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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

				guests applauded its ability to respond to voice and text inquiries.
		Sacarino, a hotel-based robot that provides information to guests		
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.
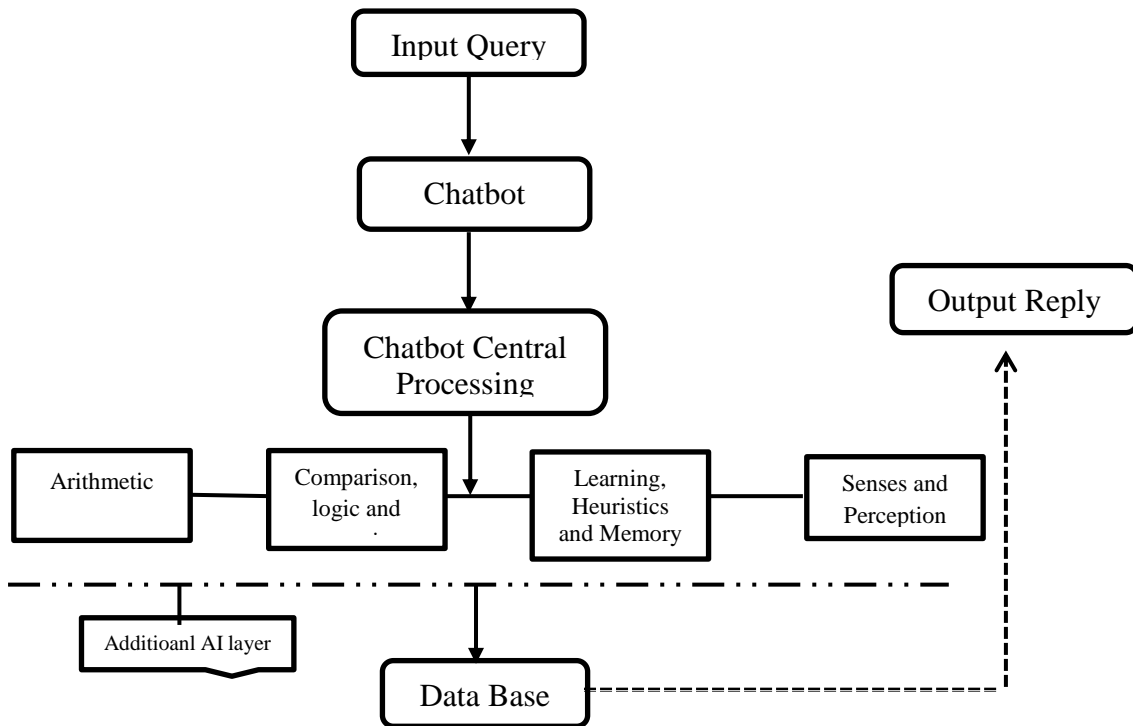
Fig. 1. Conceptual framework of tourism bot from input query to output reply

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).
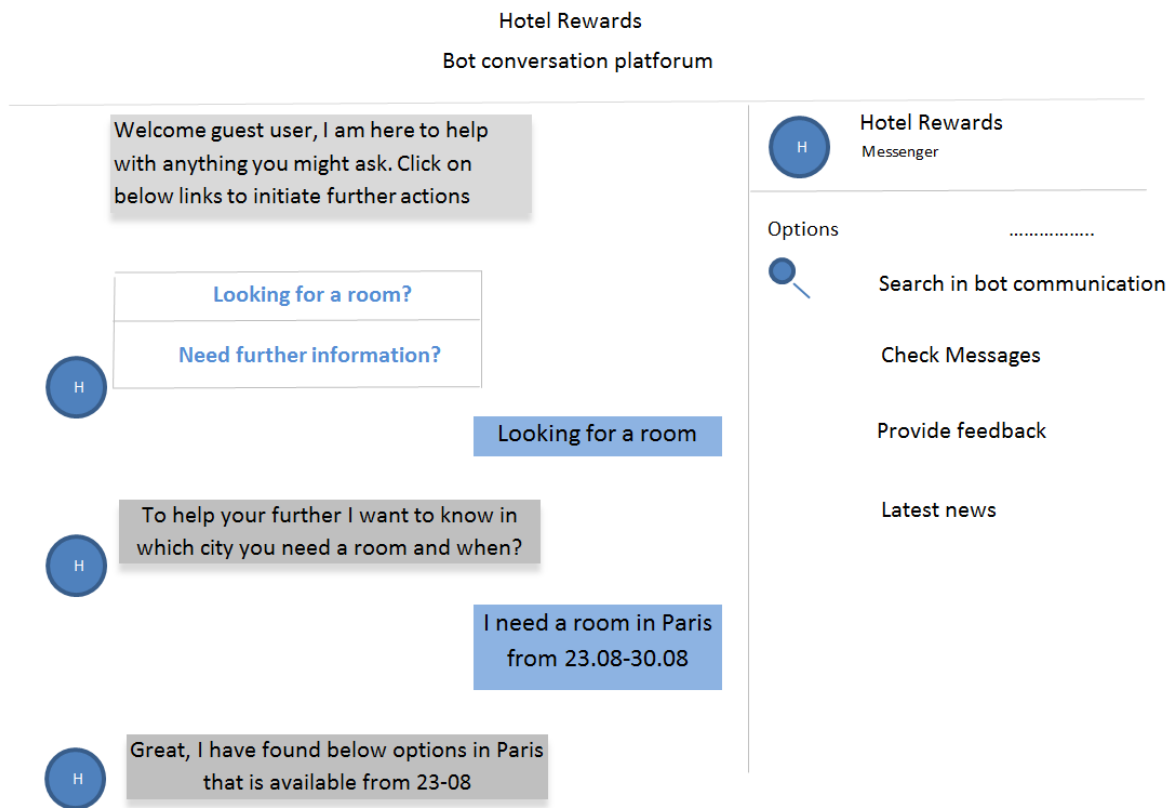
Fig. 2. Sample conversation with a hotel booking chatbot

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.
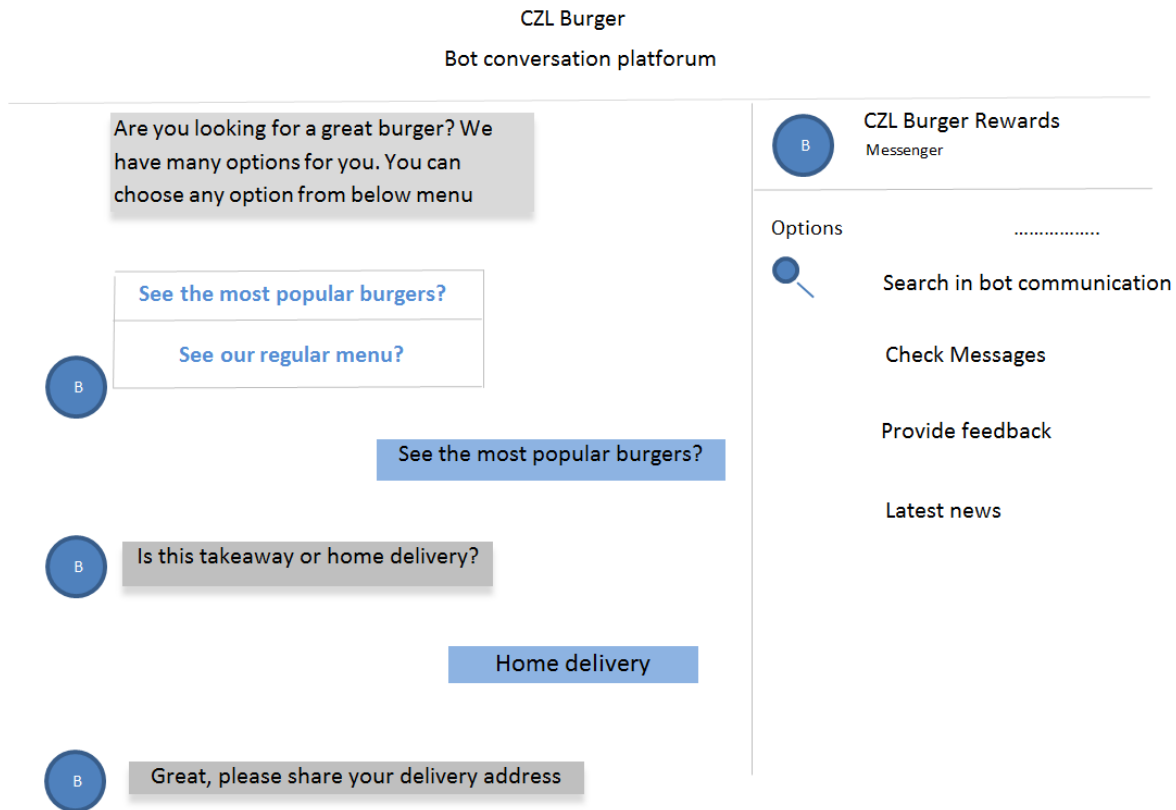
Fig. 3. Sample conversation with restaurant chatbot

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.
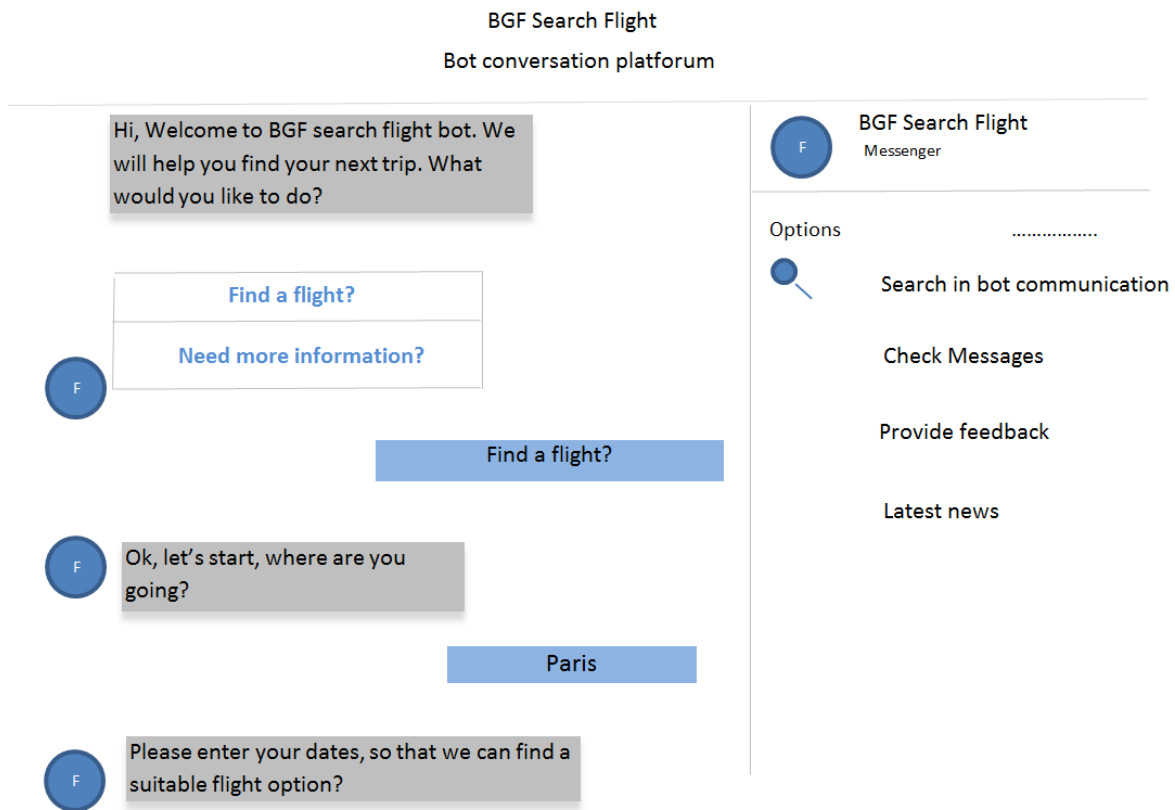
BGF Search Flight

Bot conversation platforum

Hi, Welcome to BGF search flight bot. We will help you find your next trip. What would you like to do?

Find a flight?

Need more information?

Find a flight?

Ok, let's start, where are you going?

Paris

Please enter your dates, so that we can find a suitable flight option?

BGF Search Flight
Messenger

Options ....

Search in bot communication

Check Messages

Provide feedback

Latest news

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.
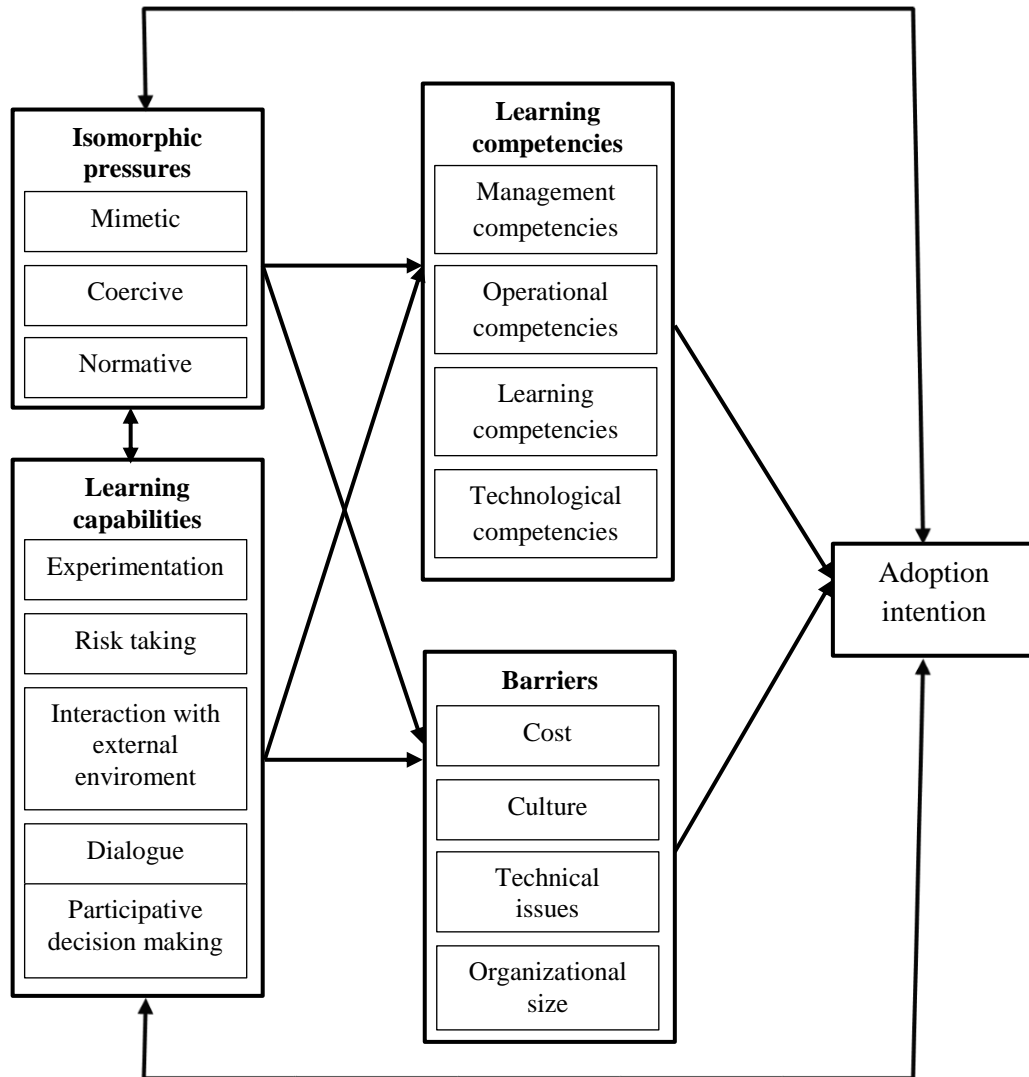
Fig. 5. Conceptual framework of chatbot adoption

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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