Library Progress International
Vol.44, No.1, January-June 2024: P.269-278

Print version ISSN 0970 1052
Online version ISSN 2320 317X

Original Article

Available online at www.bpasjournals.com

Utilisation Efficiencies of The Voice-Enabled Multimedia Library Among Users Of Tamil Nadu

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ABSTRACT

Voice Search technology represents a significant advancement in the digital era, allowing users to interact with computers through speech rather than traditional keyboard inputs. This innovative technology employs software to interpret spoken commands, converting them into textual format and transmitting them to the intended application. By enabling users to conduct searches on the internet, apps, or devices using spoken voice commands, Voice Search simplifies the search process and improves accessibility. Through speech recognition software, users' spoken words are interpreted, converted to text, and used to execute search queries. Voice search is widely employed in smartphones, smart speakers, and various connected devices, providing a hands-free and convenient means of accessing information, particularly in multitasking scenarios or when manual input is impractical. This study evaluated students' perspectives on the effectiveness of voice search technology. A questionnaire, developed based on prior research and specific objectives, was administered using Google Forms at Madras University Library. 200 students from eight departments were randomly selected to participate, with 184 completing and submitting the questionnaire. Furthermore, insights from field experts and statistical professionals were sought to validate the survey instrument. The study findings indicate that the effectiveness and usefulness of voice search significantly impact users' perception.

Key Words: Voice Search, User Perception, Utilisation Efficiency, Multimedia Library.

INTRODUCTION

Libraries have a crucial role in influencing societies by granting access to knowledge and information. They provide a broad range of resources and services, creating ample opportunities for learning and advancement. Consistent use of libraries fosters the growth of fresh ideas and perspectives, making them vital in fostering innovation and originality. Acting as important storehouses of accumulated wisdom, libraries ensure the preservation and transmission of knowledge across generations. They are utilised by various parts of society, including students, educators, scholars, journalists, and policymakers, to progress in their careers and deepen their understanding of their fields of interest. Technological advancements have pushed traditional libraries to adopt modern changes for their continued relevance. As libraries modernise, the range of resources they handle has also evolved, encompassing formats such as CD/DVDs, USB drives, flash drives, external hard disks, and books and journals. Managing, organising, and categorising these resources present fresh obstacles for libraries. The internet hosts a wide range of multimedia content that serves various aspects of life, shattering traditional boundaries and norms. Access to lectures by distinguished individuals and instructional videos from professionals has become widely available, overcoming geographical barriers. As the primary source of information, libraries must adapt to

take advantage of this multimedia explosion. However, categorising resources poses a challenge, as the existing methods for organising textual resources might not be adequate for managing multimedia content.

Searching and locating the necessary materials in a library has always been a complex task. Finding these resources is comparable to achieving a strategic victory. Many library resources remain unused due to these limitations, which hinder the development of civil society. Substantial financial resources are consistently allocated to establish and maintain a well-stocked library. In developing countries, the underutilisation of library resources is essentially a waste of money that could have been used for other important civic purposes. The advancements in Electronics and Information Technology have also impacted libraries. An "Online Public Access Catalogue" (OPAC) is an online listing of a library's collection available to the public. OPACs are created as independent online catalogues, often derived from mainframe library catalogues with the advent of the Internet. Most libraries have made their OPAC accessible from a server to users worldwide. Traditionally, searching for library resources has inherent drawbacks. It requires the user to have a basic understanding of English, specifically, the ability to remember and enter the correct spelling of the desired phrases. Additionally, the user must also possess basic computer keyboard skills. While these may appear insignificant, they are significant barriers for the majority of individuals, particularly for those from marginalised segments of society, first-time learners in their families, or individuals from deeply rural backgrounds where basic education is a valuable asset. The existing constraints lead these users to refrain from effectively utilising library resources. Another group of users hindered by text-based searches using keyboards are individuals with disabilities. They, too, are discouraged from making effective use of library resources due to inherent disabilities. This is ironic, considering that using library resources improves one's prospects for success. Voice Search is undeniably one of the most important technologies that the digital age has bestowed upon us. It allows the user to "speak" to the computer instead of using traditional keyboard inputs. Underlying software comprehends what the user has spoken, converts it into text format, and transmits it to the intended application. This feature, a reflection of the times, enables us to obtain instant and optimised solutions by simply using our voices. They are simple, quick, and personalised, offering a better user experience distinct from textual searches.

Voice search is an innovative technology that will revolutionise how libraries are utilised. The current research examines the importance of library usage when incorporating voice-based search alongside traditional search methods. The research seeks to assess the influence of this technology on specific user groups, particularly women students from rural areas with diverse socio-economic backgrounds. Additionally, the study outlines a method for automatically categorising multimedia resources and conducting searches using developed voice-based search tools. It evaluates the key considerations of implementing such tools in academic libraries. The researcher plans to investigate voice-enabled multimedia libraries and assess their effectiveness among all user groups, with a particular emphasis on rural users.

Need For Voice-Enabled Multimedia Library:

Text-based searching has been the standard method for finding resources in libraries.

While widely utilised in automated library solutions, this approach has inherent limitations.

Individuals with learning disabilities: Some have challenges reading text due to conditions such as dyslexia, which marginalises them in society and limits their access to knowledge in traditional libraries. Navigating a library to find resources is arduous and daunting for them, often deterring them from utilising library resources. Providing them with easier access to library resources would contribute to inclusive growth for sections of society traditionally neglected by libraries.

Individuals with low literacy levels:

Some have limited literacy and struggle to navigate libraries' manuals and electronic catalogues due to their textual format. Offering them a tool that converts their voice input into a machine-readable format for accessing electronic library resources would provide a more comfortable way for them to obtain valuable information.

People with difficulty in English Usage:

English is commonly used by most library automation tools, but it can be challenging for those in third-

world countries and non-native speakers. Voice-based library services can help by handling tasks such as spelling and opening up access to a wider population.

Voice Enabled Library Services:

Voice Enabled Library Services represents groundbreaking technology advancement in the digital era, offering a valuable solution for libraries. Instead of using traditional keyboard inputs, users interact with the computer through spoken commands. The underlying software comprehends the user's speech, converts it into text, and integrates it into the library's automation system. The results are then presented to the user in either text or audio formats. This innovative approach eliminates many of the constraints associated with traditional search methods for library resources. Deploying Voice Enabled Library Services in traditional libraries is crucial to expanding access to library services among segments of society that have historically not used libraries. Another important consideration for implementing Voice Enabled Services in libraries is the management of multimedia resources. Multimedia libraries contain various materials such as videos (movies, documentaries, video lectures) and audio recordings (music, audiobooks, audio lectures). A "Voice Library" or "Library of Voices" is an intriguing resource, encompassing musical albums, speeches by leaders, and expert lectures on various subjects. However, efficiently searching through these resources presents challenges beyond the typical tags used for identification. Similarly, the relevance of video resources in educational contexts has grown, encompassing not only movies and documentaries but also tutorials, online demonstrations, and live classroom recordings. Traditional search methods often fall short in effectively navigating this diverse range of materials. A major obstacle hindering the full utilisation of multimedia resources is the lack of comprehensive information about these resources in digital repositories, unlike the detailed information available for textual resources. This deficiency hampers users' ability to understand the availability of these resources, leading to their underutilisation and creating a paradoxical situation where resources remain unused despite being available. Classifying multimedia materials using tags and storing them in searchable electronic formats would facilitate easy access to these resources, similar to textual resources. Enabling voice search capabilities for this repository would further enhance the ease and efficiency of resource utilisation. By establishing such a facility, more users would be encouraged to utilise multimedia resources, enhancing the library's role as a central mediator in the aggregation and dissemination of information. Therefore, implementing voice-enabled solutions for searching multimedia resources in the library are essential.

1. Profile of sample units:

The University of Madras, also known as Madras University, is a public state university in Chennai, India. Established in 1857, it is one of the oldest universities in India. The university has six campuses and offers more than 230 courses under 87 academic departments. It has received high accreditation from the National Assessment and Accreditation Council and is recognised for its nanotechnology, photonics, and neurotoxicity research. The Madras University Library, established in 1857, is one of the oldest academic libraries in India. It is located at the Chepauk Campus of the University of Madras in Chennai, Tamil Nadu. The library offers a vast collection of over 500,000 books, numerous national and international journals, rare manuscripts, theses, and digital resources. It provides circulation, reference support, digital library access, inter-library loan, and photocopying facilities. Embracing modern technology, the library offers access to digital resources and is part of various consortia. Membership is primarily open to students, faculty, and staff of the University of Madras, with limited access to researchers from other institutions. The library plays a crucial role in supporting academic research and learning.

2. Review of Literature:

Rajinder Kaur Gill (2016) concentrated on the changing part of library experts in the advanced period. He revealed that Data and correspondence innovation had turned out to be a fundamental piece of 21st-century libraries, and the curators must convey this mechanical condition to comprehend an assortment of advanced accumulations and e-assets. They distinguished procedures to access various systems and data assets. The examination reasoned that library experts require new aptitudes and abilities to oversee and make numerous data sources and administrations, as the capabilities and aptitudes frame the reason for the survival and development of experts in the new data innovative age. It was also proposed that the library proficient must have multiple aptitudes and multi-entrusting capacities in the quickly evolving condition and be equipped in a specific work region.

Ankrah, E., &Atuase, D. (2018) Developments in Information and Communication Technologies (ICT) have radically taken over every sphere of activity in university libraries. Academic libraries owe it a key duty to keep pace with technological advancement to cope with users' sophisticated information requirements. The main purpose of this study was to examine the use of electronic resources by postgraduate students of the University of Cape Coast, with a view of giving recommendations based on findings. The study's major objectives are: (1) To determine postgraduate students' awareness of electronic resources in the library.
(2) To determine the frequency of students' usage of e-resources. (3) To determine the computer literacy level of postgraduate students. And (4) To identify the likely problems in using electronic resources by postgraduate students. The findings revealed that most postgraduate students were aware of the e-resources in the library. The findings of this study also revealed that most postgraduate students preferred to access information from Google Scholar and other web-based databases more frequently than the databases in the library. The respondents identified poor internet connection as the most significant constraint for ineffective access to e-resources.

Balasubramanian. P. and Vinoth Sermarajan A. (2024), "The study analysed users' perceptions regarding the e-books offered for Competitive Exams from University Libraries in Tamil Nadu. Four universities in Tamil Nadu were chosen as sample units, and 200 questionnaires were distributed via Google Forms, yielding 183 fully completed responses from the participants. The analysis focused on examining the resources available in university libraries and the expectations of the student community. The study also measured the students' satisfaction with the e-books available in the university library. Besides, the researcher evaluates the challenges students face when using the university library resources for competitive examinations.

3. Statement of Problem:

The impact of voice search technology on university libraries is significant. It provides a more inclusive way for users with disabilities to access library resources and allows for multitasking. Voice search makes the search process more intuitive, speeds up finding information, and helps users discover resources they might not find through traditional search methods. It can offer personalised results based on user interactions and guide users through library services, increasing engagement. Integration with AI chat bots or virtual assistants can provide tailored assistance to users, and voice search data provides valuable insights for libraries to improve their services and stay current with their academic community's evolving needs. The present study analyses the users' perception of the voice-enabled searches in the university libraries.

4. Objectives of the study:

→ To analyse the user perceptions of voice enabling resources search in the university libraries.
→ To study the utilisation efficiencies of Voice Search among library users.

5. Null and Alternative Hypotheses:

H_O: The users' perceptions of voice search are not influenced by its utilisation efficiencies

H_1: The users' perceptions of voice search are influenced by its utilisation efficiencies.

6. Scope of the study:

The researcher selected the Madras University library as a sample unit for the present study. The study attempts to analyse the significance of library usage when a traditional search is complemented by a voice-based search and measure the impact of such technology among the target segments of users. The study was conducted to analyse user perceptions of voice- enabling resource searches in university libraries and study the utilisation efficiencies of Voice Search among library users.

7. Methodology:

The rapid integration of technology has compelled traditional libraries to embrace technological

advancements to ensure their relevance. Among the most impactful technological developments of the digital era is Voice-enabled Library Services, presenting a valuable opportunity for libraries. This study aimed to evaluate students' perspectives on the efficiency of voice search technology. A questionnaire, designed based on prior research and current objectives, was administered using Google Forms at Madras University Library. A total of 200 students, randomly selected from eight departments, participated, with 184 completing and submitting the questionnaire. Additionally, input from field experts and statistical professionals was sought to validate the survey instrument.

8. Limitations:

→ The research is purely based on the primary data. So, the validity of the results depends upon the truthfulness of responses from the respondents.

→ A simple random sampling technique was used to select the respondents.

9. Data Analysis and Interpretation:

Table 1

Distribution of Respondents' Demographic Profile

Characteristics		Frequency	Percentage
Gender	Male	73	39.71
	Female	111	60.29
Age	< 21 Years	51	27.94
	21 – 23 Years	91	49.26
	> 23 Years	42	22.79
Residential Area	Rural	55	30.15
	Semi-Urban	76	41.18
	Urban	53	28.68
Department	Literature	28	15.44
	Science	43	23.53
	Social Science	62	33.82
	Commerce and Management	50	27.21
Year of Studying	Integrated Course	35	19.12
	P.G first year	47	25.74
	P.G Second year	60	32.35
	Research Scholars	41	22.06
Family Annual Income	< Rs.3,00,000	35	19.12
	Rs.3,00,000 – 5,00,000	92	50.00
	>Rs.5,00,000	57	30.88

(Source; Primary Data)

Table 1 presents the demographic distribution of the survey respondents. The data reveals that 60.29% of the respondents are female, while 39.71% are male. The largest proportion, accounting for 49.26% of the total, falls within the 21-23 age bracket. Furthermore, 33.82% of the respondents are affiliated with the social science

department, and 32.35% are second-year postgraduate students. Notably, 50% of the respondents' families report an annual income ranging from Rs. 3,00,000 to 5,00,000.

Table 2

Distribution of Respondents based on Frequency Level of Use of Voice Search

Sl. No	Frequency Level of Use of Voice Search	No. Respondents	Percentage
1	Moderately	42	22.83
2	Often	47	25.54
3	Very often	51	27.72
4	Occasionally	28	15.22
5	Rarely	16	8.70
	Total	**184**	**100**

Table 2 reveals the distribution of respondents based on the frequency level of voice search use. It is understood that a maximum of 27.72 per cent of the respondents use the voice search very often, 25.54 often, and 22.83 per cent moderately use the voice search. Further, it is inferred that 15.22 per cent of the respondents occasionally use the voice search, and 8.70 per cent rarely use the voice search in the university libraries.

Table 3

Distribution of Respondents based on Levels of Interest in Voice Search

Sl. No	Respondents Levels of Interest in Voice Search	No. Respondents	Percentage
1	Neutral	34	18.48
2	Interesting	36	19.57
3	Very Interesting	72	39.13
4	Not Interested	26	14.13
5	Boring	16	8.70
	Total	**184**	**100**

Table 3 provides a breakdown of respondents' interest levels in voice search. 39.13 per cent of the respondents expressed a high level of interest, 19.57 per cent indicated interest and
18.48 per cent were neutral. Additionally, 14.13 per cent of the respondents expressed no interest, while only 8.30 per cent found voice search uninteresting.

Table 4

Distribution of Respondents on Perceived Sense of Benefits of Voice Search

Sl. No	Respondents on Perceived Sense of Benefits of Voice Search	No. Respondents	Percentage
1	Neutral	28	15.22
2	Beneficial	42	22.83
3	Extremely Beneficial	75	40.76
4	Not so Beneficial	27	14.67
5	Not Beneficial at all	12	6.52
	Total	**184**	**100**

Fig 1

Distribution of Respondents on Perceived Sense of Benefits of Voice Search

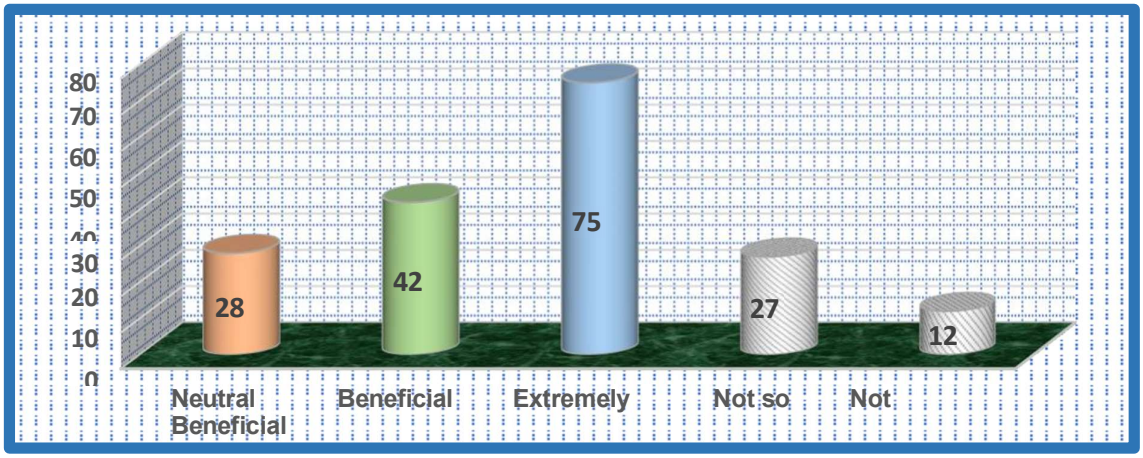

Table 4 presents the distribution of respondents based on their Perceived Sense of Benefits of Voice Search. The data indicates that 40.76% of respondents find voice search extremely beneficial, 22.83% consider it beneficial, and 15.22% expressed a neutral stance. Additionally, 14.67% of respondents indicated that voice search could be more beneficial, while 6.52% stated it was not.

Table 5

Distribution of Respondents on Perceived Effectiveness of Voice Search Reducing Time in Searching for Library Resources

Sl. No	Respondents on Perceived Effectiveness of Voice Search	No. Respondents	Percentage
1	Moderately Reduces	24	13.59

2	Considerably Reduces	45	24.46
3	Greatly Reduces	76	41.30
4	Reduces negligibly	24	12.50
5	Doesn't Reduce at all	15	8.15
	Total	**184**	**100**

Table 5 reveals the distribution of respondents' views on the effectiveness of voice search in reducing the time spent searching for library resources. The data shows that 41.30% of the respondents believe that voice search greatly reduces search time, while 24.46% find it considerably reduces the time. Additionally, 13.59% of respondents indicated that it moderately reduces search time. On the other hand, 12.50% of respondents mentioned that it negligibly reduces the time, and 8.15% stated that it doesn't reduce search time.

Table 6

Utilisation Efficiencies of Voice Search

Sl. No	Variables	Chi-Square Value	Significance value	Result
1	Accessibility	6.690	**< 0.05**	**Significant**
2	Convenience	6.511	**< 0.05**	**Significant**
3	Growing trend	6.305	**< 0.05**	**Significant**
4	Higher visibility	5.750	**< 0.05**	**Significant**
5	Improved user experience	7.272	**< 0.05**	**Significant**
6	Local Search Opportunities	7.188	**< 0.05**	**Significant**
7	Competitive Advantage	6.774	**< 0.05**	**Significant**
8	Targeted marketing	6.417	**< 0.05**	**Significant**
9	Enhanced Search Engine results	6.944	**< 0.05**	**Significant**
10	Innovation	4.811	**< 0.05**	**Significant**

Table 6 reveals Carl Pearson's Chi-square between the selected respondents' perceptions of the voice search and their utilisation efficiencies. The researcher selected ten variables for the analysis. All ten variables significantly influence the respondent's perception of the voice search. The Chi-square value is more than the threshold level of one, and the corresponding significance value is less than 0.05 at a 95 per cent confidence level.

10. Findings:

→ The data reveals that 60.29% of the respondents are female, while 39.71% are male.

→ The largest proportion, accounting for 49.26% of the total, falls within the 21-23 age brackets.

→ 33.82% of the respondents are affiliated with the social science department, and 32.35% are second-year postgraduate students.

→ Notably, 50% of the respondents' families report an annual income ranging from Rs.3, 00,000 to 5, 00,000.

→ It is understood that a maximum of 27.72 per cent of the respondents use the voice search very often, 25.54 often, and 22.83 per cent moderately use the voice search. Further, it is inferred that 15.22 per cent of the respondents occasionally use the voice search, and 8.70 per cent rarely use the voice search in the university libraries.

→ 39.13 per cent of the respondents expressed a high level of interest, 19.57 per cent indicated interest, and 18.48 per cent were neutral. Additionally, 14.13 per cent of the respondents expressed no interest, while only 8.30 per cent found voice search uninteresting.

→ The data indicates that 40.76% of respondents find voice search extremely beneficial, 22.83% consider it beneficial, and 15.22% neutral. Additionally, 14.67% of respondents indicated that voice search could be more beneficial, while 6.52% stated it was not.

→ The data shows that 41.30% of the respondents believe that voice search greatly reduces search time, while 24.46% find it considerably reduces the time. Additionally, 13.59% of respondents indicated that it moderately reduces search time. On the other hand, 12.50% of respondents mentioned that it negligibly reduces the time, and 8.15% stated that it doesn't reduce search time.

→ All ten variables significantly influence the respondent's perception of the voice search. The Chi-square value is more than the threshold level of one, and the corresponding significance value is less than 0.05 at a 95 per cent confidence level.

13. Conclusion:

Voice Enabling Library Services and making Multimedia Resources searches increase the reach of library services manifold. Voice Enabling the Library Search Services increases the accessibility of library content for those who are physically disabled. Library services, such as those with visual impairments, orthopedically disabilities, and neural debilities like cognitive disabilities in reading, reach a larger percentage of the user population, including those whose native language differs from the language of library solution. Including this category of users from fully utilising the library services has been partially successful. With Voice Enabling the services, we can have a fair hope that they too can start utilising the library services since the major factor dissuading them from utilising them has been addressed. Thus, Voice Enabled Libraries play a pivotal role in reaching out the library services to the usually excluded sections of the population.

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