



The Voice Assistants that connect you to your Library, whether it is Alexa, Google, or Siri

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Voice assistants are a revolutionary technology that has changed how we interact with our devices. It enables users to use their voice to control their devices and access information, entertainment, and services. Voice assistants provide a hands-free, convenient, intuitive way to interact with technology. This paper describes how Voice Assistants, such as Alexa, Google Assistant, and Siri, are becoming increasingly popular in libraries. Voice assistants are being used in libraries to increase access to library materials. By accessing the library catalogue, voice assistants can help users find and reserve books and other materials. It can even provide recommendations based on a user's past selections and personal preferences. Furthermore, by providing hands-free access to library materials, voice assistants can save librarians time and energy by eliminating the need for face-to-face interactions with customers. In this paper, the authors also discussed how it is essential to consider Voice Assistants' strengths, weaknesses, opportunities, and threats (SWOT).

Keywords: Libraries; Voice assistants, SWOT analysis, Amazon Alexa, Google Assistant, Apple Siri.

Introduction

Voice assistants are becoming increasingly popular in our everyday lives. They are computer programs designed to recognize human voices, understand requests, and provide a response. These assistants often control devices like smartphones, tablets, smart TVs, and voice-activated speakers. They can also be used to search the internet, control home appliances, and even automate tasks. With advances in artificial intelligence and natural language processing, voice assistants are becoming more sophisticated. As a result, these assistants can now understand complex queries, recognize accents, and even respond to natural conversations. This means that users can interact with the assistant more naturally, making it easier and more enjoyable. This makes users more efficient in completing tasks and enhances customer experience. As a result, voice assistants are becoming increasingly popular and adopted by many businesses.

This article overviews the technology behind voice assistants and how Alexa, Google Assistant, and Siri will work. It further explores the innovative uses of such technology in libraries.

Review of Literature

There is a lack of research on voice assistant

technology in libraries, but a few articles provide a general overview. According to the American Library Association's Center for the Future of Libraries¹, voice assistant technology will be an integral part of libraries in the future. By incorporating these technologies into their regular information services by creating specialized uses for them, libraries can integrate these technologies into their regular information services by utilizing voice assistants. Alexa refers to skills and Google Assistant actions. Furthermore, most public libraries already use third-party vendors like Overdrive (for lending e-books) and Hoopla (for lending multimedia), which Amazon's Alexa can access through their websites. As far as integrating voice assistants into libraries is concerned, it is possible to do so in many creative and practical ways. For example, music and effects can be used to enhance read-along², services can be made more accessible for elderly or disabled patrons, and library events can be requested conveniently³ via a convenient search feature².

In recent years, libraries have experimented with voice assistants. Iowa State University, for instance, has developed Alexa skills for its library so that its users can access information about its collection and history⁴. To engage their communities, the Spokane

Public Library, as strategy to engage their patrons, use Amazon Echo Dots in their library to assist patrons with questions regarding upcoming bond elections⁴, which directly impacts library funding. Worthington Libraries (Ohio) incorporated voice assistant technologies into technology training and a "petting zoo kit" for patrons to try out the latest technologies³. King County Library System (Washington) is taking a novel approach to developing its voice assistant, LIBRO⁵. As libraries seek to offer voice assistant technology services, they explore various creative approaches and applications.

How Smart Are Voice Assistants?

Intelligent voice assistants are becoming increasingly popular as technology advances. With the emergence of virtual assistants like Amazon Alexa, Apple's Siri, and Google's Assistant, it is clear that these digital helpers are becoming deeply embedded in our everyday lives. But just how intelligent are these voice assistants?

To understand the intelligence of voice assistants, looking at the AI technology that powers them is essential. AI is the process of teaching machines to think and act like humans. AI software is used to give voice assistants the ability to understand and respond to human language. AI also allows voice assistants to use natural language processing (NLP) to analyze and understand the context of conversations. Voice assistants can also use machine learning to become more intelligent over time. Voice assistants can learn and adjust their responses by utilizing data collected from conversations and interactions. This means that voice assistants can become more accurate and helpful with each exchange.

Voice assistants have become an increasingly popular tool in recent years, providing users with an easy and convenient way to access information and services. As such, voice assistants must support a range of languages to ensure that as many users as possible can benefit from the technology. Language support for voice assistants is becoming increasingly sophisticated, with many assistants recognizing different accents and dialects and providing accurate translations. This enables users

of other languages to use the same assistant, making the technology accessible to an even wider audience. In addition to providing support for multiple languages, voice assistants are beginning to offer language learning and practice.

Voice assistants such as Amazon Alexa, Apple's Siri, and Google's Assistant have become increasingly popular in recent years⁶ due to their ability to understand and respond to languages other than English.

As shown in Table 1, these AI-powered assistants can understand different languages, allowing users to communicate more effectively with their devices. Alexa, for instance, can understand Spanish, French, and German, while Google's Assistant can converse in over 30 languages. On the other hand, Siri is currently limited to English, Spanish, French, German, Italian, and Japanese. With the introduction of these voice assistants, users no longer have to worry about language barriers or difficulties in understanding the device's commands. This has made it much easier to use voice assistants regardless of language or location. This has resulted in an exponential increase in the number of people using these devices and has opened up new possibilities for businesses to reach a wider audience. Furthermore, it has provided the opportunity for people to access information and services that were previously unavailable due to language barriers.

How Voice Assistant Technology Works

Voice assistant technology is a revolutionary form of artificial intelligence (AI) that provides a hands-free way to interact with digital devices. It is driven by speech recognition and natural language processing (NLP) technologies. Voice assistants are used for various tasks, including playing music, setting reminders, giving weather updates, and answering questions. Voice assistants use speech recognition to interpret the user's spoken words and convert them into a format the computer can understand. This process is known as Automatic Speech Recognition (ASR). The computer then uses natural language processing (NLP) to process the

Table 1 — Languages Supported by Voice Assistants

Voice Assistant	Languages support
Amazon Alexa	Portuguese, Spanish, French, Italian, Hindi, German, Japanese, English
Apple's Siri	Japanese, Turkish, Malay, Finnish, Cantonese, Swedish, Spanish, English, Hebrew, Italian, Norwegian, French, Mandarin, Korean, Thai, German, Russian, Danish, Portuguese, Dutch, and Arabic.
Google Assistant	English, Danish, Italian, Norwegian, Hindi, Dutch, Korean, French, Japanese, Swedish, German, Spanish.

user's spoken input and determine the user's intent. This process involves analyzing the context of the user's words and interpreting the meaning of the words. Once the user's goal is determined, the voice assistant will perform the desired action. This process is known as Natural Language Generation (NLG). It involves the voice assistant generating a response in natural-sounding language. This response may be a verbal answer to a question, a confirmation that a task has been completed, or a prompt for further user input. Voice assistants use various technologies to understand and respond to user input. These technologies include machine learning, text-to-speech (TTS), and natural language understanding (NLU) algorithms. Machine learning algorithms improve speech recognition accuracy and natural language processing. Text-to-speech algorithms are used to generate synthetic speech, while natural language understanding algorithms are used to interpret the user's intent. The functional spectrum describes these

Voice assistant technology has revolutionized the way we interact with digital devices. Using natural language processing and speech recognition technologies, voice assistants can understand and respond to user input with unprecedented accuracy. As shown in Figure 1 from Olson & Kemery's Voice report⁶, the functional spectrum of these technologies is broad and evolving. They are becoming increasingly popular, and their applications only increase as technology advances.

Voice Assistants at the Library

The library is a hub of knowledge and information, and it is essential to have easy access to these resources. Using voice assistants at the library is a great way to access the vast information available quickly. Libraries

are a great place to use voice assistants, as they provide access to knowledge and resources. Using voice assistants, library patrons can easily search for books, access resources, and receive recommendations as shown in Figure 2. Voice assistants can be used to help patrons find information quickly and easily. For example, a patron can ask the voice assistant for information about a particular book or topic, and the assistant will search library databases to find the answer. Voice assistants can also help patrons find books on specific issues and even provide recommendations for other books related to their search. In addition to helping patrons find information, voice assistants can improve library services. For example, a library can use a voice assistant to help patrons check out items from the library or to provide information about library programs and services. Voice assistants can even help patrons with research, allowing them to quickly and easily access resources from a library's digital collection.

Finally, voice assistants can create a more interactive library experience. For example, libraries



Figure 2 — Interacting with a Google Home smart speaker at North Salem (New York) Middle School and High School⁵.

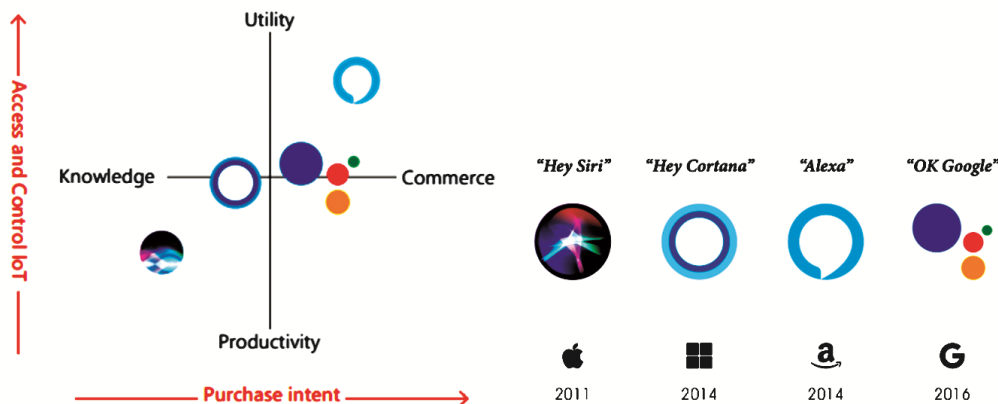


Figure 1 — Functional spectrum (Olson, 2019) of voice assistants

can use voice assistants to provide patrons with tutorials on using the library's services or audio tours of the library. Libraries can also use voice assistants to provide patrons with customized recommendations based on their interests and preferences. Voice assistants are an invaluable tool for libraries, providing patrons with easy access to information and resources. By using voice assistants, libraries can offer a more efficient and personalized experience for their patrons while also helping to promote their services and resources.

Alexa Skills at the Library

Alexa is a voice assistant developed by Amazon, making it easier than ever to stay connected with the world around us. Alexa is accessible through Amazon's Echo line of products, as shown in Figure 3, and many third-party devices. Alexa can understand and respond to verbal requests, allowing users to quickly access information, control smart home devices, manage calendars, and more. Alexa also serves as a music streaming service and can order products through Amazon. Alexa provides a unique, personalized experience that is constantly learning and evolving to meet the needs of its users better. Alexa is changing how we interact with technology, making it easier and more natural than ever.

The library is great for finding books and other leisure, learning, and research materials. But it's also a great place to find the latest in technology. The library is also great for discovering new voice assistants like Alexa. With Alexa, library patrons can access library resources from the comfort of their own homes. In the library, Alexa is capable of performing a variety of tasks. Alexa can search for books, magazines, and other library materials and provide information about

library events, services, and hours. Alexa can also provide essential reference assistance, such as definitions, directions, or explanations of library policies. With Alexa, patrons can access their library accounts to check due dates or renew items.

Alexa can also help library patrons discover new books and materials. Alexa can provide personalized recommendations based on a patron's previous searches and information on what's new in the library. In addition to providing library patrons access to resources, Alexa can help librarians manage their collections. Alexa can provide real-time updates on library materials, such as which books have been checked out and returned. Alexa can also help library staff monitor the usage of library resources, such as tracking how many times a book has been checked out or how many people have visited the library in a month. Alexa is transforming the way people interact with libraries. With Alexa, patrons can access library materials, get personalized recommendations, and help library staff manage their collections. Alexa is the perfect assistant for all kinds of libraries.

Google Assistant at the Library

As shown in Figure 4, Google Assistant dot is a voice assistant developed by Google that allows users to interact with services and applications via voice commands. It was first released on May 18, 2016, as part of Google's messaging app Allo and has since



Figure 3 — Amazon Alexa dots



Figure 4 — Google Assistant dot

become available on multiple platforms, including Android, iOS, and web browsers. Google Assistant is powered by a natural language processing system, which enables it to understand and respond to users' questions and requests. It can answer questions, perform tasks, control smart home devices, and more. Google Assistant also supports multiple languages so users can communicate in their native language. Google Assistant is available on various devices, including smartphones, smart speakers, and other home automation products. It can control connected home devices, set reminders, play music, and look up information. It can also control services like YouTube and Netflix, allowing users to search for and play content quickly. Google Assistant also has an open platform, allowing developers to create and integrate their services and applications into the system. This will enable users to access services like Spotify and Uber or use third-party applications like Google Maps and Yelp.

Google Assistant is quickly becoming an invaluable tool for library patrons to access information. With its voice recognition and natural language processing capabilities, Google Assistant can help patrons rapidly and easily find their needed resources. At the library, patrons will be able to ask Google Assistant to help them with a variety of tasks. From finding books to accessing databases to finding library events and programs, Google Assistant can provide the information patrons need. Google Assistant can also answer questions about library services, suggest books tailored to patrons' interests, and provide personalized recommendations. Patrons can access this helpful service through the library's website and devices. The library is excited to offer this service and looks forward to providing patrons with an easy and convenient way to access information. Google Assistant will be a valuable addition to the library, allowing patrons to quickly and easily find the information they need. Patrons can also use Google Assistant to get directions to the library, find out when the library is open, and even ask for specific library services. Google Assistant can answer with detailed information about library services and programs, so patrons will know exactly where to go for help.

Apple Siri at the Library

Siri is a voice assistant developed by Apple and launched in October 2011. It allows users to interact with their Apple devices using natural language voice commands. Siri is available on iPhone, iPad, Apple



Figure 5 — Apple Siri HomePod

Watch, Apple HomePod as shown in Figure 5, and Mac. Siri is designed to understand and respond to questions and perform tasks such as setting reminders, playing music, searching the web, and more. Various machine learning technologies power it, including deep learning, natural language processing, and artificial intelligence. Because of its intelligent capabilities, Siri has become an invaluable personal assistant for millions of users. It is even capable of understanding context and anticipating user needs. For example, if a user asks, “What’s the weather like outside?” Siri can give an accurate forecast based on the user’s current location. Siri is constantly evolving and gaining new capabilities. Apple is continually adding new features and improving its accuracy and understanding of natural language. With its ever-expanding capabilities, Siri will remain a popular voice assistant for years.

Siri will be a great asset to libraries everywhere. With the help of Siri, library patrons will be able to access information more quickly and easily. Through voice commands, patrons can find print and digital resources rapidly and efficiently.

Siri can help patrons by providing detailed information about books and other library materials. It can search the library catalogue with keywords, titles, or authors to find the exact item a patron wants. Siri can also provide more detailed information, such as the location of an item, the availability of an item, and other relevant information. Siri can also remind library patrons of upcoming due dates and help them

place holds on materials. Library staff can also use Siri to quickly identify items in the library, increasing efficiency and accuracy.

Siri can also help library staff with administrative tasks. It can track overdue items, check in and check out materials, and provide patrons with timely reminders about due dates and other important information. In addition, Siri can provide library staff with relevant statistics about library usage and help them to identify trends in library usage. Siri can also suggest books and materials to library patrons based on their interests and previous borrowing habits. This can help libraries increase the number of patrons, as well as provide an easy way for patrons to find materials that are of interest to them. Siri can also help library staff with tasks such as cataloguing, sorting, and organizing library materials, saving them time and effort. Additionally, Siri can monitor library usage and identify areas for improvement.

Which voice assistant is suitable for libraries?

Regarding libraries, there are three main voice assistants: Alexa, Google Assistant, and Siri.

Alexa is an excellent choice for library use because it can quickly access many library resources. Alexa can access audiobooks, e-books, articles, and more. Alexa can also search the library's catalogue for books, DVDs, and other materials. In addition, Alexa has an array of skills that can be used to access library resources, such as the ability to request library materials, search for events and programs, and receive customized recommendations.

Google Assistant is another excellent option for libraries. It has a vast array of features that make it ideal for library use. Google Assistant can access library materials, search for events, and even provide research assistance. It can also be used to access library databases and catalogues. In addition, Google Assistant has a wide range of skills and features that can be used to access library resources, such as the ability to request library materials and receive customized recommendations. Finally, Siri is also an excellent choice for library use. It can access library materials, search for events, and even provide research assistance. It also has a wide range of skills and features that can be used to access library resources, such as the ability to request library materials, search for events and programs, and receive customized recommendations. Overall, all three voice assistants offer great features and capabilities for

library use. Each has strengths and weaknesses that make it better or worse for library use, depending on the library's needs and preferences.

SWOT analysis of implementing Voice Assistants at academic libraries

Academic libraries increasingly turn to voice assistant technology to enhance user experience. To determine whether this is the right move for a library, it is essential to understand such an implementation's strengths, weaknesses, opportunities, and threats (SWOT).

Strengths: Voice assistant technology offers several advantages to academic libraries. First, it allows users to quickly and easily access library resources, eliminating the need to search through long lists of options or complex menus. Second, it enables users to access content and services on the go, as long as they have a device with an internet connection. Third, it is increasingly becoming an accepted and expected part of the user experience, meaning that libraries that do not offer this technology may be at a disadvantage.

Weaknesses: Voice assistant technology may also present some challenges. One of the most significant is the cost of implementation; voice assistant technology requires substantial up-front and ongoing expenses. Additionally, the technology still needs to be perfect, and ensuring that the system is always accurate and effective can be difficult. Finally, since the technology is relatively new, user experience and expectations may still need to be fully understood, and there may be a learning curve for both library staff and users.

Opportunities: Implementing voice assistant technology presents several opportunities for academic libraries. First, it can help libraries increase user engagement, as users are more likely to interact with the system if it is easy to use and intuitive. Second, it can help libraries reduce costs by leveraging the technology to automate specific tasks and processes. Finally, it can help libraries stay ahead of the competition, as other libraries may still need to take advantage of the technology.

Threats: There are also several potential threats to consider. One is the possibility of privacy and security breaches, as voice assistant technology can be vulnerable to malicious actors. The technology may only sometimes be reliable, as it can be susceptible to glitches and poor performance. Finally, user adoption may be slower

than expected, as users may be reluctant to use the technology if it does not meet their needs or expectations.

Conclusion

In conclusion, voice assistants have a lot to offer in terms of convenience and accessibility for libraries. They can assist patrons in finding materials, help with library events, and even create a more interactive learning experience. For instance, voice assistants can help patrons locate materials quickly and easily, notify them about library programs or events, and even provide digital tutorials on using library services. Voice assistants also offer the potential for more accurate and personalized user recommendations, which is especially beneficial for libraries that focus on specific topics or areas of expertise. The use of voice assistants such as Alexa, Google Assistant, and Siri at libraries has been met with a great deal of enthusiasm. These voice assistants have provided libraries with a cost-effective way to improve their services and offer patrons a modern and interactive experience.

Through voice commands, patrons can access library resources, book a study room, and find information about library events and services. The voice assistants streamline the process of accessing library services, allowing patrons to do so with minimal effort. As libraries continue to embrace technology, voice assistants can provide a convenient and interactive way to access library resources. As technology evolves, voice assistants will likely become increasingly capable and utilized in libraries. Ultimately, voice assistants can help libraries better serve their patrons and create a more enjoyable

experience for library users.

Overall, the article suggests that these devices have the potential to enhance library services and accessibility but that careful consideration must be given to the privacy, security, and ethical issues associated with their use. As this is an emerging area of interest and research, further exploration and experimentation will be needed to fully understand the potential benefits and challenges of voice assistants in libraries.

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