Virtual Assistants in Tourism

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This paper aims to review recent work in IA research and to identify future research opportunities for consumer / tourism experience. The result of this study has provided potential directions for advancing the theoretical and managerial implications for tourism research. Mobile tourism is now a field of emerging areas for developing smart applications. They become personal mobile assistants for a user to receive referral services. This paper initiates a discussion on the issue of developing intelligent tourism services.

Keywords: mobile, app, tourism, machine learning

1. Introduction

Smart phones are everywhere, holidays are booked online, and we walk around the destination with eyes attached to the screen. We are talking about intelligent cities, intelligent technologies, smart data, smart phones, intelligent destinations, smart tourism. Smart has become a trendy word for everything that's digital. We live in an intelligent age or at least we are heading towards it at a very fast pace. But what is the next step, following intelligently, where will the technology there evolve?

Oxford Dictionary defines intelligence as something that is computer-controlled, so it seems to act in a smart way. Google talks about intelligent learning or machine learning, which can be considered one of the many steps to artificial intelligence. A system that can think of a real science-fiction issue as a man, or perhaps better than a man. These intelligent systems are able to collect and analyze data in a way we can hardly imagine. They will collect data from millions of sources and devices, and their thinking will become better and better, depending on the amount of data they have at their disposal.

An automated personal assistant or smart personal assistant or smart assistant or chatbot is a software agent that can perform tasks or services on behalf of a person, based on a combination of user inputs, location knowledge, and the ability to access information from a variety of online sources, designed software to interface with people in a human way. This technology incorporates interactive voice response elements and other modern artificial intelligence projects to deliver full-featured "virtual identities" that converse with users.

Some of the best-known Virtual Assistants are Apple Siri and Microsoft Cortana, which are shipped with the operating systems and mobile platforms of these companies. However, in order not to be overcome, nuance has also produced a smart assistant called Nina, which is promoted as a customer solution.

They are used to replicate important interactions with users to help business processes to get information from large groups. Or they can be used simply as personal assistants. Search Engines

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use bots to probe the web and archive new pages for future hits. Sometimes, bots are also used for malicious purposes, such as virus transmission or artificially increasing the number of views of articles or videos on YouTube.

Presented in 2010 as an application and integrated into the iPhone as a key feature in 2011, Siri was the first voice assistant to run in the mainstream. Siri is now on hundreds of millions of iPhone and is used consistently to perform regular tasks such as sending messages, making reminders, and setting calendar schedules. However, Siri has now been overtaken by competitors, especially by Google, with a better voice recognition and a stronger search. These two benefits have made the Google assistant a superior intelligence assistant, which is now the most common case for intelligent assistants. The chart below compares the performance of intelligent assistants:

A quarter of the planet's population (27%) own a virtual AI-powered assistant, such as an Amazon Echo or Google Home, according to Clutch's new research, B2B rating site, and reviews. People use virtual assistants for simple tasks and orders, especially to play music or podcasts (66%), to set alarms or reminders (56%) and receive news, news, weather or sports (48%).
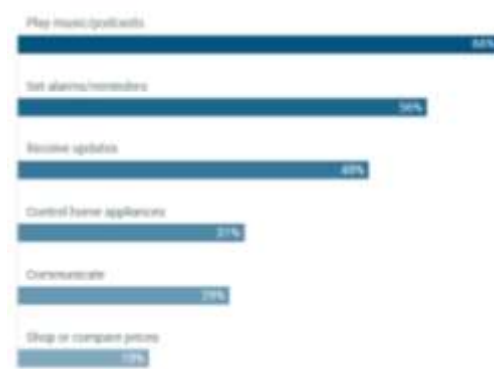

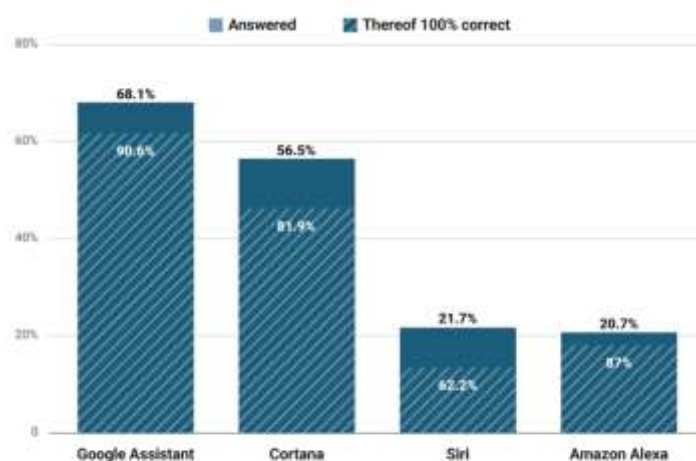Figure 1 - How people use virtual assistants [Source: Clutch]

Figure 2 –Accuracy of answers by virtual assistants
[Source: Stone temple. credit: business insider]

The greatest benefit, indicated by almost half of people (44%) of the experience of owning and using a virtual assistant, is easy access to information such as health data, notifications, and updates.

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Because most people claim that virtual assistants are useful for simple tasks, more than two-thirds (35%) claim they are not having difficulty using their virtual assistants. Connectivity is the most common challenge for experienced people (20%). As users use virtual assistants for more complex tasks, the challenges they face become more complex. Companies must optimize site content for user intent. It is therefore necessary for this content to be created to respond directly to the information that people are looking for online.

Amazon is the most popular virtual assistant brand.

Allview, the Romanian brand of smartphones and tablets, launched in 2018 AVI the first intelligent assistant, which includes an algorithm specifically developed for the voice assistant to reproduce the human voice and the Romanian language. The new Text to Speech TTS algorithm, through a machine learning robot, assists the vocal assistant in developing new and coherent links between letters and syllables, forming complex words and phrases. Reading any text in Romanian is now possible, and the voice assistant will be able to reproduce the specific tones of the Romanian language. The AVI Voice Assistant was originally launched with the basic features of a voice assistant - calling contacts, text messaging and WhatsApp, changing phone settings, or appointing appointments. Subsequently, AVI embedded personal assistant functions such as reminders, shopping lists, calendar, and general culture information.

The main goal of a smart virtual assistant is to answer the questions that users may have. This can be done in a business environment, for example, on the business website with a chat interface. On the mobile platform, as in Siri's case, intelligent virtual support is available as a ring-to-call service in which a voice asks the user "What can I do for you?" And then he answers the verbal input.

Beyond the basic utilities of a smart virtual assistant, companies are now exploring how they can be further improved. A key element of this is the involvement of adding personality; for example, some suggest that by "consolidating" the various efforts, the IT community could build more advanced virtual assistants with more developed personalities and capabilities.

2. Smart personal assistant in other industries

It is true that anything in any business we can use a smart personal assistant. And this is recommended when it comes to being productive and profitable, especially in a business. This article investigates the use of intelligent travel assistants, but we can list of industries that can use Chatbot for efficiency and profitability.

- Business Consulting - Consultancy firms rely on the support of a smart assistant because the volumes of data for providing financial advice, assisting in making decisions about the financial performance of a firm are immense.
- Law firms and legal practices - One of the things that law firms are notorious is that they have huge amounts of documents to work in short time. When you work all the clock on your watch to prepare for a big case, it may be difficult to know who to return to. A smart assistant is exactly what you need to manage your meetings and analyze large volumes of data.
- Education - If we refer to kindergartens and / or schools, there are large administrative departments dealing with repetitive tasks, such as answering questions about different courses, enrolling students, asking parents questions, tours, etc. Costs decrease considerably when such tasks are taken over by a smart assistant
- Marketing companies - In marketing, the amount of work needed to develop and implement a winning strategy is immense, and it can often be hard to know where to start. Teaching market research to a smart assistant is a great way to get to know your target markets for your customers.
- Real estate agencies- Real estate activity is one of those fast-moving industries, and if you do not keep up with the rhythm, then you will be behind. Having a smart assistant available 24 hours a day to manage your views and meetings is a great way to

make sure you never miss a chance to close a sale. It can filter out new potential customers so you can focus on where the money is.

Figure 3 –Industries that need to use a virtual assistants

3. Smart personal assistant in tourism

This article wants to show how we can plan a journey using a Chatbot. For example, you can ask for Smart Personal Intelligence to pinpoint the arguments and drawbacks of destinations you have in mind, and provide a general overview of your pictures or videos. It will also be possible to visit the destination before by virtue of virtual reality. This virtual reality may even be a real-time environment where a robot is your virtual identity. Or, ask your smart assistant to recommend a few destinations based on your travel behavior, tourist trends, news, reviews, and all other possible data sources. You can decide for yourself how much assistance you want from this smart assistant. You can do things traditionally, or you can let the assistant do everything for you.

When you have chosen your destination, you must book the flights and all other means of transportation, accommodation and activities that you want to enjoy at your destination. You can ask the smart assistant to do all the information searches. You do not have to go through a large number of hotels, look for the best flight offer, you do not have to think about the combination of flight, train and bus that will take you to your destination with enough time for change. The smart assistant does that for you. At some point the technology will be so advanced that you will have confidence in the system to make the best possible choices. Also, you will instantly reserve everything you want, no need to go through the variety of self-reservation engines.

During the trip, the assistant will always provide you with relevant information about your location and interests. You can access this information through glasses, bionic eye implants, hearing aids or even directly in the brain. You will not lose, your money or your information can not be robbed, your assistant will warn you of possible cheats, can automatically send you information to your nearest hospital or police station, recommend restaurants and guide you, assembly. Your assistant will communicate with hotel assistants, robot or taxi buses, museums, or any other object with built-in intelligence to ensure that all your preferences are environmentally friendly.

For a tourist destination or company, this means that all tourist products and services must be online and in a sort of reservation platform. Intelligent assistants can use all booking systems in every language, so it's enough for a company to have an online booking or booking option in any imaginable channel; the assistant will find him if he exists. We do not need portals, consumer sites, online travel agencies, or even traditional travel agencies when Chatbots can do all the small and big tasks for us with speed and accuracy that we cannot dream of right now. Intelligent agents will help companies find reviews and comments they have to respond to, help them produce content for other assistants, help them build and maintain their online presence, and talk with their assistants to find the best ways to improve tourism experience.

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You can give your wizard commands by voice, virtual keyboard, eye and hand movement. All these intelligent systems will discuss with each other, or even it could be, that everything is, in fact, part of the same system. You will have a lot of control over all the data that is connected to you and you can decide how much you divide, and even the compensation you want for your information.
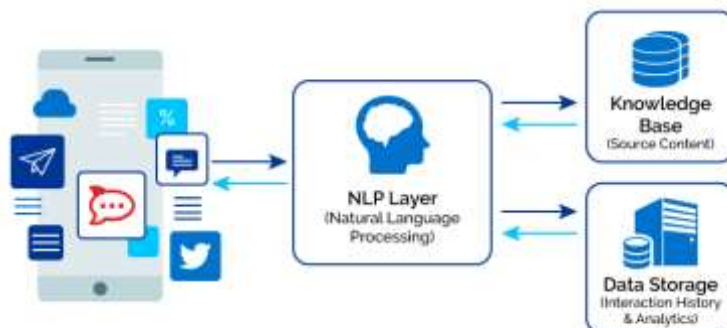

Figure 4 – Basic Architecture [Source: 4]

The first level is represented by any messaging platform: Facebook, Twitter, Slack, etc. The same principle applies to Amazon Alexa or Google Assistant or to any other consumer of webpages. The client connects to the bot either through a text channel or through a voice channel. In the case of voice option, there are two internal levels that deal with speech recognition and its transformation into input text and speech synthesis for responses. The NLP (Natural Language Processing) component helps to extract the purpose of the discussion and entities from the user request. The NLP component consists of a supervised intentional classification model that is trained on a plurality of input sentences and the purpose of the target discussion, and an entity extraction model that can be pre-trained similarly to the Spacy model. It can be trained using probabilistic models such as CRF (conditional random fields). The NLG (Natural Language Generator) component produces bot responses. The easiest way to get this is by using a template mechanism. A more complicated method is the use of profiling generators through deep learning.

The main components of a chatbot are:

Dialog management component

It is one of the most important components in the architecture of a chatbot. It is responsible for a number of issues:

- is the one that confirms the user that you understand what he just said. This makes a bot seem involved and gives the feeling that the bot knows what he is doing.
- is the one that fill in missing information: When a user asks for something, the bot may not have enough information from the user to process the request. The solution is to ask the user for this information. So instead of deciding where the user's intention was, the system recognizes that some entities must be present. If the entities are not present, the bot must interrogate the user about these entities until it has all the necessary information. Each purpose of the discussion is a template / pattern that has or does not require certain positions to be complemented with information.
- configures the context of the conversation -In the discussion with a user, all sorts of information must be collected and managed. This is the context of the conversation. The context is built during user interaction and contains all the long-term and short-term information needed for managing the conversation.
- sets goals after the presence or lack of initiative. When two people communicate, one of them has the initiative. When does anyone have an initiative? Depending on intent, a user

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may signal that he wants to take the initiative. Then a bot can decide whether to leave the initiative of the other dialogue partner or take the initiative. The purpose of the discussion can be categorized by the presence or absence of the initiative.

- Change the context: As the user does not have a predictable way to communicate, it is normal for a conversation to merge with the next without the first conversation being completed. People do this frequently and expect a bot to do the same.

Training component

A chatbot must be created and trained on a data set. There are several ways to train them on bots:

- Data collection through all input channels. There are some internal data sources that can be used: customer service records or support service documentation.
- Assemble real-time analytical data. Monitor interactions to turn them into more relevant bot responses.
- Training for understanding semantics. This allows developers to understand how they can get better results, seeing what is not working and aligning the scope of input data.
- Training to be more personal. A chatbot will interact with many people. The response must be tailored to the transaction's specificity, whether positive or negative. For example, we can train the data to meet the needs of the different groups in a satisfactory and productive manner.
- Training to make it clearer. If that is the case, then the data is trained to correctly identify the goals.
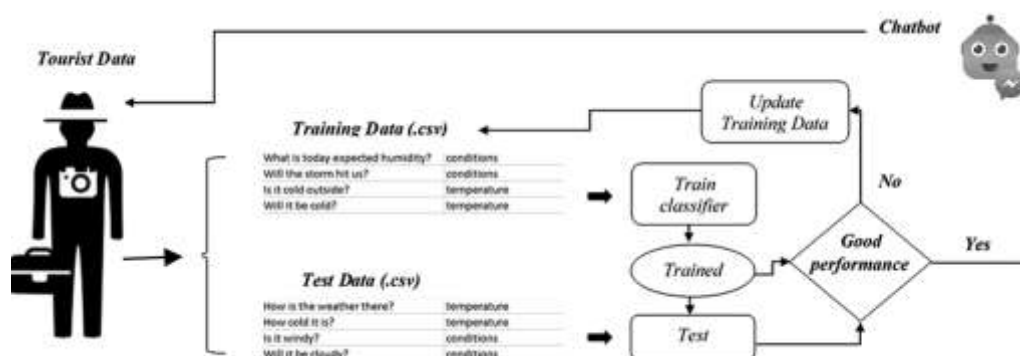

Figure 5 – Training component

In tourism, the use of these intelligent assistants concerns the following sides

- The use of predictive analytical data and deep customization to optimize prices is another important side. Thus a hotel may have a surplus of rooms available due to a last-minute cancellation (a flight is canceled). To remedy this situation, the AI could reduce the price and promote this special price among locals.
- Some hotels create chatbot to check if a hotel is available. If customers have completed their booking, a chatbot can then send custom content links such as articles about top restaurants in the area, tourist guides, or other local exploration opportunities. Once booked, a shoe can allow customers to check in, request room service, order from the restaurant, and after check-out will collect feedback or ask them where they want to travel. The key to success lies in assuming customer experience from start to finish and maintaining the open communication channel!
- One of the major challenges of the hotel industry is the differentiation of competition. Personalization changes this. Hotels will be able to offer unique personalized packages based

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on the person's interests, including multiple activities in one package as the client himself would do. By offering personalized packages, hotels no longer have to be competitive at the price level.

- Hotels start using algorithms of the next-product-to-buy type. These algorithms can analyze historical data to determine, for example, whether a customer prefers coffee in the morning, whether he / she takes his spouse on travel, and then using the location of the person's mobile phone to give a buy-one-receive - free when the customer enters the hotel's café in the morning. Moreover, there are other opportunities to enchant the client by sending him a pre-ordered dinner in the room when the client enters the lobby, or by letting the cleaning staff know that a room is available for cleaning as soon as the customer leaves.

- Hotels have begun to use such bots that can provide an extraordinary customer experience that can suggest places of interest and that can make things happen by chat or voice. Because the system maintains the status, you can start the conversation on a channel (messenger, for example) and continue on another channel (email, Echo) without repeating it.

4. **Conclusion**

Chatbots are a new business frontier, but as any innovation, especially if applied to financial transactions, it has to guard users and business on security issues. However, as long as the fundamental principles of security - processes, individuals and technology - are successfully applied, chatbots can be an important component of the strategy of an organization that wants to place the customer at the heart of its interests. Chatbots can be secured using similar mobile phone methods. Analytical behavioral data, biometric data are only a few of the modern technologies that attempt to solve the problem of authentication or encryption, important topics for a chatbot's security. If we consider the authentication issue, the user's identity is verified by security credentials, such as usernames or passwords, that are offered in exchange for an authentication token used continuously to verify the identity of the user. With chatbots, we also use other mechanisms to identify the user. For example, after you register your Facebook account may be your userID.

Additional security measures such as double authentication, where a user checks their identity through two different channels or where biometric authentication uses fingerprint identification and retrieval scanning, can all provide additional security. For maximum security, chatbot communication should be encrypted. This is especially important in highly regulated industries such as health or finances handling personal information.

Chatbots are a new technology with enormous potential for sales, marketing and customer service. When launching a chatbot, organizations should resolve security risks by applying valid principles to other environments in areas of interest such as processes, individuals, and technology. By providing good practices in these areas, businesses can benefit from the potential of a chatbot.

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