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EVALUATING THE DIGITAL READINESS OF GOVERNMENT TECHNICAL UNIVERSITIES IN HARYANA: A LIBRARIAN'S PERSPECTIVE IN LIGHT OF NEP 2020

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ABSTRACT

Higher Education Institutions (HEIs) must gauge their digital readiness to remain relevant in the era of digitalization. The present study attempts to evaluate the digital readiness of government technical universities in Haryana, aligning with the National Education Policy (NEP) 2020 objectives. The study is focuses on examining Library resources, ICT infrastructure, digital services, and the digital efficiency of library staff. The findings reveal significant disparities in digital capabilities, highlighting strengths and areas requiring improvement, particularly in adopting emerging technologies. The study emphasizes the necessity of training and strategic investments in digital resources to foster a digitally empowered academic environment. This analysis provides valuable insights for educators and policymakers in improving the digital landscape in higher education institutions.

Keywords: Digital, Digital Readiness, Technology, Higher Education Institutions, Libraries, Librarians

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1. INTRODUCTION

Digital readiness refers to the preparedness of Higher Education Institutions to adapt and integrate digital technologies/tools (Chounta et al., 2024). Digital technology integration ushered education into a new digital world in the past few decades. Digital readiness is a continuous process and become imperative in the present digital age. The lack of digital readiness in education, especially in developing countries, may prove counterproductive for the students and teachers (Atta et al., 2021). Ogbevoen Linda (2020) stated that digital readiness is how an organization's workforce is prepared to adapt to digital workflows made possible by software and Technology. Digital readiness refers to the ability to effectively use technology-related knowledge, skills, and attitudes to achieve educational goals for college students in Higher Education Institutions (HEIs) (Kim et al., 2019). Hong and Kim (2018) defined digital readiness as "technology-related knowledge, skills, attitudes, and competencies for using digital technologies to meet educational aims and expectations in higher education." The digital readiness of students is the extent to which they are using digital technologies for their academic and information needs. Digital learning is a domain of international research exploring

people's preparedness in technology-rich education (Blayone, 2018). Digital readiness is similar to digital transformation and digitization. Digital readiness refers to the ability of individuals and organizations to use digital technologies effectively. It encompasses essential digital skills, such as navigating online platforms, sharing content, and performing tasks. Digital readiness extends beyond mere access to technology, emphasizing preparedness, digital literacy, and confidence in using digital tools (Horrigan, 2016).Libraries are pivotal in advancing knowledge and fostering academic excellence in universities.

In the present study, four government technical universities of Haryana: Deenbandhu Chhotu Ram University of Science & Technology, Murthal, Sonepat (DCRUST), Guru Jambeshwar University of Science & Technology, Hisar (GJUST), J.C. Bose University of Science & Technology, Faridabad (YMCA), and Pandit Lakhmi Chand State University of Performing & Visual Arts, Rohtak (PLCSUPVA) has been selected out of total four, to evaluate their digital readiness. The Library of an educational institution reflects its digital preparedness. Brief information about the central libraries of the government technical universities of Haryana is given below in Table 1:

Table 1 Government Technical University Libraries

Sr. No.	University	Name of Library	Year of Establishment
1	GJUST	Dr. Bhim Rao Ambedkar Library	1996
2	DCRUST	Saraswati Library	2006
3	JCBUST	Pt. Deendayal Upadhyay Central Library	2009
4	PLCSUPVA	University Library	2014

Different authors have reviewed several significant studies on digital readiness with their designed/selected parameters, as given below in the review of literature part and Table 2. The present study has been carried out from the library's perspective, and hence, selective digital readiness parameters have been chosen to this effect, as mentioned in Table 3.

2. REVIEW OF LITERATURE

Atta et al. (2021) aimed to validate the Digital Readiness for Academic Engagement (DRAE) scale among healthcare students in Pakistan. The research was conducted across 1744 students from seven institutions using the DRAE scale, encompassing five key domains: digital tool application, information-seeking skills, digital media awareness, information-sharing behaviour, and digital application usage. Similarly, Giang et al. (2021) introduced criteria for assessing the digital readiness of a "digital university" using four fundamental facets, including Learners, Education Program, Training Services, and Governance. Their study presented a framework for digital readiness, serving as a reference for the other HEIs and helpful in digital transformation.

Building on this, Händel, Stephan, and Gläser-Zikuda (2020) explored students' digital learning readiness during the COVID-19 pandemic and its socio-emotional impacts. The study was conducted in 1826 by German University students, the findings revealed that while most students were ready for digital learning, those unprepared experienced loneliness and stress, emphasizing the importance of addressing inequalities and supporting under-resourced students.

Furthermore, Soomro, Hizam-Hanafiah, and Abdullah (2020), in their systematic literature review of 57 research papers spanning 2007-2019, investigated digital readiness models in the context of the Fourth Industrial Revolution. Their analysis identified four critical success factors: Digital Infrastructure & systems, Digital tools & applications, Digital agents & skills, and Digital ecosystem & culture, underscoring the significance of digital readiness for organizations in the digital age.

Similarly, Roffi, Ranieri, and Bruni (2020) assessed the digital readiness of schools during the COVID-19 pandemic using the SELFIE questionnaire and interviews related to Infrastructure, digital technologies, digital literacies, etc. Their findings highlighted significant gaps in digital competence among teachers and students, further stressing the necessity of training, support, and strategic planning to enhance their digital readiness.

Kim, Hong, and Song (2019) emphasized the pivotal role of e-learning environments and digital readiness in ensuring academic success for students of higher education. They advocated for robust digital skills among students and faculty to effectively integrate digital technologies and e-learning platforms. Likewise, Blayone et al. (2018) highlighted the alignment of digital readiness with online learning for educational innovation, drawing from a study on university students in Georgia & Ukraine.

Nasution et al. (2018) examined the concept of digital readiness in their paper "The Evaluation of Digital Readiness Concept: Existing Models and Future Directions." They highlighted various predictive models such as the Technology Readiness Index, Digital Readiness, Employee Readiness to embrace Electronic Business, and Mobile Readiness. Their work provided a simplified pathway for organizations to evaluate and enhance their digital readiness, emphasizing the utilization of digital technologies in today's digital landscape.

3. DIGITAL READINESS ASSESSMENT OF EDUCATION INSTITUTIONS

Table 2 Digital Readiness Assessment Scales Given by Different Authors

Sr. No.	Authors	Assessment Scale	Parameters
1	Atta et al. (2024)	DRAE Scale	1. Digital Tool Application 2. Information Seeking skills 3. Digital Media Awareness 4. Information Seeking Behaviour Digital Application Usage
2	Chounta, et al. (2024)	Digital readiness dimensions	1. Leadership and governance, 2. Policies and strategies, 3. Teaching and learning, 4. Content and curricula, 5. Training and support 6. Infrastructure
3	European Commission (2017); Castaño Muñoz, Pokropek, and Weikert García (2022)	SELFIE (Self-reflection on Effective Learning by Fostering Innovation through Educational Technology) is a free tool for schools	1. Collaboration and networking, 2. Infrastructure and equipment, 3. Professional development, 4. Assessment practices, 5. Student digital competence 6. Pedagogy (support and resources).
4	European Commission (2018); Hippe, Pokropek, and Costa (2022).	SELFIE for work-based learning (WBL) online self-reflection tool for VET (Vocational Education and Training) schools and companies.	1. Leadership and governance, 2. Collaboration and networking, 3. Infrastructure and equipment, 4. Pedagogy (supports and resources) 5. Pedagogy (implementation in the classroom) 6. Assessment practices, 7. Continuous professional development 8. Student digital competence.
5	Hong & Kim (2018)	Digital Readiness for Academic Engagement (DRAE) Scale.	1. Technological proficiency, 2. Digital learning attitudes, 3. Adaptability to digital environments.

4. DIGITAL READINESS OF LIBRARIES UNDER NATIONAL EDUCATION POLICY (NEP) 2020

The NEP 2020 outlines several goals, including those relevant to the role of libraries and library professionals in education. The key parameters for the present study have been derived from the key recommendations of NEP 2020 concerning libraries in its different chapters, as mentioned below:

1) ICT Infrastructure and Resources available in the Digital library

- Ensured ICT-equipped infrastructure for adult education and lifelong learning (Part-III; Para 21.6, 21.10).
- Digital infrastructure (Part-III; Para 24.2, 24.4).
- To strengthen & modernize the existing colleges and universities libraries (Part-III; Para 21.9).
- To provide quality technology-based, including online books, apps, and ICT-equipped libraries for learning (Part-III; Para 21.10).
- To make library books more accessible and available online (Part-III; Para 21.9).
- To provide access to sufficient books that cater to the interests of students (Part-III; Para 21.9).
- High-quality learning, translations, and print materials must be available in different Indian languages, including textbooks, workbooks, videos, plays, journals, magazines, novels, non-fiction books & poetry (Part-III; Para 22.6, 22.20).

2) Services available in Digital Library

All HEIs should have libraries and classrooms with the latest educational technologies for better learning experiences (Part-II; Para 13.2).

Utilizing Technology for Digital or Online Education (Part-III; Para 24.2, 24.4).

Increased access to learning materials, available and accessible to remote, socio-economically disadvantaged, underprivileged students & learners with disabilities (Part- II, III; (Para 9.3 (i), 21.9).

To establish rural and mobile libraries (Part-III; Para 21.9).

3) Digital readiness of library staff

- To foster collaborations between libraries and educational institutions (Part-III; Para 21.9).
- Assist in advancing research at HEIs and universities (Part-II; Para 17.8, 17.9).
- India may become a digitally empowered nation by integrating cutting-edge technologies like Blockchain, machine learning, AI (Artificial Intelligence), other educational software and hardware, (Part-III; Para 24.2, 24.4).
- E-learning platforms such as SWAYAM, DIKSHA, and SWAYAMPRABHA digital content repositories, including creating and disseminating e-content, will be available to students (Part-III; Para 24.2, 24.4).
- To provide quality libraries in HEIs for quality learning (Part-II; Para-12.1).

4) Continuous professional development (CPD) through training programs

To promote career pathway development for library staff (Part-III; Para 21.9).

Using technological platforms for teacher training, like SWAYAM and DIKSHA (Part-II; Para 15.10).

5. OBJECTIVES OF THE STUDY

The present study has been carried out with the following objectives:

To assess the digital readiness of government technical Universities in Haryana.

To study the digital resources of libraries of selected technical universities.

To evaluate their digital readiness in light of NEP 2020.

To identify the challenges the library staff faced in acquiring digital readiness.

6. METHODOLOGY

Based on the literature survey, parameters for digital readiness have been designed from a librarian's perspective. This study adopted a descriptive research design to evaluate the digital readiness of government technical universities of Haryana. The study employed a structured questionnaire as the primary data collection tool, based on the identified parameters and objectives. The survey has been conducted on library staff of technical universities. Respondents have

been asked to provide information on five parameters such as Infrastructure, services, resources, training, and digital readiness. The responses were compiled, analyzed and presented in tabular form for comparison across universities under study. The study is limited to the responses of library staff, and analysis is confined to the selected governmental technical universities in Haryana.

7. DIGITAL READINESS PARAMETERS FOR THE CURRENT STUDY

Drawing insights from the digital readiness assessment scales mentioned by different authors is given in Table 2. The present study introduces four digital readiness parameters tailored to align with the objectives of NEP 2020 from the librarian's perspective, as given below in Table 3:

Table 3 Digital Readiness Parameters

Digital Readiness Parameters	1. Library Resources
	2. ICT Infrastructure facilities in the library
	3. Digital Services provided by the library
	4. Digital proficiency of library staff
	5. Training and Support by the library

These above mentioned parameters aim to strengthen the digital capabilities of libraries, enabling them to effectively contribute to the policy's educational reforms.

8. RESULTS AND DISCUSSION

The this section analysis of data was carried out on several parameters such as library resources, ICT Infrastructure facilities, Digital Services of library, Digital proficiency of library staff and Training and Support by library. The analysis help in assessing digital readiness of library staff of government technical universities of Haryana. The analysis is presented in various tables throughout this section, as given below.

1) LIBRARY RESOURCES

The library collection is a total of materials that make up a particular library's holding in the form of print and Electronic Information Resources (EIRs). Through the study, an attempt has been made to analyze the collection strength of the technical university libraries as given in Table 4 below:

Table 4 Library Resources (Print and EIRs)

LIBRARY RESOURCES	Name of the Technical University			
	GJUST	DCRUST	JCBUST	PLCSUPVA
Books	130584	85042	85627	32,000
Newspapers	20	20	16	15
Magazines	42	53	36	100
Journals (Indian + Foreign)	283	165	129	98
Thesis/Dissertations/Projects	1102/966	320	116	82
E-Thesis/Dissertation	814	320	100	00
Bound Journals	5850	1400	700	700
Abstracting Database	02	01	01	00
Bibliographic Database	02	01	01	00
E-Journals	8000+	17613	3400	10
E-Books	262281	10493	7100	3000
Audio/Video Materials	18200	84331	84000	00
Institutional Repository	01	01	01	00
Plagiarism Detection Software	02	02	02	02
CD/DVDs	2068	07	00	76

Any additional resources not covered above.	Expert talk (2949), Video lectures (18310) from IITs.	Virtual Lab (142), Expert talk (7773), Video lectures (84331) from NPTEL.	Expert talks (2949), Lab experiment (142)	Full-text database (01)
Total	**4,41,408**	**2,92,015**	**1,84,320**	**36,084**

The above Table 4 provides a comparative analysis of the library resources available in the Haryana's four selected technical universities. Among these, the library at Guru Jambeshwar University of Science & Technology (GJUST) demonstrates the highest overall collection, with 4,41,408 print and digital resources, followed by Deenbandhu Chhotu Ram University of Science & Technology (DCRUST) library with a total of 2,92,015 resources, showcasing a moderate level of print and electronic materials. DCRUST shows strength in journals and bound volumes, reflecting a balanced approach to print and electronic resources. In contrast, the libraries at J.C. Bose University of Science & Technology (JCBUST) and Pandit Lakhmi Chand State University of Performing & Visual Arts (PLSUPVA) lag, with collections of 1,84,320 and 36,084 resources, respectively, pointing to gaps in their digital readiness.

2) ICT Infrastructure Available in The Library

Table 5 ICT Infrastructure available

ICT INFRASTRUCTURE	Name of the Technical Universities			
	GJUST	DCRUST	JCBUST	PLCSUPVA
Computers/PCs	79	40	15	12
Server	03	04	01	01
Laptop	04	02	01	00
Printers	08	07	04	01
Scanners	02	01	01	02
Barcode Scanners	03	02	02	04
Generators	01	01	01	00
Multimedia Projectors	01	00	00	00
LED Screen	02	02	01	00
UPS system	04	05	02	01
CCTV	70	32	10	10
Webcam	11	00	00	02
RFID	00	00	00	00
Total	**188**	**96**	**38**	**33**

Table 4 provides a detailed overview of the ICT infrastructure available in the government technical university libraries of Haryana. From the table it is observed that there is significant variations in the availability of ICT resources among these institutions. GJUST's Library leads in ICT infrastructure with 79 computers, multiple servers, and various additional devices such as barcodes, scanners, printers, and LED screens. It indicates that the library is well-equipped to support digital initiatives and provide robust technological support to its patrons. DCRUST's Library ranks second, offering 40 computers and a similar range of electronic devices, though in smaller quantities compared to GJUST. JCBUST and PLSUPVA libraries demonstrate limited ICT infrastructure, indicating significant gaps in their technological capabilities. Notably, none of the selected university libraries have implemented RFID technology, a critical feature for efficient tracking and circulation. Similarly, specific modern tools, such as multimedia projectors and webcams, are either absent or minimally available, which may hinder the library's ability to provide contemporary library services effectively.

3) Digital Services Provided by Library

Table 6 Digital Services Provided by Library

E-SERVICES	Name of the Technical University			
	DCRUST	GJUST	JCBUST	PLCSUPVA
Fully automated Library services through Library management software	01 (KOHA)	01 (KOHA)	01 (Libsys)	01 (KOHA)
Library Digitization	01 (Refread)	01 (Dspace)	01 (Refread)	00
Circulation with Barcodes	01	01	01	01
Circulation with RFID	00	00	00	00
OPAC/ Web OPAC facility	01	01	01	01
Multimedia/ Audio-visual room	00	01	00	00
Scanning and printing facility	01	01	01	01
Online Reference Service	01	01	01	00
Services/Technology to assist patrons with disabilities	00	01	00	00
Facility to digitize library resources	01	01	00	00
New additions to library (E-Alerts) Service	01	01	01	01
Email Assistance Service	01	01	01	01
E-circulation Service	01	01	01	01
E-Document Delivery Service	01	01	01	00
Video & Teleconferencing Service	00	01	00	00
Total	**11**	**15**	**10**	**7**

1= Yes & 0 = No

Table 6 evaluates the range of digital services offered by the libraries of the selected technical universities of Haryana, reflecting the libraries' preparedness to meet user needs in a digital environment. The data demonstrates that GJUST's library provides the most comprehensive digital services, offering 15 out of 16 listed services. Notable strengths include a fully automated library system, library digitization through DSPACE, e-document delivery service, online reference services, video conferencing service, and technologies to assist patrons with disabilities, emphasizing its efforts to provide modern and inclusive library experiences. DCRUST ranks second with 11 digital services. It provides core functionalities such as library automation, e-alerts, online referencing services, and circulation with barcode scanning. However, DCRUST lacks advanced digital services like audio conferencing and technology to assist patrons with disabilities, indicating areas for future improvement. JCBUST's library offers 10 digital services, focusing on essential functionalities, but lacks advanced features, which limits its ability to serve diverse user needs. PLSUPVA provides the least digital services, with only 7 out of 16, highlighting significant gaps in its digital readiness.

4) Digital Proficiency of the Library Staff

Table 7 Digital proficiency of the library staff

DIGITAL READINESS	Name of the Technical University			
	DCRUST	GJUST	JCBUST	PLCSUPVA
Can easily connect hardware components of the computer	03	04	03	02
Knows how to create files and folders	05	05	04	03
Knows how to move files between drives	03	05	03	03
Can run CDs/ DVDs effectively	04	05	03	03
Knows how to secure library digital data	01	04	02	04
Can use and create power point presentations.	03	05	03	04
Know how to attach files to email	05	05	04	04

Know how to host online meetings	02	05	02	02
Experience using emerging technologies such as AI, machine learning, or Blockchain for academic or research purposes.	01	04	02	01
Can effectively record, edit, and share videos	03	02	02	02
Utilize advanced search features (e.g., Boolean operators, & filters).	02	05	02	02
Total	**32**	**49**	**30**	**30**

1=No Knowledge, 2=Basic Knowledge, 3=Intermediate, 4=Advanced, & 5= Expert

Table 7 assesses the digital proficiency of library professional staff across the selected technical universities in Haryana by measuring their competency and knowledge in various digital skills. The data underscores the disparity in digital proficiency of library staff among the universities. GJUST scores the highest, with a total of 49 points. The library staff exhibits advanced to expert-level proficiency areas such as connecting hardware components, creating files/folders, moving files between drives, attaching files to email, creating PowerPoint presentations, hosting online meetings, using advanced search techniques and emerging technologies, indicating their digital readiness to adopt innovative solutions for library services. DCRUST's library staff follows with 32 points and demonstrates intermediate proficiency in several digital skills. They lack expertise in advanced skills, reflecting a necessity of regular training programs for library staff. JCBUST and PLSUPVA library staff scored 30 points, indicating similar levels of digital readiness. It highlights significant gaps in their ability to leverage advanced digital tools for library operations.

5) Training and Support by the Library

Table 8 Training and Support provided by Library

TRAINING PROGRAMS	Name of the Technical University			
	DCRUST	GJUST	JCBUST	PLCSUPVA
Library orientation	02	02	02	01
Virtual library orientation	02	02	01	01
Training in the use of databases (by library staff)	01	02	00	00
Training by vendors/ publishers	01	02	01	01
Seminar/Webinar/Workshop	02	02	02	00
Awareness about e-resources	02	02	02	01
Awareness to protect personal data and privacy in the digital environment	02	02	02	02
Training in search skills/ strategies	02	02	01	01
Extension Lectures	00	02	02	00
Total	**14**	**18**	**13**	**7**

2 = Biannually, 1 = Annually, & 0 = Never

Table 8 identifies training and support programs offered by libraries of the government technical universities of Haryana. The data highlights the significant disparities in the availability and regularity of these programs across the institutions. The table shows that GJUST leads with a total score of 18, indicating a strong emphasis on providing regular training and support. The GJUST's library conducts biannual activities such as seminars/webinars, orientation sessions, training in database usage, awareness program in e-resources, extension lectures, and data privacy. DCRUST lags behind GJUST in providing extension lectures and the frequency of training programs for database usage and publisher/vendor-led sessions. JCBUST's library score is 13, reflecting moderate training efforts. The library conducts regular orientation sessions and awareness programs on e-resources and data privacy but lacks consistent training in virtual library orientation, search strategies, and database usage. PLSUPVA's library scores the lowest, with a total of 7, and provides minimal training opportunities, with only occasional user orientations and awareness sessions on e-resources and data privacy. The absence of virtual orientations, extension lectures, and database training highlights significant gaps in its support programs, limiting its ability to equip library users with digital competency.

9. CHALLENGES AND PROBLEMS FACED BY LIBRARY STAFF

Table 9 Problems faced by library staff

1. PROBLEMS	2. Name of the Technical University			
	3. DCRUST	4. GJUST	5. JCBUST	6. PLCSUPVA
7. Financial Constraints in acquiring the necessary digital technologies and tools.	8. 01	9. 02	10. 02	11. 02
12. Limited Infrastructure, insufficient access to computers, and devices hinder my digital work	13. 02	14. 02	15. 02	16. 02
17. Inadequate training for updating knowledge	18. 03	19. 02	20. 03	21. 04
22. Difficulty in integrating various digital tools into academic or research work	23. 03	24. 02	25. 04	26. 04
27. Lack of administrative support	28. 01	29. 02	30. 02	31. 03
32. Inadequate cyber security/ data security/ privacy	33. 03	34. 02	35. 03	36. 03
37. Lack of ICT skills among library staff	38. 04	39. 02	40. 02	41. 02
42. Lack of awareness of open source software (OSS)	43. 03	44. 04	45. 04	46. 04
47. Lack of awareness about Digital library software	48. 04	49. 04	50. 04	51. 04
52. Lack of training to overcome digital challenges/ new technologies	53. 04	54. 03	55. 04	56. 04
57. Inadequate Internet connectivity	58. 03	59. 01	60. 02	61. 02
62. Total	63. 31	64. 26	65. 32	66. 32

1 =Strongly Disagree, 2 =Disagree, 3 =Neutral, 4 =Agree, &5 =Strongly Agree

Table 9 highlights the challenges library staff in Haryana's selected technical universities faced in acquiring and utilizing digital technologies. The analysis reveals common issues, as well as institution-specific difficulties, affecting digital readiness. The problems users of selected universities face in acquiring and effectively utilizing digital technologies. JCBUST and PLSUPVA report the highest score (32 each), indicating significant challenges. Both institutions face consistent issues, including inadequate training on digital tools, technologies in academic work, limited awareness of open-source software and digital library systems. DCRUST score slightly lower (31), demonstrates moderate challenges but requires targeted efforts to improve ICT skills, awareness of open access tools, and training on data security practices. Meanwhile, GJUST scores the lowest (26), while library staff faces fewer issues related to financial constraints and basic training.

10. CONCLUSION

The study provides an insightful evaluation of the digital readiness of government technical universities of Haryana, focusing on their libraries in alignment with the objectives of NEP 2020. The finding reveals significant disparities in digital infrastructure, services, and digital proficiency among the selected institutions. GJUST emerges as a leader, showcasing a robust digital infrastructure, comprehensive digital services, and well-trained library staff. However, even GJUST faces challenges in adopting emerging technologies and ensuring data security measures. Other institutions, such as JCBUST and PLSUPVA, demonstrates varying degree of readiness but share common issues, including limited digital infrastructure, inadequate training programs, and a lack of awareness regarding emerging technologies and digital tools. The study underscores the critical need for continuous investments in digital resources, infrastructure, targeted training programs, and awareness initiatives to bridge these gaps. Collaborative efforts among technical institutions, regular

upskilling of library staff, and adoption of advanced technologies like AI and blockchain can significantly enhance the digital readiness of these universities. By addressing these areas, libraries play an important role in fostering digitally empowered learning environments, thereby aligning the transformative goals of NEP 2020 and contributing to the overall academic excellence of their institutions.

CONFLICT OF INTERESTS

None .

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