' buying process. In addition, small on-ground factors at targeted locations must be considered before sending a location-based message; such factors include crowding or traffic, which can hinder message processing (Wilson & Suh, 2017). However, overall targeting of consumers in crowded environments with mobile promotions may be beneficial (Andrews et al., 2017). Research shows that men are more receptive to LBA advertisements during work hours, and women respond well in their leisure time (Banerjee & Dholakia, 2012). Thus, it can be assumed that men should be targeted during office hours (typically 9 am to 5 pm) in all working days except public holidays and seasonal vacations. Meanwhile, women should be targeted after office hours, that is, prime time or during vacations and weekends. Marketers who are interested in time-specific campaigns, such as those involving discount coupons, should shorten coupon validity to signal urgency (Danaher et al., 2015).

Diverse factors can create positive or unfavorable attitudes towards LBA messages. For example, perceived utility, utilization of contextual information, perceived risks, and trust influence mobile users' perceived value of LBAs (Barnes, 2003; Lin et al., 2016). Richard & Meuli (2013) conducted experiments and concluded that LBA must be entertaining, informative, include some form of incentive, and not irritate consumers. Considerable customization, permission, and lack of perceived intrusiveness are keys to creating positive attitudes towards such messages and, ultimately, purchase intent (Gazley et al., 2015).

Privacy is at the heart of LBA. According to Banerjee & Dholakia (2012), LBA should be an opt-in process, given that sending commercial messages to wireless devices without recipients' permission is prohibited under the Telephone Consumer Protection in the United States (US) (Kimball, 2004). Furthermore, GDPR requires the sending of requests for consent in an intelligible and easily accessible form; an explanation about the purpose of data processing should be attached to this consent request.

3.2 SMS:

SMS advertising refers to the transmission of advertising messages via mobile phones in the form of short text-based messages (Haghirian et al., 2005). Managers are interested in this medium because of the generally positive attitude of consumers towards SMS, its role in location-based services, and its effectiveness towards

low-involvement products (Okazaki & Taylor,2008; Drossos et al.,2014). SMS advertising is one of the most discussed topics in mobile advertising literature (Barwise & Strong, 2002; Tsang et al., 2014). The use of SMS is not restricted to its own domain. Other mobile marketing activities, especially LBA and even in-app advertising, can use SMS as a message delivery option. For example, SMS can be one choice for delivering an LBA message after the user location is determined. Bauer & Strauss (2016) confirmed this phenomenon, that is, SMS and MMS notifications are widely used for serving LBA messages.

Similar to LBA, SMS advertising is highly personalized and subject to privacy. Such media can attract negative sentiments and be perceived as highly intrusive. A study by Aydin & Karamehmet (2017) estimated that more than 60% of the respondents had negative attitudes towards SMS advertising. Hence, it is important to comprehend the factors that can help build positive consumer response towards SMS advertising. Properly addressing consumer privacy will also help reduce the perceived intrusiveness (Cortés & Vela, 2013). Furthermore, this basic privacy rule should be expanded. Consumers should be allowed to choose how many messages they are willing to receive in a given time frame (Cleff, 2007).

Like LBA, context plays an important role in the acceptance of SMS advertising. Context ranks as the most important driver of acceptance of SMS advertising (Dix et al., 2016). Barnes and Scornavacca (2004) showed that the irritation and interruption caused by SMS advertising can be reduced by advertisers by ensuring content relevance, providing incentives, and creating contextual congruency. Context-driven personalization technology strongly influences the persuasion process (Chutijirawong & Kanawattanachai, 2014). However, the way literature defines context in the case of SMS should be understood. In the early days of SMS, it was matching of the time, location, and message (Heinonen and Strandvik, 2003). By contrast, nowadays, consumer preferences and attitudes can be derived from social media or through online activities; physical footprints can be noted also. Therefore, the concept of context is no longer limited to time and location. The contextual model that we developed for LBA is also relevant to SMS advertising, especially in the case of online shopping or cases where consumers' online data (such as social media, search, and general browsing data) is available. Consumers' online activities on web sites can also be easily monitored. Data regarding online activities may include a user's visited sections or products that are being considered. These elements can help interpret consumer psychology and needs. In particular, with the help of modern techniques, such as AI, managers can accurately predict consumer needs through data and send SMS messages accordingly.

In cases where such information is not available because of technological restrictions or other factors (For example, a company has physical stores only or cannot obtain its consumers' online data.), context can be properly addressed by creating consumer profiles. Such profiles should store small details, such as purchase history, buying trends, dates and times of purchases, and other demographic information. This information can be stored in real time as a consumer buys items from a brick-and-mortar store. This profile has to be updated whenever the consumer initiates any sort of exchange with the company, such as by making new purchases or asking for information. The SMS advertising should be aligned according to the details in the consumer's profile. Likewise, timing is valuable in contextualization. According to Luo et al. (2014), same-day SMS can be 9.5 times less effective as SMS that is sent one day before. The underlying reason could be the fact that consumers feel mentally prepared for the perceived benefits and potential costs of the offer. However, messages sent more than two days before the offer date are 71% less effective as one-day-prior SMS. The main challenge

is deciding which advertisements to broadcast to which customers at what time, given all the information at hand (Reyck & Degraeve, 2003). Best effects occur on Mondays and weekends. Additionally, participants in a past work showed higher acceptance and purchase intention during the afternoon and evening than in the morning (Rau et al., 2011).

The third important factor that must be understood is the internal characteristics of the SMS messages themselves, particularly the alignment of textual information and the selection of words, that is, the message that should be written in text form to create positive consumer attitude. Barwise & Strong (2002) advised that SMS messages should be short, straight, funny and entertaining, and eye-catching; they should also offer some incentive, such as promotions. Muk & Chung (2015) concluded that perceived usefulness and social influence help create a positive attitude toward SMS advertisements. Moreover, small factors, such as interactivity, appeal, product involvement, and attitude toward SMS advertising in general, directly influence attitudes toward advertisements (Drossos et al., 2007).

3.3 In-app advertising:

Consumers throughout the globe have widely adopted mobile applications after the introduction of multi-touchscreen smartphones in 2007. Gupta (2013) explained that mobile applications fall into four categories, namely, games and entertainment, social networks, utilities (such as maps, clocks, calendars, cameras, and email), and branded apps. Generally, there are two ways of using mobile applications for marketing or advertising purposes. First, they can be used for in-app advertising across various types of mobile applications. Second, companies or brands can be in contact with their consumers through their own branded apps. By doing so, a company can do various activities, such as LBA, sales promotions, communication of important events, and tasks related to consumer engagement.

Most apps on Google Play and the Apple Store are free for download. The revenue model adopted by many free apps includes advertisements (advertisements) that are embedded in apps and displayed at various points during use (Rodriguez et al 2012). The ecosystem of in-app advertising is explained through Fig (3). A developer creates an application, registers with an advertising provider, and uploads his or her work to an application platform (such as Google Play) for consumers to download. Consumers download the app for free, and in exchange for its usage, they are obliged to watch/interact with advertisements coming from an advertisement provider. The advertisements can be shown according to customers' interests or location (Ruiz et al., 2016). To ensure that advertisements are delivered and displayed non-intrusively, advertisers usually have strict guidelines on how advertisements should be used and displayed in apps (Li et al., 2015). Other revenue models include offering paid added services. For example, in a gaming app, a user can buy items for the game to progress quickly in the game.

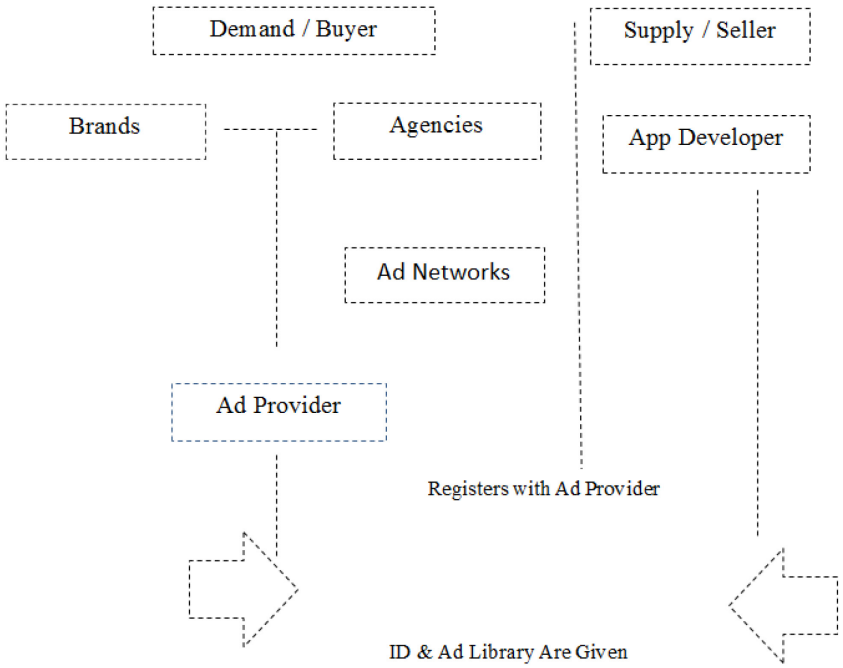

Fig (3): In-app advertising ecosystem and mechanics

The attitude towards mobile app advertisements can be negative (Ydin & Karamehmet, 2017) primarily due to the fact that in-app advertising appears while a consumer is using the app. This setup can disturb customer usage, thereby eliciting a negative attitude towards the advertising. In the study of Ghose & Han (2014), app demand decreased with in-app advertisement that was shown to users while they were engaging with the app. Additional factors, such as distraction, interruption, delay, and stoppage, hinder in-app advertising (Nadeem et al., 2015). Nevertheless, some minor adjustable factors can increase in-app advertising effectiveness. Cicek et al.(2018) observed that users recall banners and their contents better when such banners have landscape orientation and are located at the top of apps. However, for a customer who uses an app for a long time or has been exposed to many advertisements before, the probability of clicking on advertisements will significantly diminish (Sun et al., 2017). It is also preferable to advertise in apps that satisfy different gratification factors, such as personal relationships and surveillance. These apps might include social media, gaming, and assistance apps (Logan, 2017).

Alternatively, mobile apps can be used for marketing and advertising purposes through branded apps, which are the own apps of companies or brands. This method is also highly effective for location-based services. Companies or brands do not need to work with third-party firms for advertising communication, unlike in the case of in-app advertising. Instead, these companies or brands develop their own apps and encourage consumers to download them. This technique offers a personalized touch to consumer communication. Consumers find branded apps interesting because they fulfill consumers' informational needs (such as product reviews, store addresses, and coupons) or entertainment needs (such as games and check-ins). Continuous use of branded apps advertisements to an increase in spending (Wang et al., 2016). By contrast, discontinued use of branded apps is associated with reduced future spending (Kim et al., 2015). Creative execution, perceived interactivity, and

compatibility positively influence branded app effectiveness (Kang et al., 2015; Bellman, 2011). Global brands design their apps in a way that improves ease of use, understanding, and control and navigation through mobiles (Kim et al., 2013).

3.4 Mobile social media and search engine advertising:

Social media has changed the way people communicate and interact. Yadav & Rahman (2015, p. 337-338) defined mobile social media as "all mobile marketing applications that enable the formation of user generated content." Consumers' interest in mobile social media lies primarily in social influence and feeling of belonging. Such social influence creates a bandwagon effect; a consumer will continue using mobile social media even if they are not interested in it (Zhou, 2014). Users' behavioral intention toward using mobile SNSs is strongly determined by social influence, mobility, habitual behavior, and critical mass (Nikou & Bouwman, 2014).

Marketing and advertising firms use mobile social media for branding, market sensing, relationship management, and content development (Bolat et al., 2016). Meanwhile, location-based apps are used by individuals to share information with their friends regarding their hangout places, such as cafes, restaurants, and other important tourist locations, in one specific area (Kaplan, 2012). Their friends see this information and can be interested to join them. Foursquare and Gowalla incentivize users to check in using game mechanics. On these platforms, users earn badges after accumulating a certain number of check-ins or gain special recognition if they have more check-ins at a particular location than all other users (Chang & Sun, 2011). Companies or brands have several means of attracting nearby foot traffic through such apps. Foursquare offers display advertising that targets users who are most likely to become customers based on the places that these individuals have visited (for instance, at similar places in another part of town) or on these users' search for something related to any particular business (for instance, "pizza") (Foursquare,2019). Companies can also open up their brand pages and offer special discounts and promotions for users who check in at their stores.

It is important to understand the factors that can affect the continuous use of social media. Flow is one of these factors. Flow reflects "the holistic sensations that people feel when they act with total involvement" (Csikszentmihalyi, 1975, p. xx). In other words, flow refers to the time spent on social media with users' full attention and involvement. Gao & Bai (2014) showed that among other factors, flow also determines the continuance intention of mobile SNS. For creating flow, mobile social media should provide quality information without any technical glitches and offer ways to expand users' social circles (Zhou, 2015; Zhou et al., 2010).). Consumers also show addictive characteristics with mobile social media usage; such characteristics are not vividly present in other advertising formats. Frequent use of social media and large network sizes, which eventually result in increased social capital, are the strongest predictors of SNS addiction (Salehan & Negahban,2013; Yang et al ., 2016). Consumers who are addicted to mobile social media and show good flow tendencies might show heightened interest towards advertising messages. A company or a brand that is interested in launching a social media platform in the form of a branded game or planning to open a new brand page on mobile social media networks must create their technical and content design with flow and addiction factors in mind. Additionally, consumers' networks of relationships with people who live and work in a particular society can be referred to as these consumers' social capital. Users who have higher social capital

show more interest in advertising and increased advertisement-sharing behavior with their networks (Li & Wang, 2014).

Other salient attributes of mobile SNS advertising include social, mobile convenience, and active control informativeness, entertainment, and irritation (Haa & Lee, 2014). In general, advertisers should work closely with mobile social network providers to identify high-engaging users. In particular, advertisers should pay attention to users who seek news and information from mobile social networks, use a considerable amount of mobile data, and/or frequently check in to publish their locations (Wu, 2016). Brands should establish close relationships with consumers and establish and increase attachment, commitment, closeness, cooperation, and understanding in their interactions with consumers (Lee, 2016).

3.4.1 Mobile search engine advertising

In recent years, the use of search engines through mobile devices has increased substantially. Search engine companies display keyword-targeted advertising. On mobile phones, these advertisements are typically displayed on the top and bottom of pages and contain two to three sponsored results, with the bottom containing only one to three organic results (Murillo, 2017). Major search engines, such as Google, have also begun indexing and ranking web sites based on these sites' mobile content instead of desktop experience, as was done historically (Selbach, 2017). This change will impact Google's organic search listings. In other words, obtaining a high ranking on Google now requires mobile-optimized versions of websites.

The advertisement mechanism of Google mobile search engine advertising is similar to that for desktop. Advertisers bid against targeted keywords. Google combines bids with multiple quality factors, such as expected click-through rates (CTR), landing page and advertisement relevance, and expected impact of advertisement formats in calculating a score or rank for each advertisement (Aslam & Karjaluoto, 2017). However, given the small screens of mobile devices and the increased trend of conducting local searches on mobile, studies show that additional measures are needed to enhance the effectiveness of mobile search engine advertisements. Because of the small screens of mobile devices, users spend more time on the first three results on search engine query retrieval pages than on the following results (Kimetal, 2012). Hence, the top rankings are very important in mobile search engine advertising. Additionally, mobile search advertisements should have clear call to action. For example, a simple call to action, such as "Call us," can bring improved results for retail businesses that are implementing mobile search engine advertising (Goh et al., 2015). Ghose et al. (2012) also showed that ranking effects are high on mobile phones, suggesting high search costs; links that appear on the top of the screen are especially likely to be clicked on mobile phones. This increased cost can be justifiable by managers who are advertising local content, given that a link to a store located close to a user's home is highly likely to be clicked on a mobile phone. The text itself should be informative and entertaining and should not cause irritation (Murillo, 2017).

Due to the difficulty of entering text on mobile, query length is shorter in mobile devices than in desktops (Kamvar, 2009). Interestingly, two-term queries are more common than one-term queries on mobile devices despite that the former typically requires more effort from users. This is in line with the main hypothesis, that is, users prefer to be precise to avoid refing the query and being required to input added text (Yates et al., 2007).

4 Privacy and application of GDPR:

Users have an ultimate right over their information; if these rights are violated, they become reluctant to disclose personal information, will not respond to advertising offers, and may even seek stricter regulatory control over mobile advertising (Okazaki et al.,2009). At the government level, consumer rights, their privacy, and data safety are now priorities. The EU's new GDPR framework was developed to safeguard consumers from privacy and data leakage threats. Large fines are imposed on companies who violate such laws. Cate (2016) showed that people become increasingly likely to accept potentially invasive technology if they think its benefits will prevail over its potential risk. Moreover, consumers are likely to accept such offers when offered a monetary reward for their usage of data or location data (Gutierrez et al., 2018). Users should also be given an easy opt-out option from these services. Designing such systems with complex privacy settings, thus giving consumers increased control, will benefit all parties (Kelly et al., 2011). Increased personalization of users' privacy settings can significantly enhance mobile marketing adoption and use (Gurău & Ranchhod, 2009). Finally, consumers should be able to decide about when, where, and how often they want to receive messages (Cleff, 2007).

5 Theoretical implication:

This paper reviewed previous literature related to mobile advertising and marketing to bring clarity, given the fragmented nature of existing research on this topic. Because of the newness of the topic and the rapid changes that have occurred in mobile technology in the last decade, only a few studies have attempted to explain the broad practical picture of mobile advertising, which also satisfies industry needs. Consequently, the substantial impact that mobile advertising is generating in the real world is hardly reflected in previous studies. The present paper is constructed in a way that covers all the important dimensions of mobile marketing and advertising. Each domain is analyzed in light of all valuable previous findings to produce a holistic and conclusive results, rather than abstract ones, against each discussed category.

6. Practical implication:

After examining all mobile-oriented formats and combining them with location-based services and advertising, we recommend three practical scenarios that take privacy into account. In Scenario 1, a company develops an in-house location-based mobile advertising solution typically through an app; this solution uses in-app and SMS advertising formats for message delivery. In this scenario, the company develops and manages its own branded app. The project can be outsourced to a third party, but managing this project internally can give the company enhanced control. However, execution through a third party will ensure smooth operations and reduced hassle for the focal company. Third-party firms usually have the appropriate expertise for the required operations and will be professionally and technically stronger than the focal company. Hebdry (1995) gave the following guide regarding outsourcing decisions. If contracting out is cheaper than doing the job yourself, then outsourcing is the better option. In this way, a company not only saves money through improved efficiency but also gains effectiveness by focusing on their in-house expertise. Afterward, a company or brand will bring consumers on board by marketing its app from existing customers to potential customers and to users who will be interested to sign up for this app. The company needs to clearly state the benefits that users stand to gain by signing up and allowing the company to track their movements. The benefits should be engaging and attractive enough to

compel consumers to sign up. For example, a consumer who downloads the company's app will receive on-the-spot notifications when he or she is near the location of purchase and will obtain special discounts. Consumers will then become informed about the company's offers, latest trends, and announcements regarding seasonal sales and new arrivals. Additionally, a company has to provide some additional monetary benefits that will only be available for the users of the app. Integrating attractive features into the app can also address this issue. Bonus points or virtual currency can be given after a few months of active app usage. Virtual currency can be made redeemable from the company's brick-and-mortar or online stores.

Consumers should be asked for permission during signing up to avoid breaching any privacy fence or any GDPR framework. Users should be informed that their location will be tracked to give them advanced services and monetary benefits. They should also be notified that they can opt out from such offers at any time. Additionally, customers should be given control over their privacy. Initially, they should be asked about small details, such as their interest in receiving on-the-spot location messages and their preferred time, date, location, or frequency of receiving such messages. Consumers should be informed that they can change these settings at any time while using the app. Increased monetary and other benefits should be offered to consumers who are willing to participate and interested to receive messages frequently. A company that is also interested in tracking customers' social media and other online activities for serving enhanced contextual messages must clearly mention this purpose in the beginning; users should also be given the option to unsubscribe from such offering at any time they wish.

In Scenario 2, a company collaborates with an intermediary that provides LBA solutions. In Scenario 1, a company or a brand can engage with their existing and potential customers by exploiting user location and delivering mobile advertising and marketing messages. However, this scenario vastly ignores the random foot traffic that is near the targeted location. Given privacy concerns by customers and governmental laws, it is not recommended to target random traffic in public places. Even if it were allowed, its future seems quite unclear. Every person walking near a market place could be blitzed with advertising messages from unknown brands or companies.

Scenario 2 will attempt to address this problem through an intermediary service. This location-based intermediary service incorporates both customers and brands simultaneously. Fig (4) explains these phenomena; the right side shows consumers from diverse backgrounds and demographics signing up with this intermediary. The registration process will be the same and aligns with the GDPR framework, as discussed in Scenario 1. Users will give their explicit permission for tracking their location and for receiving location-based messages; in return, they will receive some benefit, such as monetary rewards. They will also be given opt-out options and other privacy customization options, which they can change at any time during the service, thus having full control over their privacy. The intermediary will segment consumers internally, analyze their suitability, and deliver suitable LBA by brands or companies. Meanwhile, advertisers, brands, and companies will also register themselves with the intermediary and give their details about the demographical consumers they are targeting. For example, a 30-year-old female consumer is located near the shopping mall. The intermediary can look for an appropriate brand for this consumer (such as any female-oriented consumer brand) and then send an advertising message to her; the advertising content will have already been given to the intermediary by the brand.

This entire process can be automated on the basis of real-time bidding. That is, when the intermediary finds a suitable consumer at a location, it can ask for bids from different brands. The highest and most appropriate bidder will deliver their advertising content to the consumer at the location. This whole process will be completed in less than a second, as it happens in programmatic buying or real-time bidding. Additionally, consumers can be contextualized by reviewing their online and social media activity and upcoming events.

In Scenario 3, a company adopts location-based mobile search engine and mobile SNS advertising solutions. Compared with Scenarios 1 and 2, Scenario 3 incorporates more industry-based advertising and marketing solutions. The term industry specifically means big internet social media and search engine companies, such as Facebook, Foursquare, Instagram, and Snapchat. For simplicity, we can divide these companies in three broad categories. The first involves social media companies that are based on social interactions, such as Facebook and Instagram. The second includes social media companies that are based on location sharing, such as Foursquare. The third covers search engine companies, such as Google. All these services offer LBA and marketing solutions. By nature, when a consumer signs up for these services, they usually agree with all terms and conditions. Maintaining privacy and complying with governmental laws fall under in this domain. As an advertiser, manager, or a company will not be liable for any privacy intrusion or serious allegation, such as data breaches, advertising on these portals mainly happens in available spaces around different areas of their respective apps. These spaces are called Internet advertising paid slots and spaces (IAPS) (Aslam & Heikki, 2017). Depending upon the product and required results, an advertiser can choose a suitable option. For example, companies like Foursquare, Google Latitude, and Facebook Places are preferred for restaurants and brick-and-mortar stores, where consumers' online check-ins can help increase foot traffic or sales. Meanwhile, mobile search engine advertisements are good options for companies who wish to increase consumer contact through phone for further information or for booking services. Such companies believe that their potential consumer might search on their mobile first. Typical examples include car rental services. For general companies, such as those in FMCG and similar areas, who are looking to build their brands and conduct general promotion of their physical stores, interaction-based social media apps are preferred, such as Facebook, Instagram, and Snapchat.

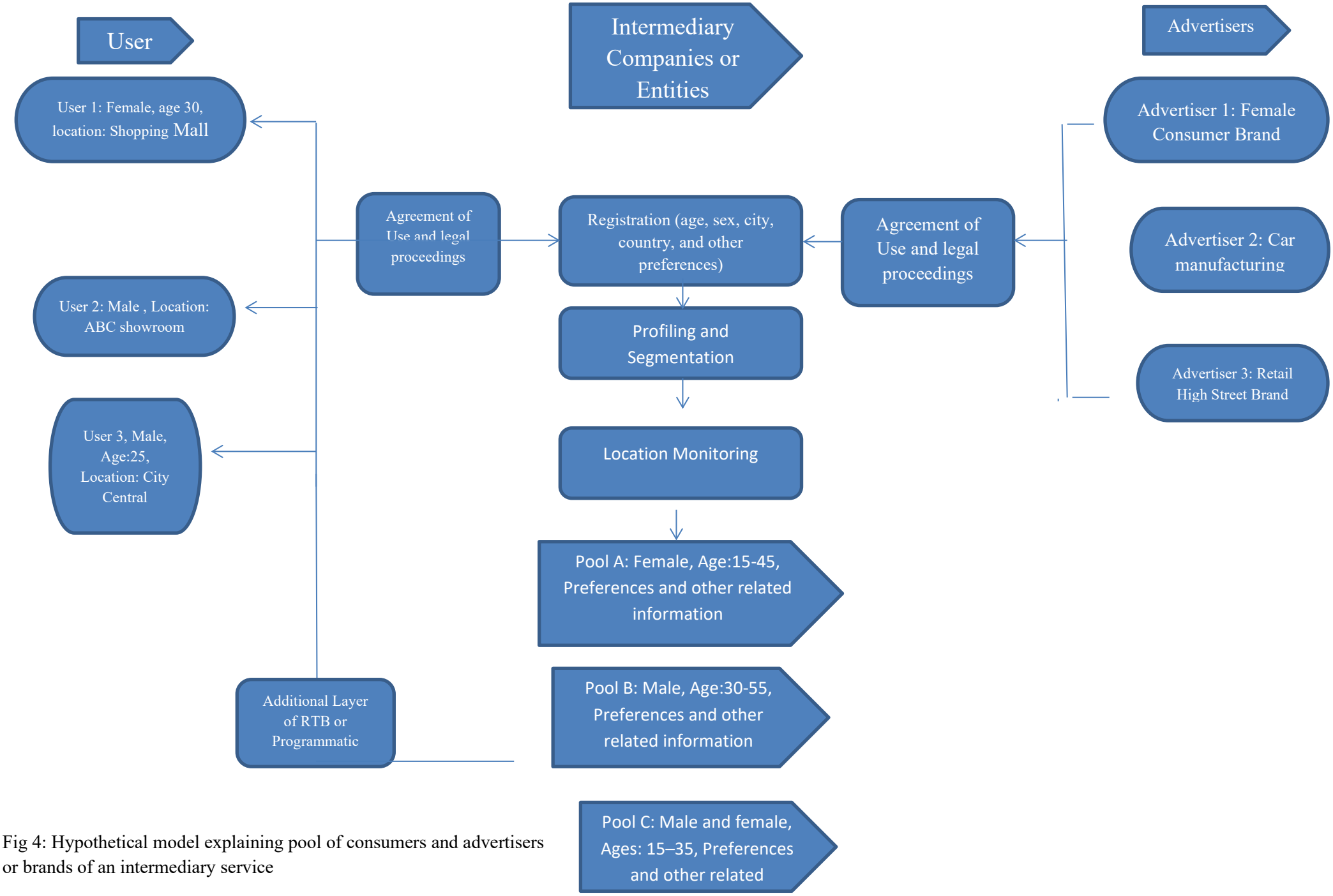

Fig 4: Hypothetical model explaining pool of consumers and advertisers or brands of an intermediary service

7 Limitation and future research directions:

Although we attempted to discuss all advertising domains that can be deployed only in mobile, other advertising media, such as banner advertising on mobile-optimized advertisements and mobile video formats, were not covered primarily due to lack of academic literature about them. Thus, examining them as a separate domain was difficult. However, these domains are very important from the industry point of view. Mobile video advertisement spending in the US will nearly double, going from almost $16 billion this year to almost $25 billion in 2022, and advertising on mobile video and on mobile-optimized websites will mostly be bought and sold pragmatically (eMarketer, 2019). Future studies on these topics will be valuable for the mobile advertising field. Artificial intelligence (AI) is also changing the future of digital advertising, and its application to mobile marketing is no exception. AI would be greatly beneficial for improved contextualization through big data analysis. This means that consumers will likely only see advertisements that matter to them. Therefore, future studies in this area will open up new avenues. Meanwhile, many studies have been conducted on social media advertising and search engine adverting with respect to desktop computers. However, are these findings pertinent to mobiles as well? In particular, mobile social media or search engine advertising done on the basis of location is a vastly unexplored field.

8 Conclusion:

In this paper, we highlighted the distinctive features of mobile advertising. Advertisers and marketers are becoming increasingly interested that spending on mobile advertising has already surpassed those for all other media, such as TV, print, and outdoor advertising in developed countries, especially the US. We learned that because of the portability of mobile devices and the fact that users carry them everywhere, location is the prime reason among all important factors. Mobile advertising also gives a big opportunity to understand consumer context, which is hardly possible in any other device. We also identified certain advertising domains that are possible only on mobiles. By combining location, context, and these advertising domains, we attempted to understand mobile advertising’s specialty and unique selling proposition. We then considered privacy and the implication of GDPR, as it affects mobile advertising, and recommended practical solutions for effective deployment of mobile advertising.

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III

CHATBOT ADOPTION IN TOURISM SERVICES: A CONCEPTUAL EXPLORATION

by

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Chatbot adoption in tourism services: A conceptual exploration

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Introduction

The substantial increase in communication on popular instant messaging platforms such as WhatsApp, Facebook Messenger, Snapchat, and Skype has clear implications for companies. Especially in the tourism sector, companies should seize this opportunity to improve their existing services through chat robots, or chatbots. The recognition of the importance of chatbots has continued to grow. SM Marketing Platform (2017) reports that Facebook Messenger grew from 33,000 bots in September 2016 to 100,000 bots in April 2017, a more than 100% increase in deployment. SM Marketing Platform further reported an 80% success rate with customers a month after Tec inStore (an online-based mobile phone repair company) launched its chatbot services, with 1,500 customers requesting help from the bots and 1,000 customers leaving "thank you" messages for the bots. Currently, tourism and travel booking companies like Expedia, Hipmunk, SnapTravel, have adopted chatbots in their operations (Techemergence, 2018).

The information-intensive nature of the tourism and hospitality industry demands regular communication with stakeholders. Specifically, customers want to be up-to-date with what firms are offering, and they seek this information through websites and other mediums such as phone calls and instant messaging. In order to maintain constant communication, tourism and hospitality firms spend large sums of money annually on inquiry and desk officers. Despite this, notable instances of customer dissatisfaction arise from embarrassment in emotion-inducing service encounters (Grace, 2009), increasing levels of customer churn (Kim and Yoon, 2004). In addition to service consistency, Hsu *et al*. (2017) argue that the deployment of chatbots has the following advantages: bots assist users in navigating websites, thus shortening time and assisting in quick decision-making; build social relationships with customers; maintain customer confidence in firms; and strengthen customers' emotional bonds with firms. Additionally, scholarly evidence supports customers' acceptance of robots in hotel services in particular (Pan *et al*., 2015), with chatbots significantly increasing hotel sales (Lasek & Jessa, 2013).

Some areas of the tourism industry, particularly airlines, are leading the way in the adoption of chatbots such as Alex (United Airlines), Mildred (Lufthansa) and Finn (Finnair), but many others have been very slow to adopt this strategy. Important internal and external organizational influences create differentials in the rate of adoption. In particular, an organization's desire to adopt and embrace a new technology is determined less by competition and more by the desire

to remain legitimate among its stakeholders (Liang *et al*., 2007). Given that a complex web of business relationships permeates the tourism and hospitality industry, the degree of adoption by firms in the industry will be high when early adopters are perceived as successful.

Integrating institutional theory and organizational learning theory, our study seeks to understand the factors influencing the adoption of chatbots by tourism and hospitality firms. First, our study aims to understand how the external forces in the tourism eco-system (mimetic, coercive, and normative) influence adoption. Second, the study examines how the interplay of the organization's learning capabilities and competencies relates to adoption. Finally, our study will advance a conceptual framework that shows how tourism firms' learning capabilities and barriers moderate the relationship between the isomorphic pressures and competencies regarding adoption. Thus, by integrating institutional theory and organizational learning theory, our study contributes to existing knowledge by demonstrating that both a firm's internal factors and the prevailing environmental conditions in its ecosystem underpin the adoption of new technology (in this case, chatbots), with certain variables determining its impact on the firm. We believe that with the conceptual framework, our study contributes to the tourism and hospitality body of knowledge by providing a sound theoretical background and pinpointing research gaps that will be useful for future research agendas.

Fundamentals of Chatbots

Hatwar *et al*. (2016) define chatbots as software agents that simulate an entity, usually a human counterpart of vague or specifically defined characteristics, with whom the user can interact in a conversation (either written, oral, or mixed). All chatbot programs understand one or more human languages by using Natural Language Processing or Artificial Intelligence Markup Language (Khanna *et al*., 2015). A chatbot's knowledge base consists of a collection of dialogue management rules that use different techniques for processing the user's input. Chatbots are a practical and user-centered form of artificial intelligence (AI). According to Transparency Market Research, the global IT robotic automation market is expected to grow to $4.98 billion by 2020, a 60.5% leap from 2014. It is easy to understand why. Thanks to powerful platforms, companies can develop a bot in about one-fourth the time it takes to build a standard mobile app. Because bots do not rely on costly servers, they are approximately 50% cheaper to build and maintain than mobile apps (Waxer, 2016). Table 1 outlines studies related to the application of chatbots in a variety of contexts.

Table 1. Literature on chatbots in different contexts

Number	Author	Objective	Research method	Context	Key findings
1	Holtgraves & Han (2007)	To explore chatbots' online conversation processing	Experimental	Communication	The realization that their conversational partners were not human beings did not affect participants. Additionally, chatbots can progress through different chat topics without getting stuck.

2	Fan, Fought, & Gahn (2017)	To evaluate the performance of a pop-up chatbot inserted on the web page of a medical website	Experimental	Medical	The pop-up chatbot was able to provide prompt services to frustrated users. Inserting pop-up chatbots on web home pages would increase the use of chat references, enhancing user experiences and satisfaction.
3	Hsu *et al*. (2017)	To design a chatbot that provides food allergy information for restaurants	Experimental	Restaurant/ hospitality	Allergybot provides dining options for users without information inquiry overload. It also provides available restaurant menus, simplifying response tasks and time for inquirers.
4	Horzyk, Magierski, & Miklaszewski (2009)	To present a chatbot acting as a shop assistant that interacts with and recognizes the personality traits of customers based on search and shopping preferences	Experimental	Online shopping	The implementation of a self-adaptive mechanism in the form of chatbot that interacts with online shoppers considerably improved customer experience and shopping.
5	Negi *et al*. (2009)	To build a task-oriented system (chatbot) that enables human-machine conversations that respond to customer requests	Experimental	Car rental	The chatbot was able to supply information on different fares for car bookings, make bookings/reservations, and modify pick-up locations on existing bookings.
6	Lasek & Jessa (2013)	To compare the performance of chatbots on different hotel/guesthouse websites	Quantitative	Hotel/ accommodation	Hotels that deployed chatbots experienced sales growth.
7	Holotescu (2016)	To examine the role of chatbots in enhancing learning experience in massive open online courses (MOOCs)	Conceptual	Education	Implementing MOOCBuddy (a chatbot) provides the online learner with storytelling interactions related to online information.
8	Abashev *et al*. (2016)	To provide a model for chatbot organization for doctor-patient and clinic-patient communication	Theoretical/ Conceptual	Medicine	The study provides a model suitable for doctor-patient and clinic-patient interactions at the level of outpatient medicine.
9	Calvert (2017)	To examine the different uses of robots, including chatbots, in performing repetitive tasks such as responding to customer inquiries	Conceptual	Education	The deployment of chatbots to respond to inquirers has distinct advantages over humans, including the following: they do not get tired, they are not annoyed by silly questions, they provide service consistency, and their output does not diminish over time.
10	Zalama *et al*. (2014)	To describe the three levels of the development of	Experimental	Hotel/ accommodation	Sacarino assists guest by showing them around the hotel environment, and hotel

		Sacarino, a hotel-based robot that provides information to guests			guests applauded its ability to respond to voice and text inquiries.
11	Imrie & Bednar (2013)	To examine the role of chatbots as virtual personal assistants	Conceptual	Social interactions	Kari, the chatbot developed to interact with humans and provide virtual assistance, serves as a friend, providing answers to inquiries.

Chatbot Intelligence

A vast number of chatbots are being built to utilize decision-tree logic, so the response a bot gives depends on keywords identified in the user's input. The bot takes the user through a conversation route based on what he or she has asked (Skerrett, 2017). Any chatbot unable to perform this function is doomed to failure. This basic function of chatbots seems very obvious and easy to implement, but it is in fact quite hard to achieve, which can be a major hurdle to chatbot adoption. Only an intelligent chatbot understands and replies to the input query in such a way that users cannot tell a robot from a real customer service operator. An intelligent machine can perform functions like 1) arithmetic; 2) comparison, logic, and reasoning; 3) learning, heuristics, and memorizing; and 5) sensing and perceiving (Khanna *et al*., 2015). The functioning of chatbots with respect to their application in the tourism industry is presented in Figure 1. It is an algorithm to understand possible backend structure and process to design and implement tourism bot.

For clarity, a new model was developed pertinent to this study. The algorithm (Figure 1) starts with the user's input query in the chatbot's main interface. The message is filtered through the chatbot's engine and central processing. All or some of the functions can mimic human intelligence and look like a human answer. The engine and connects with the company's database, which is updated constantly to produce reliable information, such as the latest information about vacant hotel rooms, rates, or available flights. The machine can offer this information to the user instantaneously. In the last step bot gives appropriate answer to the user. Each step in the process refines output reply and produces most appropriate answer satisfying user needs and problems, closest to real human customer service response.

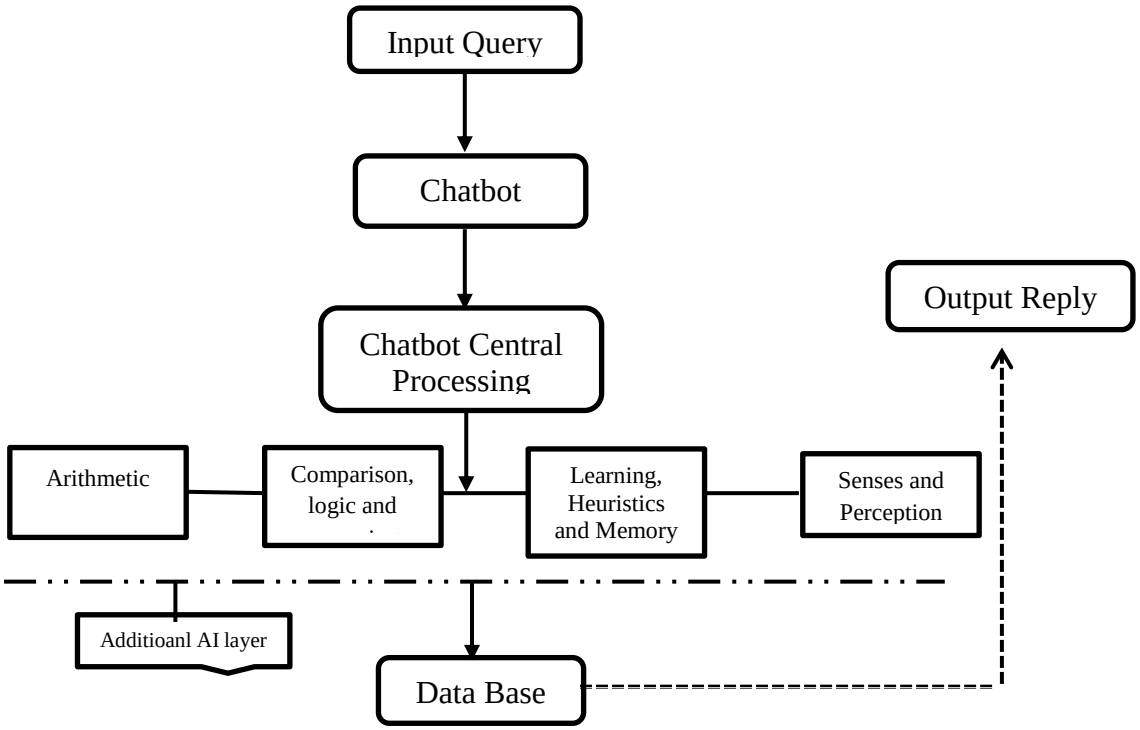

Fig. 1. Conceptual framework of tourism bot from input query to output reply

Chatbots in the Tourism and Hospitality Industry

Chatbots have the potential to help the tourism industry in many ways. For any industry, accessibility to the company's offerings is important to the customer in both the pre-sale and the post-sale process. Now, as more and more people are using instant messaging services like Facebook Messenger and WhatsApp, this ease of use can be further enhanced by a company's offering all of its services where customers are already chatting with their friends. Performing common administrative and menial tasks through chatbots, such as scheduling appointments, setting reminders, booking tickets, and sharing traffic or weather updates, is highly valued. Although there are some potential pitfalls, discussed later, the potential of chatbots in diverse sectors of the tourism industry is enormous. Hotels, restaurants, car rental services, travel agencies, and tourist information centers can all benefit from this technology.

The hotel industry can particularly benefit from the direct application of chatbots. Increasing the percentage of online bookings impacts sales growth, confirming the economic value of the hotel chatbot (Lasek & Jessa, 2013). Expedia took advantage of Facebook's technology to launch a basic bot to help travelers book hotels. Marriott Hotels also introduced a chatbot service to offer basic services like booking a room over chat, utilizing the Facebook chatbot interface. Chatbots can be particularly helpful (an example in Figure 2) in enriching the pre-arrival experience, allowing users to book rooms and other amenities, like spa treatments, airport transfers, and dinner reservations (Ukpabi, Karjaluoto, Olaleye & Mogaji, 2018). A bot that interacts with guests at all stages of the customer journey can gather valuable data, which algorithms and hotel staff alike can then use to provide personalized services (Bhargava, 2017).

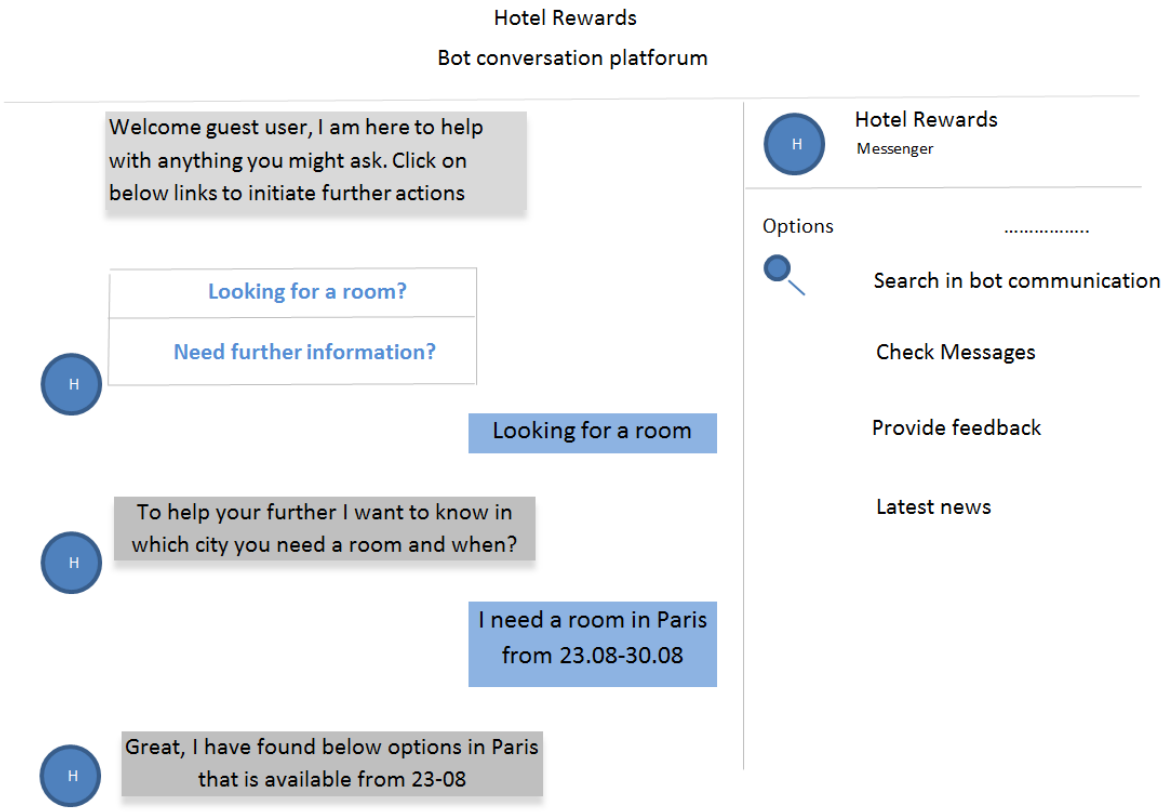

Fig. 2. Sample conversation with a hotel booking chatbot

The direct application of chatbots in the restaurant business can be very impactful as well. In fact, Taco Bell in 2016 launched TacoBot that facilitates food ordering and recommends items while providing witty responses. Other restaurants and fast food giants like Burger King, Pizza Hut, and Dominos have followed suit with their own proprietary chatbots (Moharana, 2017). Soon placing delivery orders over the phone will be obsolete; customers will do this through Facebook, WhatsApp, or other social networking sites as shown in Figure 3. Chatbots will eventually accept payments as well; MasterCard already provides such services through its Masterpass app.

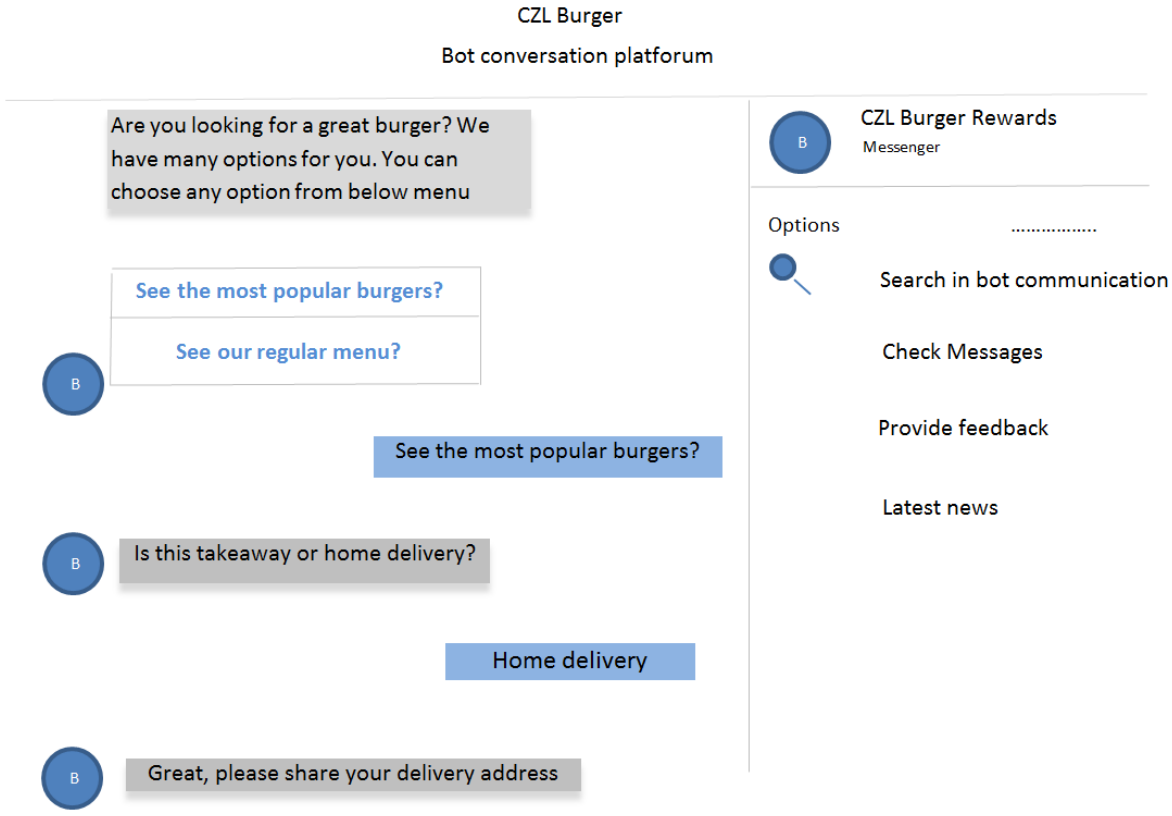

Fig. 3. Sample conversation with restaurant chatbot

Deploying chatbots can reduce costs for both customers and firms. Customers do not need to call, which reduces their communication expenditures, and companies will no longer need to hire customer service representatives or outsource answering services to a call center facility (Ukpabi *et al*., 2018). The advantages are not limited to the ordering and delivering processes. Other possible chatbot benefits Gamanyuk (2017) highlights include the allowing customers to perform the following tasks without having to download mobile apps: 1) find and explore restaurant reviews, photos, menus, prices, and available tables; 2) manage restaurant reservations on the go, easily book, change, cancel, or re-book tables; and 3) search and find restaurants according to party size, date, time, preferred cuisine, price, or distance.

Chatbots in the Airline Industry

Customer service in the airline industry is one of the first areas that could benefit from chatbots as a result of high volume of customer contact through inquiries and bookings. A good customer service bot could save money by automating tasks and unclogging call centers. It could help customers find suitable flight options by gathering information like time, date, destination, and other preferences (Agostinho, 2016). It could help in flight booking, saving customers the trouble of visiting the airline's website and entering page after page of

information. It could give status updates about flights, such as information about delays or cancellations. It could also provide digital boarding passes, a service Turkish Airlines has begun to provide; offer baggage information; and gather feedback. It is reported that its introduction has recorded a huge surge in online booking (Singapore Chabots, 2017). Figure 4 shows an example of a conversation pattern with a flight booking chatbot. Normally, at the start of the conversation chatbots provide options in an easy-to-use chat interface.

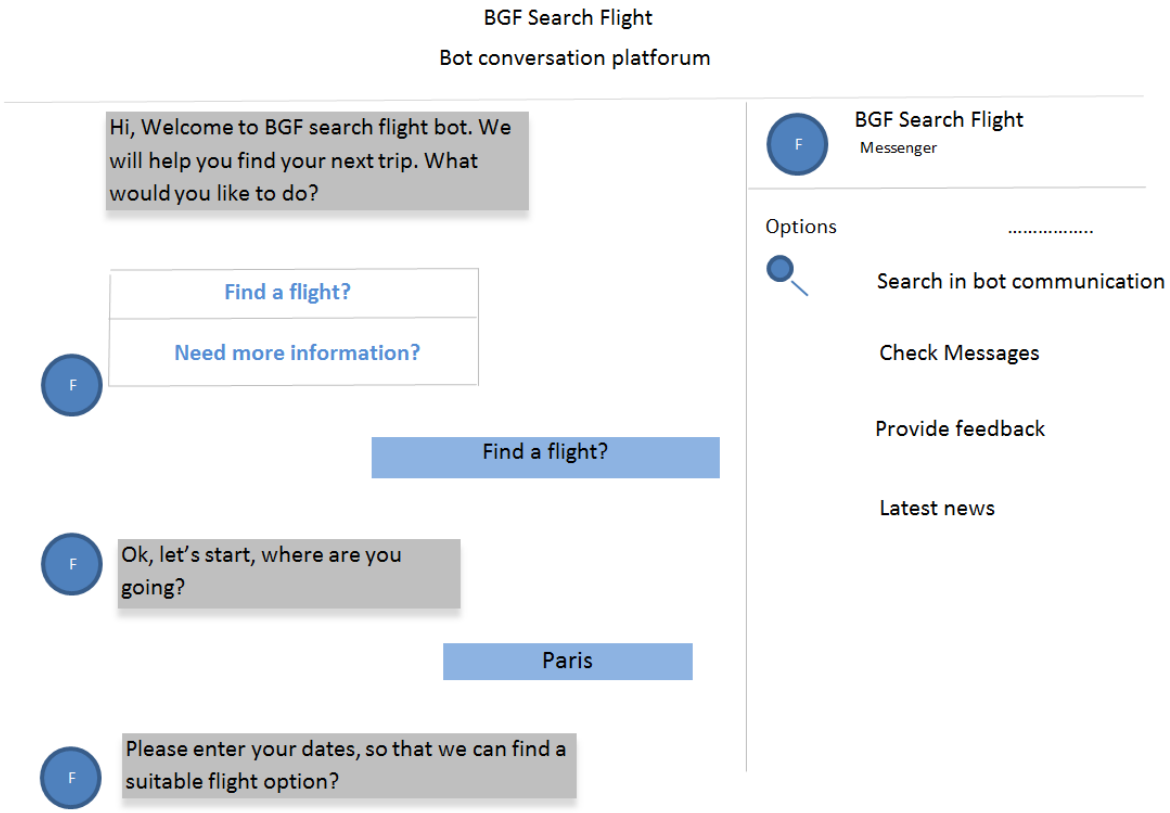

Fig. 4. Sample conversation with a flight booking chatbot

Chatbot Challenges

Although AI and chatbots have created excitement in the tourism and hospitality industry, many concerns and problems can affect their adoption. The media's portrayal of AI as being capable of handling much of tasks in the tourism and hospitality industry is at times overrated. The rush toward chatbots is partly due to the popularity of several new messaging services. The challenges with chatbot adoption involve technical issues, cost, culture, and organization size. One of the most significant technical issues is language processing. Chatbots still commonly struggle with lexical and semantic ambiguity. Other problems are more specific to chatbots themselves, such as controlling the global course of the conversation, controlling repeated sentences, and treating unclear sentences appropriately. Such problems require adequate solutions so that chatbots can reach performance levels close to those of humans (Neves, Barros & Hodges, 2006). The cost of acquisition and setup can also be a major

challenge. Murphy, Hofacker & Gretzel (2017) argue that firms will be reluctant to adopt such technology if the cost of acquisition and setup is more than they can afford. Finally, while chatbot adoption may be easy for large organizations thanks to their human and capital resources, a lack of resources may be a barrier to adoption within the tourism ecosystem, which is dominated by small and medium enterprises.

Theoretical Background

In examining factors influencing technology adoption in tourism, scholars have prominently adopted the technology acceptance model, unified theory of acceptance and use of technology and diffusion of innovation (Ukpabi & Karjaluoto, 2017). However, the networked nature of the tourism ecosystem produces interdependence among firms; as such, chatbots adoption by one firm is likely to induce environmental pressure on others to adopt. Accordingly, the institutional theory has been used to examine different pressures firms face to adopt a technology (Teo, Wei & Benbasat, 2003; Yin, 2017). Additionally, scholarly evidence supports the argument that the degree of a firm's technological adoption is dependent on its internal factors such as competencies and learning capabilities (Murray & Donegan, 2003; Chiva, Alegre, & Lapiedra, 2007; Matthews, MacCarthy, & Braziotis, 2017). Therefore, in the subsequent sections, we shall elaborate on how the integration of the institutional theory and organizational learning theory can influence chatbots adoption among firms in the tourism and hospitality ecosystem

Institutional Theory

Intrinsic and extrinsic influences shape organizational performance. How businesses cope with dynamism in the business ecosystem is the crux of institutional theory. Accordingly, an organization's conformity to changing environmental forces is driven by its desire to remain legitimate and attain its set goals (Meyer & Rowan, 1977). One overarching argument of institutional theory is that competition for scarce resources, customers, and political power pressures organizations to conform to prevailing business practices in order to continue to enjoy legitimacy and social support among their stakeholders (Teo, Wei & Benbasat, 2003; Yin, 2017). Thus, Teo, Wei & Benbasat (2003) argue that interconnectedness and structural equivalence force organizations to be isomorphic within their ecosystems. The tourism industry is a network of interdependent firms that imitate one another especially on technological adoption. As a result, chatbots adoption by leading firms is likely to diffuse rapidly within the ecosystem. According to DiMaggio & Powell (1983), organizations face three types of isomorphism: mimetic, coercive, and normative.

Mimetic, Coercive, and Normative Isomorphism

Mimetic isomorphism arises in two ways: when organizations mimic a practice prevalent in their ecosystems and when others who have adopted the practice are perceived to be successful or legitimate (DiMaggio & Powell, 1983; Teo, Wei & Benbasat, 2003). DiMaggio & Powell (1983) define coercive isomorphism as formal or informal pressure one organization exerts on another that is dependent on it. Coercive isomorphism can also arise as a result of government policies and regulations that are binding on organizations (DiMaggio & Powell, 1983; Liang *et al*, 2007). Normative isomorphism occurs as a result of the "collective struggle of members

of an occupation to define the conditions and methods of their work, to control the production of the future member professionals, and to establish a cognitive base and legitimization for their occupational autonomy" (DiMaggio & Powell, 1983, p. 152). According to Teo, Wei & Benbasat (2003), organizations with direct or indirect ties often learn from one another through formal or informal dyadic communication. Some studies have empirically tested how these variables influence adoption in different contexts. In a study of the intent to adopt financial electronic data interchange among Singaporean firms, Teo, Wei & Benbasat (2003) reported that mimetic, coercive, and normative pressures significantly and positively influenced adoption. In another study, Liang *et al*. (2007) reported that the three variables also significantly influenced the assimilation of enterprise resource planning (ERP) among Chinese firms but contended that top management's belief in ERP and willingness to participate affected how these factors influenced assimilation.

Organizational Learning Theory

Different organizations have different abilities to respond to changes in their environments; organizational learning theory addresses these capacities. Specifically, the theory holds that "firms that have developed a strong learning culture are good at creating, acquiring, and transferring knowledge, and at modifying behavior to reflect new knowledge and insight" (Murray & Donegan, 2003, p. 51). While firms operate in different environments, internal and external forces underpin their ability to learn. In evaluating determinants of organizations' learning capabilities, using Spanish firms as test samples, Chiva, Alegre & Lapiedra (2007) found that experimentation, risk taking, interaction with the external environment, dialogue, and participative decision making are critical to an organization's propensity to learn. Interestingly, while recognizing the importance of learning, Murray & Donegan (2003) contend that an organization's learning competencies influence its level of learning. They believe that an organization's learning competencies vary along management, operational, learning, and technological levels, thus implying that an organization's level of learning will be higher if it has learning competence in a specific domain. Impliedly, chatbots is a technological innovation, thus, tourism and hospitality firms with technological competencies are likely to be faster in its adoption than others.

In our conceptual framework (Fig. 5), isomorphic pressures and learning capabilities are the independent variables, learning competencies and barriers are the control variables, and adoption intention is the dependent variable. Our framework establishes that organizations consistently face both internal and external pressures to conform to practices and shared notions prevalent in their ecosystems.

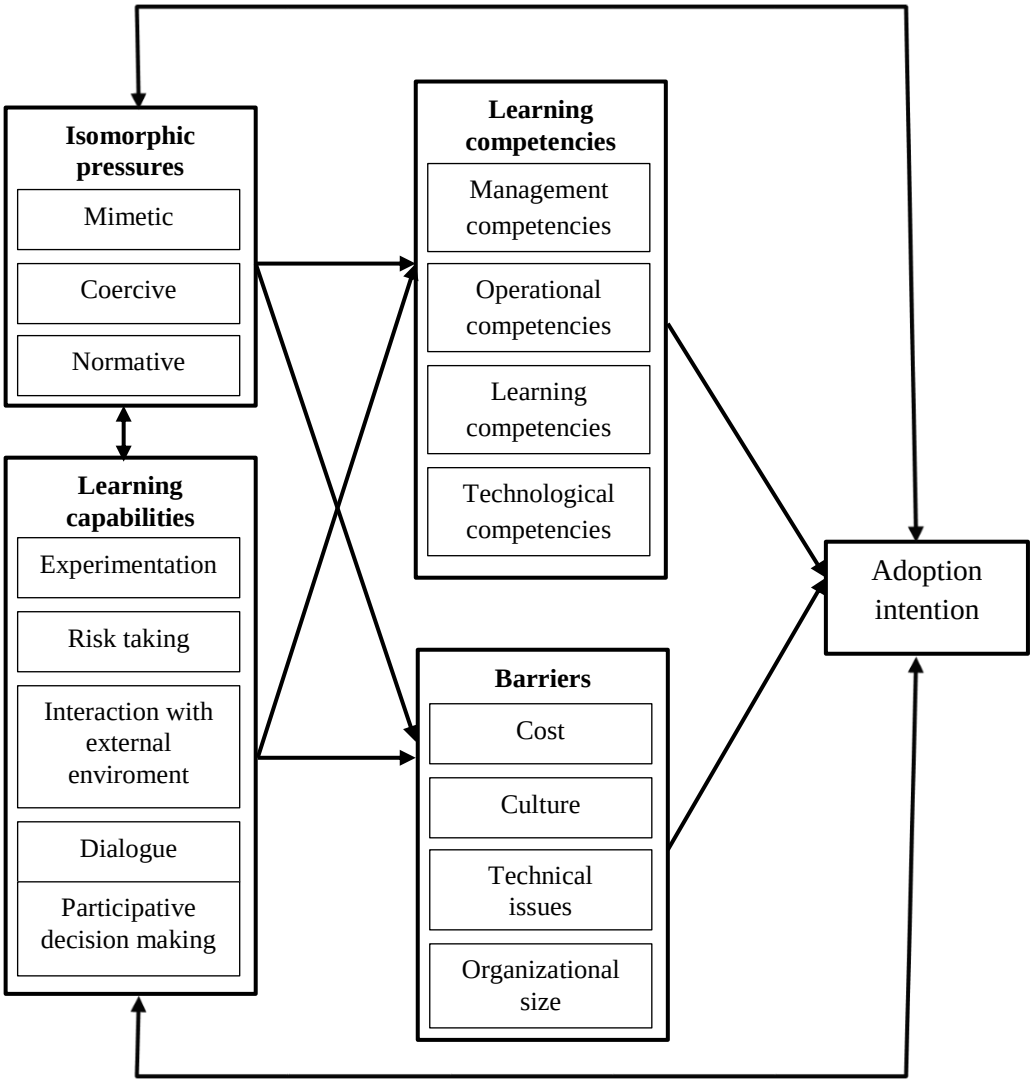

Fig. 5. Conceptual framework of chatbot adoption

The future of chatbot is essentially here; this technology has recently witnessed rapid diffusion in many sectors. Basic version of chatbots are currently utilized, which usually start conversations with easy automated options for customers and offer basic service like ordering or booking. However, fully functional chatbots that will be able to replace customer service personnel will likely become more widespread by 2020, with AI bots powering 85% of all customer service interactions (Tonner, 2016).

Discussion

The objective of this chapter was to understand the factors influencing the firm-level adoption of chatbots by tourism and hospitality industries. To achieve this, we adopted two core organizational theories: institutional theory and organizational learning theory. The institutional theory holds that firm-level adoption of information technology is underpinned by both internal and external pressures. To this end, environmental pressures exert critical influence especially in a networked and interdependent structure as it obtains in the tourism and hospitality industry to adopt chatbots. The pressure could be from dominant firms within the industry, government or from customers provided the firm have the personnel with the

technological competencies to drive the adoption. Similarly, the organizational learning theory proposes that different organizations possess different competencies that distinguish them from others. As such, an organization will excel in a domain where it has a learning competence. Take the medical and healthcare industry for example that is currently leading in the adoption of chatbots (Fan, Fought & Gahn, 2017). This is as a result of the need to maintain consistent and standardized customer service due to high volume of customer contact in addition to the conducive atmosphere provided by management in the medical industry. However, the tourism and hospitality industry could surpass its adoption rate due to the interlinked nature of the industry, the large volume of communication between tourism firms and customers, and the need to maintain consistently high level of service especially in handling inquiries from customers. Thus, the adoption of chatbots will usher in a paradigm shift in customer service.

Within the tourism, hospitality and travel services, chatbots are embedded with the capabilities that enhance efficient service delivery by the firm. These include customer segmentation, consistent service quality delivery, customer relationship management and customer concierge services. These features make its adoption a critical necessity. Till date, scholars are divided on what constitutes the best segmentation strategy in tourism services as the segmentation approaches already proposed are either conflicting, overlapping or unrealistic (Tanford & Malek, (2015; Legohérel, Hsu, & Daucé, 2015). This is further exacerbated by the ubiquity of the information and community technology (ICT) which has opened multiplicity of channels to the consumer. Interestingly, using big data accumulated through different customer contacts with the digital channels, chatbots can successfully perform segmentation using defined algorithms and also make successful recommendation and prediction. Similarly, within the customer contact points such as front desk that handles critical services like check-in, check-out and payment receivables, human agents are fraught to mistakes due to fatigue and job burn out (Cheng, & Yi, 2018). However, chatbots are capable of replicating a consistent level of service irrespective of duration. These could be in the form of answering enquiries, guest check-in or check-out including concierge services. Additionally, for destinations, chatbots can perform tour guide services with interesting commentaries on attractions within the destination.

The aggregation of customer digital footprints can be refined with data analytics to plan a robust customer relationship marketing strategy (Erevelles, Fukawa, & Swayne, 2016). This can be used to customize customer experience. Big data can be used to steer an effective engagement program that will become a new landmark of customer experience and loyalty to the brand. Insights from the customer data can assist the company to have a better understanding of the customer in relation to brand and thus promote brand engagement. It offers intelligence information to engage customers at the right channel, with right messages, at the right time and predict the customers that are about to churn and probe into the root causes of an attempted churning and proffer a remedy. Furthermore, big data through analytics helps to measure customer sentiment and to maximize customer lifetime value with personalized up-sell and cross-sell offers.

From the customer perspective, chatbots play essential roles across the customer journey. First, during pre-trip decision-making process, the customer is faced with the challenges of making

the best travel decision (Ukpabi *et al.*, 2018). From the perspective of hospitality services, certain decisions such as amenities, cost and customer service constitute critical considerations that influence a consumer's decision in the choice of a hotel (Xie, Miao, Kuo, & Lee, 2011). Interestingly, chatbots help to simplify the consumer's pre-trip decision-making by offering multiple options on hotels, their amenities and prices. This also applies to flight booking where chatbots, besides offering recommendations on flight information, but can also seamlessly manage the booking process up to the payment and receipt generation. When the booking is completed, chatbots are also embedded with capabilities of sending reminders up to the day of the journey. Similarly, chatbots play the role of customer care specialist while on the trip. They can answer questions, recommend important attractions within the destination and also serve as an interface between the customer and the service desk. They also provide information on local weather conditions, security information and driving directions. Within the travel industry, customers at the airport often experience confusion due to sudden changes in the gate and departure information. With chatbots, customers are set to constantly get updates on such changes. Finally, chatbots also make the post-trip experience a pleasurable one by helping the customer to reflect on the journey. Chatbots generate feedback forms/surveys through which the customer informs the firm of his/her experience during the trip. This can be used to improve their service delivery mechanisms.

Conclusion

In this chapter, we have examined the role of chatbots in various areas of the tourism and hospitality industry. We have also highlighted the barriers to their successful adoption. Two prominent theories in the field of management (institutional theory and organizational learning theory) have been advanced to aid in the examination of the factors influencing chatbot adoption. This is the era of chatbots. As an information intensive industry, firms that lead in its early adoption are set to experience first-mover advantage, that is, the benefit gained by being the first to launch a service. The interlinked nature of the tourism industry will subject industry laggards into undue pressures, which may not be favourable to their strategic directions at that time. So, the time to plan is now!

Since this study is conceptual, we recommend that future research consider empirically testing the relationships evinced in this study. For robust results, we recommend an intra-industry, cross-national study within the tourism sector, such as airlines, hotels/accommodations, and restaurants. Findings from such a study will both advance understanding in this emerging research stream and offer significant managerial insights. Additionally, future studies could explore consumer-level factors influencing chatbots adoption. For instance, a study that profiles customers' demographics such as age, income, status, lifestyle and education could offer some insights. Similarly, future studies could also explore if consumers are able to make any sense between the features of a mobile application and the capabilities of a chatbot. Finally, mobile applications run on mobile devices (smartphones and tablets). Per chatbots, future studies can explore how the embedding of chatbots on multiple platforms such as mobile devices, websites and messenger apps influence adoption.

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