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Consumerization of IT: Nexus of SMAC Technology adoption by the Indian Libraries

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Abstract

The study assesses awareness, use and adoption benefits of SMAC (Smart, Mobile, Analytics and Cloud Computing) Technologies among the LIS professionals working across the libraries of different strata in India. 235 responses obtained using a structured questionnaire and analysed using descriptive statistics method. 99.6% respondents use mobile phones, 58.7% post library activities using social media daily for this purpose 61.3% use Facebook, 52.8% use YouTube, 69.4 use WhatsApp, 31.5% use Facebook Messenger and 18.7% use Instagram. Majority use mobile apps for rendering services, 14.9% for searching catalogue, 11.9% for membership facilities, 8.5%, 10.6% for book renewal facilities and book reservation respectively, 10.6% for SMS alert service, 14.5% for E-resources facility, 10.5% Reference queries and 7.7% for providing referral services. 16.6% have and 15.3% don't have appropriate analytical tools to handle big data. Regarding the benefits 40.0% and 35.3% strongly agreed on Cost savings on hardware and software with regards to Cloud Computing, 28.9% and 13.2% strongly agree for the benefits on 'Cost savings on IT operations staff' and no upfront investment respectively. For overall benefits of SMAC, 32.9% strongly agreed and 34.0% agreed on education benefits, 33.2% strongly agree and 36.6% agreed on Research Benefits, 32.8% agreed and 12.8% strongly agreed on behaviour benefits, 13.6% strongly agreed and 43.0% agreed on cultural benefits.

Keywords: SMAC, Social media, Mobile technology, Mobile apps, Big data, Analytics, Cloud Computing, Intelligent computing

Introduction

With the evolution of the Internet and the proliferation of digital documents changed the way of life (Eddy et al., 2016) of learning and libraries. Online content business models have evolved to increase the user learning and consumptive behaviour among educators and learners (Krishna & Adwani, 2010). Libraries play a key role in enabling both the learners and the teachers by providing required information. Libraries also play an important role in developing reading habits and life-long learning ability among the user community (Cagdas et al., 2014). Further, libraries and LIS professionals play a substantial role in educating users on relevant sources available on the internet (Alkali & Amichai-Hamburger, 2004), adding to that, training the user by enabling them to search effectively and efficiently (Asemi, 2005) for the required information is also goes a long way in gaining ROI.

Providing library service is as old as libraries, it is needed for the most demanding tech-savvy user community with value-added services (Ying-Feng et al., 2009). For providing these value-added services, libraries needs to be equipped with the advanced systems such as integration of web 2.0 technologies and social media platforms in an efficacious manner (Idiegbeyan-ose et al., 2017). By enabling the value-added services, a library can cater to the user needs (Broady-Preston & Swain, 2012) as the user group comprising generation Y and Z born in the digital era and also connected to content (Bagudu & Sadiq, 2013).

For providing the effective library services, it is important to have access to the e-content and e-resources (Elissaveta et al., 2012). The access platform should enable seamless access to the e-resources with usage metrics for better evaluation of the content used (Ferrucci et al., 2009), (Pradhan et al., 2012). Seamless aggregation and meticulous

integration of diverse e-content sources in one platform shall ensure the uninterrupted access to information sources, as well as facility to outreach to the users on 24/7 basis (Sreekumar, 2012).

Review of Related Literature

The term SMAC denotes Social, Mobile, Analytics and Cloud Computing was coined in 2011-2012 (Karthikeyan & Thangavel, 2018) to describe the impact of the consumerization of IT and has been considered as the fifth wave of computing (Carter & Petter, 2015), (Chauhan, 2013). SMAC forms part of social technologies by providing the base platform for collaboration and integration of library services and resources (Zou, 2019). Social media enable people to connect and interact with no delay or disturbances (Drummond et al., 2020). The interactions benefit the one to gather feedback and other information from fellow social-network participants (Wang et al., 2019). The analysis on benefits to consumer is that it can generate insights into netizens sentiment output. Social networking generates data from platforms like Linked-In, Instagram, Facebook and Twitter (Belarbi et al., 2017). Social media enables the creation of communities of users, organize Social events, develops library advocates and helps the user in keeping the library relevant (Singh & Trinchetta, 2020).

Mobile technologies offer a base for “anywhere, anytime, any device” initiatives for library staff as well as the users (Ciccone & Hounslow, 2019), (Nowlan, 2013) in both access and proving information, as the main aim to use mobile for the users access to content anywhere anytime (Mayes et al., 2015). Electronic gadgets like smart-phones(Omeluzor et al., 2019), mobile-tablets, and computer-laptops delivering robust, context-aware library services to be precise (Sobol, 2019). Mobile devises enables access to digital content, use mobile apps, use mobile-friendly websites and many more (Cummings et al., 2010).

Assessing the user and user requirements analytically and helps in devising the measures to improve both service and product processes, data on the library and its activities, services for making better decisions for the next level of user satisfaction (Showers, 2015). Libraries and LIS professionals need to understand the user needs and analyse the library generated data and formulate the corrective measure and amicable solutions to engage the user in the better library resources and services use (Fang, 2007). Modern-day library websites are built using web technologies to enable easy data collection such as usage, web log analysis and so on with the assistance of Analytics (Chyrun et al., 2019).

The library trends are centred on the utilization of Web facilities, Infrastructure, E-resources and library services the library don't-own, but provides access to users (Scale, 2009) with the applications of cloud technologies impacted the libraries in terms of IT and ITES infrastructure off-late. Cloud infrastructure frees the library by taking care of IT infrastructure and concentrate on the core activities (Li et al., 2009) such as content generation, knowledge organisation and dissemination. The different types of cloud computing services include SaaS, PaaS and IaaS (Nayyar, 2019) and service deployment model which lets anyone to choose the level of control on information (Mukherjee, 2019) and service kinds to provide seamless access and server uptime and not vulnerable to hacking, power outage, data back-ups (Chiregi & Jafari Navimipour, 2018) and many more.

Significance of the study

Web technologies enabled the libraries to serve the customers effectively and efficiently. There are innumerable studies conducted in silos on social media use, smartphone as well as other mobile tools and technologies, library analysis as well as cloud computing as an emerging technology to aid the smooth functioning of library activities and services. Based on the literature review, it was found that there is no comprehensive study conducted on the comprehensive adoption of SMAC technologies by the Indian libraries. Hence, a need

for the present study to assess the adoption of SMAC Technologies in Indian libraries to serve their customers better.

Research Questions

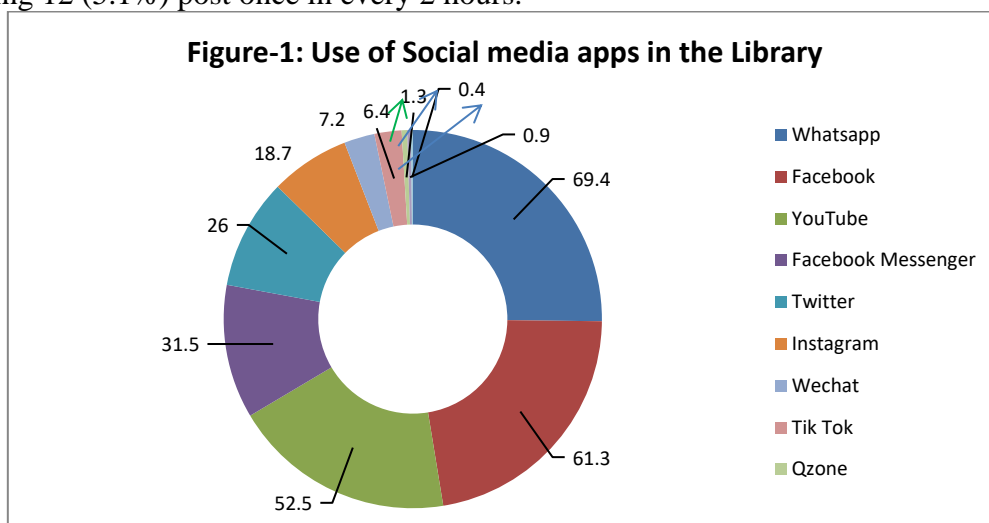
1. How much of the social media spread into the libraries of Indian subcontinent?
2. Has the SMAC really adopted by the Indian Libraries?
3. What benefits are being derived by the use of SMAC among Indian Libraries?

Scope and Methodology

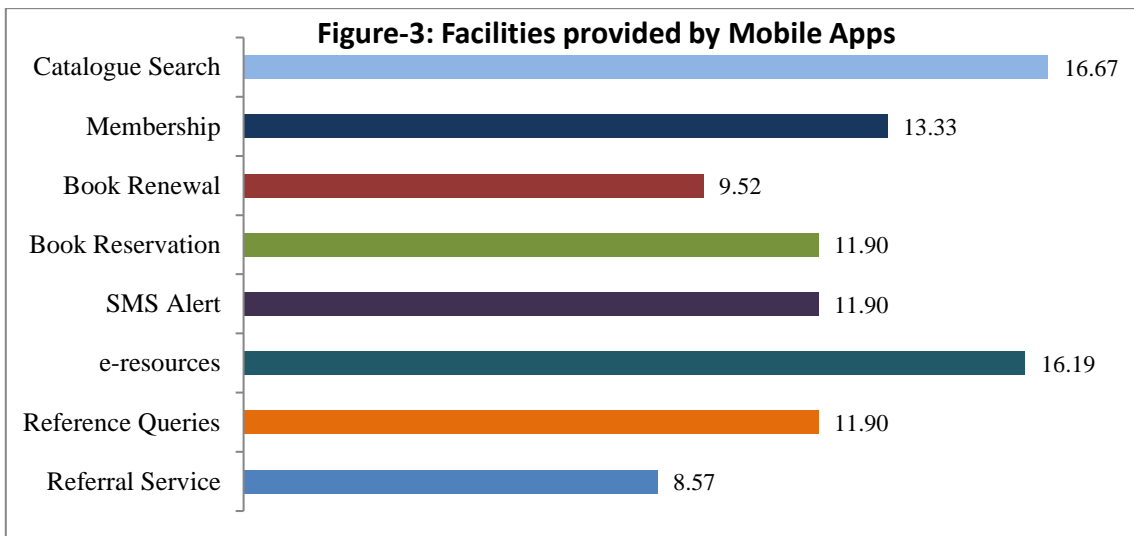
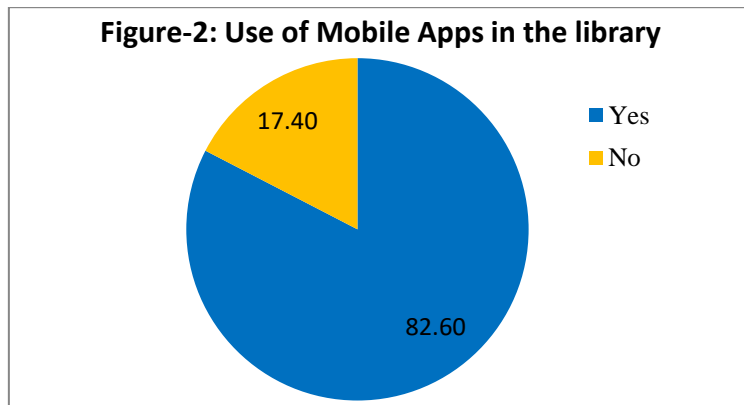
The descriptive data were collected using a questionnaire schedule. A pilot study was conducted from a sample to assess the validity of the questionnaire before sending it to the larger respondents group. The data were collected for a period of eight months during January 2020 to August 2020 from the libraries across India. A total of 235 responses obtained through an online questionnaire from different strata of libraries that effectively utilise SMAC technologies in their service delivery. The data were analysed for finding frequencies and percentage.

Data Analysis and Interpretation

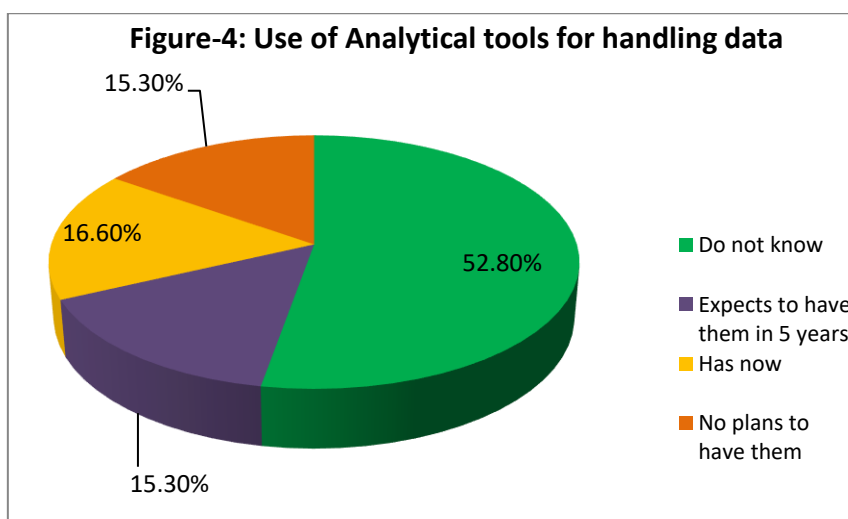
Out of 235 responses from working librarians obtained, there were 179 (76.2%) Male respondents forms the majority while 55 Females with 23.4% and a lone transgender with 0.4%. 234 (99.6%) use mobile phone and the remaining 1 (0.4%) does not. An absolute number of Male respondents use mobile phones. For the frequency of posting library activities on social media, 138 (58.7%) respondents post on a daily basis, 32 (13.6%) post twice a day, 26 (11.1%) post multiple times a day, 27 (11.5%) post on an hourly basis and remaining 12 (5.1%) post once in every 2 hours.



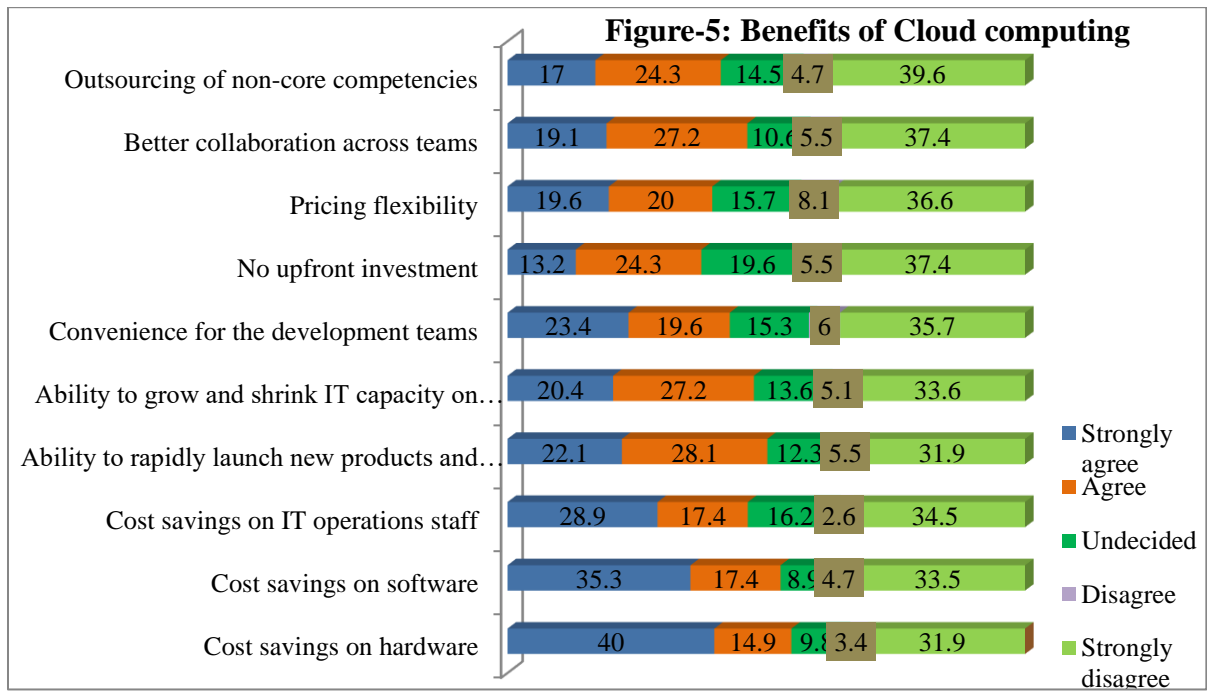
Data in figure-1 shows the respondent's Social media apps use in their respective libraries. 144 (61.3) respondents use Facebook, 124 (52.8%) use YouTube, 163 (69.4%) use Whatsapp, 74 (31.5%) and 61 (26.0%) use Facebook Messenger and Twitter respectively, 44 (18.7%) use Instagram, 17 (7.2%) use Wechat, 15 (6.4%) use Tik Tok, 3 (1.3%) use Qzone, 2 (0.9%) use Sina Weibo and 1 (0.4%) voted for QQ.



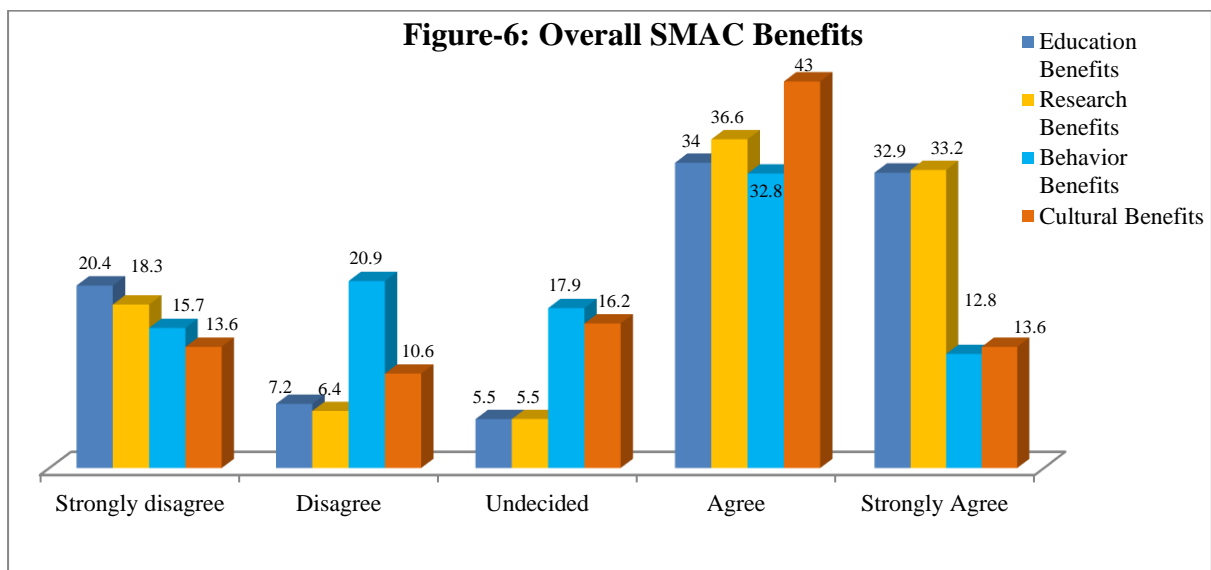
Regarding the facilities provided using the library app (figure-3) 35 (14.9%) libraries provide searching the catalogue service, 28 (11.9%) for membership facilities, 20 (8.5%) offer book renewal facilities, 25 (10.6%) allow book reservation, 25 (10.6%) enable SMS alerting, 34 (14.5%) enable access to E-resources, 25 (10.5%) for answering reference queries and 18 (7.7%) for referral services.



On the respondent's institution possessing data analytical tools to handle and analyse data, for which 124 (52.8%) does not know, 36 (15.3%) are expected to have them in next 5 years, 39 (16.6%) have appropriate analytical tools in place to handle big-data, remaining 36 (15.3%) respondents have no future plans for establishing any kind of data analysis tools (figure-4).



Of the cloud computing benefits derived, 94 (40.0%) strongly agree on cost savings on hardware and 35 (14.9%) have agreed, 23 (9.8%) are undecided, 8 (3.4%) have disagreed and remaining 75 (31.9%) strongly disagreed of cloud computing is cost saving on hardware. There are 83 (35.3%) strongly agree for the benefits on cost savings on software and 41 (17.4%) agreed. 68 (28.9%) strongly agreed for the benefits on Cost savings on IT operations staff and 42 (17.4%) agreed. 52 (22.1%) have strongly agreed and 66 (28.1%) agreed for the benefits on ‘ability to rapidly launch new products and services’. 48 (20.4%) strongly agreed and 54 (27.2%) agreed for the benefits on ‘ability to grow and shrink IT capacity on demand’. ‘Convenience for the development teams’ was rated by 55 (23.4%) as strongly agreed and 46 (19.6%) agreed. For the benefits on ‘No upfront investment’ 31 (13.2%) strongly agreed and 57 (24.3%) agreed. 46 (19.6%) strongly agree for the benefits on Pricing flexibility with 47 (20.0%) agreeing. The benefits of better collaboration across teams were strongly agreed by 45 (19.1%) and agreed by 64 (27.2%). 40 (17.0%) strongly agree and 57 (24.3%) agree for the benefits Outsourcing of non-core competencies (figure-5).



When an overall usefulness sought on multiple-responses based question as shown in the above figure describing the benefits of SMAC (figure-6). 80 (34.0%) agreed and 77

(32.9%) strongly agreed on education benefits by the use of SMAC technologies. 48 (20.4%) strongly disagree, 17 (7.2%) disagree and 13 (5.5%) undecided on the benefits of SMAC technologies in education. 78 (33.2%) strongly agreed, 56 (36.6%) agreed and 43 (18.3%) strongly disagreed on the benefits of SMAC technologies in Research. There are 77 (32.8%) respondents agreed and remaining 30 (12.8%) respondents have strongly agreed on Behavior Benefits of SMAC technologies. 101 (43.0%) respondents have agreed and 32 (13.6%) respondents strongly agree on the cultural benefits of SMAC technologies.

Discussion

There was a lone transgender responded for the study questionnaire. An absolute number of Male respondents use mobile phones. All the respondents who use mobile apps post their library updated daily. Facebook, YouTube, WhatsApp, Facebook Messenger and Twitter were the major social media apps used by the respondents. Majority of the respondents use mobile apps. Facilities provided using the library app are searching library catalogue, membership facilities, book renewal facilities, book reservation, SMS alerting, E-resources access facility, answering reference queries and providing referral services respectively. The majority of libraries do use one or the other apps in their respective libraries. Majority of the respondents either does not know or have no plans to have the appropriate analysis tools for handling big-data apart from 16.6% who have the appropriate analysis tools to handle big data presently. The majority agreed that use of cloud computing for the purpose of cost savings on hardware. 66.9% respondents either have agreed or strongly agreed that use SMAC in education is beneficial. The majority strongly agreed with the SMAC benefit in Research. The majority of respondents have agreed that the use of SMAC is beneficial in improving one's behaviour. Overall 56.6% respondents agreed or strongly agreed on cultural benefits using SMAC tools and technologies. In all senses SMAC has been a value addition as well as beneficial in the Indian libraries.

Recommendations

SMAC has come a long way globally, it is the need of the hour that the Indian libraries to adopt SMAC technologies suitably. Therefore, it is suggested to adopt the SMAC technologies to fulfil the dynamic customer requirements in present digital era. Incorporating S in the education system will help in the overall skill development among student community. This would constructively drive digital habits and enables consumerization of SMAC technologies. Use of SMAC technologies work in tandem and directly creates relevance for all the five laws of library science enunciated by Dr. S R Ranganathan.

Conclusion

SMAC is the foundation for most of the activities in today's digital age where IT is the backbone for the present libraries. Libraries of yesterday can be referred to as legacy organisations, and must need to undergo significant transformation, often referred to as "digital transformation," to cater to the dynamic user needs. According to this study, SMAC technologies can be used for providing library services to users via Facebook, Twitter, wiki, blog, and so on. The use of mobile technology powers M-OPAC, SMS Alerts services, mobile-based circulation service and etc., as quoted by Holmes, (2017) in Forbes magazine that 'Be Disruptive... or get Disrupted!'. SMAC would help enable the libraries to truly become the smart libraries of tomorrow by empowering the library staff and services too to respond to the customer needs and support problem resolution on time, thus realising the democratisation of information through consumerized IT....

References

- Aerieconsulting. (2018). *What are the different types of cloud computing services?*
<https://www.aerieconsulting.com/>
- Alfouzan, H. I. (2015). Introduction to SMAC- Social Mobile Analytics and Cloud. *International Journal of Scientific & Engineering Research*, 6(9), 128–130.
- Alkali, Y. E., & Amichai-Hamburger, Y. (2004). Experiments in Digital Literacy. *CyberPsychology & Behavior*, 7(4), 421–429. <https://doi.org/10.1089/cpb.2004.7.421>
- Asemi, A. (2005). Information searching habits of Internet users: A case study on the Medical Sciences University of Isfahan, Iran. *Webology*, 2(1).
- Bagudu, A. A., & Sadiq, H. (2013). *Students' Perception of Digital Library Services: A Case Study of International Islamic University, Malaysia*.
<https://www.semanticscholar.org/paper/>
- Belarbi, N., Chafiq, N., Talbi, M., & Namir, A. (2017). An Experimental Case Study: Integrating Mobile Dimension from SMAC Technologies, *SPOC*. 3(4),7.
- Broadly-Preston, J., & Swain, W. (2012). What business are we in? Value added services, core business and national library performance. *Performance Measurement and Metrics*, 13(2), 107–120. <https://doi.org/10.1108/14678041211241323>
- Cagdas, E., Kille, B., Brijnesh-Johannes, J., & Frank, H. (2014). Users' reading habits in online news portals, *Proceedings of the 5th Information Interaction in Context Symposium*. <https://doi.org/10.1145/2637002.2637038>
- Carter, M., & Petter, S. (2015). Leveraging Consumer Technologies: Exploring Determinants of Smartphone Use Behaviors in the Workplace. *2015 48th Hawaii International Conference on System Sciences*, 4619–4628. <https://doi.org/10.1109/HICSS.2015.550>
- Chyrun, L., Gozhyj, A., Yevseyeva, I., Dosyn, D., Tyhonov, V., & Zakharchuk, M. (2019). Web Content Monitoring System Development. *COLINS*, 126–142.
- Cicccone, A., & Hounslow, L. (n.d.). “Re-envisioning the role of academic librarians for the digital learnin” by Adriana Cicccone and Liz Hounslow. *Journal of University Teaching & Learning Practice*, 16(1).
- Chauhan, M. (2013). Use of Social Media in Libraries. *Redefining Libraries to Create Next Generation Libraries*. 46.
- Chiregi, M., & Jafari Navimipour, N. (2018). Cloud computing and trust evaluation: A systematic literature review of the state-of-the-art mechanisms. *Journal of Electrical Systems and Information Technology*, 5(3), 608–622.
<https://doi.org/10.1016/j.jesit.2017.09.001>
- Cummings, J., Merrill, A., & Borrelli, S. (2010). The use of handheld mobile devices: Their impact and implications for library services. *Library Hi Tech*, 28(1), 22–40.
<https://doi.org/10.1108/07378831011026670>
- Drummond, C., O'Toole, T., & McGrath, H. (2020). *Digital engagement strategies and tactics in social media marketing*. 54(6), 1247–1280.
<https://www.emerald.com/insight/content/doi/10.1108/EJM-02-2019-0183/full/html>
- Eddy, T., Reams, L., & Dittmore, S. (2016). Motivations and Mediated Consumption Habits of Users of Mixed-Martial-Arts Online Message Boards. *International Journal of Sport Communication*, 9(4), 440–459. <https://doi.org/10.1123/IJSC.2016-0077>
- Elissaveta, G., Asya, A., & Pavlin, D. (2012). *Integrated Platform for Mobile Learning*. Springer. https://link.springer.com/chapter/10.1007/978-1-4614-3329-3_5
- Fang, W. (2007). *Using Google Analytics for improving library website content and design: A case study*. <https://doi.org/10.7282/T3MK6B6N>
- Ferrucci, F., Scanniello, G., & Tortora, G. (2009). E-World: A Platform for the Management of Adaptive E-Learning Processes. In *Methods and Applications for Advancing Distance Education Technologies: International Issues and Solutions* (pp. 9–25). IGI Global. <https://doi.org/10.4018/978-1-60566-342-5.ch002>

- Holmes, F. (2017). *Disrupt Or Get Disrupted*.
<https://www.forbes.com/sites/greatspeculations/2017/03/07/disrupt-or-get-disrupted/#2813c280304c>
- Idiegbeyan-ose, J., Nkiko, C., & Osinulu, I. (2017). *Value-added Service to Academic Library Users in 21st Century: Using Competitive Intelligence Approach*.
<http://repository.elizadeuniversity.edu.ng/jspui/handle/20.500.12398/107>
- Krishna, K. M., & Adwani, N. (2010). Digital Information Access and its Impact on Reading Habit of Users. *SRELS Journal of Information Management*, 47(3), 289-295–295.
<https://doi.org/10.17821/srels/2010/v47i3/44028>
- Singh, R., & Trinchetta, G. G. (2020). Community Connections: Advocating for Libraries through Effective Brand Advocacy. *Public Library Quarterly*, 39(4), 295–309.
<https://doi.org/10.1080/01616846.2019.1613626>
- Li, Y., Xu-lun, L., & Sen-Sen, L. (2009). On the Application of Cloud Computing Technology in Library. *The Journal of the Library Science in Jiangxi*.
http://en.cnki.com.cn/Article_en/CJFDTotal-JXTS200901047.htm
- Mayes, R., Natividad, G., & Spector, J. M. (2015). Challenges for Educational Technologists in the 21st Century. *Education Sciences*, 5(3), 221–237.
<https://doi.org/10.3390/educsci5030221>
- Nowlan, G. (2013). Going mobile: Creating a mobile presence for your library. *New Library World*, 114(3/4), 142–150. <https://doi.org/10.1108/03074801311304050>
- Pradhan, D. R., Rai, A. K., & Arora, J. (2012). Implications of SUSHI for analysis of usage statistics of e-resources: A case study of UGC-INFONET Digital Library Consortium. *Annals of Library and Information Studies (ALIS)*, 59(3), 187-193–193.
<http://14.139.47.23/index.php/ALIS/article/view/309>
- Scale, M. (2009). Cloud computing and collaboration. *Library Hi Tech News*, 26(9), 10–13.
<https://doi.org/10.1108/07419050911010741>
- Showers, B. (2015). *Library Analytics and Metrics: Using data to drive decisions and services*. Facet Publishing.
- Karthikeyan, & Thangavel, T. (2018). *Applications of Security, Mobile, Analytic, and Cloud Technologies for Effective Information Processing and Management*. IGI Global.
- Mukherjee, S. (2019). Information Governance for the Implementation of Cloud Computing: A Review. *IUP Journal of Information Technology*, 15(3).
<https://web.b.ebscohost.com/>
- Nayyar, A. (2019). *Handbook of Cloud Computing: Basic to Advance research on the concepts and design of Cloud Computing*. BPB Publications.
- Omeluzor, S., Saliu Sambo, A., & Sunday, I. D. (2019). Identifying Contextual Challenges and Modifying Traditional Methods of Library Instruction in Private University in Nigeria. *Library Philosophy and Practice, Summer*, 14.
- Sobol, B. (2019). *Academic Library Service Models in British Columbia: A Report for Practitioners*. <https://doi.org/10.14288/1.0385183>
- Sreekumar, M. G. (2012). Strategies on e-resources management for smart information systems. *Annals of Library and Information Studies (ALIS)*, 59(3), 155-169–169.
- Wang, X.-W., Cao, Y.-M., & Park, C. (2019). The relationships among community experience, community commitment, brand attitude, and purchase intention in social media. *International Journal of Information Management*, 49, 475–488.
- Ying-Feng, K., Chi-Ming, W., & Wei-Jaw, D. (2009). The relationships among service quality, perceived value, customer satisfaction, and post-purchase intention in mobile value-added services. *Computers in Human Behavior*, 25(4), 887–896.
<https://doi.org/10.1016/j.chb.2009.03.003>
- Zou, H. (2019). *Understanding the Role of Social Media in Enhancing Participatory Services in Public Libraries*. 133.