
Innovation in an Ever-Changing World - Using a Virtual Reference Service to Develop a Technology Inclusive, Research Driven Caribbean Library for the Future: A Literature Review**Daisy St. Rose**

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Abstract

This article aims to analyze the usage patterns and current trends in virtual reference services (VRS), providing insights into the benefits, challenges, and emerging practices in this field. By shedding light on the evolutionary nature of VRS, this study seeks to contribute to the growing body of literature on VRS and guide future developments in this vital area of library and information science, especially within the Caribbean context.

It draws from the experiences and outcomes of the UWI libraries' reengineered VRS to contribute to the broader discourse on VRS. The insights gained can inform other institutions in the Caribbean region and beyond, empowering them to optimize their VRS operations and continue delivering vital support to their communities in an increasingly digital and remote learning environment.

The VRS has opened opportunities for innovation and collaboration in the Caribbean academic library landscape. Cooperative partnerships, resource sharing, and the development of comprehensive knowledge bases facilitate efficient information management, exchange, and preservation. Embracing VRS enables libraries to set goals, support teaching, learning, and research endeavors, and effectively serve the diverse needs of Caribbean communities. Librarians must continue to adapt and develop expertise in VRS to effectively meet the changing needs of patrons to thrive in the evolving digital environment. Incorporating recommended guidelines and best practices from existing literature, Caribbean libraries can enhance their VRS practices and policies.

Keywords: asynchronous; chat; client-centred services; email; Reference Analytic Form (RAF), reference service; synchronous; tick sheets; unmet needs; Virtual Reference Knowledge Base (VRKB); Virtual Reference Service (VRS); Virtual Reference System (VRS)

Introduction

This paper explores the operational definition of reference services and the transition to Virtual Reference Services (VRS) and examines the trends in VRS since the COVID-19 pandemic, with a specific focus on the University of the West Indies (UWI) Libraries. It discusses the closure of UWI Libraries and the subsequent reengineering of VRS operations, highlighting their implementation of enhanced VRS operations. Current trends of VRS in the Caribbean, taking The UWI as a case study are also discussed.

The literature review investigates the impact and benefits of enhanced VRS, including opportunities for innovation and collaboration in Caribbean libraries. It explores the implementation of best practices and standards for VRS, including assessing effectiveness and efficiency, and building robust VRS policies and procedures.

The paper emphasizes the importance of service and quality assurance evaluation in VRS. Key findings are summarised and recommendations made for future research and improvement of VRS in Caribbean libraries. The suggested future research directions aim to enhance the understanding of VRS practices and their effectiveness, contributing to the advancement of VRS in the region. Through this research, valuable insights can be gained to enhance VRS practices, strengthen service quality, and guide future research in the field.

Methodology

The qualitative methodology employed in this study aimed to explore the benefits of VRS and identify opportunities for collaboration, particularly within the Caribbean context. Given the dearth of information on VRS in the Caribbean, this research aimed to bridge various streams of work to enhance the rigor and relevance of the findings.

To ensure the study captured the evolving nature of VRS since its inception in 2002 (Kern 2009), a comprehensive search for current and up-to-date information on the topic was conducted. To access a wide range of resources, the researchers leveraged the UWI's online databases, which provided access to scholarly articles, research papers, and other relevant publications related to VRS.

Identification of the different literature was based on geographic locations, different research methodologies used and varied journal articles on the topic (Webster and Watson 2002). Multiple journals, including leading publications in the field, conference proceedings, and studies from professional bodies, were examined to triangulate the findings and gather diverse perspectives. A thorough review of article citations and references was conducted. This process helped determine prior articles to consider and ensured the inclusion of relevant literature to enrich the study. The impact of the journals used was also considered to ensure the credibility and scholarly significance of the sources.

Furthermore, the researchers recognized the importance of incorporating their own experiences to further explore the use of VRS within the Caribbean context and provide

valuable insights for future research and practice. They acknowledged that their unique perspectives could contribute to building a bank of knowledge specific to the region.

In summary, this qualitative methodology combined document analysis, literature review, and the researchers' own experiences. This study aimed to contribute to the research literature on the benefits of using VRS while addressing the specific needs and context of the Caribbean region.

Operational Definition of Reference Services

In an increasingly digital age, the field of library and information science has witnessed a significant transformation in the way reference services are provided. Gone are the days when patrons had to physically visit a library and consult a librarian for information needs. The advent of VRS has revolutionized the information-seeking landscape, offering users the convenience and accessibility of obtaining reference assistance remotely.

Reference services encompass a broad range of activities designed to meet the information needs of library users (Lipow 1999; Tyckoson 1999). Traditionally, reference librarians have played a vital role in connecting individuals with relevant resources, helping them navigate complex databases, answering research queries, and providing guidance on information retrieval (Kern 2009; Mendelsohn 1997; RUSA 2004).

Transition to VRS

Traditional reference services have gradually evolved, transitioning from phone and fax-based assistance to the development of VRS in the mid-1980s (Ferguson 2000; Janes 2002; Rader 1999). Technological advancements and patron demand have led to the development of web-based VRS (Ferguson 2000; Janes 2002; Rader 1999; Greenberg and Bar-Ilan 2015; Shachaf and Horowitz 2008), which provide convenient access to reference services through various formats such as email, chat, and SMS. Asynchronous and synchronous formats are both used in VRS to cater to patrons' needs (Greenberg and Bar-Ilan 2015; Tenopir 2004). This allows patrons to access reference assistance online from the comfort of their own homes or any location with internet connectivity (Christopherson 2011; Greenberg and Bar-Ilan, 2015; Horowitz 2008; Tenopir 2004).

The transition to VRS has been ongoing since 2002, with the development of guidelines and best practices by organizations like the Association of Research Libraries (ARL) and the

Reference and User Services Association (RUSA) of the American Library Association (Christopherson 2011; Kern 2009; Nicol and Crook 2012; RUSA 2004; Shachaf 2008; Strothmann, McCain and Scrivener 2009). Kresh's (2002) study highlighted the limitations of manually collecting reference service data through tick sheets, as it does not accurately capture the librarian's true level of activity. This emphasized the need for more accurate and comprehensive methods of data collection to assess the effectiveness and efficiency of reference services in the digital age. Additionally, the study suggested the importance of redefining the role of the library and librarian in response to the changing technological landscape.

The researchers note that as libraries increasingly embrace digital resources and VRS, it is essential to reassess the librarian's responsibilities and adapt their roles to meet the evolving needs of users in the digital era.

Operational Definition of VRS

VRS can be defined as an extension of traditional reference services, using electronic means to provide reference assistance remotely (IFLA 2004; Pinto and Manso Rodriguez 2012; RUSA 2017). Today, VRS involves the use of various digital communication tools such as email, chat, video conferencing, and instant messaging to connect users with librarians who offer real-time assistance in their information-seeking endeavors (Ferguson 2000). It allows users to access a wide range of resources, including digital collections, online databases, e-books, and more, eliminating the barriers of time and physical proximity.

Usage of VRS has witnessed a significant surge in recent years (Abubakar 2021; De Groote and MiScolas 2021; Strothmann, McCain, and Scrivener 2009). With the proliferation of digital technologies and the increasing reliance on online resources, users are seeking convenient and efficient ways to access information. VRS not only provides timely assistance but also caters to the preferences of a technologically savvy population that is accustomed to the speed and convenience of digital platforms. Moreover, VRS has proven to be particularly beneficial for individuals who face physical or geographical constraints, making it an inclusive service that caters to diverse user needs.

Trends in VRS Since COVID-19

The COVID-19 pandemic has accelerated this transition as libraries had to close their physical spaces and switch to virtual services, leading to an increase in the use of VRS (Abubakar 2021; De Groote and Mi Scoulas 2021; Nicolas 2021). The increasing use of the VRS provided an added benefit of bringing the library team closer together (Nelson and Tugwell 2022; Nicolas 2021) as the roles of libraries emerge (Ashiq, Jabeen, and Mahmood 2022) and include 'infrastructure, accessibility, and outreach', 'awareness and wellbeing', leadership and policymaking' and 'human capacity building' respectively.

A study conducted by De Groote and Míscolas (2021) showed a significant increase in the use of virtual support in libraries during the COVID-19 pandemic. This was reflected in the rise of email and chat reference interactions, as well as virtual consultations. Nicolas (2021) observed that despite the closure of library doors, three libraries were able to maintain communication using VRS. The technology enabled the libraries to handle enquiries more efficiently and to monitor progress. These findings demonstrate the importance of VRS in providing efficient and effective support to library patrons during times of crisis.

The rapid rollout of service platforms during the COVID-19 pandemic significantly accelerated the adoption of enhanced VRS to support teaching, learning, and research in a remote work environment. Greenhall's (2020) study conducted for Research Libraries United Kingdom (RLUK) found that the majority of the respondents (61%) of the 336 respondents considered the pandemic to be a catalyst for change, accelerating the adoption of online platforms and remote work practices that were already in place and facilitating its integration and accelerated implementation. This highlights the suitability of technology in research libraries to meet the evolving needs and demands of users. Further support for this notion is provided by Baxter, Beard, Beattie, Blake, Greenhall, Lingstadt, and Reimer's (2021) study, explores these dynamics and provide additional insights into the impact of COVID-19 on the transition to remote work in research libraries and the effectiveness of technology in facilitating these transformations. VRS has proven to be particularly beneficial for individuals who face physical or geographical constraints, making it an inclusive service that caters to diverse user needs.

The UWI Libraries Since COVID-19

The UWI libraries across the Caribbean faced closures in adherence to COVID-19 national guidelines, affecting the campuses from March 2020. During this period, the libraries responded by reengineering their VRS to incorporate more comprehensive methods of tracking statistical and analytical data. This section of the review explores the efforts made by the Open Campus Libraries and Information Services (OCLIS), Alma Jordan Library, Mona Campus Library, and Sidney Martin Library to enhance their VR operations and services to fulfill their mission of providing essential teaching, learning, and research support to diverse communities.

Closure of UWI Libraries and Shift to Reengineering of VRS

Prior to March 2020, The UWI Libraries employed the use of email and various cloud software technology to conduct VRS. The COVID-19 pandemic necessitated the closure of UWI libraries, prompting a greater shift towards VRS. The UWI libraries faced challenges in maintaining their services, for example, access to in-house Special Collections resources and databases and recognized the increasing importance of VRS in ensuring continued access to resources and support for its patrons.

Implementation of Enhanced VR Operations at OCLIS

The implementation of enhanced VR operations by OCLIS started in late 2019, even before the COVID-19 pandemic-related library closures. OCLIS, which had offered VRS since 2015 switched from the vendor OCLC to SpringShare's LibAnswers and extended their VRS hours by 12.5 hours per week (UWI, 2020). These changes aimed to improve communication between the library and its patrons, track user interactions more effectively, and gather valuable data for analysis. By implementing these enhancements, OCLIS aimed to maintain its mission of providing critical teaching, learning, and research services to its diverse and decentralised communities, even in the face of challenges later presented by the pandemic.

The Alma Jordan Library, which had remained closed since 2020, took the initiative to reengineer its reference operations and services by transitioning from primarily on-site and face-to-face interactions to remote and online support using Springshare's LibAnswers system (Peltier-Davis, Rajah, and Winter 2022). This strategic shift allowed Alma Jordan to adapt to the changing circumstances and continue providing essential reference services to its users.

Similarly, the Mona Campus Library and Sidney Martin Library also sought to improve their VR operations during the closure period. They recognized the importance of expanding their engagement with patrons through various social media platforms. By leveraging social media channels, such as Facebook and WhatsApp, these libraries aimed to enhance user engagement, reach a broader audience, and provide convenient avenues for users to seek assistance and access library resources.

Current trends of VRS in the Caribbean - The Case of the UWI

By embracing new technologies, software solutions, and innovative approaches, the UWI libraries sought to adapt to the changing needs of their users and continue providing essential teaching, learning, and research support.

Furthermore, all three libraries explored and adopted robust systems to track key statistical and analytical data. By implementing advanced technologies and software solutions, such as the Springshare LibAnswers system, the libraries aimed to ensure more efficient service provision and informed decision-making. These systems allowed the libraries to collect data related to user interactions, inquiries, and usage patterns for analysis, which can enable them to identify areas for improvement and make data-driven decisions to enhance their VR services.

Through the reengineering of their VRS, the OCLIS, the Alma Jordan Library, Mona Campus Library, and Sidney Martin Library demonstrated their commitment to adapting to the changing needs of their patrons and maintaining their mission of providing essential teaching, learning, and research support to their respective communities. By embracing new technologies and platforms, and by strategically leveraging data and analytics, these libraries aimed to deliver enhanced VRS that meet the evolving demands of their patrons in a rapidly changing world.

Impact and Benefits of Enhanced VRS

The benefits of VRS for patrons include anonymity, convenience, extended hours, and access to library services regardless of location (Greenberg and Bar-Ilan 2015; Tenopir 2004). For library staff, VRS provides a more efficient way of handling enquiries and collecting reference analytics and statistics (Nicolas 2021). It also allows for the development of a comprehensive knowledge base and FAQ development (Iton 2015).

The enhanced VRS implemented by the UWI libraries, including the OCLIS's adoption of SpringShare's LibAnswers, have resulted in several impactful benefits. Firstly, these enhancements have allowed the libraries to continue providing uninterrupted online services to the communities they serve, ensuring that patrons can still access the resources and support they needed even during the closure period.

One notable benefit is the improved tracking of statistical and analytical data through SpringShare's LibAnswers Reference Analytics. This feature enables the libraries to gather valuable insights into user interactions, trends, and needs, which can inform decision-making and improve service provision. The availability of comprehensive data allows the libraries to better understand their user base and tailor their support to meet the diverse needs of different user groups.

The increased staffing and training of OCLIS library staff have also contributed to the efficiency and effectiveness of the VRS. With well-trained staff members, the libraries can respond to inquiries promptly and provide high-quality assistance to patrons. This ensures a seamless communication experience and enhances patron satisfaction.

Additionally, the VRS have played a crucial role in maintaining critical teaching, learning, and research activities during the closure period. By providing VRS support, the libraries have enabled students, faculty, and researchers to access necessary resources, receive guidance, and engage in academic pursuits remotely. This contribution has been instrumental in ensuring that the UWI libraries continue to fulfill their mission of supporting the educational and research needs of their communities, despite the challenges posed during the closure.

In general, the implementation of enhanced VRS has had a positive impact on the UWI libraries, allowing them to sustain their services, improve data tracking, enhance staff capabilities, continue to cater to diverse user groups, and support academic activities during the closure period.

Opportunities for Innovation and Collaboration

The VRS offers novel avenues for promoting innovation and collaboration within the Caribbean region. This study highlights the potential of VRS in enhancing teaching, learning, and research initiatives by identifying patrons' unmet needs, managing information effectively, fostering collaboration, and utilizing the Virtual Reference Knowledge Base (VRKB). Additionally, the study emphasizes the significance of setting goals, evaluating performance,

and leveraging the expertise of reference librarians to meet the diverse needs of Caribbean society.

- **Identification of Unmet Needs:** The VRS enables libraries to identify and address patrons' unmet needs through the analysis of missed and concurrent chats, stored questions and answers, and statistical data. By evaluating these interactions, libraries can gain insights into the specific reference and research requirements of their target audience, such as information literacy, citation management, and access to specialized Caribbean resources.
- **Theme Identification and Service Gap Analysis:** VRS facilitates the identification of thematic areas that require specific resources and helps identify service gaps within the Caribbean library landscape. Examples of such areas include Caribbean special collections, instructional support, statistics, information literacy, and marketing. By focusing on these themes, libraries can tailor their services and resources to better meet the needs of their patrons, thus enhancing the overall user experience.
- **Knowledge Management and the VRKB:** The VRKB serves as a repository for storing knowledge generated from online reference services. It acts as a valuable resource in the Caribbean context by offering evidence-based data and facilitating accurate and timely responses to patrons' queries. Libraries can leverage the VRKB to support cooperative and networked environments, enabling knowledge exchange among participating libraries. This repository of information preserves valuable knowledge and facilitates its repeated use in search for new information.
- **Collaboration and Partnership:** VRS promotes collaboration and partnership opportunities among libraries at local, regional, and international levels. By fostering joint knowledge exchange and searchability, libraries can enhance their services and support patrons' information needs effectively. The cooperative nature of VRS encourages a shared approach to knowledge sharing and collaboration among libraries.
- **Goal Setting and Performance Evaluation:** Through the implementation of VRS, libraries can define their objectives and measure their progress in supporting the teaching, learning, and research needs of Caribbean society. Libraries can distribute the knowledge of reference librarians as they interact with patrons and establish a knowledge distribution knowledge base as part of their knowledge management efforts.

This approach ensures that libraries continually evolve and meet the evolving needs of their patrons.

Exploring Opportunities and Best Practices for VRS in Caribbean Libraries

The VRS holds significant promise for Caribbean libraries in supporting teaching, learning, and research. This review explores the existing literature to uncover opportunities for Caribbean libraries to assess and enhance their VRS offerings. It focuses on best practices, effectiveness and efficiency evaluation, implementation of standards, and the development of robust policies and procedures. The findings from various studies shed light on key considerations in providing high-quality VRS in the Caribbean context.

Assessment of Best Practices

Shachaf and Horowitz's (2008) study examines the adherence of academic libraries in North America to guidelines and recommendations for effective VRS. This research serves as a benchmark for Caribbean libraries looking to improve their services by understanding successful practices adopted by other institutions.

- **Assessing Effectiveness and Efficiency:** McClure et al. (2002) provide insights into evaluating the effectiveness and efficiency of VRS. Their work guides Caribbean libraries in developing assessment procedures to gauge the impact and efficiency of their own VRS, enabling continuous improvement.
- **Implementing Best Practices and Standards:** Manso Rodriguez's (2008) analysis of VRS policies established by organizations and professional associations offers valuable insights into the implementation of VRS. By examining the policies of various institutions, Caribbean libraries can identify best practices and standards to guide the development and improvement of their own VRS policies and procedures.
- **Building Robust VRS Policies and Procedures:** Neuhaus (2003) focuses on confidentiality, privacy, and the responsibilities of librarians in VRS. This study underscores the importance of protecting user information and complying with ethical and legal frameworks. Caribbean libraries can use this knowledge to establish comprehensive policies and procedures that safeguard user privacy while delivering effective VRS.
- **Service and Quality Assurance Evaluation:** Pinto and Manso Rodriguez (2012) highlight the opportunities for service and quality assurance evaluation offered by VRS.

Caribbean libraries can utilize these evaluations to assess their performance, address usability and organizational issues, and continuously improve their services to meet patron needs.

Conclusions

This article aims to analyze the usage patterns and current trends in VRS, providing insights into the benefits, challenges, and emerging practices in this field. By shedding light on the evolving nature of VRS, this study seeks to contribute to the growing body of literature on VRS and guide future developments in this vital area of library and information science especially within the Caribbean context.

By sharing the experiences and outcomes of the UWI libraries' reengineered VR services, this article aimed to contribute to the broader discourse on VRS. The insights gained can inform other institutions in the Caribbean region and beyond, empowering them to optimize their VR operations and continue delivering vital support to their communities in an increasingly digital and remote learning environment.

By considering the insights from Shachaf and Horowitz (2008), McClure et al. (2002), Manso Rodriguez (2008), Neuhaus (2003), and Pinto and Manso Rodriguez (2012), Caribbean libraries can enhance their VRS practices and policies. Incorporating recommended guidelines and best practices into their frameworks will ensure consistency, professionalism, and ethical conduct. Libraries can also prioritize user privacy by establishing and reviewing comprehensive VRS policies and providing VRS training to librarians. The implementation of these insights will contribute to the growth and improvement of VRS in the Caribbean, fostering a secure and trustworthy environment for all stakeholders.

The VRS has opened new avenues for innovation and collaboration in the Caribbean academic library landscape. The sharing of resources and expertise among libraries has the potential to enhance sustainability and cost-effectiveness. Through cooperative partnerships, libraries can foster joint knowledge exchange and searchability, maximizing the value of VRS. Furthermore, VRS enables the identification of patrons' unmet needs, helping libraries tailor their services to effectively meet those needs. The development of comprehensive knowledge bases and FAQ repositories facilitates efficient information management and preservation. The VRKB plays a vital role in capturing and disseminating knowledge within a cooperative and networked environment. By embracing VRS, academic libraries can set goals, support

teaching, learning, and research endeavors, and enhance their effectiveness in serving the diverse needs of Caribbean communities. To continue to remain relevant and meet the needs of their users, libraries in the Caribbean should continue to prioritize the implementation and use of VRS. By doing so, they can continually improve their reference services and adapt to the changing landscape of information provision in the Caribbean region.

Finally, the increasing adoption of digital resources and VRS by libraries necessitates a reevaluation of the librarian's responsibilities and roles. As technology continues to shape the information landscape, librarians must adapt and evolve to effectively meet the changing needs of users. By embracing new technologies, acquiring digital literacy skills, and developing expertise in VRS, librarians can enhance their effectiveness in providing quality information services and support in the digital era. It is crucial for libraries to invest in training and professional development opportunities that empower librarians to thrive in the evolving digital environment and continue serving as valuable resources for their patrons.

Recommendations

Based on the opportunities presented by VRS, the following recommendations are proposed for academic libraries in the Caribbean:

- **Foster Collaboration:** Academic libraries should actively seek opportunities for collaboration and partnerships, both locally and internationally, to leverage the full potential of VRS. Collaborative efforts can include resource sharing, joint training programs, and cooperative knowledge exchange.
- **Prioritize Data Analysis:** Libraries should invest in analyzing VRS data, such as missed and concurrent chats, stored questions and answers, and demographic information. This analysis can provide insights into patrons' needs, identify service gaps, and guide decision-making to improve the effectiveness of reference services.
- **Develop Comprehensive Knowledge Bases:** Libraries should focus on building and maintaining robust knowledge bases and FAQ repositories based on evidence-based data. This will ensure accurate and timely responses to user inquiries and create a valuable resource for both patrons and library staff.
- **Embrace the VRKB:** Libraries should actively contribute to and utilize the VRKB to facilitate knowledge sharing and exchange within the Caribbean context. By

participating in the VRKB, libraries can enhance the cooperative and networked nature of VRS and support evidence-based decision-making.

- **Continual Assessment and Improvement:** Libraries should regularly assess the effectiveness and efficiency of their VRS initiatives, seeking feedback from patrons and staff. This feedback can inform ongoing improvements and ensure that VRS aligns with the evolving needs of the user community.

Future Research

The literature review highlights the growing significance of VRS in libraries, particularly during the COVID-19 pandemic. The increased use of email and chat interactions, as well as virtual consultations, underscores the effectiveness of VRS in maintaining communication and supporting patrons remotely. The findings also emphasize the need to reassess the role of librarians in the digital age, as their responsibilities evolve with the adoption of digital resources and virtual services.

Moving forward, several areas for future research emerge from the literature review. First, it would be valuable to investigate the long-term impacts of the COVID-19 pandemic on the utilization and effectiveness of VRS in libraries. Understanding the sustained use and benefits of VRS beyond the immediate crisis can provide insights into their ongoing value and potential improvements.

Second, further research could focus on the user experience and satisfaction with VRS. Examining patrons' perceptions of the effectiveness, accessibility, and quality of virtual reference interactions would help identify areas for enhancement and provide guidelines for improving user satisfaction especially in the Caribbean context.

Additionally, exploring the integration of emerging technologies, such as artificial intelligence and chatbots, within VRS could be a fruitful avenue for research. Assessing the impact of these technologies on efficiency, accuracy, and user experience would contribute to the ongoing development and optimization of VRS.

Finally, comparative studies across different library settings, regions, and cultures would provide a broader understanding of the implementation and effectiveness of VRS. Investigating the challenges, successes, and best practices in diverse contexts can facilitate knowledge sharing and inform the adoption of VRS in various library environments.

By addressing these research gaps, scholars can contribute to the continuous improvement of VRS and the overall effectiveness of libraries in meeting the evolving needs of their patrons in the digital age.

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