Digitization and Archiving of Dr. P.G. Halakatti Literary Legacy: A Comprehensive Study

Thesis submitted to BLDE (Deemed to be University) for the Partial Fulfilment for the award of the degree of

Post Graduate

In

Library and Information Science

By

Mr. Dhanesh Tolanur

23STMLIB03

Department of Library and Information Science

School of Applied Science & Technology

Supervisor

Dr. Prasanna Kumar B. M

Department of Library and Information Science

School of Applied Science & Technology

BLDE (Deemed to be University)

Vijayapura – 586103, Karnataka

2024-2025

BLDE (Deemed to be University)

School of Applied Science and Technology Vijayapura, Karnataka

DECLARATION BY THE CANDIDATE

This is to certify that the thesis entitled **"Digitization and Archiving of Dr. P.G. Halakatti Literary Legacy: A Comprehensive Study"** submitted by Mr. Dhanesh Tolunur (Reg. No.: 23STMLIB03) for the award of the degree of Post-Graduation to the BLDE (Deemed to be University), Vijayapura, is a record of bonafide research work carried out by me under the supervision and guidance of Dr. Prasanna Kumar B.M Assistant Professor and University Librarian Department of Library and Information Science at BLDE (Deemed to be University) Vijayapura, Karnataka.

Date: **Signature of the Student**

Place: Vijayapura

Mr. Dhanesh Tolunur
23STMLIB03
Post Graduate
Department Library and Information Science
School of Applied Science & Technology
BLDE (Deemed to be University)
Vijayapura, Karnataka

BLDE (Deemed to be University)

School of Applied Science and Technology Vijayapura, Karnataka

CERTIFICATE FROM THE SUPERVISOR

This is to certify that the thesis entitled **"Digitization and Archiving of Dr. P.G. Halakatti Literary Legacy: A Comprehensive Study"** submitted by **Mr. Dhanesh Tolunur** (Reg. No.: 23STMLIB03) for the award of the degree of Post-Graduation to the BLDE (DU), Vijayapura, is a record of bonafide research work carried out by him under the supervision and guidance of Dr. Prasanna Kumar B.M Assistant Professor and University Librarian Department of Library and Information Science at BLDE (Deemed to be University) Vijayapura. I consider that the thesis has reached the standards and fulfilling the requirements of the rules and regulations relating to the nature of the degree. The contents embodied in the thesis have not been submitted for the award of any other degree or diploma in this or any other university.

Date: **Dr. Prasanna Kumar B.M**

Place: Vijayapura

Assistant Professor and University Librarian

Department of Library and Information Science

School of Applied Science and Technology

BLDE (Deemed to be University)

Vijayapura, Karnataka

BLDE (Deemed to be University)

School of Applied Science and Technology Vijayapura, Karnataka

ENDORSEMENT BY THE HEAD OF DEPARTMENT

This is to certify that the thesis entitled **"Digitization and Archiving of Dr. P.G. Halakatti Literary Legacy: A Comprehensive Study"** submitted by Mr. Dhanesh Tolunur (Reg. No.: 23STMLIB03) for the award of the degree of Post-Graduation to the BLDE (DU), Vijayapura, is a record of bonafide research work carried out by his under the supervision and guidance of Dr. Prasanna Kumar B.M Assistant Professor and University Librarian Department of Library and Information Science at BLDE (Deemed to be University) Vijayapura. This work has been carried out by his in the School of Applied Science & Technology BLDE (Deemed to be University) Vijayapura, Karnataka.

Date:

Place: Vijayapura

Dr. Prasanna Kumar, B.M

Assistant Professor and University Librarian
Department of Library and Information Science
School of Applied Science and Technology
BLDE (Deemed to be University)
Vijayapura, Karnataka

BLDE (Deemed to be University)

School of Applied Science and Technology Vijayapura, Karnataka

ENDORSEMENT BY THE DEAN

This is to certify that the thesis entitled **"Digitization and Archiving of Dr. P.G. Halakatti Literary Legacy: A Comprehensive Study"** submitted by Mr. Dhanesh Tolunur (Reg. No.: 23STMLIB03) for the award of the degree of Post-Graduation to the BLDE (DU), Vijayapura, is a record of bonafide research work carried out by his under the supervision and guidance of Dr. Prasanna Kumar B.M Assistant Professor and University Librarian Department of Library and Information Science at BLDE (Deemed to be University) Vijayapura. This work has been carried out by his in the School of Applied Science & Technology BLDE (Deemed to be University) Vijayapura, Karnataka.

Date:

Place: Vijayapura

Dr. S.V. PATIL

Dean School of Applied and Technology

BLDE (Deemed to be University)

Vijayapura, Karnataka

BLDE (Deemed to be University)

School of Applied Science and Technology Vijayapura, Karnataka

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Date:

Place: Vijayapura

Signature of the Student

Mr. Dhanesh Tolunur
23STMLIB03
Post Graduate
Department Library and Information Science
School of Applied Science & Technology
BLDE (Deemed to be University)
Vijayapura, Karnataka

ACKNOWLEDGMENT

I take this opportunity to express my profound sense of gratitude to all those who have supported me in the successful completion of this dissertation entitled **"Digitization and Archiving of Dr. P. G. Halakatti Literary Legacy: A Comprehensive Study"**

I am deeply grateful to my guide, **Dr. Prasanna Kumar B.M Assistant Professor and University Librarian** Department of Library and Information Science, School of Applied Science and Technology, BLDE (Deemed io be University), Vijayapura, Karnataka for his constant encouragement, valuable guidance, and continuous support throughout the progress of this work. His insights and constructive suggestions have been a great source of inspiration.

I extend my sincere thanks to the **Head, Department of Library and Information Science**, School of Applied Science and Technology, BLDE (Deemed to be University), for his cooperation, timely advice, and academic support.

My heartfelt thanks are also due to the **Dean**, School of Applied Science and Technology, BLDE (Deemed to be University), for providing the necessary facilities and encouragement for the successful completion of this dissertation.

I would like to express my appreciation to the **faculty members, library staff, classmates and friends** who directly or indirectly assisted me in this endeavor with their valuable suggestions and kind support.

Finally, I owe my deepest gratitude to my **family members** for their patience, moral support, and encouragement, and to the **Almighty** for granting me the strength and wisdom to complete this study successful

Acknowledgment

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LIST OF ABBREVIATIONS

Abbreviation	Full Form
AI	Artificial Intelligence
API	Application Programming Interface
B/W	Black and White
CCD	Charge-Coupled Device
CMS	Content Management System
CSV	Comma-Separated Values
DBMS	Database Management System
DDL	Data Definition Language
DLC	Digital Library Collection
DLT	Digital Linear Tape
DOI	Digital Object Identifier
dpi	Dots Per Inch
FTP	File Transfer Protocol
GIS	Geographic Information System
HDD	Hard Disk Drive
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
ICT	Information and Communication Technology
IETF	Internet Engineering Task Force
IIIF	International Image Interoperability Framework
IP	Intellectual Property
IPR	Intellectual Property Rights
ISBN	International Standard Book Number
ISSN	International Standard Serial Number
IT	Information Technology
JPEG	Joint Photographic Experts Group

JPEG2000	Advanced JPEG format
Kibo XS	Overhead Book Scanner
LAN	Local Area Network
MLA	Modern Language Association
ML	Machine Learning
NLP	Natural Language Processing
OCR	Optical Character Recognition
ODM	Original Document Material
PDF	Portable Document Format
PDF/A	Archival PDF Format
QA	Quality Assurance
QC	Quality Control
RAID	Redundant Array of Independent Disks
RGB	Red, Green, Blue
SQL	Structured Query Language
TIFF	Tagged Image File Format
URL	Uniform Resource Locator
USB	Universal Serial Bus
UTF-8	Unicode Transformation Format 8-bit
UX	User Experience
XML	Extensible Markup Language
ZIP	Compressed File Format
A/D	Analog-to-Digital Conversion
BCR	Bibliographic Control Record
CDL	Controlled Digital Lending
DAM	Digital Asset Management
DAS	Digital Archiving System
DC	Dublin Core

DCMI	Dublin Core Metadata Initiative
DLMS	Digital Library Management System
FADGI	Federal Agencies Digital Guidelines Initiative
LOD	Linked Open Data
LIS	Library and Information Science
METS	Metadata Encoding and Transmission Standard
MODS	Metadata Object Description Schema
OAIS	Open Archival Information System
PPI	Pixels Per Inch
TTS	Text-to-Speech
VRA Core	Visual Resources Association Core Metadata

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Abstract

Digitization and Archiving of Dr. P.G. Halakatti Literary Legacy: A Comprehensive Study

The study entitled “Digitization and Archiving of Vachanana Pitamaha Dr. P. G. Halakatti Research Centre Literary Works” focuses on the preservation and digital transformation of rare and valuable Vachana manuscripts. These works, collected and edited by Dr. P. G. Halakatti, hold immense significance in understanding the philosophical, cultural, and linguistic foundations of the Kannada-speaking region. However, due to age, fragility, and lack of systematic preservation, much of this invaluable literary heritage faces the threat of deterioration and eventual loss.

The research employs a qualitative case study approach to explore the existing preservation and archival practices at the Dr. P. G. Halakatti Research Centre, Bijapur. Through direct observation, field visits, and interviews, the study investigates the condition of manuscripts, storage environments, cataloguing systems, and institutional workflows. The qualitative design enables a contextual understanding of the challenges, practices, and opportunities in digitizing culturally significant collections.

Methodologically, the study integrates descriptive, exploratory, and applied research approaches. Descriptive research documents the physical condition and storage conditions of the manuscripts, while the exploratory component identifies gaps in preservation techniques, metadata structuring, and institutional capacity. The applied approach is reflected in the implementation of a practical digitization model using modern tools and technologies appropriate for archival science.

The digitization workflow developed in this study makes use of the Kibo XS scanner, Optical Character Recognition (OCR) software for Kannada texts, and the DSpace repository for digital storage and access. These technologies enable non-destructive digitization, accurate text recognition, and long-term preservation of fragile materials. The process also introduces standardized metadata entry, ensuring improved discoverability, accessibility, and academic usability of the digitized content.

The findings indicate that while significant progress has been made in digitizing earlier works, substantial gaps remain in terms of technological infrastructure, staff training, metadata consistency, and funding. Several manuscripts and early printed books are still awaiting digitization. The study emphasizes the importance of institutional collaboration, policy formation, and capacity building to ensure a sustainable and holistic digital preservation strategy.

In conclusion, this research contributes meaningfully to the field of digital humanities and cultural preservation by providing a replicable framework for digitizing regional literary archives. By transforming fragile physical materials into enduring digital assets, the project not only safeguards Karnataka's Vachana heritage but also broadens global access to this rich intellectual tradition. The outcomes reinforce that digitization is not merely a technical process but a cultural responsibility aimed at preserving identity, knowledge, and heritage for future generations.

Keywords: Digitization, Preservation, Vachana Literature, P. G. Halakatti, Digital Humanities, Kannada Manuscripts, DSpace Repository, OCR, Archival Science.

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The preservation of Karnataka's literary heritage, particularly Vachana literature, has long been a scholarly priority due to its distinctive contribution to medieval Bhakti traditions and Kannada cultural identity. Vachana literature emerged during the 12th-century Sharana movement and is recognized for its social reformist ideals, spiritual depth, and accessible poetic form (Gokhale, 2015; Ramanujan, 1973). Among the key figures who ensured the survival and revival of this tradition in the modern era is Dr. Phakirappa Gurubasappa Halakatti (1880–1964), popularly known as the Vachana Pitamaha for his pioneering work in collecting, editing, and publishing neglected Vachana manuscripts (BLDE Association, 2008).

Figure-1: Dr. P. G. Halakatti

Born in Dharwad, Dr. Halakatti trained as a lawyer but dedicated his life to Kannada literature and social reform. His efforts led to the rediscovery of important manuscripts such as Shatsthala Tilaka, which had remained obscure for centuries (Shastriya Kannada, n.d.). Through the Bijapur Liberal District Education (BLDE)

Association, he established a strong institutional framework that promoted research, education, and cultural preservation in North Karnataka (BLDE College of Engineering & Technology, 2022). His editorial contributions, exceeding 115 publications, significantly shaped modern scholarly understanding of Lingayat and Sharana traditions (Deccan Herald, 2017).

Today, the Dr. P. G. Halakatti Research Centre continues his legacy by maintaining rare manuscripts, early printed books, journals, and correspondence connected to Sharana and Vachana literature. However, the aging condition of these materials poses significant risks, reinforcing the need for systematic preservation and digitization strategies (National Mission for Manuscripts, 2019). Digitization offers a sustainable, long-term solution by reducing physical handling of fragile items, enhancing accessibility, and ensuring continuous scholarly engagement with this culturally significant corpus (Conway, 2010).

1.2 Significance of Vachana Literature

Vachana literature occupies a central position in Kannada literary history due to its philosophical depth, social reformist tone, and linguistic originality. Emerging during the 12th-century Sharana movement, the Vachanas introduced a new genre of free-verse compositions that departed from classical Sanskrit poetics and instead embraced simplicity, directness, and spiritual authenticity (Ramanujan, 1973). The movement, led by figures such as Basavanna, Allama Prabhu, Akka Mahadevi, and Siddarama, promoted social equality, personal devotion, and moral integrity, giving the Vachanas a transformative socio-cultural role in Karnataka (Gokhale, 2015).

One of the most significant contributions of Vachana literature lies in its powerful critique of caste hierarchy and ritualistic practices. The Sharanas advocated for kayaka (dignity of labor), dasohabhava (spirit of sharing), and a spiritual path rooted in ethical living rather than elaborate rituals (Schouten, 1995). This democratization of religious expression allowed marginalized communities and women to participate meaningfully in spiritual discourse, making the Vachana corpus fundamental to social reform in medieval Karnataka (Limbale, 2004).

Vachanas also played a major role in shaping the Kannada language. Their use of colloquial and accessible Kannada brought literary expression closer to everyday speech and expanded the literary reach to common people (Nagaraj, 1999). This

linguistic shift not only enriched Kannada literature but also influenced subsequent poetic and philosophical works in the region.

Culturally, the Vachanas continue to be revered for their timeless relevance. The themes of social justice, gender equality, devotion, and ethical sensitivity resonate strongly even in contemporary society, making them valuable resources for literary, philosophical, and socio-cultural studies (Mukherjee, 2011). Their oral, performative, and mnemonic qualities also contribute to Karnataka's intangible cultural heritage.

1.3 Need for Digitization

Digitization has become an essential strategy in the preservation and dissemination of cultural heritage, particularly in the context of rare manuscripts, fragile books, and historically significant documents. The literary corpus associated with Vachana Pitamaha Dr. P. G. Halakatti—including manuscripts, early printed editions, editorial notes, and archival materials—faces natural deterioration due to aging, ink corrosion, environmental exposure, and handling over time. Without systematic preservation measures, much of this invaluable material risks permanent loss (National Mission for Manuscripts, 2019).

Digitization provides a sustainable means to safeguard such material by creating high-quality digital surrogates that minimize physical handling of originals, thereby reducing wear and tear (Conway, 2010). Scholars emphasize that digital formats enable long-term preservation when supported by proper storage, metadata, and archival standards, allowing institutions to migrate content across technological changes over time (Hedstrom, 1998). Such preservation is especially critical for collections like the Halakatti corpus, which includes rare documents integral to understanding Karnataka's literary and socio-religious history.

Equally important is the enhancement of accessibility. Researchers, students, and cultural institutions increasingly depend on digital platforms for academic inquiry. Digitized collections overcome geographic and physical barriers, enabling global access to Vachana literature and related research materials (Smith, 2007). For regional languages like Kannada, digitization plays a significant role in language preservation and scholarly visibility, as digital archives help integrate regional literature into national and international academic networks (Gurram, 2008).

Digitization also facilitates advanced scholarly activities such as text mining, OCR-based searchability, digital annotation, comparative studies, and computational analysis—tools central to modern digital humanities research (Terras, 2011). For handwritten manuscripts that face challenges in OCR accuracy, digitization at least ensures high-quality photographic preservation until better technologies become available.

1.4 Statement of the Problem

The Statement of the Problem of the present study ***Digitization and Archiving of Dr. P.G. Halakatti Literary Legacy: A Comprehensive Study***

1.5 Objectives of the Study:

i. To digitize the literary works of Dr. P.G. Halakatti.

ii. To develop a digital repository for his works.

iii. To preserve Kannada cultural heritage.

iv. To promote academic and cultural research.

1.6 Scope and Limitations

The scope of this study is centered on the digitization and archiving of 115 the literary works of Vachana Pitamaha Dr. P. G. Halakatti, available at the Dr. P. G. Halakatti Research Centre, Vijayapura, The study focuses on documenting the existing collections, assessing current preservation practices, and designing a digitization workflow using tools such as Kibo XS for Scanner, for PDF, OCR, and Audio file format and DSpace digital library Software for Archiving the digitized documents. In doing so, the study aligns with global digitization standards that emphasize systematic imaging, metadata creation, and long-term digital preservation

The scope includes:

1. Identified 115 documents consisting of manuscripts, rare books, editorial notes, correspondences, and archival materials as given in the table 1
2. Implementation of digitization techniques suitable for fragile materials.

3. Creation of metadata based on accepted standards such as Dublin Core.
4. Organization of digital files within a repository for improved accessibility and sustainability.

Table-1: List of Books of Dr PG Halakatti

S.N	Title of the Book	Year
1	Vachanashastrasara Bhaga-1 (Poorvardha)	1923
2	Basaveshvarana Vachanagalu	1926
3	Mahimme Stotra	1926
4	Mahadeviyakkana Vachanagalu	1926
5	Lingapoojeja Tatvagalu	1926
6	Veerashaiva Ragale (Shankaradevakruta)	1926
7	Varadani Guddammeya Charitreyu	1926
8	Ganadasi Veerannana Vachanagalu	1926
9	Tontadarya Ragale	1926
10	Ekottara Shatasthala	1926
11	Shivayogaacharane	1926
12	Sanganabasaveshvarana Vachanagalu	1927
13	Ghanalingana Vachanagalu	1927
14	Naitika mattu Bhaktiya Vachanagalu	1927
15	Devara Dasimayyana Vachanagalu	1927
16	Lingayata Matatatva	1928
17	Sangeetadalla Shivasharanara Vachanagalu	1928
18	Mailara Basappanavara Shivanubhava Darpana	1929
19	Hadapada Appannana Vachanagalu	1929
20	Lingammana Vachanagalu	1929
21	Kai. Va. Chennabasappa Basalingappa Dharawada Ivara Charitre	1930
22	Sakalesha Madarasana Vachanagalu	1930
23	Shivanubhava Sutra	1930
24	Shunya Sampadane Bhaga-1	1930
25	Prabhudevara Vachanagalu	1931
26	Hariharana Ragalegalu Bhaga-1	1931
27	Adayyana Vachanagalu	1931
28	Adish etti Purana (Raghavanka Virachita)	1931
29	Trimurtigalu	1932
30	Shatstala	1932
31	Siddharameshvarana Vachanagalu	1932
32	Kodagina Samsthanada Rajendraname	1932
33	Chennabasaveshvarana Vachanagalu	1932
34	Niranjana Vamsha Ratnakara	1932
35	Ambigara Chaudayyaana Vachanagalu	1932
36	Kaalajnanada Vachanagalu	1933
37	Sateeka Shatsthala Brahmadipika	1933
38	Hariharana Ragalegalu Bhaga-2	1933
39	Hariharana Ragalegalu Bhaga-3	1933

40	Hariharana Ragalegalu Bhaga-4	1933
41	Beelagiya Arasarugala Vamshavali	1933
42	Somekatti Kavi Vrushabhendrana Kaivalya Padyagalu	1933
43	Vachana Shastrasara Bhaga-1	1934
44	Basaveshvarana Shatsthala Vachanagala Kathasara	1934
45	Hariharana Ragalegalu Bhaga-5	1934
46	Hagalavadi Siddharamappa Kruta Mahanubhava Prakashini	1934
47	Urilinga Peddiyya Vachanagalu	1934
48	Hariharana Ragalegalu Bhaga-6	1935
49	Moligeya Maarayyanna Vachanagalu	1936
50	Shri Nagabhushanaghanamathararyara Krushijnana Pradipike	1936
51	Shivanubhava Satyamarga	1937
52	Shivasharanara Sankirna Vachanagalu Bhaga-1	1938
53	Shivasharanara Sangeeta Vachanagalu	1938
54	Hariharana Ragalegalu Bhaga-7	1938
55	Madiwala Machidevana Vachanagalu	1938
56	Vachanashastrasara Bhaga-2	1938
57	Vachanashastrasara Bhaga-3 Poorvardha	1939
58	Shivasharanara Sankirna Vachanagalu Bhaga-2	1939
59	Padamantra Gopya (Chennabasava)	1939
60	Bhairaveshvarana Kavyada Kathamani Sutraratnakara	1939
61	Havinahala Kalladevana Vachanagalu	1939
62	Satyakkana Vachanagalu	1939
63	Madhuvarasana Vachanagalu	1939
64	Shivasharanara Sankirna Vachanagalu Bhaga-3	1940
65	Shivanubhava Shabdhakosha	1940
66	Shivanubhava Srushitiya Vachanagalu	1940
67	Hariharana Ragalegalu Bhaga-8	1940
68	Bahura Bommayyana Vachanagalu	1940
69	Shivaloka Manjannana Vachanagalu	1940
70	Kavi Gurubasava Kruta Avadhutagite	1941
71	Sateeka Ekottara Shatasthala	1941
72	Haralayyana Tripadigalu	1941
73	Haralayyana Charitreyu	1941
74	Elesha Ketayyana Vachanagalu	1941
75	Soddala Bacharasana Vachanagalu	1941
76	Hosa Paddhatiya Basaveshvarana Vachanagalu	1942
77	Keladi Samsthanada Raja Vamshavali	1943
78	Shivasharanara Padagalu Bhaga-1	1943
79	Shivasharanara Charitregala Bhaga-1	1943
80	50 Tarada Acharagalu (Chennabasavanna)	1943
81	Bhaktiya Vachanagalu	1943
82	Gummulapurada Siddialingadevara Vachanagalu	1943
83	Shivasharanara Charitregalu Bhaga-1	1944
84	Shivasharanara Charitregalu Bhaga-2	1944
85	Kaalajnanada Vachanagalu	1944

86	63 Shivasharanara Charitregalu	1945
87	Meremindadevana Vachanagalu	1945
88	Kampaniya Sarakarada Dandaka	1946
89	Vachanashastrasara Bhaga-3 (Uttarardha)	1947
90	Shivasharanara Charitregalu Bhaga-3	1947
91	Paramatmana Svarupa	1948
92	Basaveshvarana Tatvagalu	1950
93	Vemennayogiya Jnanmargada Padyagalu	1950
94	Arivina Maritande Vachanagalu	1951
95	Pranalingajnanadarpana Charitrya	1951
96	Shivasharanara Charitregalu (Bhaga-4)	1952
97	Sateeka Basaveshvara Vachanagalu	1953
98	Sateeka Shunya Sampadane Prathamopadesha	1953
99	Sateeka Shunya Sampadane Dvitiyopadesha	1954
100	Sateeka Shunya Sampadane Trutiyopadesha	1954
101	Sateeka Shunya Sampadane Bhaga-4	1954
102	Sateeka Shunya Sampadane-(Bhaktajangamada Sthala) Bhaga-5	1954
103	Sakalagama Shikhamani Vachana	1954
104	770 Amaraganadhishvararu	1954
105	Surondara Hadugalu	1955
106	Nijada Arivu	1956
107	Shivasharanara Ahimsadharma	1956
108	Sarangamatharishvararu	1957
109	Shunyasampadane (3 mattu 10ne Upadeshagalu)	1956
110	Ganastottara-Ghanamatesha	1957
111	Sharanasatiyara Nuremttu Namagalu	1957
112	Shivasharaneyara Charitregalu	1958
113	Brahmana Shivasharanara Charitregalu	1959
114	Devara Dasimaryara Kathe (Yakshagana)	1960
115	Sadaanandappana Vachanagalu	1960

Limitation

However the study also faces several limitations

- Only 54 manuscripts are able to digitize and archive because of not availability of remaining 61 documents at of Dr. P.G. Halakatti Research Centre
- The study is confined to the collection available within the Research Centre and does not extend to Halakatti related materials housed in private collections, libraries or other archives, because of my course time frame.

1.7 Significance of the Research

The digitization and archiving of the literary works of Vachana Pitamaha Dr. P. G. Halakatti hold significant academic, cultural, technological, and social value. The research contributes to multiple fields, including manuscript studies, Kannada literature, archival science, and digital humanities. By addressing the challenges associated with preserving fragile manuscripts and rare books, the study aligns with broader global and national efforts to safeguard cultural heritage in digital form (Conway, 2010; National Mission for Manuscripts, 2019)

At the academic level, this research enhances access to primary sources of Vachana literature, enabling scholars to examine rare texts that were previously inaccessible due to geographical and physical limitations. Increased digital availability supports interdisciplinary research in linguistics, history, religious studies, and cultural studies (Terras, 2011). Digital archives also facilitate computational methods such as text mining and digital annotation, expanding opportunities for modern scholarship.

At the cultural level, digitizing the Halakatti corpus preserves a vital segment of Karnataka's intellectual and spiritual heritage. Vachana literature, central to the 12th-century Sharana movement, continues to influence contemporary discourse on social equality, devotion, and ethical living (Gokhale, 2015). Ensuring its preservation supports cultural continuity and strengthens community identity.

At the technological level, the study contributes to the development of sustainable digital preservation practices in regional research institutions. By implementing tools such as Kibo XS, OCR, and DSpace, the research demonstrates practical, cost-effective approaches that can be replicated by other heritage centers facing similar

constraints (Smith, 2007). The workflow developed through this study provides a model for digitizing fragile manuscripts using locally accessible technologies.

At the **institutional level**, the research supports the Dr. P. G. Halakatti Research Centre in modernizing its archival systems. Standardized metadata, organized repositories, and digital surrogates enhance the Centre's capacity to manage collections and serve scholars efficiently (Gilliland, 2014). These improvements also strengthen institutional resilience against risks such as material degradation, environmental threats, and loss due to handling.

Finally, at the social level, the research democratizes access to literary heritage. Digitized collections enable students, researchers, and the public—both within India and globally—to engage with Vachana literature without physical barriers (Smith, 2007). This promotes inclusive education and fosters a deeper understanding of Karnataka's cultural legacy.

CHAPTER 2

REVIEW OF LITERATURE

The literature on digitization competencies in libraries and archives emphasizes the necessity of developing specialized skills to manage the complex lifecycle of digitization projects, which spans from planning and project management to digital capture and preservation. Staff are required to acquire diverse competencies, including project management, metadata creation, and digital asset management, to ensure successful outcomes. Despite the usefulness of workshops, training efforts face challenges such as time constraints, varying participant skill levels, and the rapid evolution of technology that can quickly outdate acquired knowledge if not applied promptly

Experiential learning through hands-on practice, such as testing workflows and pilot projects, is highlighted as a particularly effective approach for grasping practical skills and standards like FADGI, which are often complex The literature further stresses the importance of collaborative and adaptive strategies, including thorough documentation, knowledge transfer, and organizational learning, especially to sustain competencies beyond grant-funded projects. Additionally, community engagement via workshops fosters collaboration and resource sharing, which proves crucial for smaller or rural institutions with limited resources. Overall, building digitization competencies is seen as an ongoing, multifaceted process that benefits from tailored training, experiential learning, and strong institutional support to keep pace with technological advancements and diverse organizational needs (O'Hara et al., 2020)

The reviewed literature highlights the vital role of indigenous knowledge (IK) in Nepal, spanning traditional practices related to natural resource management, agriculture, medicinal plants, and ecological understanding. Nepal's diverse ethnic communities possess collectively owned knowledge systems that have been passed down through generations, contributing significantly to sustainable development and environmental conservation. Despite its importance, efforts to digitalize and document this wealth of indigenous knowledge remain limited, primarily due to infrastructural challenges, lack of digital literacy, and concerns over cultural rights and ownership,. Digitalization is seen as a promising approach to preserve, disseminate, and utilize IK more effectively, offering benefits like enhanced transparency, improved access, and

new opportunities for economic development, especially when coupled with modern mapping technologies such as digital cartography that can link traditional knowledge with geographical information (Ghimire, 2021)

However, there are significant hurdles to overcome in the process of digital transformation. Challenges include ensuring the protection of cultural protocols and intellectual property rights, managing access and ownership rights, and developing sustainable digital infrastructures that are interoperable and adaptable across time, Additionally, gaps in digital literacy and technological infrastructure hinder widespread participation of indigenous communities in digital knowledge management. Despite these challenges, the literature emphasizes that with careful planning, culturally sensitive approaches, and supportive policies, digitalization has the potential to safeguard indigenous knowledge while facilitating socio-economic growth and sustainable development goals, (Ghimire, 2021)

The literature consistently highlights the critical importance of developing comprehensive digital competencies among library professionals. Studies by Atchrimi and Ogunbodede examining digital competencies in South-South Nigeria found that while librarians demonstrated high levels of basic digital skills, significant challenges persist in acquiring advanced capabilities. These competencies encompass technical skills for managing digitization software, metadata creation abilities, project management capabilities, communication skills for stakeholder engagement, and knowledge of intellectual property rights. Research by Osinulu further emphasized that digital literacy competencies are essential for enhancing daily work processes, with particular attention needed for training and retraining programs. The systematic approach to digitization requires expertise across multiple domains, including selection criteria for materials, feasibility studies, implementation strategies, and ongoing maintenance protocols. However, the literature reveals a concerning gap between the acknowledged importance of these skills and actual proficiency levels, with most librarians lacking formal professional training in digitization and spending minimal time on self-directed skill development.(Adeleke, n.d.)

The literature consistently identifies several critical operational challenges that impede successful digitization initiatives across archival institutions. Fundamental obstacles include inadequate funding mechanisms, insufficient technological infrastructure, lack of skilled ICT personnel, and limited professional training opportunities. These challenges are compounded by copyright complexities,

particularly for twentieth-century materials, and the need for comprehensive disaster recovery planning. Best practices frameworks emphasize the necessity of conducting thorough user needs analysis, as digitization serves dual purposes of preservation and enhanced accessibility. Effective implementation requires systematic approaches including equipment and software needs assessment, comprehensive metadata creation protocols, and ongoing technological transformation support for both archivists and users. The preservation aspect demands adherence to established technical standards, with institutions like the Smithsonian Institution Archives recommending specific file formats including PDF/A for text documents, TIFF for images, and BWF-Broadcast WAV for audio materials. Digital preservation strategies must incorporate the 3-2-1 rule (three copies of data stored on two different media with one copy maintained off-site) and regular migration planning to address technological obsolescence. The literature emphasizes that successful digitization programs require interdisciplinary collaboration between archivists, IT professionals, and subject matter experts to ensure both technical sustainability and scholarly utility of digital collections.(Şentürk, 2014)

The literature on the digitization of libraries, archives, and museums in Russia reflects an evolving focus on using information technology for cultural heritage preservation. Researchers emphasize that while major cultural repositories such as state libraries and museums have advanced legislative and technological frameworks for digitization, several persistent challenges remain, including the sheer scale of collections, geographic dispersal of rare materials, and underutilization of digitized documents. Notably, studies by Lopatina, Neretin, and Astakhova highlight issues in modernizing information resource systems and transforming cultural objects into accessible digital formats, while Miroshnichenko's work points to difficulties in the organization and provision of open access to archival materials. Policy analysis reveals that regulatory measures and government programs have steadily promoted open digital access and legal protections for rare and valuable materials, although some gaps remain, particularly regarding the management of born-digital objects and comprehensive legislative frameworks.(Kim & Maltceva, 2022)

A common theme across research is the role of state institutions as leaders in digitization efforts, contrasted with the slower pace among local libraries, archives, and museums. Scholars such as Shapovalova and Kruglikova argue that the

government must further develop unified policies and improve legal definitions related to digital cultural heritage, as current laws tend not to cover objects originally created in digital form. Comparative analyses suggest that Russia's scope and level of digitization research lag behind many European countries. Despite the progress made in large national projects, limitations persist in the equitable distribution, accessibility, and sustainable management of digitized collections. (Kim & Maltceva, 2022)

The literature on digitization competencies in libraries and archives emphasizes the pivotal role of project-based learning for developing essential skills in project planning, grant writing, project management, metadata, digital capture, and digital asset management. This view is shaped by case studies, such as those at the University of Nevada, Las Vegas, which show how grant-funded projects provide opportunities for both early-career and experienced librarians to actively refine these competencies through real-world tasks, experiential mentorship, and collaborative workshops. Professional organizations like the American Library Association and the Archives Records Association establish broad frameworks for core competencies, yet research suggests domain-specific skills—especially those relevant to digital librarianship—must be continually adapted to local environments and evolving technological standards.(O'Hara et al., 2020)

Experiential learning models, such as Kolb's cycle, are highlighted as highly effective for staff gaining proficiency, progressing from hands-on experience through reflective observation to conceptual understanding and experimentation. The literature also notes the limitations of purely workshop-based approaches, which often lack opportunities for practical application and may not adequately bridge gaps in technical expertise among staff with differing backgrounds. Sustainable capacity-building strategies advocate for decentralized, peer-to-peer education and ongoing staff development, particularly within organizations unable to support permanent digitization units. Competency development not only enhances project outcomes but also contributes to organizational resilience as digitization continues to reshape access and preservation in libraries and archives. (O'Hara et al., 2020)

The literature highlights the evolving approaches to studying Tardigrada, emphasizing the significance of collections such as the Ramazzotti Collection. Bertolani and Nelson (2011) review the developments in tardigrade research over 35 years, underscoring the importance of historical collections for understanding species diversity and taxonomy, which are crucial for taxonomic revisions and biodiversity assessments. Additionally,

Wieczorek et al. (2012) discuss the importance of standardized biodiversity data formats, such as Darwin Core, facilitating the sharing, accessibility, and integration of biological data across global platforms like GBIF. These standards enable researchers to effectively utilize historical collections by digitizing specimens and associated metadata, thus preserving valuable taxonomic and geographic information for future studies.(Zaupa et al., 2025)

Furthermore, recent advancements in digital imaging and data sharing have transformed the management and dissemination of biological collections. The integration of photographic documentation, as demonstrated by the Ramazzotti Collection, allows for detailed morphological studies and virtual access to specimens, broadening their utility beyond physical confines. Castelli (2023) explores the cultural and scientific implications of maintaining historical collections, emphasizing their role in contemporary research and conservation. The adoption of standardized digital metadata, as described by Zaupa et al. (2025), ensures that valuable collections like Ramazzotti's are accessible to a wider scientific community, facilitating taxonomic revisions, ecological research, and educational initiatives. These developments underscore the enduring importance of well-maintained, digitized biological collections in advancing biodiversity science globally.(Zaupa et al., 2025)

The literature highlights the transformative potential of immersive and interactive technologies in the cultural heritage sector, particularly within museums and archives. Falk and Dierking (2016) emphasize the importance of the museum experience as a dynamic process shaped by visitor engagement and social context. Derrida's (1996) concept of archive fever underscores the inherent interpretative challenges posed by archives, which cannot speak for themselves but are co-constructed through embodied and social interactions (Cook, 2013; Brunow, 2017; Paalman et al., 2021). Recent developments in digital and born-digital archives necessitate innovative approaches beyond traditional methods, employing computational and immersive tools to facilitate situated, experiential encounters with collections (Colavizza et al., 2021; Kidd, 2018).

Building on these insights, the paper introduces Gilbert Simondon's concept of transduction, which suggests that meaning and form in archives emerge through ongoing relational processes driven by embodied engagement. This perspective shifts focus from static collections to dynamic, relational spaces where interpretative paths are co-created by participants, systems, and spectators (Dalsgaard & Hansen, 2008; De Assis, 2017). The use of spatial navigation systems and immersive installations

exemplifies this approach, transforming archives into embodied, multisensory environments that support a fluid and collective process of interpretation, thus redefining access and engagement in the digital age.(Alliata & Kenderdine, 2025)
Digitization involves converting items like printed text, manuscripts, images, sound, film, or video recordings from their original format (typically print or analog) into a digital format This process essentially creates an 'electronic photograph' of a physical object, captured using devices such as scanners or digital cameras, which is then stored electronically and made accessible via computers Digital resources are broadly categorized into two types: those initially created and distributed digitally, and those originally in another format that are later converted to digital through digitization This paper specifically focuses on the digitization of printed materials, rather than other media like objects, sound, film, or video recordings A significant advantage of digital documents is the ability to search their entire content for specific words, which is particularly beneficial for reference books, compilations, and classical texts studied for particular words and phrases To make these scanned 'electronic photographs' searchable, they are often converted into ASCII text files, typically using Optical Character Recognition (OCR) software (Parekh, n.d.)

The basic process of digitization involves creating a digital image as a grid of pixels, each representing a small portion of the image with an allocated tonal value, digitally represented in binary code Image resolution and color depth are crucial factors determining scanning quality While scanning is often the most cost-effective method for creating digital files, digital cameras offer an alternative, particularly for fragile or oversized materials After image capture, various value additions are often undertaken, including OCR, tagging, and the addition of metadata Markup languages like SGML, HTML, and XML are used to structure documents for better accessibility and interoperability across networks Metadata, such as the 'Dublin Core,' is essential for making digitized products locatable on the web by providing information about their creation, location, and content However, challenges remain, including the fact that no OCR software provides 100% error-proof results, often requiring significant manual editing Furthermore, the rapid evolution of hardware and software raises concerns about the long-term stability and obsolescence of digitized products, necessitating costly and time-consuming migration strategies to preserve them (Parekh, n.d.)

The literature highlights the rapid growth of digital resources in Indian libraries, emphasizing the importance of digitization as a means of preservation and increased accessibility. Gurram (2008) notes that while many developed countries have advanced in digital library initiatives, Indian libraries—such as IISc, IITs, and IIMs—have started digitizing their collections to mitigate risks associated with physical deterioration, loss, and obsolescence . Kumar Das and Sharma (2009) define digital preservation as a process ensuring the usability and integrity of digital data over time, but they also acknowledge significant challenges, including technological changes, media fragility, and copyright issues .(Griffiths, 2020)

Further literature underscores various strategies to address these challenges. Gurram (2008) advocates for the development of centralized repositories and the selection of suitable software, metadata standards, and hardware to facilitate effective digitization . Additionally, Madalli et al. (2012) discuss the importance of adopting open-source digital library software and initiating research on advanced image processing and OCR for Indian languages to improve accuracy in digitized texts . Together, these works suggest that a combination of technological innovation, policy formulation, and capacity building is essential for sustainable digital preservation in Indian libraries.(Griffiths, 2020)

The literature highlights India's growing recognition of the importance of open access to theses and dissertations as critical research assets. Various national initiatives, such as the UGC regulations of 2005 and 2009, the INDEST consortium, and recommendations by the National Knowledge Commission, have established policies to promote the digitization and dissemination of academic research output , . These efforts aim to improve accessibility, reduce duplication, and facilitate wider dissemination of research findings. Studies also emphasize the role of national and institutional repositories, such as Vidyanidhi and others, in creating centralized collections of electronic theses and dissertations (ETDs) , The movement towards open access is driven by the need to harness ICT effectively, encouraging researchers to archive and share their work digitally, which aligns with global practices and enhances the visibility and impact of Indian research(Hirwade, 2011)

However, despite these advancements, challenges remain concerning researcher participation in self-archiving and the across institutions. Many theses still suffer from limited access due to institutional policies or lack of awareness, hindering their potential for broader utilization . The literature stresses uniformity of policies the

necessity of mandatory deposition policies and institutional repository development to ensure open access . Overall, India’s strategic policy framework, combined with ongoing infrastructural and advocacy efforts, supports the digitization of theses and dissertations, although consistent researcher engagement and infrastructural enhancements are needed to realize the full benefits of open access ETD initiatives(Hirwade, 2011)

This literature review focuses on key works related to the digitization of archival and library materials, with a particular emphasis on the technical aspects of data management and web presentation, as well as specific studies concerning Montenegro's cultural heritage. Technical literature highlights the use of Microsoft Access 2000 for database management, as detailed by Prague and Irwin . The creation of dynamic web content is addressed through works on Active Server Pages (ASP) by Buser, Kauffman et al. and general web database development by Buyers. Furthermore, Microsoft Office Assistance provides guidance on exporting data from Access to XML, indicating the importance of flexible data formats for internet dissemination These resources collectively underscore the foundational software and web technologies employed in digital heritage projects.

Specific studies on Montenegrin archival heritage, particularly in Kotor, are extensively covered. S. Kordić and S. Pejović have authored multiple works focusing on manuscripts in the Franciscan Monastery of Santa Clara, including publications on their protection, appraisal, description, and presentation as well as digital protection efforts for church funds Further research by Kordić delves into specific ancient texts, such as fragments of Carolingian Bibles from the same library The practical aspects of preparing archival material for internet export from Kotor's church archives are detailed by Pejović and Bauk Additionally, Pejović has contributed to the understanding of historical connections through an Italian 13th-century codex and highlighted significant digitization projects in Kotor. M. Radulović-Vulić's work on ancient musical cultures in Montenegro also provides context for the broader cultural landscape These studies collectively illustrate the concerted efforts to preserve and present Montenegro's rich cultural and historical documentation through modern digital means.(Zaupa et al., 2025)

Electronic document management and digitization represent critical approaches to enhancing organizational effectiveness in handling archives. Electronic document management encompasses document creation from various sources, online storage through networked systems, automatic processing where applications organize data by classification, and document retrieval through computer searches. Effectiveness, measured through achieving predetermined organizational targets, depends on clear objectives, well-defined strategies, solid policy analysis, mature planning, appropriate program development, adequate facilities and infrastructure, effective implementation, and robust monitoring systems. Document digitization involves converting printed, audio, or video formats into digital form through scanning, editing, and uploading processes. The digitization technique includes document capture—converting original formats to digital through scanning—and document management—processing digital collections by converting between formats. Methods include scanning printed documents to digital image data, converting office documents to permanent image formats, and importing electronic data while maintaining original formats, all aimed at creating accessible and retrievable digital archives that improve organizational efficiency and decision-making capabilities(Sobandi et al., 2020)

The literature review in "Digitization Perspective of Medieval Manuscripts" underlines that digitization is essential for the preservation, access, and sustained utility of medieval manuscripts, which are cultural treasures at risk due to fragile physical conditions and limited accessibility. The review notes that while Western countries have actively pursued digital initiatives for such preservation, similar efforts in India remain less organized. Digitization enables cost-effective bibliographic control and global access, overcoming traditional barriers. It also facilitates effective retrieval, mitigates disasters (like war or degradation), and promotes the revival and exposure of cultural heritage. The review highlights that a structured digital library for manuscripts enhances availability for research worldwide and supports moral and traditional values by making manuscripts more transparent and accessible. The process, however, faces challenges including technical hurdles, planning, appropriate metadata systems, and the need for standardized access and delivery mechanisms, suggesting a roadmap for India to improve its digital archival practices by learning from global best practices and adapting them to local needs(Shafi, n.d.)

The literature review in the file "Archiving the New Manually Digitized Radar Data" discusses the evolution and importance of archiving manually digitized radar (MDR) data for meteorological research and forecasting. Since November 1973 MDR data from hourly teletype reports have been used in severe weather prediction, model validation, and improved probability forecasting by relating radar observations to large-scale predictors. The review highlights the technical progression from the older PE model-aligned MDR grids to new, finer, LFM model-based grids, emphasizing the necessity to transpose historical data for continuity. It details how archival formats, data storage, and technical standards evolved with new requirements, ensuring research value is sustained. Archiving practices adapted to support not only present needs but also future quantitative analysis, demonstrating that robust, flexible data management systems are essential for effective scientific forecasting and verification in operational meteorology.

The Abbey Theatre Digital Archive project at the National University of Ireland Galway represents a landmark achievement in large-scale digitization within the digital humanities, demonstrating innovative methodological approaches to managing complex archival materials while generating substantial academic and institutional impact. Completed between 2012 and 2015, this project digitized nearly two million pages, 500 hours of video, and 2,500 hours of audio recordings, making it the largest theatre archive digitization project globally at the time. The project's methodological innovation centered on a "more product, less process" approach that prioritized efficiency and output over traditional detailed archival processing, challenging conventional archival thinking by streamlining workflows to complete the massive undertaking within three years while maintaining quality standards. Key technological innovations included the development of a bespoke Digital Asset Management (DAM) system capable of automatic redaction based on keyword recognition, timed release of embargoed materials, and sophisticated rights management, alongside the strategic integration of the Abbey Theatre's existing production database to create metadata linkages between diverse document types.(Cox, 2017)

CHAPTER -3

3.1 Research Design

This study employs a qualitative research design supported by descriptive, exploratory, and applied methodological approaches. Qualitative inquiry is appropriate because the study aims to understand contextual processes such as preservation conditions, cataloguing practices, institutional workflows, and digitization challenges rather than quantify them. Using a case study approach focused on the Dr. P. G. Halakatti Research Centre allows for an in-depth examination of real-world archival practices and the Centre's handling, management, and potential digitization of its manuscript collections (Yin, 2018). The design is also descriptive, documenting the physical condition of manuscripts, rare books, and archival materials, along with their storage environments and cataloguing methods. It is exploratory in identifying preservation gaps, institutional limitations, and challenges arising from fragile materials, especially within the under-researched domain of Kannada literary heritage and the Halakatti corpus. Finally, the study is applied in nature, as it aims to implement practical solutions—such as developing a digitization workflow using the Kibo XS scanner, applying OCR to Kannada texts, and organizing digital files in a DSpace repository—to enhance preservation and accessibility of the Centre's collections

Descriptive Research Design

The descriptive component of the research design focuses on systematically documenting the existing conditions, characteristics, and practices associated with the preservation and management of literary materials at the Dr. P. G. Halakatti Research Centre. Descriptive research aims to provide an accurate, detailed, and factual account of a situation or phenomenon without manipulating variables or testing hypotheses In the context of this study, it serves as the foundation for understanding the environment in which digitization must occur.

This approach enables the researcher to record and analyze:

- The physical condition of manuscripts, rare books, and archival documents
- Existing storage methods, including shelving, environmental control, and handling practices
- The cataloguing and documentation systems currently used by the Centre
- Institutional preservation routines and workflows

- The availability of equipment, technological infrastructure, and staff expertise

By documenting these existing features, the descriptive method establishes a factual baseline that highlights the preservation challenges faced by the Centre, including the fragility of materials, inadequate environmental conditions, lack of standardized metadata, and absence of digitization infrastructure—all of which must be addressed to develop an effective digitization strategy Descriptive research is further appropriate because the study involves observing and recording real-world archival practices as they naturally occur, without altering or controlling the environment, thereby enhancing the authenticity, depth, and reliability of the findings. Overall, the descriptive design provides a comprehensive understanding of the current state of the Halakatti collection and serves as a critical foundation for developing the digitization workflow and preservation recommendations presented in subsequent chapters.

3.2 Data Collection Methods

3.2.1 Field Visits

Field visits played a central role in the data collection process by enabling the researcher to directly observe the physical environment, operational practices, and preservation conditions of the manuscripts and archival materials at the Dr. P. G. Halakatti Research Centre. Observation is an essential qualitative method in archival and heritage studies because it provides first-hand understanding of real-world practices, institutional workflows, and material conditions that cannot be fully understood through verbal reports alone.

During the field visits, attention was given to several key aspects:

1. Physical Condition of Materials

The researcher examined the state of manuscripts, rare books, Vachana texts, and editorial notes. Issues such as brittleness, ink fading, dust accumulation, and binding deterioration were documented. These observations helped identify which materials required priority in the digitization workflow

2. Storage and Environmental Conditions

The arrangement of materials in cupboards, shelves, and storage rooms was examined. Environmental factors—such as exposure to humidity, temperature fluctuations, and natural light—were assessed, as these significantly impact the longevity of archival documents (Hedstrom, 1998).

3. Handling Practices

The researcher observed how staff, scholars, and visitors interacted with the materials. The frequency of handling, the methods used to access documents, and the presence or absence of protective measures (such as gloves or support cushions) were noted. These observations provided clarity on risks associated with frequent manual handling.

4. Institutional Workflow and Infrastructure

Field visits allowed the researcher to understand the daily operations of the Centre, including cataloguing routines, user access policies, and the availability of preservation tools or digitization equipment. Existing technological capacities—such as computers, scanners, and storage facilities—were evaluated to determine feasibility for implementing digitization tools like Kibo XS, OCR, and DSpace.

3.2.2 Document Analysis

Document analysis was employed as a key data collection method to examine the manuscripts, rare books, catalogues, editorial notes, and archival records housed at the Dr. P. G. Halakatti Research Centre. This method is widely used in qualitative research because it allows researchers to systematically review and interpret documents to gain contextual insights, verify information, and understand institutional practices

Document analysis was particularly appropriate for this study because the research focuses on literary and archival materials whose physical and informational characteristics directly influence digitization and preservation decisions. By examining these documents in their authentic state, the researcher was able to evaluate both their content and material condition.

Key Components Analysed

1. Rare Books

- Physical condition (fragility, brittleness, ink loss)
- Completeness and legibility
- Marginal notes or editorial comments
- Suitability for scanning and OCR processing

2. Accession Registers and Old Catalogues

Existing cataloguing records were reviewed to understand how the collection has been documented over time. This allowed the researcher to identify gaps in description, inconsistencies in metadata, and limitations in retrieval systems—insights that guided the creation of improved metadata structures for DSpace.

3. Editorial Notes, Correspondence, and Supporting Documents

Archival notes, letters, and related documents provided valuable historical context about the materials collected and published by Dr. Halakatti. These sources helped confirm provenance, authenticity, and scholarly significance.

Purpose and Value of Document Analysis

- It enabled cross-verification of information gathered through observation and interviews, enhancing research validity.
- It provided direct evidence about the physical and informational characteristics of materials.
- It helped assess OCR feasibility for Kannada texts.
- It facilitated the development of a digitization workflow grounded in actual collection needs.
- It offered insights into historical cataloguing practices and documentation gaps.

3.3 Selection Criteria for Materials

The selection of materials for digitization is a crucial step in any digital preservation project, particularly when dealing with fragile cultural heritage resources such as the manuscripts and rare books housed at the Dr. P. G. Halakatti Research Centre. A systematic and clearly defined set of criteria was used to determine which items were prioritized for digitization. These criteria are aligned with recommended archival practices that emphasize significance, condition, feasibility, and research value.

1. Rarity and Historical Importance

Materials with high historical, cultural, or literary significance were given priority. These included:

- Handwritten manuscripts related to Vachana literature
- Rare editions compiled or edited by Dr. P. G. Halakatti
- Documents reflecting the Sharana movement or early Lingayat traditions

Rarity is a major selection criterion in heritage digitization because such materials are irreplaceable and often highly vulnerable.

2. Physical Fragility and Risk of Deterioration

Items showing signs of damage or deterioration were prioritized to prevent further loss.

Indicators included:

- Brittle paper
- Fading ink
- Torn or loose pages
- Fragile bindings
- Evidence of environmental damage

Digitizing fragile items reduces physical handling and is a core preservation strategy recommended for aging collections.

3. Scholarly and Research Value

Materials frequently referenced by scholars, researchers, or students—such as foundational Vachana texts or annotated versions by Halakatti—were prioritized to enhance academic access, The potential to support linguistic, literary, historical, or cultural research was a key determinant.

4. Feasibility of Digitization

- Size and binding flexibility
- Legibility of text
- Layout complexity
- OCR readability

5. Completeness and Metadata Availability

Materials with identifiable titles, authorship, dates, or contextual notes were prioritized because they allow clearer metadata creation and repository organization Records with missing descriptive information were digitized later, following further documentation.

6. Institutional Priorities and User Needs

The priorities of the Research Centre, such as preserving its core collection of Vachana texts and Halakatti's edited volumes, guided material selection. User demand—particularly from researchers and postgraduate students—was also considered to support ongoing scholarship

7. Rights and Permissions

Only materials that the institution had legal or custodial rights to digitize were included. Adhering to copyright and access policies is essential for ethical and lawful digitization.

3.4 Tools and Technologies Used

Figure- 2: Kibo XS Scanner

The Kibo XS Scanner was a primary digitization tool used in this study due to its suitability for fragile and rare archival materials. As a portable, overhead, non-contact scanner, the Kibo XS provides an efficient and safe method for digitizing manuscripts, rare books, and delicate documents commonly found in cultural heritage collections (Gurram, 2008). Unlike traditional flatbed scanners, which may damage aging bindings or brittle paper, the Kibo XS allows materials to remain open at a natural angle, significantly reducing the risk of physical stress during the digitization process.

Key Features of the Kibo XS Scanner

1. Non-Contact Overhead Scanning

The scanner captures images from above, eliminating direct contact with documents. This is especially important for manuscript collections susceptible to deterioration through handling.

2. High-Resolution Image Capture

The Kibo XS is capable of producing high-quality digital images that preserve textual clarity, marginalia, and fine details—critical for scholarly research and long-term digital preservation.

3. LED Illumination

The scanner uses cool LED lighting, which avoids heat exposure and reduces light damage to old, sensitive documents. This is an important consideration for conservation-friendly digitization.

4. Live Preview and Auto-Cropping

The built-in preview interface enables users to adjust document placement before scanning, while automated cropping and image enhancement ensure consistent output quality.

5. Multiple File Format Outputs

The Kibo XS supports various output formats, including TIFF, JPEG, and PDF. TIFF is preferred for archival master files due to its high fidelity, while JPEG/PDF versions are used for access copies.

6. User-Friendly Operation

Its compact size, simple interface, and compatibility with standard computer systems make the Kibo XS accessible for small research centres—an important factor for institutions with limited technical resources.

Why Kibo XS Was Suitable for the Halakatti Collection

The manuscripts and rare books at the Dr. P. G. Halakatti Research Centre are often fragile, with aging bindings, brittle paper, and fading ink. The Kibo XS scanner was selected due to:

- Its **non-destructive design**, which minimizes physical stress
- Ability to handle **bound volumes** without flattening
- **Cost-effectiveness**, suitable for regional institutions
- Compatibility with OCR software for Kannada texts
- Capability to produce **archival-quality digital surrogates**

Role of Kibo XS in the Digitization Workflow

- Capturing high-resolution master images
- Generating access copies in user-friendly formats
- Preparing image files for OCR processing
- Ensuring consistent lighting and readability
- Supporting preservation by reducing manual handling

Figure-3: Optical Character Recognition

Optical Character Recognition (OCR) software played an essential role in transforming scanned images of textual materials into machine-readable text. OCR technology enables the automatic extraction of printed text from digital images, thereby enhancing searchability, accessibility, and usability of digitized documents. For the digitization of the Dr. P. G. Halakatti collection, OCR was applied particularly to printed Kannada texts, allowing the creation of searchable digital surrogates.

Importance of OCR in Digitization

- Full-text search, enabling quick retrieval of specific terms

- Metadata extraction, improving cataloguing efficiency
- Text mining and linguistic analysis
- Digital annotation, beneficial for scholars and researchers
- Enhanced accessibility, particularly for remote users

Without OCR, digital images remain static and less useful for research and academic work.

OCR Use in Kannada Script

Applying OCR to Kannada poses several challenges due to:

- Complex ligatures and conjunct characters
- Variations in historical typefaces
- Faded ink in older texts
- Non-uniform print quality
- Absence of standardized training datasets for legacy fonts

Workflow Integration

1. Pre-processing of scanned images
2. Cropping, straightening, and contrast adjustments to enhance legibility.
3. OCR text conversion
    a. Batch processing of printed texts.
    b. Export of results in UTF-8 plain-text format.
4. Manual verification and correction
    a. Proofreading of OCR-generated text to ensure accuracy.
    b. Correction of misrecognized characters and spacing.
5. Integration into DSpace
    a. Including OCR text as part of the item record.
    b. Enhancing search and retrieval within the digital repository.

Benefits of OCR for the Halakatti Collection

Implementing OCR provided several advantages:

- Improved discoverability of Vachana-related texts
- Ability for scholars to conduct keyword-based research
- Enhanced metadata creation, especially for titles, names, themes
- Better user access, particularly for educational institutions

OCR significantly increased the scholarly value of the digitized Halakatti corpus by making textual information accessible in a searchable digital format.

Dspace

The DSpace Institutional Repository was used as the primary platform for organizing, storing, and preserving the digitized materials from the Dr. P. G. Halakatti Research Centre. DSpace is one of the most widely used open-source digital repository systems in academic and cultural heritage institutions due to its strong support for metadata standards, long-term digital preservation, and global interoperability.

DSpace plays a crucial role in the overall digitization project by ensuring that digital files are not only safely stored but also accessible, searchable, and maintained over time.

Key Features of DSpace

1. Support for Standardized Metadata

DSpace uses Dublin Core as its primary metadata schema, allowing uniform description of items across the collection. Metadata fields such as title, creator, subject, description, date, and format help make digital items discoverable and well-organized (Gilliland, 2014).

2. Hierarchical Collection Structure

The platform allows digital content to be organized into Communities and Collections, making it easier to group materials based on themes, subjects, or departments. For the Halakatti collection, materials can be organized under categories such as:

- Manuscripts
- Rare Books

- Vachana Literature
- Halakatti Edited Works

3. Long-Term Digital Preservation

DSpace provides:

- Bitstream management
- Version control
- Regular checksum verification
- Support for non-proprietary file formats

4. Persistent Identifiers

Each item in DSpace is assigned a persistent URL or handle, ensuring stable access for citations and long-term referencing—an important requirement for scholarly use.

5. User Access and Searchability DSpace offers a built-in search engine, allowing users to browse or search by keywords, metadata fields, dates, or collection categories. This functionality dramatically improves the accessibility of digitized materials compared to physical-only archives

6. Interoperability through OAI-PMH

DSpace supports the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH), enabling global repositories and digital libraries to harvest metadata. This makes the Halakatti collection discoverable beyond the hosting institution.

Role of DSpace in the Halakatti Digitization Project

In this project, DSpace was used to

- Upload high-quality scanned images and OCR text
- Organize materials into structured collections
- Enter descriptive metadata using Dublin Core
- Provide controlled access to digitized files
- Preserve digital surrogates for long-term sustainability

- Facilitate global scholarly access to Vachana literature.

Advantages for a Regional Research Centre

- It is open-source and cost-effective
- Requires modest server infrastructure
- Offers a user-friendly web interface
- Supports multiple languages, including Kannada metadata
- Can be maintained with basic technical training

CHAPTER 4

OVERVIEW OF THE DR. P. G. HALAKATTI RESEARCH CENTRE

The Dr. P. G. Halakatti Research Centre is a distinguished institution dedicated to the preservation, study, and dissemination of Vachana literature and related Kannada cultural heritage. Named after Vachana Pitamaha Dr. P. G. Halakatti, a pioneering scholar and editor who played a crucial role in collecting and publishing scattered Vachana manuscripts, the Centre stands as a major repository of Karnataka's intellectual and spiritual legacy.

Established with the aim of promoting research in Vachana Sahitya, Lingayat studies, and Kannada literature, the Centre serves as a vital hub for scholars, historians, linguists, cultural practitioners, and students. The institution safeguards a wide range of primary sources, including manuscripts, rare books, letters, editorial notes, photographs, and historical documents associated with the Sharana tradition and early Kannada scholarship.

The Centre's significance lies in its role as:

- A custodian of rare and fragile manuscripts, many of which date back several decades and represent unique textual traditions.
- A research and reference hub, providing access to primary sources essential for academic study of Vachanas and Sharana philosophy.
- A cultural repository, preserving the legacy of the 12th-century reformers like Basavanna, Allama Prabhu, Akka Mahadevi, and the Shivasharanas whose works shaped social, ethical, and literary landscapes.

In addition to preservation, the Centre actively engages in:

- Publication of critical editions
- Organizing seminars, lectures, and cultural events

- Facilitating research collaborations
- Digitization and documentation projects to protect heritage materials

The current digital preservation initiative reflects the Centre's commitment to modernizing its archival practices and ensuring long-term access to culturally significant works. The shift towards digitization not only safeguards delicate manuscripts from damage but also expands accessibility for global scholars and future generations.

4.1 History and Establishment of the Dr. P. G. Halakatti Research Centre

The Dr. P. G. Halakatti Research Centre was established to honour and preserve the scholarly legacy of Vachana Pitamaha Dr. P. G. Halakatti, a pioneering editor, reformer, and researcher who played a central role in reviving, collecting, and publishing Vachana literature in the early 20th century. Dr. Halakatti devoted his life to gathering scattered manuscripts of the 12th-century Sharana saints, many of which were preserved in mathas, private households, and remote village repositories (Gokhale, 2015). His contributions laid the foundation for modern Vachana studies and earned him recognition as the "Father of Vachana Literature."

Origins of the Centre

The Research Centre was established with the primary aim of safeguarding the invaluable literary materials collected and edited by Dr. Halakatti. Its founding objectives included:

- Preserving rare manuscripts and early printed editions
- Supporting scholarly research in Vachana literature and Lingayat studies
- Encouraging publication of critical editions
- Creating a dedicated space for researchers, historians, and students

The establishment of the Centre reflects a broader movement in Karnataka to preserve and promote indigenous knowledge systems and vernacular literary traditions, particularly those associated with the Sharana movement's social and spiritual reform ethos.

4.2 Collections Overview

The Dr. P. G. Halakatti Research Centre houses a diverse and culturally significant collection that forms the core of its mandate to preserve, study, and disseminate Vachana literature and related Kannada heritage materials. The collection reflects the literary, religious, and socio-cultural dimensions of the **Sharana movement** and includes rare manuscripts, early printed editions, archival records, and editorial materials associated with Dr. P. G. Halakatti's lifelong work. These materials serve as valuable primary sources for scholars, historians, linguists, and cultural researchers.

1. Manuscripts

The Centre preserves a rich assortment of manuscripts, including:

- Palm-leaf manuscripts
- Handwritten notebooks
- Folios and bound manuscripts
- Early Vachana compilations
- Sharana biographies (Sharana Charitre)
- Religious and philosophical treatises

Many manuscripts are written in older Kannada scripts, exhibiting unique stylistic variations and calligraphic features. Their fragility and historical value make them high-priority items for conservation and digitization (National Mission for Manuscripts, 2019).

2. Rare Books and Early Printed Editions

The Research Centre holds an extensive collection of rare and early printed books related to:

- Sharana literature
- Classical Kannada poetry
- Dr. Halakatti's edited works

These include first editions and out-of-print volumes, some of which were published by the famed institutions with which Dr. Halakatti collaborated, such as Vachana

Samithi and various Lingayat presses. Rare books in this category are vital for textual criticism and comparative literary research.

Significance of the Collections

The collections housed in the Centre are invaluable for:

- **Textual research** in Vachana literature
- **Historical and cultural studies** on the Sharana movement
- **Linguistic research** on old Kannada forms

4.3 Current Preservation Practices

The preservation practices currently followed at the **Dr. P. G. Halakatti Research Centre** are foundational but limited in scope, reflecting both the Centre's commitment to safeguarding its rare collections and the practical constraints of resources, infrastructure, and technical capacity. These practices aim to prolong the life of manuscripts, rare books, and archival documents, though they require modernization to meet contemporary preservation standards.

1. Physical Storage and Basic Conservation

- Wooden cupboards and closed cabinets
- Bundled paper wrappings for fragile manuscripts
- Shelves arranged according to broad subject categories

Although these methods offer basic protection, they do not meet archival best practices for long-term preservation. Environmental controls—such as temperature regulation, humidity monitoring, and insect management—are minimal or absent. Fluctuations in humidity and temperature can accelerate paper brittleness and ink fading, placing older manuscripts at risk

Some minimal conservation actions—such as re-binding damaged books, taping torn pages, and cleaning dust—have been undertaken, but the Centre lacks professional conservators and specialized tools.

2. Handling Practices

Staff members handle materials with care, and frequent handling by visitors is generally restricted. The Centre encourages:

- Gentle page turning
- Restricted access to fragile volumes
- Limited photocopying of old documents

However, the absence of written handling guidelines, protective gloves, book supports, and archival storage boxes indicates the need for improvement. Over time, repeated manual handling can damage fragile binding structures, particularly in older Vachana manuscripts.

3. Cataloguing and Documentation

The Centre maintains basic cataloguing records, including:

- Accession registers
- Handwritten catalogues
- Notebooks listing manuscript titles
- Informal classification systems

While these records provide essential information, they lack:

- Standardized metadata
- Subject indexing
- Digital cataloguing systems

4.4 Institutional Challenges

The **Dr. P. G. Halakatti Research Centre** faces several institutional challenges that affect its ability to preserve, manage, and disseminate its valuable collections. These challenges reflect common issues faced by small and medium-sized cultural heritage institutions, particularly those dealing with fragile manuscripts and vernacular

literature Understanding these challenges is crucial for designing effective digitization and preservation strategies.

The key institutional challenges observed at the Centre include the following:

1. Fragility and Deterioration of Materials

Many manuscripts and early printed books at the Centre are in a fragile state due to:

- Aging paper
- Poor-quality ink
- Brittle bindings
- Environmental fluctuations

Without controlled temperature and humidity conditions, manuscripts deteriorate faster, increasing the urgency for preservation and digitization. Fragile items also limit physical access for researchers.

2. Inadequate Preservation Infrastructure

The Centre lacks advanced preservation facilities such as:

- Climate-controlled storage rooms
- Archival-quality storage boxes and folders
- Deacidification or conservation tools
- Pest management systems

The absence of such infrastructure makes it difficult to ensure long-term safety of rare materials and limits the ability to carry out preventive conservation.

3. Limited Cataloguing and Metadata Management

- Incomplete or outdated catalogues
- No consistent subject classification
- Lack of digital cataloguing systems
- Absence of unique identifiers

4. Staffing and Skill Gaps

The Centre operates with limited staff, many of whom are engaged in administrative responsibilities rather than archival or technical duties. Skill gaps include:

- Lack of training in conservation techniques
- Limited knowledge of metadata standards
- Inexperience with OCR or repository software
- Minimal exposure to archival best practices

5. Financial Constraints

As a culturally oriented research institution, the Centre relies on limited funding for:

- Conservation materials
- Technical equipment
- Professional training
- Infrastructure development

Funding scarcity restricts the Centre's ability to undertake large-scale digitization or hire specialized professionals.

6. Lack of a Digital Preservation Strategy

Even when digital files exist, there is no integrated system for:

- Backup and redundancy
- File naming conventions
- Version control
- Long-term archival planning
- Repository-based access

7. Restricted Accessibility

Scholars often face challenges accessing materials due to:

- Fragility of documents
- Limited reading space
- Manual retrieval systems
- Restricted visiting hours

CHAPTER 5

DIGITIZATION AND ARCHIVING PROCESS

The digitization of the Dr. P. G. Halakatti Research Centre collection was carried out through a structured workflow designed to ensure the safe handling, high-quality imaging, accurate description, and long-term digital preservation of culturally significant materials. This chapter outlines the systematic procedures followed in planning, scanning, metadata creation, repository development, and quality assurance, aligning with recognized standards in cultural heritage digitization

Kibo XS device

Digitization and digital preservation rely heavily on technological tools that ensure accuracy, accessibility, and sustainability. In this study, aimed at preserving and disseminating the literary works of Vachanana Pitamaha Dr. P.G. Halakatti, three major tools and technologies were central: Kibo XS device, optical character recognition (OCR) software, and the DSpace repository system. Together, these technologies formed the backbone of the digitization workflow, from capturing high-quality digital surrogates to enabling long-term preservation and scholarly access.

Step 1: Place the soft mat on a flat surface and place the Kibo XS device on the designated square cut out area.

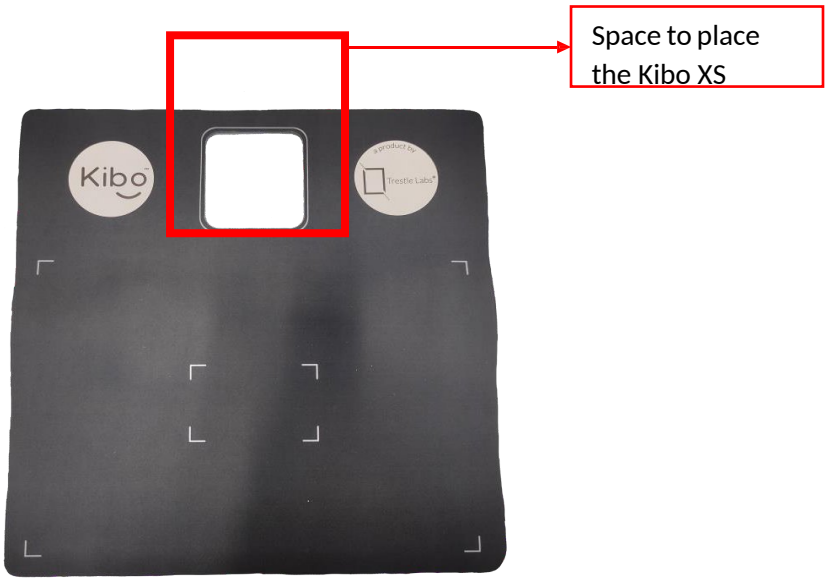

Figure-4: Space to place the Kibo XS

1. The highlighted square area in the centre of the mat represents the document placement zone or scanning area.
2. This is where you place the page, document, or object that needs to be scanned or digitized.
3. The Kibo and Trestle Labs logos on the mat indicate the brand and developer of the scanner.
4. The dotted or marked lines around the central area help users align the document properly to ensure it is captured accurately.

Step 2: Press the camera open button on the side of the device. The camera arm of the

device will gently lift up and take the shape of a table lamp.

Figure-5: Camera Open button

- The device is a vertical scanner designed for digitizing books or documents placed on the black mat below.
- The highlighted section (in red box) indicates the push button on the scanner's body.
- The label points out this button, which is used to start or stop the scanning process or capture an image of the document.
- The black mat at the bottom is the scanning area, where the document or book page is placed for digitization.

Step 3: Connect one end of the cable provided to the side of the device (USB A) and the other end (USB B) to your laptop or Computer.

Figure-6: USBA

- The red circled area shows a USB cable connection port at the base of the Kibo scanner.
- This USB cable provides power to the scanner and may also be used for data transfer between the scanner and a computer or laptop.
- The Kibo mat below the device is the scanning surface, where documents or books are placed for digitization.
- The connection ensures that the scanner operates correctly — it enables image capture and communication with scanning software.

Step 4: Touch the LED fill light button provided at the bottom of the Kibo XS device to turn on light with three levels of light intensity – Low/Medium/High

Figure-7: Turn on light

- The highlighted circular area represents the camera lens or scanning sensor of the Kibo device.
- This camera is used to capture images of documents, pages, or objects placed on the scanning mat below.
- The lens design ensures that the captured images are clear and properly aligned for digitization or text extraction.
- The surrounding base provides stability and helps maintain the correct scanning distance between the lens and the document

STEPS TO ACCESS KIBO WEB

Step 1: Open any browser (e.g. Google Chrome) and visit https://kibo.trestlelabs.com

Figure-8:Turn on light link

Step 2: Place your printed/handwritten hardcopy document on the soft mat of the Kibo XS device.

Please note: Placement of the document is orientation friendly and the document can be placed in any orientation within the soft mat area.

Click on the Capture image button to capture your page in preview. Flip the pages and click on the Capture button to scan multiple pages.

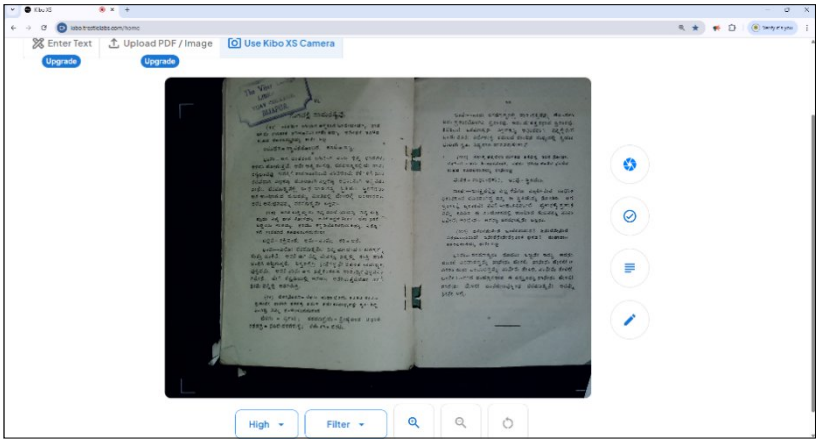

Figure-9: Open the book

- The open book visible in the centre is placed under the Kibo scanner, and the live scan image is displayed on the computer screen.
- The software interface (on the screen) is part of the Kibo application, which allows users to scan, capture, and process documents or books.
- The blue control icons on the right side are used for various functions such as:

Adjusting image quality

- Cropping or rotating the scanned image
- Editing or re-capturing the page
- The buttons below the image ("High", "Filter", "Zoom", etc.) help modify the scan's clarity, brightness, or resolution.
- The top bar options like "Upload PDF/Image" and "Use Kibo XS Camera" allow users to either import existing documents or scan new ones directly using the Kibo scanner.

Step-3 : Processing

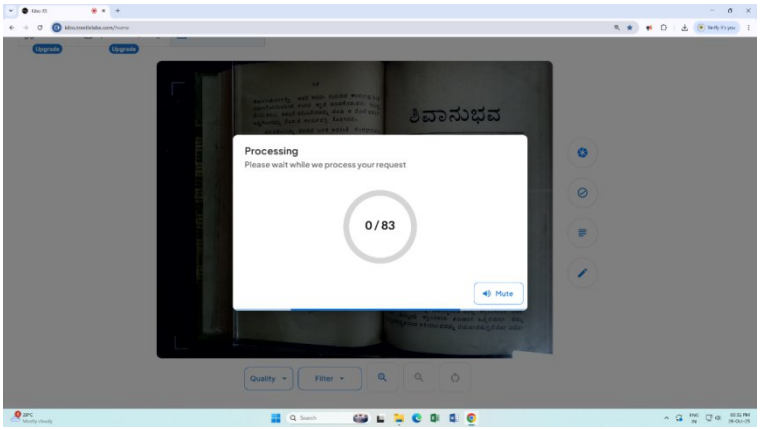

Figure-10:Processing

- The book page in the background shows that a physical document or book is

being scanned using the Kibo scanner.

- The foreground pop-up box displays a “Processing” message, indicating that the scanned image is currently being analyzed and converted into digital text using OCR (Optical Character Recognition) technology.
- The counter “0/83” shows the progress status, meaning the system is processing page 1 out of 83 total pages. As the process continues, this number increases until all pages are completed.
- The “Mute” button at the bottom-right of the pop-up allows the user to silence audio notifications during processing.
- Below the pop-up, options such as “Quality”, “Filter”, and Zoom controls are visible — these allow users to adjust image clarity and optimize text recognition before or after processing.
- The web address (kibo.trestlelabs.com/home) indicates this process is being conducted through the Kibo XS online platform.

Step-4 Optical Character Recognition (OCR) Scanner

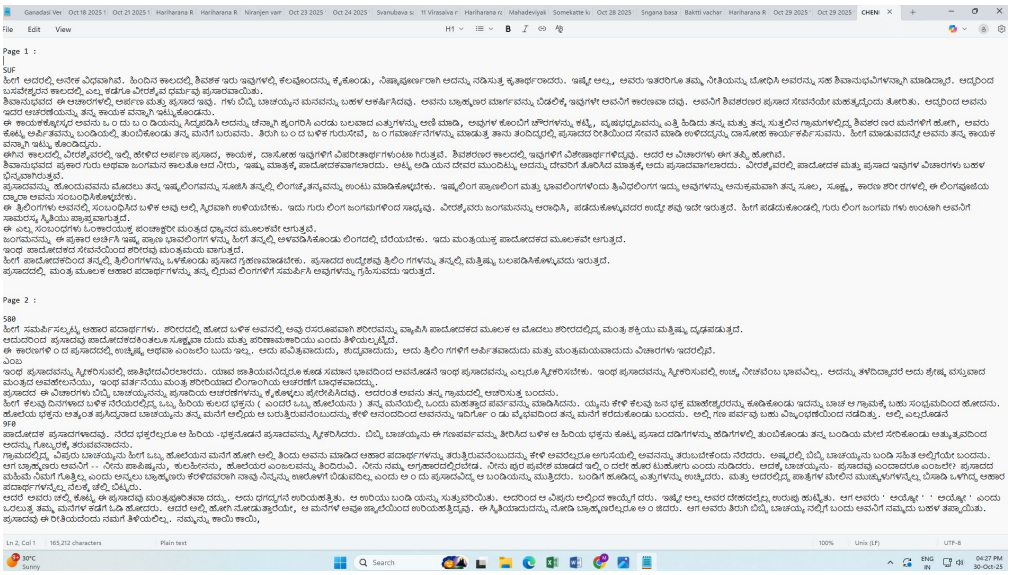

Figure-11:Convarting into OCR text

Once images are scanned, they must be made searchable and machine-readable to maximize their research value. OCR Scanner enables this by converting image-based text into editable and searchable text files. This functionality allows researchers to locate keywords, copy passages, and perform textual analysis.

1. For the Halakatti collection, OCR was particularly applied to printed Kannada texts. While OCR for handwritten manuscripts remains a challenge due to variable handwriting, advances in AI-based OCR engines such as Tesseract

and ABBYY FineReader are increasingly improving recognition accuracy Nevertheless, for handwritten works, manual transcription and validation were still necessary to complement automated processes.

OCR served two important purposes in this study:

Searchability: Digitized texts became keyword-searchable, enabling efficient retrieval and enhancing research productivity.

1. Accessibility: Machine-readable texts improved accessibility for users with disabilities, as screen readers and assistive technologies can process OCR outputs.
2. Accuracy was a central concern. Each OCR-generated file underwent manual proofreading to correct errors, especially with Kannada texts where diacritical marks and script complexities often resulted in misrecognition. This hybrid method, combining automation with human oversight, ensured reliable outputs for both scholarly use and general access.
3. OCR also facilitated the creation of metadata elements, such as automatically extracting author names, publication dates, or keywords, which were then validated and added to the DSpace repository. As Terras notes, the value of OCR lies not only in digitizing text but in enabling the computational analysis and retrieval that underpin modern digital humanities.

- The text displayed in the window is in the Kannada language, representing the recognized or converted content from a previously scanned book or manuscript.
- At the top of the screen, there are navigation buttons labelled "<" and ">" to move between pages — indicating that this is Page 5 of 27 in the scanned document.
- The URL (kibo.trestlelabs.com/output) in the browser's address bar shows that this output is being viewed through the Kibo web platform.
- The software interface allows users to read, edit, and verify the scanned text after the Optical Character Recognition (OCR) process converts images into editable text.

The bottom of the screen shows the Windows taskbar, indicating this is being viewed on a desktop or laptop

Step-5: Kibo.trestlelabs.com/translate

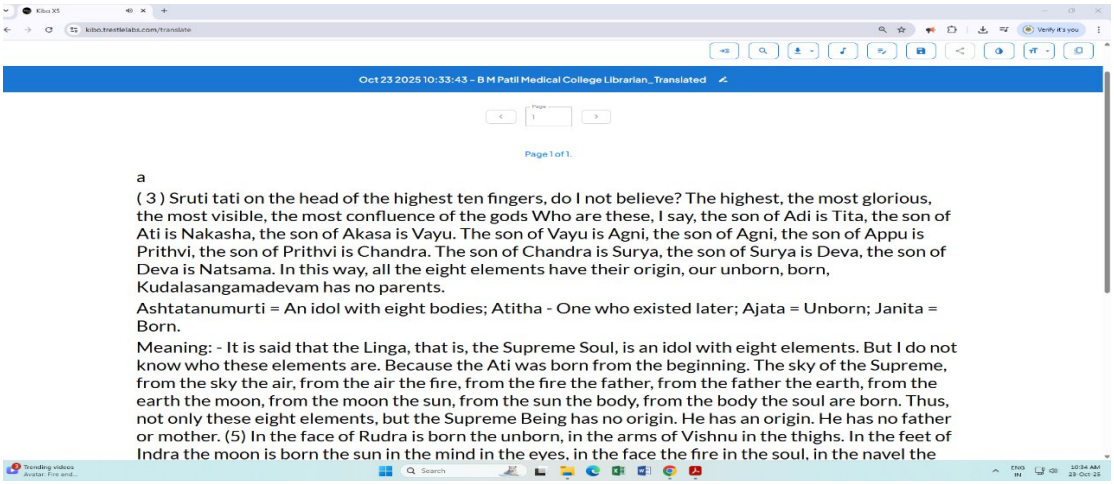

Figure-12:Text translation

- The web address (kibo.trestlelabs.com/translate) at the top indicates that this page belongs to the translation section of the Kibo platform.
- The header line (Oct 23 2025 10:33:43 - B M Patil Medical College Librarian Translated) shows the file name, translation time, and project details — suggesting that this document was digitized and translated from another language (likely Kannada or Sanskrit) into English.
- The text content below appears to be translated English text, explaining ancient philosophical or religious concepts such as Sruti, Ati, Vayu, Agni, and Ashtatanumurti — terms from Indian spiritual texts.
- The interface includes navigation arrows (< and >) and a page indicator (Page 1 of 1), showing that this is a single-page translation output.
- The top toolbar contains options for saving, downloading, or further editing the translation.

2. DSpace

1. While scanners and OCR are essential for creating digital objects, long-term preservation and access require a robust repository platform. For this purpose, DSpace was selected as the primary digital repository system.
2. DSpace is an open-source repository software widely used by academic and cultural heritage institutions. It supports both digital preservation and scholarly access, offering structured metadata management, access controls, and preservation functionalities (Smith et al., 2003). Its flexibility made it well suited for the Halakatti project, where both sustainability and user accessibility were priorities.

Step-6 DSpace

Figure -13:DSpace

The strengths of DSpace in this project included:

- Metadata Standards: DSpace supports international standards such as Dublin Core, ensuring interoperability with other digital repositories worldwide. This allowed the Halakatti collection to be catalogued in a way that aligns with global scholarly practices.
- Search and Retrieval: With full-text indexing (linked to OCR outputs), users could search the repository by author, subject, title, or keywords. This made the collection significantly more usable for researchers.
- Access Control: DSpace offered the ability to designate access levels. Publicly accessible works could be viewed freely, while rare or copyrighted works could be restricted, balancing preservation with cultural sensitivity.
- Preservation Tools: Built-in functions such as checksum verification ensured data integrity, while the platform's support for format migration safeguarded digital objects against technological obsolescence.
- Scalability: DS pace's modular architecture made it suitable for future expansion, allowing the repository to grow as more works from the Halakatti Research Centre are digitized.

In practice, DSpace functioned as the backbone of the digital archive, storing TIFF master files, accessible PDFs, and OCR text files. Each digital object was linked with descriptive, administrative, and technical metadata, ensuring discoverability and long-term management.

Step-7 Open community Dr.P.G Halakatti Literary works /Books

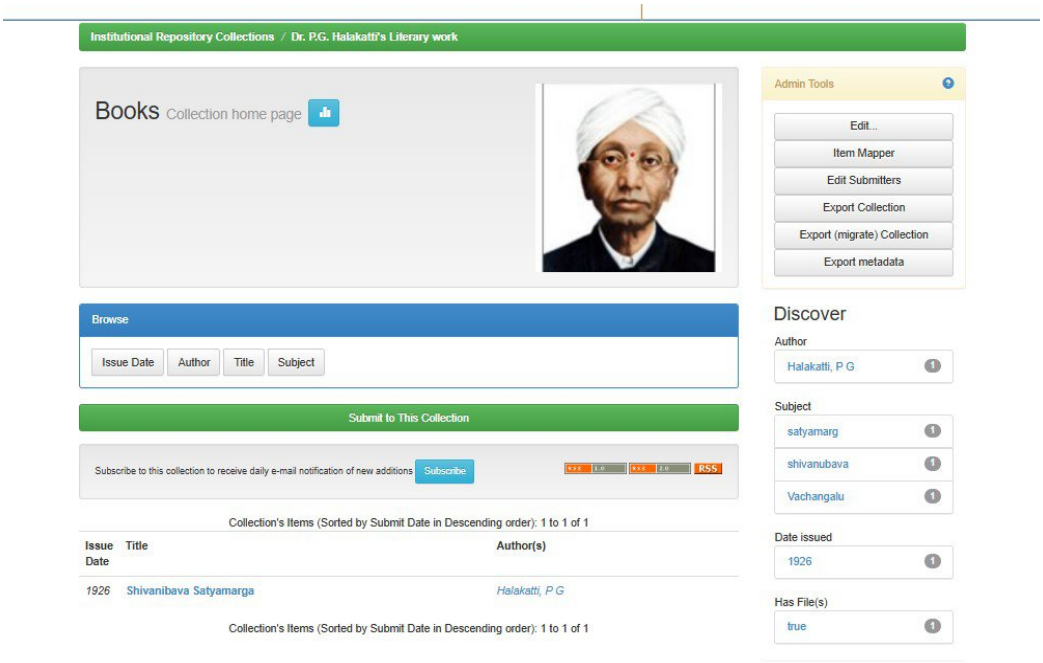

Figure-14: Dr.P.G Halakatti Literary works /Books community page Screen Shot

- At the top, the header "BLDE DU" identifies the institution —Vijayapura (Bijapur), Karnataka.
- The green bar labeled "Institutional Repository Collections" indicates that this page belongs to the digital repository system, which stores and manages digital academic resources.
- The main section highlights the Dr. P. G. Halakatti Literary Works, showing that it is a community homepage within the repository.
- This means it likely hosts digitized research papers, manuscripts, theses, and historical works related to Dr. P. G. Halakatti's research and publications.
- On the right-hand side, the Admin Tools panel contains options such as:
- Edit – to modify community details.
- Create collection/Sub-community – to organize research works.
- Export Community/metadata – to back up or share data in standard formats.
- The Browse section below allows users to explore documents or collections available in this repository.

Step-8 Uploading a file

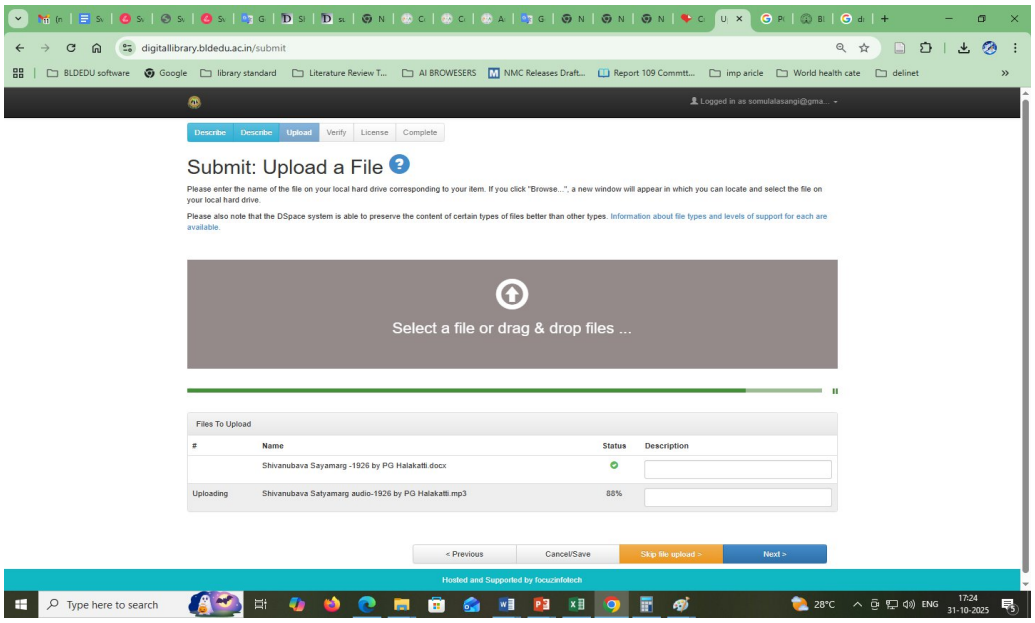

Figure-15:Drag and drop files

- The page title "Submit: Upload a File" at the top indicates that a user is in the process of submitting a new digital item (such as a document or audio file) to the BLDE Digital Library.
- The DSpace submission steps are displayed in sequence at the top: Describe → Describe → Upload → Verify → License → Complete. The current step highlighted is Upload.
- The large grey area labeled "Select a file or drag & drop files…" is where users can upload files from their computer.
- Below that, the table under "Files To Upload" shows the files being added:

1. **"Shivanubhava sathemarga - 1926 by PG Halakatti.docx"** (document file).
2. **"Shivanubhava sathemarga audio - 1926 by PG Halakatti.mp3"** (audio file, currently uploading at 86%).

- These files are part of the digitization and archiving process of Dr. P. G. Halakatti's literary works.
- The buttons at the bottom — *Previous, Cancel/Save, Skip file upload, Next* — allow users to navigate through submission steps.
- At the very bottom, the footer shows "Hosted and Supported by fossee ctiitech", meaning the digital repository is technically supported by the FOSSEE (Free/Libre and Open Source Software for Education) initiative at IIT Bombay.

Step-9 File Uploaded

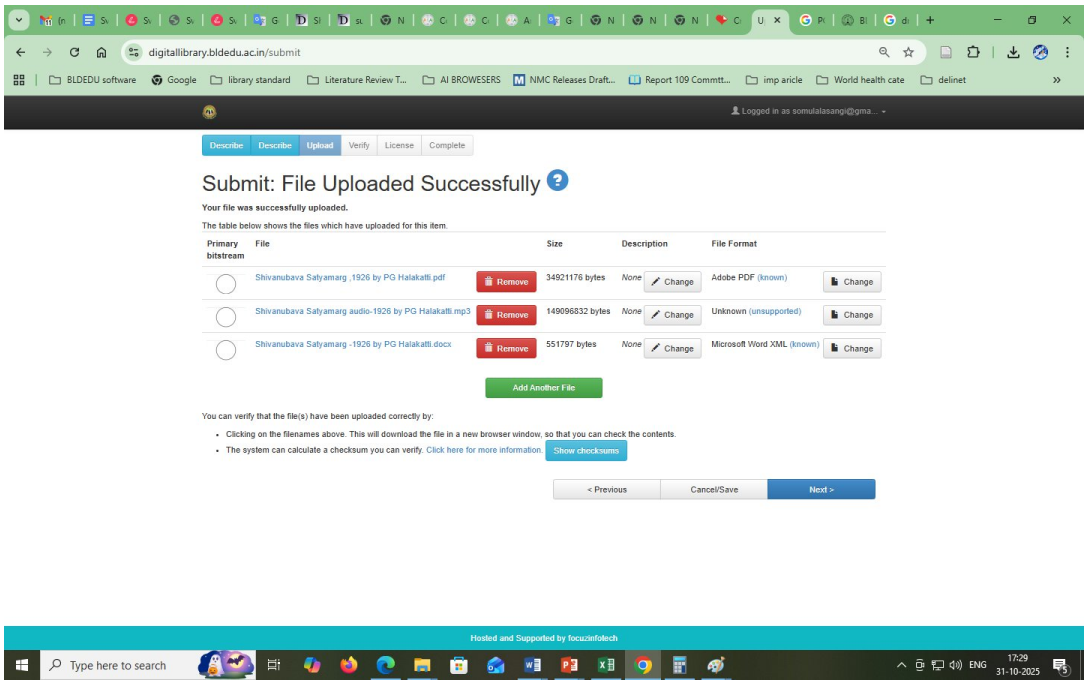

Figure-16:File Uploaded Successfully

- The **page title "Submit: File Uploaded Successfully"** at the top confirms that the files for this submission have been uploaded without errors.
- This step comes after the "Upload" phase in the **DSpace submission process**, which includes: **Describe → Describe → Upload → Verify → License → Complete.**
- The **table** lists all uploaded files for the current repository item:

1. **Shivanubhava Sathemrga 1926 by PG Halakatti.pdf** – File format: Adobe PDF
2. **Shivanubhava Sathemrga audio-1926 by PG Halakatti.mp3** – File format: Unknown
3. **Shivanubhava Sathemrga -1926 by PG Halakatti.docx** – File format: Microsoft Word XML

- The "Remove" buttons allow the user to delete any file if uploaded incorrectly.
- The "Change" buttons beside each file let the user modify the description or format information.
- The "Add Another File" button allows uploading additional related files before proceeding.
- At the bottom, the system gives verification options:
- Users can click on file names to preview or download them for checking.

- The system can calculate and show checksums (digital signatures) to ensure file integrity.
- Navigation buttons “Previous,” “Cancel/Save,” and “Next” allow the user to move between submission steps.
- The footer shows “Hosted and Supported by fossee/iitb”, meaning the repository runs with technical support from the FOSSEE (Free/Libre and Open Source Software for Education) initiative at IIT Bombay.

Step-10 Submission verification

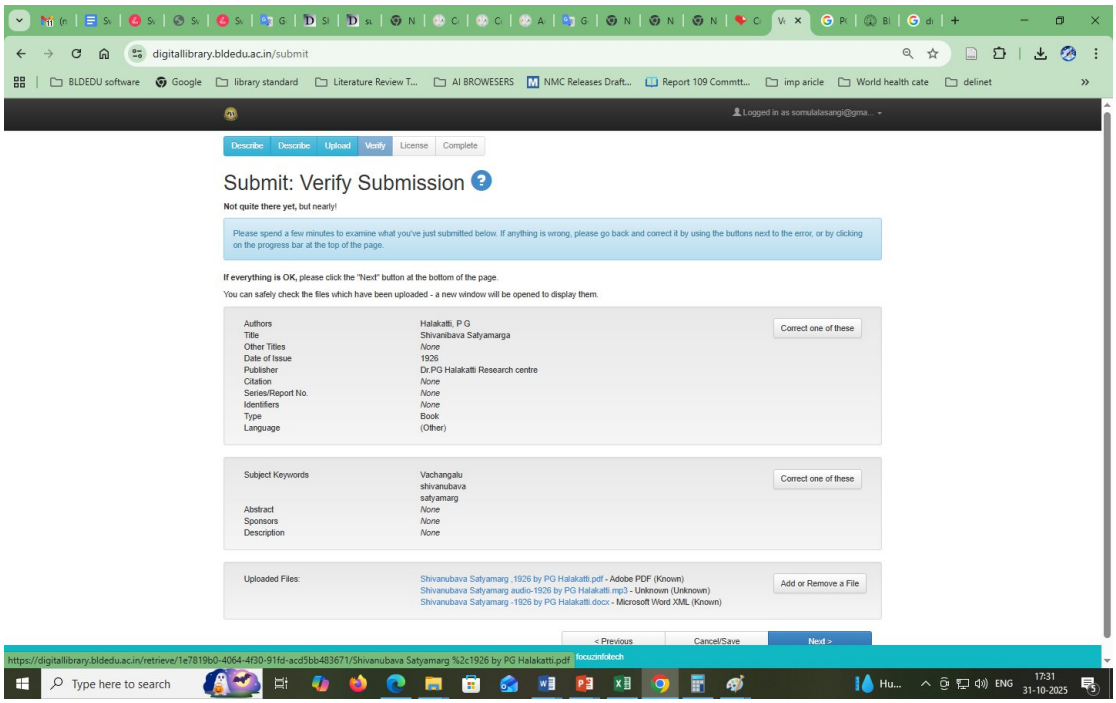

Figure-17:Verify Submission

Page Header

- **Title:** “Submit: Verify Submission”

  This indicates you are in the *verification stage* of uploading a research item into the BLDE Digital Library (a DSpace-based institutional repository).
- **Tabs:** “Describe → Describe → Upload → Verify → License → Complete”

  The blue highlight shows you are on the **“Verify”** step.

Instruction Box

“Please spend a few minutes to examine what you’ve just submitted below. If anything is wrong, please go back and correct it using the buttons

This means you should carefully check all the details before clicking **Next**, because this will finalize your submission.

Metadata Summary

- **Authors:** Halakatti, P.G.
- **Other Titles:** Shivanabruva Satyamangra
- **Date of Issue:** 1926
- **Publisher:** Dr. P.G. Halakatti Research Centre
- **Citation / Series Report No.:** None
- **Identifiers / Type / Language:** Book / Other

Subject Keywords

- The listed keywords are:

  Vachanagala, Shivanabruva, Satyamangra, None, None

  (These keywords help in searching and categorizing the document.)
- You can edit keywords by selecting **"Correct one of these."**

Uploaded Files Section

Here you see the files you uploaded earlier:

1. **Shivanabruva Satyamang, 1926 by PG Halakatti.pdf** – Adobe PDF (Known)
2. **Shivanabruva Satyamang audio-1926 by PG Halakatti.mp3** – Unknown (Unsupported)
3. **Shivanabruva Satyamang -1926 by PG Halakatti.docx** – Microsoft Word XML (Known)

Bottom Navigation

- **< Previous** — Go back to the previous step (Upload).
- **Cancel/Save** — Save your progress and continue later.
- **Next >** — Proceed to the next step, usually the **License Agreement**, to finalize submission.

Step- 11: Viewing/Opening Submitted file

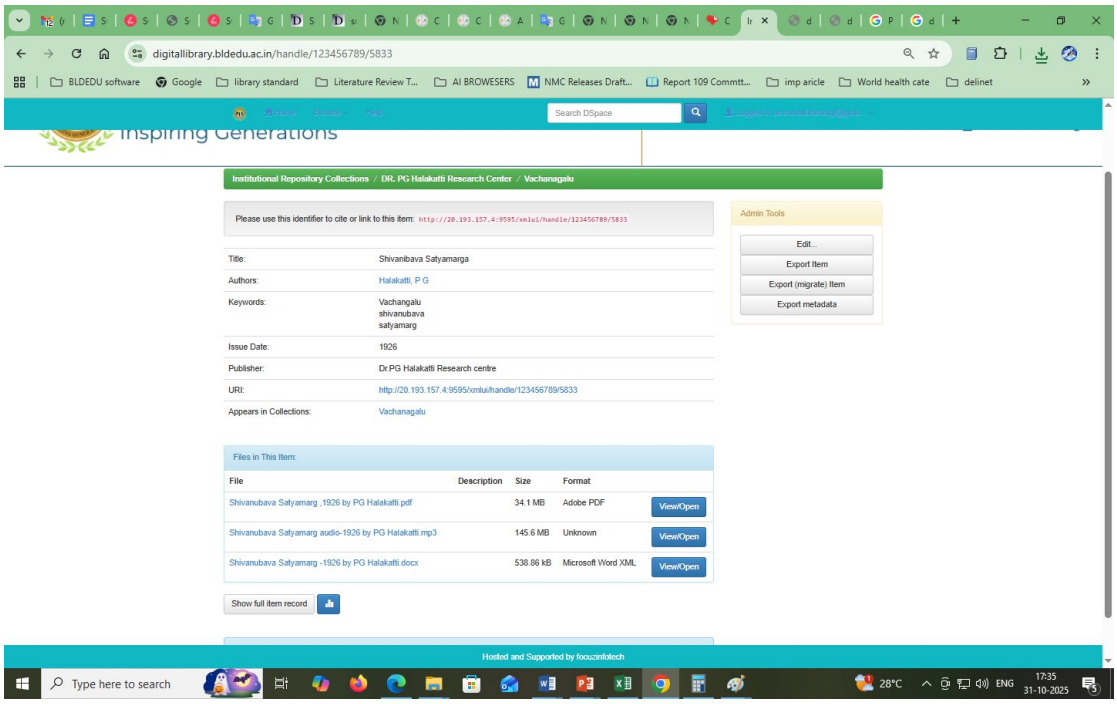

Figure-18 View/opening Submitted file

Header and Navigation

- The top bar indicates that you are browsing the **BLDE Digital Library** website, which is part of the **Dr. P.G. Halakatti Research Centre** collection under **Vachanagalu**.
- The breadcrumb trail shows:

  Institutional Repository Collections / DR. PG Halakatti Research Center / Vachanagalu

  This helps identify where the digital item is stored in the repository hierarchy.

Item Information Section

This section provides the **metadata** (descriptive information) of the uploaded work:

- **Title:** Shivanabruva Satyamarga
- **Authors:** Halakatti, P.G.
- **Keywords:** vachanagalu, shivanabruva, satyamarga
- **Issue Date:** 1926
- **Publisher:** Dr. P.G. Halakatti Research Centre
- **Persistent Link (Handle ID):**

  http://210.195.137.4:9595/xmlui/handle/123456789/5833

→ This is the **permanent URL** where the digital item can be accessed publicly.

- **Appears in Collections:** Vachanagalu
  → This shows the digital work belongs to the *Vachanagalu* category within the collection.

Admin Tools

For repository administrators (not regular users):

- **Edit** – to modify metadata or files.
- **Export Item / Metadata / Migrate Item** – used for backup or transferring data to another DSpace instance.

Files in This Item

File Name	Size	Format	Action
Shivanabruva Satyamarg, 1926 by PG Halakatti.pdf	34.1 MB	Adobe PDF	View/Open
Shivanabruva Satyamarg audio-1926 by P G Hlakatti.mp3	146.6 MB	Unknown (audio file)	View/Open
Shivanabruva Satyamarg -1926 by PG Halakatti.docx	530.86 KB	Microsoft Word XML	View/Open

This table lists all the uploaded files associated with the record:

Each file has a **"View/Open"** button allowing users to read or listen to the digital material directly in the browser.

Footer

At the bottom, it shows:

"Hosted and Supported by fossee/iitb"

This means the BLDE Digital Library system runs on DSpace software maintained by IIT Bombay's FOSSEE project, which provides open-source support.

The repository now contains three accessible digital files (PDF, audio, and DOCX), ensuring the preservation and public access to this valuable historical material.

CHAPTER 6

FINDINGS AND ANALYSIS

6.1 Condition of Manuscripts

1. Physical Deterioration

- **Brittleness and Cracking:**
  Older palm-leaf manuscripts are brittle and prone to breaking along the edges. Paper manuscripts exhibit cracking and flaking, especially along folds.
- **Ink Fading:**
  Natural pigments used in early manuscripts have faded over time, making sections difficult to read.
- **Staining and Discoloration:**
  Exposure to moisture, dust, and environmental pollutants has caused yellowing, dark spots, and uneven discoloration.

2. Environmental Damage

- **Humidity Fluctuations:**
  High humidity encourages fungal growth, while low humidity causes drying and cracking of the writing surface.
- **Temperature Variations:**
  Irregular temperature control accelerates chemical deterioration and weakens the structural integrity of manuscripts.
- **Exposure to Light:**
  Prolonged exposure to sunlight or fluorescent lighting has caused fading of text and weakening of manuscript surfaces.

3. Biological Damage

- **Insect Activity:**
  Termites, silverfish, and bookworms have caused holes, missing portions, and significant text loss in some volumes.
- **Fungal and Mold Growth:**
  In areas with poor ventilation, mold patches and fungal threads are visible, particularly on older paper manuscripts.

4. Mechanical Wear and Handling Issues

- **Tears and Breakage:**

  Fragile manuscripts crack when pages are turned without proper support.

- **Binding Damage:**

  Many manuscripts have loose, broken, or missing bindings, making them difficult to handle safely.

- **Improper Storage:**

  Some manuscripts are stored in stacked piles or non-archival folders, leading to bending, warping, and abrasion.

5. Loss of Structural Integrity

- **Detached Folios:**

  Several manuscripts have detached or unsequenced folios, making it difficult to maintain continuity in reading.

- **Fragmentation:**

  Some manuscripts exist only as fragments due to extensive wear or insect damage.

6.2 Results of the Study

Table:2 List of Books Digitized and Archived

S.N	List of Digized and Archived Book	Year
1	Vachanashastrasara Bhaga-1 (Poorvardha)	1923
2	Basaveshvarana Vachanagalu	1926
3	Mahadeviyakkana Vachanagalu	1926
4	Lingapoojeja Tatvagalu	1926
5	Veerashaiva Ragale (Shankaradevakruta)	1926
6	Ganadasi Veerannana Vachanagalu	1926
7	Tontadarya Ragale	1926
8	Sanganabasaveshvarana Vachanagalu	1927
9	Ghanalingana Vachanagalu	1927
10	Naitika mattu Bhaktiya Vachanagalu	1927
11	Devara Dasimayyana Vachanagalu	1927
12	Lingayata Matatatva	1928
13	Sangeetadalla Shivasharanara Vachanagalu	1928
14	Mailara Basappanavara Shivanubhava Darpana	1929
15	Lingammana Vachanagalu	1929
16	Kai. Va. Chennabasappa Basalingappa Dharawada Ivara Charitre	1930
17	Sakalesha Madarasana Vachanagalu	1930

18	Shivanubhava Sutra	1930
19	Shunya Sampadane Bhaga-1	1930
20	Prabhudevara Vachanagalu	1931
21	Hariharana Ragalegalu Bhaga-1	1931
22	Adayyana Vachanagalu	1931
23	Adish etti Purana (Raghavanka Virachita)	1931
24	Chennabasaveshvarana Vachanagalu	1932
25	Niranjana Vamsha Ratnakara	1932
26	Ambigara Chaudayyaana Vachanagalu	1932
27	Sateeka Shatsthala Brahmadipika	1933
28	Hariharana Ragalegalu Bhaga-2	1933
29	Hariharana Ragalegalu Bhaga-3	1933
30	Hariharana Ragalegalu Bhaga-4	1933
31	Beelagiya Arasarugala Vamshavali	1933
32	Somekatti Kavi Vrushabhendrana Kaivalya Padyagalu	1933
33	Vachana Shastrasara Bhaga-1	1934
34	Hariharana Ragalegalu Bhaga-5	1934
35	Hagalavadi Siddharamappa Kruta Mahanubhava Prakashini	1934
36	Urilinga Peddiyya Vachanagalu	1934
37	Hariharana Ragalegalu Bhaga-6	1935
38	Shivanubhava Satyamarga	1937
39	Shivasharanara Sankirna Vachanagalu Bhaga-1	1938
40	Shivasharanara Sangeeta Vachanagalu	1938
41	Hariharana Ragalegalu Bhaga-7	1938
42	Madiwala Machidevana Vachanagalu	1938
43	Vachanashastrasara Bhaga-2	1938
44	Vachanashastrasara Bhaga-3 Poorvardha	1939
45	Shivanubhava Shabdhakosha	1940
46	Hariharana Ragalegalu Bhaga-8	1940
47	Haralayyana Tripadigalu	1941
48	Haralayyana Charitreyu	1941
49	Keladi Samsthanada Raja Vamshavali	1943
50	Bhaktiya Vachanagalu	1943
51	Vachanashastrasara Bhaga-3 (Uttarardha)	1947
52	Paramatmana Svarupa	1948
53	Shunyasampadane (3 mattu 10ne Upadeshagalu)	1956
54	Shivasharaneyara Charitregalu	1958

A total of 54 books from the archival collection have been successfully digitized across three major formats—OCR text, high-resolution scanned PDF, and audio narration. The OCR process ensures that each book is text-searchable, enabling efficient retrieval and digital preservation. The scanned PDF versions provide faithful

visual reproduction of the original printed pages, maintaining historical accuracy and layout integrity. Additionally, audio digitization has been completed for the works, significantly improving accessibility for visually impaired readers and enhancing the usability of the collection through multimodal formats. Although OCR and PDFs were completed for all 54 titles, a few files encountered OCR failures, but the raw scans remain preserved; meanwhile, the audio format has been successfully produced without issues. This comprehensive digitization effort strengthens long-term preservation and expands public access to valuable Vachana and Lingayat literary heritage.

1. Positive Impact of Proposed Tools

Image quality, safe handling of fragile manuscripts, metadata management, and long-term digital preservation.

2. Stakeholder Support for Digitization

Interviews with scholars, staff, and students showed strong support for digitization. They emphasized the need for: wider access, reduced handling of original manuscripts, and improved academic usability.

3. Need for Policy and Training

The study found that the Centre requires: proper digitization policies, standardized workflows, trained staff, and regular preservation monitoring.

4. Improved Access and Academic Visibility

Accessibility for researchers, opportunities for digital humanities, global scholarly engagement, and public outreach for Vachana literature.

CHAPTER 7

Recommendations And Conclusion

1. The recommendations call for advanced scanning technologies, OCR integration, image enhancement tools, and a secure DSpace repository supported by strong metadata standards and cybersecurity measures.
2. Upgrading hardware, storage systems, and network infrastructure, along with staff training, is essential for maintaining an efficient digitization workflow.
3. Administratively, institutions must establish clear policies, SOPs, committees, documentation systems, and sustainable resource allocation strategies.
4. Preservation efforts focus on environmental control, archival-quality storage, routine conservation, pest management, disaster preparedness, and reduced handling of fragile originals.
5. Access and outreach strategies include developing a public digital library, implementing tiered access policies, improving reading room services, and conducting academic and community engagement programs.

CONCLUSION

The study on the Digitization and Archiving of Literary Works at the Vachanana Pitamaha Dr. P.G. Halakatti Research Centre highlights the critical importance of preserving Karnataka's rich literary and cultural heritage. The research demonstrates that the Centre holds invaluable manuscripts, rare books, and archival documents that require immediate and systematic preservation due to their fragile physical condition and historical importance.

Digitization emerges as a transformative and sustainable solution for safeguarding these cultural assets. The evaluation of digitization tools such as the Kibo Scanner**,** OCR software, and DSpace repository reveals that modern technologies can significantly reduce physical deterioration, improve access, and enhance long-term preservation. At the same time, the study identifies gaps in existing archival practices, including inconsistent cataloging, inadequate preservation measures, and limited metadata frameworks.

The study concludes that comprehensive digitization, combined with strong administrative planning, technical infrastructure, and trained staff, can transform the Halakatti Research Centre into a model digital archive. By implementing standardized metadata, structured workflows, advanced preservation techniques, and effective outreach strategies, the Centre can serve researchers, students, and the public more efficiently.

Furthermore, digitization amplifies the cultural impact of Vachana literature by making it globally accessible, thus fostering academic research, cultural understanding, and digital humanities initiatives. The preservation and dissemination of these materials ensure that the intellectual legacy of the Vachana movement continues to inspire future generations.

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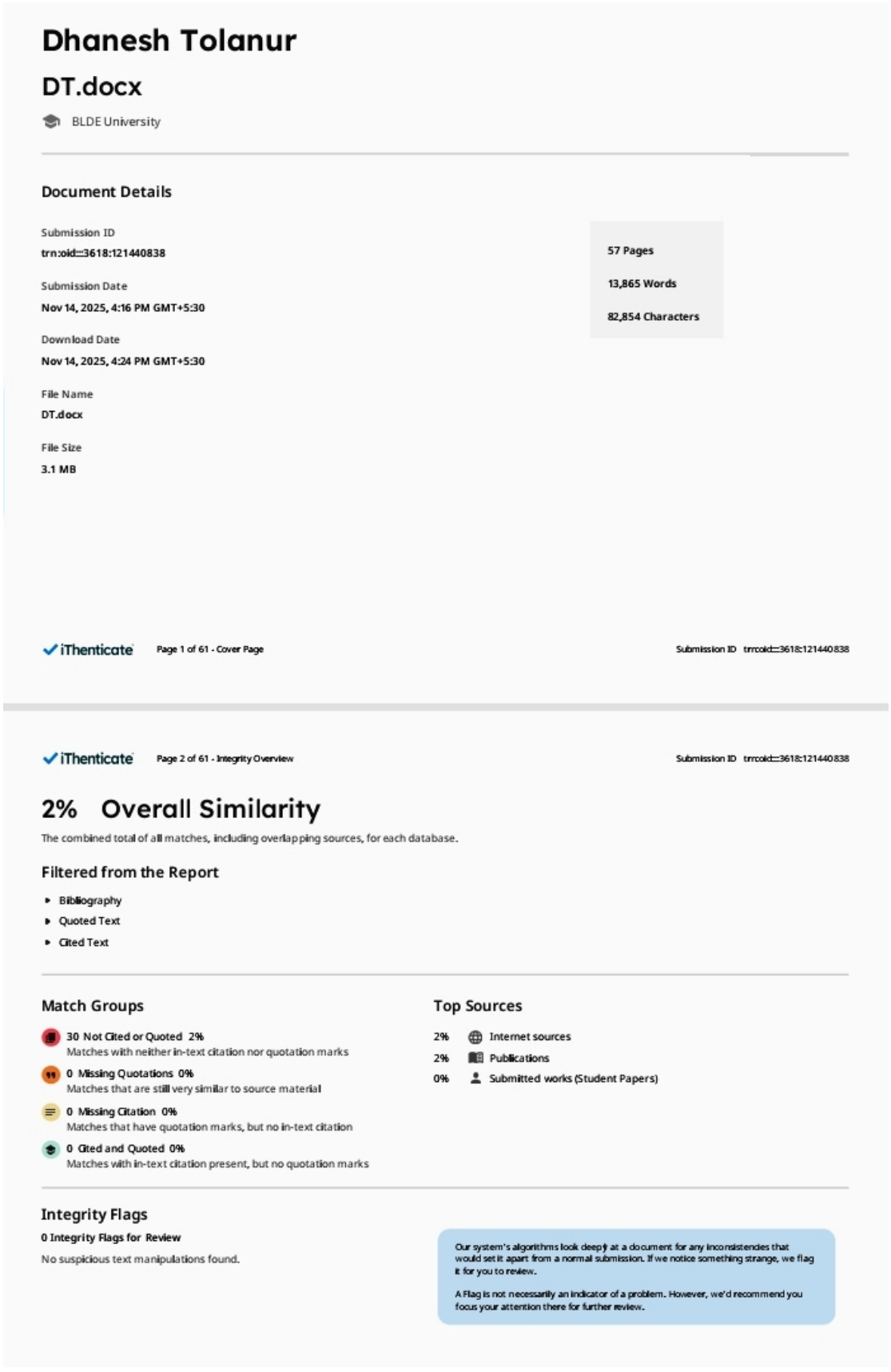

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