e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:05/May-2023 Impact Factor- 7.868 www.irjmets.com

THE VOICE ASSISTANT'S SYSTEMETIC LITERATURE REVIEW

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ABSTRACT

Voice assistants (VAs) like Siri, Alexa, Google Assistant, Cortana, and Bixby are becoming more and more common among the general public. Voice assistants (VA) have a significant impact on how people carry out jobs, use services, and engage with organizations. Therefore, they have a great deal of economic and social potential. This article serves as a systematic review of the voice assistant (VA) literature. The definition of the voice assistant, a novel way of interaction, is based on developments in specialized systems, speech recognition, semantic webs, diagnostic tools, and natural language processing.On this subject, there is currently a wealth of literature. To the best of our knowledge, the most recent research in this field is not yet available. In light of this, we present a field survey in this paper that highlights key trends, problem areas, and opportunities for voice assistants. Another contribution is the idea for a voice assistant categorization taxonomy. To accomplish these objectives, a methodical literature review with a PICOC (population requirements, action, contrast, outcomes, and meaning) focus was conducted. In order to increase the likelihood of discovering highly pertinent papers from more than 1250 scientific articles published in the recent six years, we searched a collection of databases. The investigation determined open questions and challenges and chose the 131 most significant papers. In the paper, we discuss the present state, usage, security and privacy issues, fashion trends, and voice assistant architectures.

Keyword: Voice Assistant, Artificial Intelligent, Alexa, Google Assistant, Siri

I. INTRODUCTION

Voice interaction with electronics is a routine chore for many people nowadays. Voice assistants like Amazon Alexa, Microsoft Cortana, Google Assistant, or Apple Siri enable users to organize meetings or make hands-free calls outside of their homes without having to think about many topics. Since the advent of the voice assistant in the 1990s, a number of research publications have been published on the topic, including various surveys. Azvine, Djian, Tsui, and Wogcke (2000) provide a general review of the voice assistant type, the device, and the user interface. Pokojski (2004) discusses the fundamentals of voice assistant software, along with suggestions for a specific methodology and information-based solutions. The authors draw the conclusion that creating software for a universal smart personal assistant is not very simple. To comprehend the design, architecture, and implementation of the framework, another paper (Ricky & Gulo, 2015) compares personal support staff. Finally, Costa, Novais, and Julian (2018) examine cognitive assistants, a subset of IPAs built on all-purpose platforms. The page summaries current issues and lists new projects. And talk about how technology helps elderly persons with impairments or long-term illnesses. By examining all the papers found in this research, no one presented a comprehensive literature evaluation to determine the many major areas of voice assistant research. According to Bugden and Brereton (2006), systematic reviews are a means to identify, assess, and interpret all available research relevant to a certain research subject or field. Due to the fact that it highlights critical applications, technology-based solutions, software architecture issues and open questions, as well as voice assistant opportunities, a work of this kind is crucial in many domains, including artificial intelligence, expert systems, cognitive and conversational agents, and many others. Therefore, the current work uses this methodology to discuss ideas and important findings related to voice assistants. However, as indicated in other works (Rattan, Bhatia, & Singhm 2013; Roehrs, da Costa, Righi & de Oliveira, 2017), the systemic reviews literature research has some limitations as a result of the increased methodological rigor.

II. METHODOLOGIES

1. Material And Procedure

In order to provide a thorough overview of the voice assistant research field, to summaries the voice assistant technology without engaging in an in-depth analysis or synthesis, and to pinpoint interesting research prospects, this paper conducts a systematic literature review. For the planning and implementation of structural mapping studies, we have utilized generally acknowledged guidelines (Biochini, Gomes Mian,

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Candeda, Natali, & Travassos, 2005; Kitchenham & Charters, 2007; Petticrew & Roberts, 2006; Roberts stal, 2017).

The hierarchical approach of literature review was presented through the following activities:

1.Planning the review;

2. Investigation of research questions.

3. Definition of both data source and data collection strategy;

4. Definition of additional data collection sources;

5. Description of the search criteria for selection and studies;

6. Description of parameters for inclusion and exclusion to evaluate the studies;

7. Definition of the selected studies quality assessment;

8. Comparison between the study and selected studies.

III. MODELING AND ANALYSIS

The following parts explain how this study mapping method has been performed.

The most important component of any systematic analysis is the research questions (Kitchenham & Charaters, 2007). We work hard to identify and adapt the existing voice assistant literature depending on new features, issues, challenges, solutions, and research trends. The study's generic questions were narrowed down to specific issues for the suggested structural analysis in order to more accurately identify and analyze subjects. The research issues and prospective research directions for additional investigation are the broader perspectives of the voice assistant.

RQ-1 what are the key features of commercial solution for voice assistant?

The goal of the query was to specify a voice assistant solution profile for the business. There have been discovered and tested 3-0 works.Lopex, Quesada, and Guerrero (2018) examined the naturalness, mood, intonation, and rhythm of an assistant's voice while analyzing significant business platforms. He also measured eye contact. Moore (2016, Orehovaafter, Babi, and Etinger (2018) all addressed the gap between the voice assistant application's capabilities, expectations, and features. Researchers Cowan et al. (2017) and Kiseleva et al. (2016b) have been investigating how mobile devices can access IPA. 11.8 percent of studies discovered the employment of personal assistants in video games.Even though games have strong visual and auditory appeal, Ciccin and Quesada (2018) employed Alexa in this way to allow persons with visual impairments to play games. The emphasis in games is not on voice input, but rather on music and sound effects. Additionally, Kobayashi et al. (2015) suggested using Siri voice instructions to improve player interaction across a network. Allen et al. (2018) have used Google Echo to connect with autistic children, which is an important aspect of healthcare. A Google Glass-based system was proposed by Jalainiyan and Pederson (2015) to help orthopedic surgeons. The article by Nogueira et al. For user data saved, accessible, and shared by Apple, Google, and Microsoft platforms (Soros et al. 2013), (2017) has suggested using Google Glass to construct a bike collaborative training programmed.

Rq2- what are the area that provide opportunities to voice assistant application?

We have discovered a market for voice assistant applications based on their quote. According to the articles categorized under the category of education, students studying a second language would be given a focus on games and sports (Kobayashi, Tanio, & Sassano, 2015), a framework for audio games (Ciccio & Quesada, 2018), outdoor gaming (Vpra el A1, 2014), and a bicycle. Sport-related papers will help them in this regard (Todoorov et al., 2016; Zhu et al., 2014). The most referenced studies focus on storing and processing consumer vital signs (Angelini et al., 2013; Santos et al., 2016) and suggest treatments (Allen et al., 2018; Silv et al., 2017), as projected by the health sector. The same is true for the privacy and usability fields, where the majority of research focuses on improving user experiences (Kiseleva et al., 2016b), comprehending how voice assistants are used, and providing clarification on their use (Cowan et al., 2017; Graus el A1., 2016; Heieh & Buehrer, 2014; Porcheron, Fischer & Sharples, 2017 and 2015; Nogueira el a1., 2017). The aim of infrastructure work is assisted discussion and choice (Heredero, Penmetsa, Agrawal, & Shastri, 2013; Hauswald el a1., 2016; 2015). Numerous general studies have focused on voice assistants, stressing their comprehensible issues (Bellegarda,

2013; 2014; Moore, 2016), as well as more recent publications that have proposed assistants (Misra & Such, 2017; Vinothinietal, 2017).

RQ3- what is the current personal assistant's usuage?

Speech conversation interfaces draw heavily from a wide range of articles exploring contextual social problems (Cowan et al., 2017, Dubiel et al., 2018, Moorthy & Vu, 2014; Shneiderman, 2000). According to certain research (Han & Yang, 2018; Moorthy and Vu, 2014; 2015), it is more likely that people will be able to convey non-private information via voice assistants in private settings. Additionally, they will contact with voice agents in public places to get non-private information via a mobile keypad rather than a voice assistant since they consider this may be socially unacceptable. Additionally, a more recent study (Bubilel el A1., 2018) has supported this information. According to the author, using voice assistants more frequently does not necessarily result in less privacy concerns. Users find it annoying when the assistant asks them to tap the screen to confirm or select alternatives rather than speaking, according to Cowan el a1.Most users currently utilize their voice assistants for routine tasks like searching, checking the weather, and playing music. Other studies (Cowan et al., 2017; Dubiel et al., 2018) demonstrate that users frequently mention a potential correlation between user satisfaction and the frequency of voice assistant use. Speech recognition is actually one of the main worries for users of uncommon voice assistants, despite the fact that their impression and expectations of their assistants are identical for both ordinary and unique users (Dubiel et al., 2018).

IV. CONCLUSION

An organized review of the existing literature has been suggested for the current study in order to pinpoint many crucial topics for research on intelligent personal assistants. In order to achieve this, we have conducted a methodical examination of the relevant papers during the last six years. Then, we recommend a taxonomy of a personal employee that includes various voice assistant and door types. The taxonomy and review outcome allowed for the specification of broad responses and inquiries regarding current affairs.

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