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Changing Role of Librarians from Disseminating of Information to Policy Informatics: An Analytical Study of Vernacular Collection Management of Government of Gujarat

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Introduction:

Citizens of any country are how much well informed or knowledgeable that depends on the efforts of that government in publishing, sharing and distributing government information and information resources through various mechanisms, media and channels. Government publishes various types of documents such as Historical documents; Legal treatises; Posters; Maps; Satellites and Datasets; Scientific papers; Satellite imagery; Land records; Databases; Transcripts of Press conferences and speeches of President, Prime Minister, members of upper and lower houses, government officials; Decisions of courts (high courts, Supreme courts, Information Commissions etc); Union Budget; Railway Budget; Sessional papers of both the Houses of Parliament which requires overnight printing; Weekly and extra-ordinary Gazettes of India; Import and Export policy; Secret and Confidential publications such as Question papers and reports; Periodicals; Reports; Journals; Annual Reports and many more publications (Forte; Hartnett & Severson, 2011). Some publications are made accessible through open access on website of concern government entities or digital libraries, some of publications are accessible through manual visits of libraries or government offices and some of publications are accessible through commercial databases on subscription, lease or rent bases.

Governments of all over the world are playing vital role to implement e-governance or digital governance model to simplify their operations and services to their own citizens. In the digital era, digital technologies such as internet, social media, mobile technologies, smart technologies, robotic and Artificial Intelligence (AI) are used by governments in their functions, operations, services, activities and relationship with their stakeholders such as businesses, civil societies and citizens. E-governance removes the gaps between Government and citizens in displaying, publishing, sharing, distributing and retrieving the information on the web (Lips, 2019). However, some governments lack the documentation context while publishing and sharing the government publications through open access domain. The term 'Documentation' refers the process connected with identification, recording, organizing, storage and disseminating of intellectual contents recorded in document in print or non-print medium. The terms organizing and disseminating are very much important while publishing government documents on open access domain by any entities of government. Government is considered one of the biggest publishers of that country, county, state whether is a federal government, central government or

state government. Documents should be classified and catalogued through standard methods otherwise the focus of government to make its citizenry well informed and knowledgeable will go in vain. But in this situation, policy informatics provides vision to government through its citizens (e.g. library professionals) to resolve the complex problems of managing information by applying communication technology.

The Policy Informatics is the study of how computation and communication technology is leverage to understand and address complex public policy and administrative problems and realize innovations in governance processes and institutions (Johson, 2015)

This study takes a systematic approach to addressing challenges and problems of Government of Gujarat in organizing and providing access to documents published in vernacular language through citizen centric language interface.

The study inspects how the existing mechanism of identification, recording, organising, storing and disseminating of Legal, Administrative and Constitutional documents (Circulars, Government Resolutions and Notifications) of Government of Gujarat works to fulfill the information demands of its citizens and also recommends to create digital library in vernacular language to provide access of the documents published in vernacular language. The websites of 270 entities of Government of Gujarat have been explored and 119 entities have been taken into consideration for this study as these entities publish any of Legal, Administrative and Constitutional documents on open access domain.

At the nutshell, the Government of Gujarat has been doing pioneer work in e-governance or digital governance however some changes are required in existing mechanism of organization and management of government documents which may help to promote the awareness and usage of government publications among the citizens.

Statement of the Problem:

The documents published by Government of Gujarat (GoG) are needed proper mechanism in searching & retrieving, accessing and managing them in vernacular language

Objectives of the Study:

- (1) To explore the number of documents published in Gujarati and English available on websites of GoG
- (2) To find out standard metadata set and the language of metadata value of documents
- (3) To know the language of interface of the websites and its domain names
- (4) To inspect the Linking (Browsing), Searching & Retrieval System of documents
- (5) To know the number of visitors to the website of each entity
- (6) To suggest a model that facilitates in creating digital library in vernacular language

Methodology and Data Collection Technique:

The bibliographical information about the current mechanisms such as searching & retrieval, browsing, filtering, etc for Government Resolutions, Notifications and Circulars available on websites of 119 entities of GoG have been explored from November 2019 to October 2020 subject to access date of the website of concern government entity.

The bibliographical information such as Title of Document, Date of Documents Released, Document Number, Publication Year, Branch Name, Subject, Type of Document, Language (Document Title), Parent Body, URL of Parent Body, Name of Government Entity, URL of Government Entity, Link Address of Document, Date of Link Address Copied, Date of Bibliographical Information Gathered, Format have been explored from the 119 websites of GoG.

The Data Sheets have been prepared to record both types of bibliographical information. Since the data collection has been conducted on base of survey of different websites of GoG so the questionnaire has not been prepared and none of the Data Sheet has been sent to any government entities.

Sample Size:

Out of 270 entities, 119 entities publish any of category of documents such as Circulars, Government Resolutions and Notification on their websites and hence 119 entities have been considered as sample of this study.

Scope & Limitation:

Government of Gujarat publish many documents but it has been restricted to only Circulars, Government Resolutions and Notifications available on open access domain which have been selected as sample for this study.

If data such as Title of Document, Date of Document, Document Number and URL of Document are not available on the websites even though it has been included in total sample but the missing information has not been filled while exploding to Digital Library since it is time bound project.

If any entity compiles the Circulars, Government Resolutions and Notifications in PDF files and links such documents to its website without indexing such entity has not been taken into consideration to explode the bibliographical information of documents into GSDL.

Literature Review:

Sivaram and Rajashekar discussed the volume of digital materials published in Indian languages and how to organise and make it accessible through digital library software. The emphasis was given on two main requirements such as indexing and searching, and customizing the collection. They have discussed various issues such as different encoding formats, fonts, Unicode characters etc. Looking to the feature and various issues, five collections in two Indian languages Hindi and Kannada were tested to check various aspects of collection such as multilingual support, search and retrieval, interface design etc in respect to Greenstone Digital Library Software. The result shows that the User Interface carried out simple and Boolean searches on all five collections successfully but limitations found in GLI approach (Sivaram & Rajashekar, 2004). Anup Kumar Das mentioned multilingual digital library initiatives in India. He mentioned that the Digital Repository of West Bengal Public Library Network (DR-WBPLN) is multilingual digital library and it has established using DSpace however he has mentioned that the value of metadata has been assigned in Bengali language for Title only. The article does not give information about the Searching & Retrieval is possible in Bengali or not. Also, not mentioned whether the interfaces of DSpace are available in Bengali Language or not. He discussed that the Digital Library of India provides partial metadata for Indian language which are entered in transliterated form (Das, 2012).

The digital library for Hindi collection of Krishi Vigyan Kendras of Indian Council of Agriculture Research was created by using Greenstone Digital Library Software. It was found that the User Interface allowed Unicode compliant search facility (Bahuman & Nair, 2013). Aforesaid three studies suggest that the User Interface allows various facilities in vernacular language collection Hindi and Kannada such as searching and retrieval, assigning metadata value, customization etc but no study suggested the technical details of GSDL whether what percentage of translation of various modules of GSDL completed into Hindi and Kannada, Bengali etc languages. The success of GSDL lies to translate the strings regularly otherwise the new version of GSDL will not be helpful. The Gujarati collection containing documents such as Government Resolutions, Notifications and Circulars of Government of Gujarat created through Greenstone Digital Library Software was tested various features such as Installation, Greenstone Librarian Interface, various Panels of GLI, metadata value, User Interface, searching and retrieval facility, browsing, multilingual support etc and found successfully. The translation of various modules of GSDL into 8 Indian languages is in progress. 60% translation in Gujarati has been complete followed by 52% Marathi, 44% Kannada, 43% Tamil, 20% Bengali, 9% Telugu and 3% Hindi has been completed. The installer is available in only Gujarati language among all 8 Indian languages (Zala, 2018).

Data Analysis and Interpretations

Departments, Government Entities and Documents Published on Website:

Table 1 shows that Gujarat Government has 26 departments with various sections and divisions which consist of total 270 entities. Out of 270 entities, 119 (44.07%) entities have published 24262 documents (Circular, Government Resolutions and Notifications) on their concerned websites.

Table 1: Government Departments and Number of Entities Having Documents Published on Websites

Sr. No.	Government Entity	Total Number of Entity	Total number of entities having documents published on website
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Sr. No.	Government Entity	Total Number of Entity	Total number of entities having documents published on website
1	Agriculture & Co-operation Department	19	14
2	Social Justice and Empowerment Department	12	10
3	Revenue Department	40	9
4	Education Department	14	8
5	Narmada and Water Resources, Water Supply and Kalpsar Department	15	8
6	Health and Family Welfare Department	7	7
7	Finance Department	7	6
8	Food and Civil Supplies Department	7	6
9	General Administration Department	12	6
10	Labour and Employment Department	8	6
11	Tribal Development Department	7	6
12	Industries and Mines Department	14	5
13	Science and Technology Department	8	5
14	Home Department	36	4
15	Forests and Environment Department	7	3
16	Ports and Transport Department	3	3
17	Urban Development Department	8	3
18	Panchayats, Rural Housing and Rural Development Department	36	2
19	Climate Change Department	2	1
20	Energy and Petro Chemicals Department	1	1
21	Directorate of Information	2	1
22	Legal Department	1	1
23	Legislative and Parliamentary Affairs Department	1	1

Sr. No.	Government Entity	Total Number of Entity	Total number of entities having documents published on website
24	Roads and Buildings Department	1	1
25	Sports, Youth and Cultural Activities Department	1	1
26	Women and Child Development Department	1	1
	Total	270	119

Categories of Documents

Table 2 describes that out of 119 entities, 90 (75.63%) entities publish Government Resolution, followed by 58 (48.74%) entities publish Circular and 51 (42.86%) publish Notification on their websites.

Table 2: Types of Documents and Number of Government Entities

Type of Document	Number of Entity	%
Government Resolution	90	75.63
Circular	58	48.74
Notification	51	42.86
Total	119	

Number of Documents

Table 3 represents that 119 entities publish 23576 documents which represent 15738 (66.76%) Government Resolution, followed by 4438 (18.82%) Notification and 3400 (14.42%) Circular on the website of concern entities.

Table 3: Types and Number of Documents

Document Type	Number of Documents (Available in GSDL)	%
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Government Resolution	15738	66.76
Notification	4438	18.82
Circular	3400	14.42
Total	23576	100.00

Interface Language and Number of Entities

Table 4 indicates the interface language of website i.e. Gujarati, English, Hindi etc. Out of 119 entities, 94 (78.99%) entities having the interface of their websites in Gujarati and English (bilingual), followed by in English 17 (14.29%) entities, in Gujarati, English and Hindi (trilingual) 6 (5.04%) entities, in English and Hindi (bilingual) 1 (0.84%) whereas in Multilingual 1 (0.84) entity

Table 4: Interface Language and Number of Entities

Interface Language of Website	Language	Number of Entity	%
English	Sole	17	14.29
Gujarati and English	Bilingual	94	78.99
English and Hindi	Bilingual	1	0.84
Gujarati, English and Hindi	Trilingual	6	5.04
Multilingual (19 Languages)	Multilingual	1	0.84
Total		119	100

Circulars:

Heads under which Circulars are Published

The Table 5 indicates the heads under which Circulars are linked i.e. E-Citizen, Circulars Policy etc. Out of 119 entities only 58 entities publish Circulars under 26 different heads on the concern websites. 17 (29.31%) entities publish the Circulars under the head called E-Citizen followed by 7 (12.07%) entities under the head called Policy, 4 (6.90%) entities publish the Circulars under the head called Circular and Notice, and Download each, Some entities use common heading

but they do not spell the heading in unique nature e.g. Circular and Circulars. 3 (5.17%) entities publish Circular under Circulars heading whereas 2 (3.45%) entities publish it under Circular. 2 (3.45%) entities publish Circular under Notice Board whereas 19 entities publish Circulars under different 19 headings.

E-Citizen is the most popular head under which 17 (29.31%) entities publish their Circulars, followed by Policy 7 (12.07%), Circular and Notice, and Download 4 (6.90%) each and so on.

Table 5: Heads under which Circulars are Published

Sr. No.	Head	No. of Entity	%
1	E-Citizen	17	29.31
2	Policy	7	12.07
3	Circular and Notice	4	6.90
4	Download	4	6.90
5	Circulars	3	5.17
6	Circular	2	3.45
7	Notice Board	2	3.45
8	Circulars & Notifications	1	1.72
9	Circular and Notification	1	1.72
10	Circular and Tenders	1	1.72
11	Doing Business with	1	1.72
12	Government Resolutions	1	1.72
13	GR / Circulars	1	1.72
14	Haj 2020	1	1.72
15	HOD's / Offices	1	1.72

Sr. No.	Head	No. of Entity	%
16	Important Circulars	1	1.72
17	Information	1	1.72
18	IT Companies	1	1.72
19	Latest News	1	1.72
20	Media Corner	1	1.72
21	Notice and Tender	1	1.72
22	Notification	1	1.72
23	Policy & Circulars	1	1.72
24	Resources	1	1.72
25	Service	1	1.72
26	VAT Tribunal Notification	1	1.72
	Total	58	

Searching mechanism for Circular

Tables 6 represents searching mechanism of Circulars whether government entities facilitate it or not. Out of 58 entities 23 (39.66%) entities provide proper searching mechanism for Circular whereas 35 (60.34%) entities do not provide any mechanism to search the Circulars.

Table 6: Availability of Searching Mechanism

Searching Mechanism	Nos. of Entity	%
Yes	23	39.66
No	35	60.34
Total	58	100.00

Number of Searching Fields of Circulars

Table 7 shows that searching of Circulars is possible by total 16 fields through the websites of 23 entities. 23 entities facilitate the Circulars Search through minimum 1 field to maximum 6 fields.

Table 7: Number of Searching Fields

Searching Through Number of Fields	Number of Entity
1	1
2	6
3	8
4	7
6	1
16	23

Name of Searching Fields

Table 8 shows that the 23 entities provide Circular search by maximum 15 fields. 'Date' field is used maximum by 19 (82.61%) entities, followed by 'Keyword' 13 (56.52%) entities, 'Subject' 10(43.48%) entities 'Number' 8 (34.78%) entities and so on.

Moreover, no specific terminology is used for common search field by various entities such as Number; Document Number and GR Number are part of common category called Circular Number, Date and Published Date are part of common category called Circular Date, Subject; Subject/Title and Name are either part of common category called Circular Subject or Circular Title field, however these fields have been displayed individually.

Table 8: Name of Searching Fields

Sr. No.	Name of Searching Fields	Number of Entity	%
1	Date	19	82.61
2	Keyword	13	56.52
3	Subject	10	43.48
4	Number	9	39.13
5	Subject/Title	6	26.09
6	Branch	5	21.74
7	File Type	2	8.70
8	Type	1	4.35

Sr. No.	Name of Searching Fields	Number of Entity	%
9	Published Date	1	4.35
10	Document Number	1	4.35
11	Department	1	4.35
12	Document Type	1	4.35
13	Branch / Section	1	4.35
14	Name	1	4.35
15	GR Number	1	4.35

Metadata in Use

Table 9 shows that no entity has used standard metadata to manage circulars on website.

Table 9: Metadata Used

Metadata	Number of Entity
Y	0
N	58
Total	58

Availability of Browsers

Table 10 indicates whether browsers have been used to browse the circulars from the concern website or not. Out of 58 entities only 2(3.45%) entities provide Browser facility to access the Circulars.

Table 10: Availability of Browsers

Browser used	Number of Entity	%
Y	2	3.45
N	56	96.55
Total	58	100.00

Name of Browsers

Table 11 describes the browsers which have been used to browse the circulars. Out of 58 entities 2 entities have used browser namely Branch and Year.

Table 11: Name of Browsers

Browsers	Number of entity
Branch	1
Year	1
Total	2

Circular Listed on Page Only (without Table or Fields)

Table 12 shows that 50 (86.21%) entities publish Circulars in tabular format with different fields (html file) whereas 8 (13.79%) entities publish Circulars without proper tabular format or without any fields within table on their website. These entities have simply listed circulars on the websites.

Table 12: Circular Listed on Page Only (without Table or Fields)

Circular Listed on Page Only (without Table or Fields)	Number of Entity	%
Y	8	13.79
N	50	86.21
Total	58	100

Availability of Filters

Table 13 indicates whether any filter has been used to filter out the circular from the website or not. Out of 58 entities only 10 (17.24%) entities used filters.

Table 13: Availability of Filters

Availability of Filters	Number of Entity	%
Y	10	17.24
N	48	82.76
Total	58	100.00

Name of Filters

Table 14 reveals the types of filters used by various entities. Out of 58 entities, 10 entities used 5 types of filters namely Branch (9 entities), Department and Document Type 2 entities each, Subject and Year 1 entity each.

Table 14: Name of Filters

Name of Filters	Number of Entity
Branch	9
Department	2
Document Type	2
Subject	1
Year	1

Number of Fields / Data Elements to Display Circulars

Table 15 indicates number of fields used to display circulars in tabular format on the websites. Fields are nothing but which describe bibliographical value of each circular. Minimum 2 fields (21 entities) and maximum 7 fields (1 entity) have been used to display circulars in tabular format on various websites. Majority of entities (21) used 2 fields to display Circulars on their websites.

Table 15: Number of Fields / Data Elements to Display Circulars

Number of Fields	Number of Entity	%
2	21	42
3	10	20

4	14	28
5	1	2
6	3	6
7	1	2
27	50	100

Fields / Data Elements to Display Circulars

Table 16 describes various fields or Data Elements used to display circulars in tabular format. Out of 58 entities 50 entities publish Circulars within tabular format with 29 fields to display circulars on websites of different entities. Out of 29 fields ‘Date’ field is used maximum by 31 (62%) entities, followed by URL 20 (40%) entities, Details 18 (36%) entities, Download 14 (28%) entities, Number 12 (24%) entities, Title 10 (20%) entities and so on to display the bibliographical information of circular in tabular format.

Moreover, the consistency is not maintained to name the fields or Data Elements which represent common category of documents. E.g. URL, Download, File and PDF etc fields are considered common category of Source; Document Type, Type, Category etc. fields are considered common category of Circular Type; Details, Description, Particulars etc Fields are considered common category of Description; Number, Circulars Number, Document Number, Notification Number may be part of common category of Circular Number; Subject and Subject / Title may be part of common category of Circular Subject; Circular Name, Title, Document Name, Name of Notification may be part of common category of Circular Title; Branch, Branch / Section and Branch Name may be part of common category of Circular Branch however these all fields or Data Elements have been used individually to display Circulars on the websites.

Table 16: Fields / Data Elements to Display Circulars

Sr. No.	Fields / Data Elements Name	Number of Entity	%
1	Date	31	62
2	URL	20	40
3	Details	18	36

Sr. No.	Fields / Data Elements Name	Number of Entity	%
4	Download	14	28
5	Number	12	24
6	Title	10	20
7	Subject	9	18
8	Subject / Title	7	14
9	Branch	6	12
10	Published Date	4	8
11	Document Type	4	8
12	Type	2	4
13	Description	2	4
14	Circular Name	1	2
15	Document Name	1	2
16	Year	1	2
17	Circular Number	1	2
18	Document Number	1	2
19	Category	1	2
20	Particular	1	2
21	Branch/Section	1	2
22	Branch Name	1	2
23	Information	1	2
24	Department	1	2
25	Action	1	2
26	File	1	2
27	PDF	1	2
28	Notification Number	1	2
29	Name of Notification	1	2

Government Resolutions:

Heads under which Government Resolutions are Linked

Table 17 describes various heads under which Government Resolutions are linked i.e. E-Citizen, Policy, About Us etc. Out of 119 entities 90 entities published their Government Resolutions under 18 different heads. E-Citizen is one of the most popular head under which 45 (50%) entities publish their Government Resolutions, followed by Policy 17 (18.89%), About Us 8 (8.89%) and so on.

Table 17: Heads under which Government Resolutions are Linked

Sr. No.	Resolution Linked under head	Number of Entity	%
1	E-Citizen	45	50.00
2	Policy	17	18.89
3	About Us	8	8.89
4	Download	3	3.33
5	Government Resolutions	2	2.22
6	HOD's/ Offices	2	2.22
7	Resources	2	2.22
8	Circular and Notice	1	1.11
9	Citizens	1	1.11
10	GR	1	1.11
11	GR / Circulars	1	1.11
12	GR & Notification	1	1.11
13	Important Links	1	1.11
14	Information	1	1.11
15	IT Companies	1	1.11
16	Notices & Tenders	1	1.11
17	Service	1	1.11
18	Useful Info	1	1.11
	Total	90	

Availability of Searching Mechanism

Table 18 indicates whether different entities provide searching mechanism for Government Resolutions or not. Out of 90 entities, 46 (51.11%) entities provide searching mechanism to search Government Resolutions.

Table 18: Availability of Searching Mechanism

Searching Mechanism Available	Number of Entity	%
Yes	46	51.11
No	44	48.89
Total	90	100.00

Number of Searching Fields

Table 19 shows number of fields used by 46 entities to search Government Resolutions. 46 entities used total 10 fields to search Government Resolutions with minimum 1 (1 entity) field to maximum 4 (16 entities) fields.

Table 19: Number of Searching Fields

Resolution Searching through Number of Fields	Number of Entity
1	1
2	9
3	20
4	16
10	46

Availability of Searching Fields

Table 20 describes various 16 fields to search Government Resolutions i.e. Date, Branch, Keyword etc. Date is used by maximum 38 (42.22%) entities, followed by Branch 26 (28.89%), Keyword 20 (22.22%), Number 17 (18.89%), Subject/Title 15 (16.67%) entities used to search Government Resolutions from the websites of concern entities.

Moreover, the consistency is not maintained to name the fields or Data Elements which represent common category of documents E.g. Subject and Subject / Title are considered common category called Resolution Subject; Number, GR. Number, Gr. No. and Resolution Number are considered common category called Resolution Number; Document Type and Type are considered common category called Resolution Type however all these fields represent individual category of document.

Table 20: Availability of Searching Fields

Sr. No.	Searching Fields Name	No. of Entity	%
1	Date	38	42.22
2	Branch	26	28.89
3	Keyword	20	22.22
4	Number	17	18.89
5	Subject/Title	15	16.67
6	Subject	8	8.89
7	GR Number	4	4.44
8	File Type	3	3.33
9	Text	3	3.33
10	GR No.	2	2.22
11	Document Type	2	2.22
12	Title	1	1.11
13	Year	1	1.11
14	Resolution No.	1	1.11
15	Word	1	1.11
16	Type	1	1.11

Metadata Used

Table 21 shows that no entity has used standard metadata to manage Government Resolutions on website.

Table 21: Metadata Used

Metadata	Number of Entity
Y	0
N	90
Total	90

Number of Browsers Used

Table 22 indicates whether the any browser has been used to browse Government Resolutions from the websites of concern entities or not. Out of 90 entities only 2 (2.22%) entities have provided browsing facility to browse Government Resolutions.

Table 22: Number of Browsers Used

Browsers Available	Number of Entity	%
Yes	2	2.22
No	88	97.78
Total	90	100

Name of Browsers

Table 23 describes the browsers which have been used to browse Government Resolutions. Out of 90 entities, 2 (2.22%) entities have used two browsers namely Branch (2 entities) and Subject (1 entity).

Table 23: Name of Browsers

Browser Name	Number of Entity
Branch	2
Subject	1

Government Resolutions Listed on Page Only (without Table or Fields)

Table 24 shows publishing of Government Resolutions without proper tabular format with some fields on their websites. Out of 90 entities, 8 (8.89%) entities publish Government Resolutions without proper tabular format with some fields such as GR Title, GR Number, GR Subject etc. whereas 82 (91.11%) entities publish GRs in proper tabular format.

Table 24: Government Resolutions Listed on Page Only (without Table or Fields)

Resolution Listed on Page Only	Number of Entity	%
Y	8	8.89
N	82	91.11
Total	90	100.00

Number of Filters Used

Table 25 indicates whether any filter has been used to filter Government Resolutions from the website or not. Out of 90 entities, 35 (38.89%) entities have used filters to filter out GRs from the websites. Whereas 55 (61.11%) entities have not used any filter.

Table 25: Number of Filters Used

Resolution Filters	Number of Entity	%
Y	35	38.89
N	55	61.11
Total	90	100.00

Name of Filters

Table 26 describes the name of filters which have been used by 35 entities. Out of 90 entities, 35 entities have used four types of filters namely Branch (33 entities), Document Type (2 entities), Subject and Year (1 entity each).

Table 26: Name of Filters

Resolution Filter Name	Number of Entity
-------------------------------	-------------------------

Branch	33
Document Type	2
Subject	1
Year	8

Number of Fields / Data Elements to Display Government Resolutions

Table 27 indicates number of fields used to display Government Resolutions in tabular format on the websites. Fields are nothing but which describe bibliographical value of each GR. Minimum 2 fields (13 entities) and maximum 6 fields (4 entities) have been used to display GRs in tabular format on various websites. Majority of entities (26) used four fields to display GRs on their websites.

Table 27: Number of Fields / Data Elements to Display Government Resolutions

Number of Fields	Number of Entity	%
2	13	15.85
3	22	26.83
4	24	29.27
5	19	23.17
6	4	4.88
Total	82	

Fields / Data Elements to Display Government Resolutions

Table 28 describes various fields used to display circulars in tabular format. 82 entities used 25 fields to display Government Resolutions on the websites of different entities. Out of 25 fields ‘Date’ field is used maximum by 74 (90.24%) entities, followed by Number 44 (53.66%), Branch 40 (48.78%) entities, Subject, Download and URL 24 (29.27%) entities each, Details 20 (24.39%) entities, and so on to display the bibliographical information of GRs in tabular format.

Moreover, the consistency is not maintained to name the Fields or Data Elements which represent common category of documents E.g. Download and URL are part of common category called Resolution Link; Subject and Subject / Title are part of common category of document called GR Subject; Details, GR Details and Particulars are part of common category called GR Details; Date, Year and Publish Date are part of common category called GR Date; Number, GR No. / Notification, GR No. are part of common category called GR Number; Document Type and Type represent common category called GR Type and Name, Title and Name of Resolution describe same category called GR Title, Branch and Branch Name represent common category of Branch Name however all fields or data elements are represented individually.

Table 28: Fields / Data Elements to Display Government Resolutions

Sr. No.	Resolution Field	Number of Entity	%
1	Date	74	90.24
2	Number	44	53.66
3	Branch	40	48.78
4	Subject	24	29.27
5	Download	24	29.27
6	URL	24	29.27
7	Details	20	24.39
8	Subject/Title	17	20.73
9	Title	9	10.98
10	Document	5	6.10
11	GR Number	5	6.10
12	Keyword	4	4.88
13	Document Type	3	3.66
14	Year	2	2.44
15	GR Details	2	2.44
16	Name of Resolution	2	2.44
17	Published Date	1	1.22
18	GR No. / Notification	1	1.22

19	GR No.	1	1.22
20	Attachment	1	1.22
21	Type	1	1.22
22	File	1	1.22
23	Name	1	1.22
24	Particulars	1	1.22
25	Branch Name	1	1.22

Notifications

Heads under which Notifications are Published

Table 29 describes various heads under which Notifications are linked i.e. E-Citizen, Policy, Circular and Notification etc. Out of 119 entities, 51 entities published their Notifications under 18 different heads. E-Citizen is one of the most popular head under which 30 (58.82%) entities (out of 51 entities) publish their Notifications, followed by Policy 3 (5.88%), Circulars and Notification 2 (3.92%) and so on.

Table 29: Heads under which Notifications are Published

Sr. No.	Notification under Head	Number of Entity	%
1	E-Citizen	30	58.82
2	Policy	3	5.88
3	Circular and Notification	2	3.92
4	Download	2	3.92
5	Acts & Rules	1	1.96
6	Also In this Section	1	1.96
7	Citizens	1	1.96
8	GERC	1	1.96
9	Government Resolution	1	1.96
10	GR & Notification	1	1.96

11	HOD's/ Offices	1	1.96
12	Information	1	1.96
13	News & Announcements	1	1.96
14	Notice & Tenders	1	1.96
15	Notification	1	1.96
16	Policies	1	1.96
17	Service	1	1.96
18	VAT Tribunal Notification	1	1.96
	Total	51	

Availability of Searching Mechanism

Table 30 indicates whether different entities provide searching mechanism for Notifications or not. Out of 51 entities, 19 (37.25%) entities provide searching mechanism to search Notifications whereas most of entities i.e. 32 (62.75%) entities do not provide any searching mechanism to search Notifications from their websites.

Table 30: Availability of Searching Mechanism

Searching Mechanism	Number of Entity	%
Y	19	37.25
N	32	62.75
Total	51	100

Number of Searching Fields

Table 31 shows number of fields used to search Notifications. Out of 51 entities 19 entities used different number of fields to search Notifications. 19 entities used different 9 fields to search Notifications with minimum 2 (5 entities) fields to maximum 4 (8 entities) fields. Most of entities i.e. 6 entities used maximum 3 different fields to search Notifications.

Table 31: Number of Searching Fields

Searching through Number of Fields	Number of Entity
2	5
3	6
4	8
Total	19

Availability of Searching Fields

Table 32 describes various 13 fields which have been used to search Notifications i.e. Date, Number, Subject / Title etc. Date is used by maximum 16 (84.21%) entities, followed by Number 12 (63.16%), Subject / Title 7 (36.84%%), Branch 6 (31.58%), Subject 5 (26.32%) entities and so on used to search Notifications from the websites of concern entities.

Moreover, the consistency is not maintained to name the fields or Data Elements which represent common category of documents E.g. Date and Year represents common category of document called Notification Date; Number, Notification Number and GR Number are part of common category of document called Notification Number; Subject and Subject/ Title are part of common category of documents called Notification Subject however all these fields or data elements are represented individually.

Table 32: Availability of Searching Fields

Sr. No.	Notification Searching through Fields	Number of Entity	%
1	Date	16	84.21
2	Number	12	63.16
3	Subject / Title	7	36.84
4	Branch	6	31.58
5	Subject	5	26.32
6	Keyword	4	21.05
7	Text	3	15.79
8	File Type	2	10.53

Sr. No.	Notification Searching through Fields	Number of Entity	%
9	Title	1	5.26
10	Type	1	5.26
11	Notification Number	1	5.26
12	Year	1	5.26
13	GR Number	1	5.26

Metadata Used

Table 33 shows that no entity has used standard metadata to manage Notifications on the websites.

Table 33: Metadata Used

Metadata	Number of Entity
Y	0
N	51
Total	51

Number of Browsers Used

Table 34 indicates whether the any browsers have been used to browse Notifications from the websites or not. Out of 51 entities only 2 (3.92%) entities have provided browsing facility whereas majority of entities i.e. 49 (96.08%) do not provide any browsing facility to browse Notifications from their websites.

Table 34: Number of Browsers Used

Browser Available	Number of Entity	%
Y	2	3.92
N	49	96.08
Total	51	100.00

Name of Browsers

Table 35 describes the browsers which have been used to browse Notifications. Out of 51 entities, 2 (2.22%) entities have used three browsers namely Document Type, Branch, and Subject by one entity each.

Table 35: Name of Browsers

Browser Name	Number of Entity
Document Type	1
Branch	1
Subject	1

Notifications Listed on Page Only (without Table or Fields)

Table 36 shows publishing of Notifications without proper tabular format with some fields on their websites. Out of 51 entities, 3 (5.88%) entities publish Notifications without proper tabular format with some fields such as GR Title, GR Number, GR Subject etc. whereas 48 (94.12%) entities publish Notifications in proper tabular format.

Table 36: Notifications Listed on Page Only (without Table or Fields)

Notification Listed on Page Only	Number of Entity	%
Y	3	5.88
N	48	94.12
Total	51	100.00

Number of Filters Used

Table 37 indicates whether any filter have been used to filter Notifications from the website or not. Out of 51 entities, 16 (31.37%) entities have used filters to filter out Notifications from the websites whereas 35 (68.63%) entities have not used any filter.

Table 37: Number of Filters Used

Filters Available	Number of Entity	%
Y	16	31.37
N	35	68.63
Total	51	100

Name of Filters

Table 38 describes the name of filters which have been used by 16 entities. Out of 51 entities, 16 entities have used four types of filters namely Branch (14 entities), Year (8 entities), Document Type and Subject (1 entity each). Most of entities (14 entities) used Branch filter.

Table 38: Name of Filters

Filters Name	Number of Entity
Branch	14
Year	8
Document Type	1
Subject	1

Number of Fields / Data Elements to Display Notifications

Table 39 indicates number of fields used to display Notifications in tabular format on the websites. Fields are nothing but which describe bibliographical value of each Notification. Minimum 2 fields (8 entities) and maximum 6 fields (3 entities) have been used to display Notifications in tabular format on various websites. Majority of entities (26) have used 4 fields to display Notifications on their websites.

Table 39: Number of Fields / Data Elements to Display Notifications

Fields in Number	Number of Entity	%
2	8	16.67
3	4	8.33
4	26	54.17

5	7	14.58
6	3	6.25
Total	48	100.00

Fields / Data Elements to Display Notifications

Table 40 describes various fields used to display Notification in tabular format. Out of 51 entities 48 entities publish Notifications within tabular format with 23 fields to display Notification on the websites of different entities. Out of 23 fields 'Date' field is used maximum by 40 (83.33%) entities, followed by Number 29 (60.42%) entities, Subject 21 (43.75%) entities, URL 17 (35.42%), Download 16 (33.33%) entities and Branch 12 (25%) entities, Subject / Title 11 (22.92%) and so on to display the bibliographical information of Notifications in tabular format.

Moreover, the consistency is not maintained to name the fields or Data Elements which represent common category of documents E.g. URL, Download, Download PDF and File are part of common category of document called Notification Link; Subject and Subject / Title represents common category called Notification Subject; Number, Notification Number, GR No / Notification, GR No., Gazette No. are part of common category called Notification Number, Date, Publish Date and Year are part of common category called Notification Date; Category and Branch represent common category called Notification Branch; Document Type and Type indicate common category called Notification Type; Name and Title also represent common category called Notification Title however all these fields or data elements are represented individually.

Table 40: Fields / Data Elements to Display Notifications

Sr. No.	Notification Fields	Number of Entity	%
1	Date	40	83.33
2	Number	29	60.42
3	Subject	21	43.75
4	URL	17	35.42
5	Download	16	33.33

Sr. No.	Notification Fields	Number of Entity	%
6	Branch	12	25
7	Subject/ Title	11	22.92
8	Title	7	14.58
9	Details	5	10.42
10	Document Type	4	8.33
11	Document	4	8.33
12	Notification Number	3	6.25
13	Published Date	3	6.25
14	Category	2	4.17
15	Year	2	4.17
16	Type	2	4.17
17	Download PDF	1	2.08
18	GR No. / Notification	1	2.08
19	GR No.	1	2.08
20	Gazette No.	1	2.08
21	File	1	2.08
22	Name	1	2.08
23	Notification	1	2.08

Table Number of Visitors Visit the Various websites of Various Entities of GoG

The Table 41 shows that 745328382 visitors have visited the websites of entities of all 25 departments for any of purpose till 4th September 2020. 69.42% online visitors visited Finance Department followed by Urban Development Department & Urban Housing Department 5.46% and Health and Family Welfare Department 3.66% visitors took online visits.

Table 41: Online Visits on Websites of Various Government Entities

Sr. No.	Name of Department	Total Visitors (Department with Entities)	%	Website Access Date for Counting Visitors
1	Agriculture & Co-operation Department	15324295	2.06	19/11/2019
2	Climate Change Department	147331	0.02	19/11/2019
3	Education Department	25845382	3.47	19/11/2019
4	Energy and Petro Chemicals Department	287581	0.04	19/11/2019
5	Finance Department	517442605	69.42	19/11/2019
6	Food and Civil Supplies Department	14612724	1.96	19/11/2019
7	Forests and Environment Department	3316148	0.44	19/11/2019
8	General Administration Department	9781500	1.31	19/11/2019
9	Home Department	7911312	1.06	19/11/2019
10	Health and Family Welfare Department	27290855	3.66	03/06/2020
11	Industries and Mines Department	4239926	0.57	03/06/2020
12	Directorate of Information	10925164	1.47	03/06/2020
13	Labour and Employment Department	14121981	1.89	03/06/2020
14	Legal Department	149961	0.02	03/06/2020
15	Legislative and Parliamentary Affairs Department	266871	0.04	03/06/2020
16	Narmada and Water Resources, Water Supply and Kalpsar Department	9484383	1.27	03/06/2020
17	Panchayats, Rural Housing Department & Rural Development Department	15105924	2.03	03/06/2020
18	Ports and Transport	4241745	0.57	03/06/2020
19	Revenue Department	10519977	1.41	03/06/2020
20	Roads and Buildings Department	Data Not Available	0.00	04/04/2020
21	Science and Technology Department	5261269	0.71	04/05/2020
22	Social Justice and Empowerment Department	5348109	0.72	04/06/2020
23	Sports, Youth and Cultural Activities Department	928465	0.12	04/08/2020
24	Tribal Development Department	1925471	0.26	04/08/2020
25	Urban Development Department & Urban Housing Department	40693124	5.46	04/08/2020

Sr. No.	Name of Department	Total Visitors (Department with Entities)	%	Website Access Date for Counting Visitors
26	Women and Child Development Department	156279	0.02	04/09/2020
	Total Visitors	745328382		

Findings:

General

- Documents from 26 departments have been taken for the consideration of this study
- Out of 270 entities, 119 entities from 26 departments have been taken as sample for this study
- Revenue Department having 40 entities, out of which 14 entities publish 1332 documents on their websites
- Agriculture & Co-operation Department having 19 entities, out of which 14 entities publish 2157 documents on their websites
- Three types of documents have been explored for this study such as Circular 3400 (58 entities), Government Resolution 15738 (90 entities) and Notification 4438 (51 entities)
- All entities of Government of Gujarat providing website interface in various languages such as English (Sole language), Gujarati and English (Bilingual), English and Hindi (Bilingual), Gujarati, English, Hindi (Trilingual) and Multilingual (19 languages)
- Out of 119 entities, only 94 (78.99%) entities provide the interface of website in Gujarati and English (Bilingual)
- All 119 entities of Government of Gujarat host their website under 5 different domain names such as “gov.in”, “.org”, “org.in”, “co.in” and “.net”
- 113 (94.96%) entities host their website under domain name called “gov.in”

Circulars

- Out of 119 entities, 58 entities publish circular on concern websites.
- Circulars are published under 26 different heads

- The head “E-Citizen” is popular under which 17 (29.31%) entities publish circulars
- 23 (39.66%) entities provide searching mechanism to search circular through websites.
- Circulars are search through single field, 2 fields, 3 fields, 4 fields and 6 fields within tabular format
- Majority of entities such as 8 entities provide searching facility of circular through 3 fields.
- Searching of circular is possible through 15 different fields
- “Date” field is used 19 (82.61%) entities to search circular, followed by “Keyword” 13 (56.52%), “Subject” 10 (43.48%) entities.
- No entity used standard metadata to display bibliographic information of circulars
- Out of 58 entities, only 2 (3.45%) entities use different browsers namely Branch and Year to browse circulars from the websites
- 8 (13.79%) entities do not display bibliographical information of circulars in tabular format with some fields or data elements
- 10 (17.24%) entities, out of 58 entities use 5 types of filters (Branch, Department, Documents Type, Subject, and Year) to filter circulars from the websites of concern entities
- Branch filter is used by most of entities (9 entities) to filter the circulars
- The bibliographical information of circulars are displayed through 2 fields, 3 fields, 4 fields, 5 fields, 6 fields and 7 fields within tabular format
- Majority of entities such as 21 (42%) entities display the bibliographical information of circulars through 2 fields whereas 14 (28%) entities display bibliographical information of circulars through 4 fields
- Out of 58 entities, 50 entities display the bibliographical information of circulars through 29 fields within tabular format and “Date” fields is used by 31 (62%) entities, followed by ‘URL’ 20 (40%) entities, “Details” 18 (36%) entities, “Download” 14 (28%) entities, “Number” 12 (24%) entities and “Title” 10 (20%) entities to display bibliographical information within tabular format

Government Resolutions

- Out of 119 entities, 90 entities publish Government Resolutions on concern websites.

- Government Resolutions are published under 26 different heads
- The head “E-Citizen” is popular under which 45 (50%) entities publish Government Resolutions
- 46 (51.11%) entities provide searching mechanism to search Government Resolutions through websites
- Government Resolutions are search through single field, 2 fields, 3 fields, and 4 fields within tabular format
- Majority of entities such as 20 entities provide searching facility of Government Resolutions through 3 fields.
- Searching of Government Resolutions is possible through 16 different fields
- Majority of entities such 38 (42.22%) entities use “Date” field to search Government Resolutions, followed by “Branch” 26 (28.89%), “Keyword” 20 (22.22%), “Number” 17 (18.89%) and “Subject / Title” 15 (16.67%) entities.
- No entity used standard metadata to display bibliographic information of Government Resolutions
- Out of 90 entities, only 2 (2.22%) entities use different browsers namely Branch and Subject to browse Government Resolutions from the websites
- 8 (8.89%) entities do not display bibliographical information of Government Resolutions in tabular format with some fields or data elements
- 35 (38.89%) entities, out of 90 entities use 4 types of filters (Branch, Documents Type, Subject, and Year) to filter Government Resolutions from the websites of concern entities
- Branch filter is used by most of entities (9 entities) to filter the Government Resolutions
- The bibliographical information of Government Resolutions are displayed through 2 fields, 3 fields, 4 fields, 5 fields, and 6 fields within tabular format
- Majority of entities such as 24(29.27%) entities display the bibliographical information of Government Resolutions through 4 fields
- Out of 90 entities, 82 entities display the bibliographical information of Government Resolutions through 25 fields within tabular format and “Date” fields is used by 74 (90.24%) entities, followed by ‘Number’ 44 (53.66%) entities, “Branch” 40 (48.78%) entities to display bibliographical information within tabular format

Notifications

- Out of 119 entities, 51 entities publish Notifications on concern websites.
- Notifications are published under 18 different heads
- The head “E-Citizen” is popular under which 30 (58.82%) entities publish Notifications
- 19 (37.25%) entities provide searching mechanism to search Notifications through websites
- Notifications are searched through 2 fields, 3 fields, and 4 fields within tabular format
- Majority of entities such as 8 entities provide searching facility of Notifications through 4 fields
- Searching of Notifications is possible through 13 different fields
- Majority of entities such 16 (84.21%) entities use “Date” field to search Government Resolutions, followed by “Number” 12 (63.16%) entities
- No entity used standard metadata to display bibliographic information of Notifications
- Out of 51 entities, only 2 (3.92%) entities use different browsers namely Document Type, Branch and Subject to browse Notifications from the websites
- 3 (5.88%) entities do not display bibliographical information of Notifications in tabular format with some fields or data elements
- 16 (31.37%) entities, out of 51 entities use 4 types of filters (Branch, Year, Documents Type, and Subject) to filter Notifications from the websites of concern entities
- Branch filter is used by most of entities (14 entities) to filter the Notifications
- The bibliographical information of Notifications are displayed through 2 fields, 3 fields, 4 fields, 5 fields, and 6 fields within tabular format
- Majority of entities such as 26 (54.17%) entities display the bibliographical information of Notifications through 4 fields
- Out of 51 entities, 48 entities display the bibliographical information of Notifications through 23 fields within tabular format and “Date” fields is used by 40 (83.33%) entities, followed by ‘Number’ 29 (60.42%) entities, “Subject” 21 (43.75%), “URL” 17 (35.42%) and “Download” 16 (33.33%) entities to display bibliographical information within tabular format

Recommendations:

- It should make mandatory for all entities of Government of Gujarat to provide website interface in vernacular language (e.g. Gujarati language) to increase access of various contents available on websites. Simultaneously, they can use other language such as English or Hindi language.
- All entities of Government of Gujarat should use common domain name (e.g. gov.in) to host their websites
- Government of Gujarat should create One-Stop-Search facility to access all Circulars, Government Resolutions and Notification
- Government of Gujarat should create Digital Library in Citizen-centric language (e.g. Gujarati language) through any of Open Source Software packages (E.g. Greenstone Digital Library Software)
- Government of Gujarat should publish Circulars, Government Resolutions and Notification under unique heading
- Government of Gujarati should use standard metadata (e.g. Dublin Core Metadata)
- Government of Gujarat should provide standard Searching & Retrieval facility through various access points to access Circulars, Government Resolutions and Notification at one place
- Some filets/browsers such as Branch, Subject, Year, Date range, Department etc should be provided to filter /browse the pin-pointed information quickly
- The bibliographical information such as Document Title, Document Number, Document Date, Year, Branch, Link Address, Department, Entity, Subject and many more pertaining to Circular, Government Resolution and Notification should be visible in user friendly manner
- Government of Gujarat should provide persistence link to the fulltext of every document

Digital Library Model

The digital library of Circulars, Government Resolutions and Notifications is created by using open source software called Greenstone Digital Library Software which is designed and produced by New Zealand Digital Library Project at the University at Waikato. GSDL is published in mainly two versions, the original version is called Greenstone2 and redesigned and re-implemented version is called Greenstone3.

There are many open source software packages for creating digital library are available such as DSpace, Fedora, Imprint and GSDL. However, the purpose of selecting GSDL for creating Digital Library is its vernacular feature which is not available with any software. The Library Interface, User Interface and Installer are available in more than 60 languages of the globe (Greenstone Language Support, n.d.).

The GSDL facilitates Librarian Interface (4 languages) and Reader or User Interface (8 languages) in 8 Indian languages. It also provides installer in Gujarati language only (Greenstone Translator Interface, n.d.) (see Table 42).

Table 42: GSDL and its multilingual features in Indian languages (As on 21 March 2021)

Sr. No.	Language	Greenstone2 (2.87 latest version released on 1 October 2017)			Greenstone3 (3.10 latest version released on 28 February 2021)		
		Reader's Interface	Librarian's Interface	Installer	Reader's Interface	Librarian's Interface	Installer
1	Bengali	Yes	No	No	Yes	No	No
2	Gujarati	Yes	Yes	Yes	Yes	Yes	Yes
3	Hindi	Yes	No	No	Yes	No	No
4	Kannada	Yes	Yes	No	Yes	Yes	No
5	Malayalam	Yes	No	No	Yes	No	No
6	Marathi	Yes	Yes	No	Yes	Yes	No
7	Tamil	Yes	Yes	No	Yes	Yes	No
8	Telugu	Yes	No	No	Yes	No	No
Total		8	4	1	8	4	1

Source: <http://gti.greenstone.org/cgi-bin/library.cgi?a=gti&p=home>

The Table 43 reveals that the translation of various modules of GSDL in Indian language is in progress. Out of 3725 strings 2346 (63%) strings have been translated in Gujarati, followed by 1932 (52%) strings in Matathi, 1659 (45%) strings in Kannad and 1617 (43%) strings in Tamil have been translated. Hindi, Telugu and Bengali languages are far behind in translating various modules (Greenstone Translator Interface, n.d.).

Table 43: Status of GSDL translations in Indian languages (As on 21 March 2021)

Sr. No.	Name of module	Total stings (in English)	Strings translated in various Indian languages							
			Bengali	Gujarati	Hindi	Kannada	Malayalam	Marathi	Tamil	Telugu
1	Greenstone Interface (Core)	396	380	396	111	380	340	367	371	308
2	Greenstone Interface (Auxiliary)	307	288	307	0	288	285	280	288	0
3	GLI Dictionary	998	0	998	0	926	0	921	893	0
4	GLI Help	280	0	33	0	0	0	68	0	0
5	Perl Modules	866	0	34	0	0	0	229	0	0
6	Greenstone Installer	140	1	140	1	1	1	1	1	1
7	Greenstone .org	300	0	0	0	0	0	0	0	0
8	Greenstone 3 Interface	430	66	430	16	64	60	66	64	44
9	GS3 demo collection-config strings	8	0	8	0	0	0	0	0	0
	Total (Percentage appx.)	3725	735 (20%)	2346 (63%)	128 (3%)	1659 (45%)	686 (18%)	1932 (52%)	1617 (43%)	353 (9%)

Source: <http://gti.greenstone.org/cgi-bin/library.cgi?a=gti&p=home>

The whole research work has been divided in 7 stages. Stage 1 : Compilation of general and bibliographic information from the websites of government entities (in excel file), Stage 2:

Compilation of bibliographic information of documents from the websites of government entities (in excel file), Stage 3: Enrichment of fields, Stage 4: Authority check / Cleanse Process, Stage 5: Metadata mapping, Stage 6: Conversion of Excel file into CSV file (bibliographic information of documents), Stage 7: Creation of Collection in GSDL, The series of activities and the status of work have been explained in details as follow.

Stage 1: Compilation of general and bibliographic information from the websites of government entities

It contains series of exercises to compile following information from more than 270 entities of Government of Gujarat. The Excel file contains 52 variables (see Datasheet 1). The list of various entities has been prepared on the base of information published on Official Gujarat State Portal (<https://gujaratindia.gov.in/>). The bibliographical information of various entities has been gathered in following broad categories.

1. Name of Entity: The name of entity has been taken from the its website
2. URL of Entity
3. Visitors: Number of visitors visited the website
4. Number of Documents (Circulars, Notifications and Government Resolutions) It indicates number of documents published on the website of concerned entity
5. Documents Linked Under the Head: It shows the head under which various types of documents are linked
6. Searching Mechanism: It shows whether the website has any mechanism to search documents within the website. E.g. Search by title, date, year, branch, subject etc.
7. Metadata: It shows the information about metadata standard is used for searching, retrieving, indentifying the bibliographical information of documents
8. Browsers: It shows the mechanism how information is browsed e.g. Year, Subject, Branch etc.
9. Listing of Documents Only: It indicates the entity does not use any format and table to display bibliographical information of documents but documents are listed through simple HTML file on website.
10. Filters: It helps to filter the documents from vast collection of documents. Whether the entity used any filter or not. E.g. Branch, Subject, Year etc.

11. Fields or Elements of Document: It indicates HTML files contains how many fields or elements of documents E.g. Title, Subject, Branch, Date, Year, Link of Document etc.
12. Date of Various Documents Accessed from Website: It reveals the date of access of website
13. Language of Website Interface of Government Entity: It shows the website which provides access of its interface in which language either in Sole, Bilingual or Multilingual
14. Overall fields: it contains overall fields or elements of all types of documents such as circulars, notifications, and government resolutions.

Stage 2: Compilation of bibliographic information of documents

It has been found through first stage that out of 270 entities 151 entities do not possess any types of documents such as circular, notification or government resolution hence 119 entities have been taken into consideration for collecting bibliographic information of documents in Excel file. The Excel file contains various columns (along with associated information) such as:

1. Title: It is the title of a document. E.g. Title of Government Resolution
2. Number: It is a specific number allotted to the document . E.g. Resolution Number or Circular Number or Notification Number
3. Date: It is the date on which the document is created or released. E.g. DD/MM/YYYY
4. Year: It is the year on which the document is created or released E.g. YYYY
5. Subject: It is the common name of various documents. E.g. Elementary Education; Higher Education; Technical Education etc.
6. Branch: It is a division of subject known in short name. E.g. K, Kh, G etc.
7. Type of Document: It indicates the category of documents E.g. Circular or Government Resolution
8. Language: It indicates the language used to display the title of document
9. URL of document: It is a unique link a document. E.g.
https://agri.gujarat.gov.in/Portal/Document/1_2333_3_03-20-11-2019.pdf
10. Name of Department or Ministry: It is name of government entity which is responsible for creating the documents. E.g. Agriculture, Farmer Welfare and Cooperation Department
11. URL of Department or Parent Body: It is URL of parent body or department E.g.
<https://agri.gujarat.gov.in/>

12. Name of Entity: It is the division of main body of government. E.g. Agriculture Technology Management Agency (ATMA)
13. URL of Entity: It is URL of government entity E.g. <https://atma.gujarat.gov.in/>
14. Date of Bibliographical Information Gathered: It is the date on which the bibliographical information of various documents are accessed
15. Date of Link Address Copied: It is the date on which the link address of document is copied from stage 1 in which bibliographical information documents have been gathered in excel file
16. Date of Work Done: It is the date on which every type of work relating to gathering and enriching of field or columns in excel file is completed.

Stage 3: Enrichment of fields

This stage contains series of activities such as enrichments of some fields e.g. Link Address of Documents, URL of Parent Body, URL of Entity.

1. Creating Hyperlink of Document: The link address of document has been copied and stored in Excl file in stage 2. The same link address is enriched by creating hyperlink in this stage.

Example:

Link Address of Document (original link retrieved from the website):

https://atma.gujarat.gov.in/writereaddata/Portal/Magazine/Document/1_91_2_GR-SC.pdf

Link Address of Document (After creating hyperlink of link address):

આ સરકારી ઠરાવ વાંચવા અહીં ક્લિક કરો

2. Creating Hyperlink of Parent Body: The URL of parent body has been copied and stored in excel file in stage 2. The same URL is enriched by creating hyperlink.

Example:

URL of Parent Body (URL of document retrieved from the website)

<https://agri.gujarat.gov.in/>

URL of Parent Body (After creating hyperlink of URL of Parent Body)

[કૃષિ, ખેડૂત કલ્યાણ અને સહકાર વિભાગ, ગુજરાત સરકાર](https://agri.gujarat.gov.in/)

3. Creating Hyperlink of Entity: The URL of entity has been copied and stored in excel file in stage 2. The same URL is enriched by creating hyperlink.

Example:

URL of Entity (URL of document retrieved from the website)

<https://atma.gujarat.gov.in/>

URL of Entity (After creating hyperlink of URL of Entity)

[કૃષિ, ખેડૂત કલ્યાણ અને સહકાર વિભાગ, ગુજરાત સરકાર](https://agri.gujarat.gov.in/)

Stage 4: Authority Check / Cleanse Process

Authority Check / Cleanse Process contain series of activities such as:

1. Each document has been verified to check whether it has been classified in specific category or not (E.g. Circular, Notification or Government Resolution).
2. File format of document has been identified.
3. The language of title of each document has been checked (whether it has been written in which language E.g. English or Gujarati).
4. As such bibliographic information should be displayed in individual row and column. However, many entities have displayed the bibliographic information (Title, Document Date, Document Number, Branch, Subject, Year etc) of document in single cell. In that case it has been separated and put in specific rows and columns within specific field or column otherwise it will not be displayed or searched and retrieved properly.
5. Some entities display Date (Date of Document Released) field in various formats such as. 28/5/2020; 28-05-2020; 28 May 2020, 27/09/2017, 21-ઓગ્સ્ટ-2018, 25.7.2020. In such cases, the format of Date (DD/MM/YYYY) has been fixed.

6. Language of document title has been identified and mentioned the language in “Language” field

Stage 5: Metadata Mapping

The Greenstone Digital Library Software does not recognized the fields or data elements (title of column) of excel file. The Qualified Dublin Core Metadata Standard has been used to display the bibliographical information of all three categories of documents. The fields or data elements (name of column) of excel file have been mapped with Qualified Dublin Core Metadata Standard as follow.

Excel File Fields	Qualified DC Metadata
Title of Document	dc.Title
Date of Document Released	dc.Date^created
Document Number	dc.Relation^hasPart
Publication Year	dc.Date
Branch Name	dc.Relation^isPartOf
Subject	dc.Subject
Type of Document	dc.Type
Language (Document Title)	dc.Language
Parent Body	dc.Publisher
URL of Parent Body	dc.Identifier^bibliographic Citation
Name of Entity	dc.Contributor
URL of Entity	dc.Source
Link Address of Document	dc.Identifier
Date of Link Address Copied	dc.Date^dateAccepted
Date of Bibliographic Information Gathered	dc.Date^dateAvailable
Description	dc.Description
Format	dc.Format
Work Done	dc.Date^dateSubmitted

Stage 6: Conversion of Excel file into CSV file

The Greenstone Digital Library Software does allow to explode the data available in excel file. It is necessary to convert the data available in Excel file into Comma Separated Value (CSV) file. The bibliographical information of all three categories of documents available in Excel files has been converted to CSV files in this stage.

Stage 7: Creation of Collection in GSDL

This stage contains following activities to create collection/digital library of various documents by using Greenstone Digital Library Software (an open source software).

- Installation of GSDL in Gujarati
- Greenstone Digital Librarian Interface (GLI) and Its Features in Gujarati
- Creating collection in GSDL
- Exploding CSV file to concern collection
- Greenstone Reader or User Interface and its Features in Gujarati
- Searching & Retrieval Mechanism (Basic and Advance)

Installation of GSDL in Gujarati:

Greenstone Digital Library Software Version 3.09 is installed in 11 languages of the world such as English, French, Spanish, German, Russian, Chinese, Arabic, Gujarati, Japanese, Kazakh and Polish. Gujarati is only a language among India languages in which the GSDL 3.09 is installed. The installer in Gujarati will make installation process very easy without any language barrier.

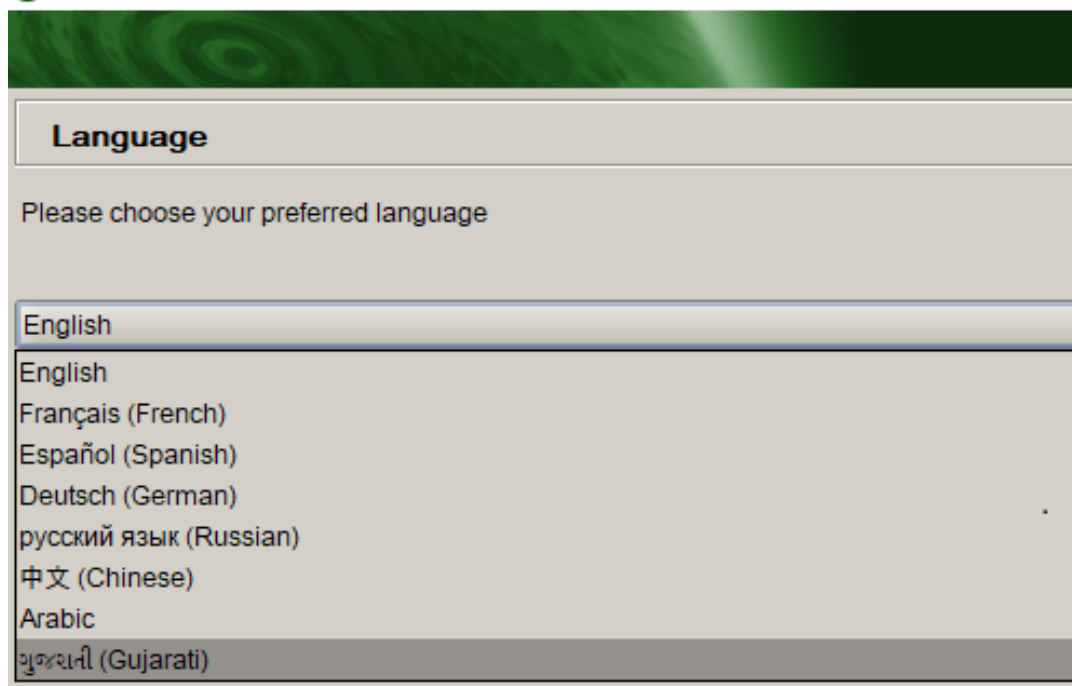


Image 1: Installer in Gujarati Language

Greenstone Digital Librarian Interface (GLI) and Its Features in Gujarati:

The Greenstone Librarian Interface is the interface in which librarian works. It contains six panels such as Download, Gather, Enrich, Design, Create and Format. Each panel works in Gujarati language.

Changes in Language Preference

The language preference can be changed through Greenstone Librarian Interface too. If GSDL has already been installed through installer of any languages of the globe that can be changed by ‘Preferences’ option which is available in File menu.

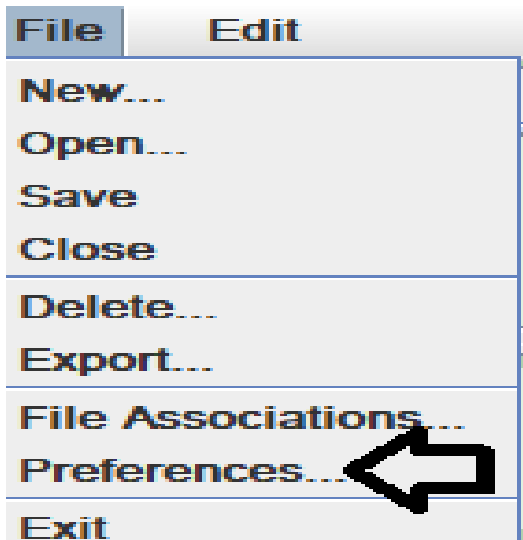


Image 2: Language preference in GLI

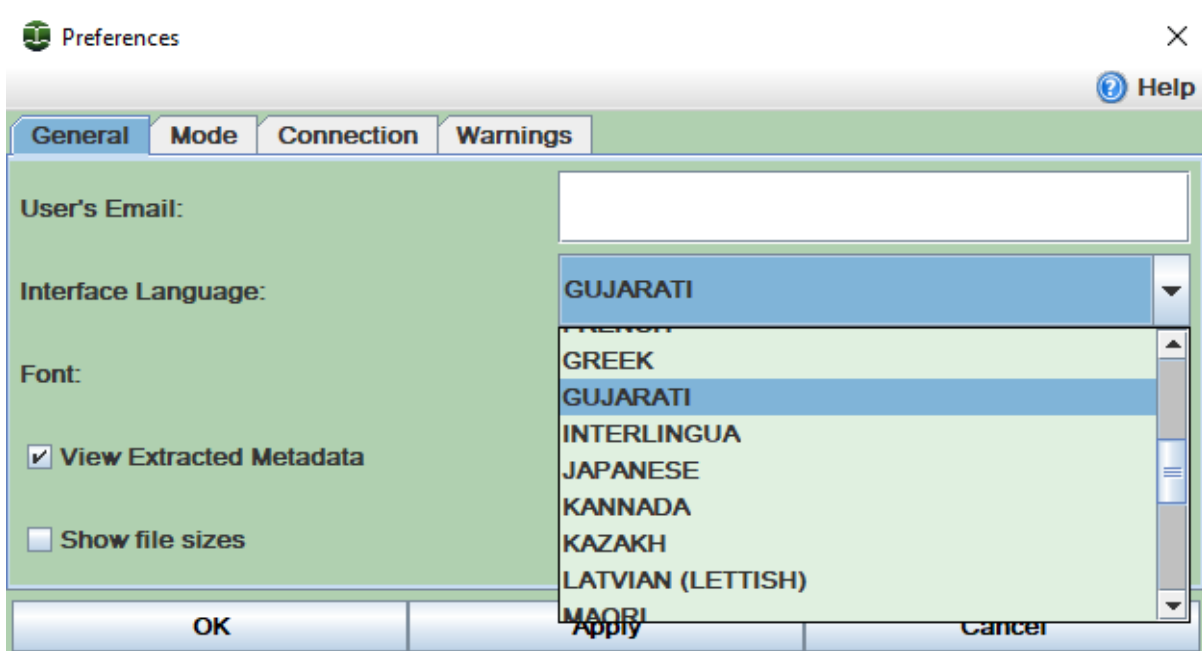


Image 3: Choice of Gujarati as the language of GLI interface

Once preference of language changed to Gujarati, the GLI interface look like

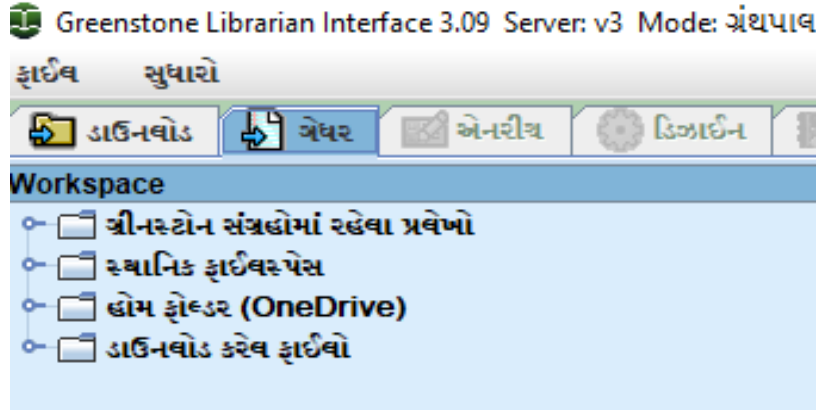


Image 4: GLI interface in Gujarati language

Different Panels

Value of each panel and instructions available within concerned panel are visible in Gujarati.

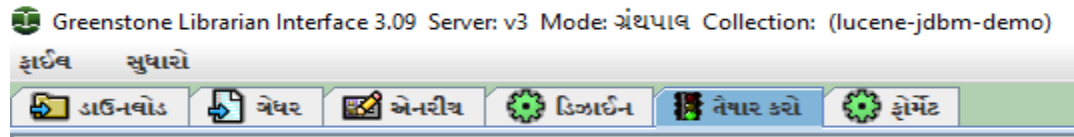


Image 5: Various panels of GLI displayed in Gujarati language

Creation of New Collection

The new collection can be created through the instructions which are available in Gujarati language

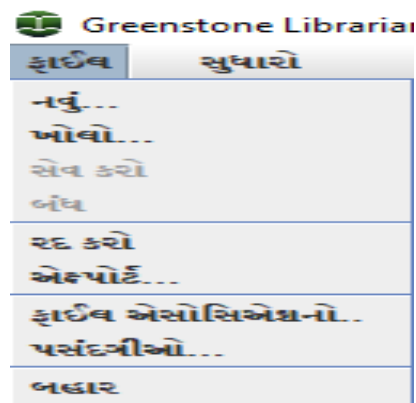


Image 6: Instructions of creating new collection or opening existing collection in Gujarati

The descriptions of collection can be displayed in Gujarati language

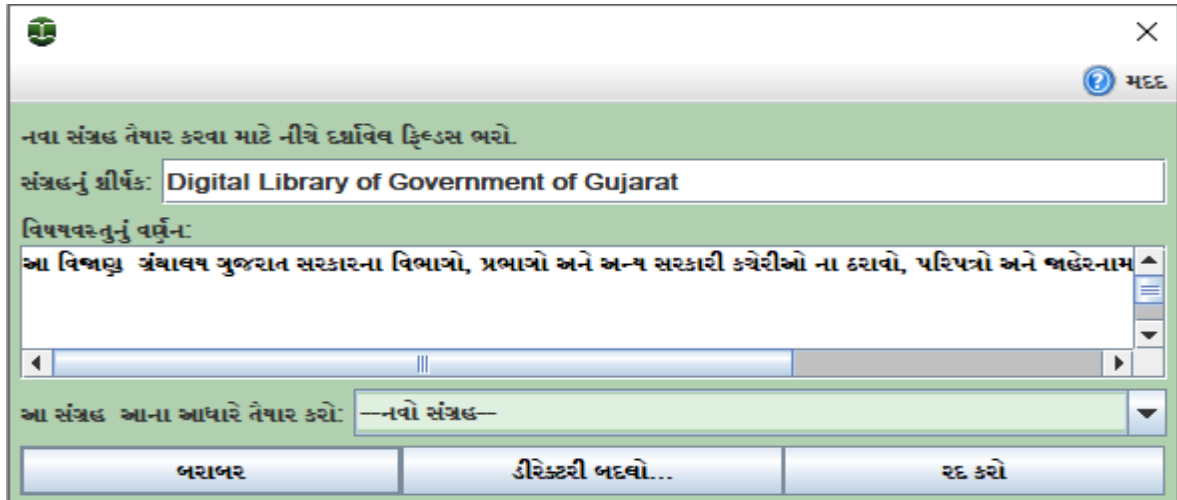


Image 7: The description of collection can be displayed in Gujarati

Assignment of Metadata Value in Gujarati Language (Enrich Panel)

The metadata value can be assigned in Gujarati language so that it will make the Searching & Retrieval, and Browsing very easy and the entire record of the document will be displayed in Gujarati language.

એલિમેન્ટ	મૂલ્ય
dc.Title	અનુસૂચિત જાતિના ખેડૂતો માટે એગ્રીકલ્ચર ટેકનોલોજી મેનેજમેન્ટ એજન્સી (ATMA project for S.C. Farmers) પોષનાને વર્ષ ૨૦૧૯-૨૦૨૦
dc.Creator	
dc.Subject and Keywords	
dc.Description	
dc.Publisher	કૃષિ, ખેડૂત ક્ષમાણ અને સહકાર વિભાગ, ગુજરાત સરકાર
dc.Contributor	એગ્રીકલ્ચર ટેકનોલોજી મેનેજમેન્ટ એજન્સી આત્મા, ગુજરાત સરકાર
dc.Date	2019
dc.Resource Type	સરકારી દસ્તાવેજ
dc.Format	PDF
dc.Resource Identifier	આ સરકારી
dc.Source	એગ્રીકલ્ચર ટેકનોલોજી મેનેજમેન્ટ એજન્સી આત્મા, ગુજરાત સરકાર
dc.Language	ગુજરાતી
dc.Relation	
dc.Coverage	
dc.Rights Management	
dc.Relation*isPartOf	ક-૭
dc.Date*created	30/04/2019
dc.Relation*hasPart	અનમ-૧૦૨૦૧૮-૪૩૫૪-ક-૭
dc.Date*dateAccepted	21/11/2019
dc.Date*dateAvailable	18/11/2019
dc.Resource Identifier*bibliographicCitation	કૃષિ, ખેડૂત ક્ષમાણ અને સહકાર વિભાગ, ગુજરાત સરકાર
dc.Date*dateSubmitted	14/12/2020
dc.DateofBibliographicInformationGathered	

Image 8: Metadata value in Gujarati

Browsing Classifiers (Design Panel)

The browsing classifiers value can be given in Gujarati language so that all the browsers will be displayed in Gujarati language only.

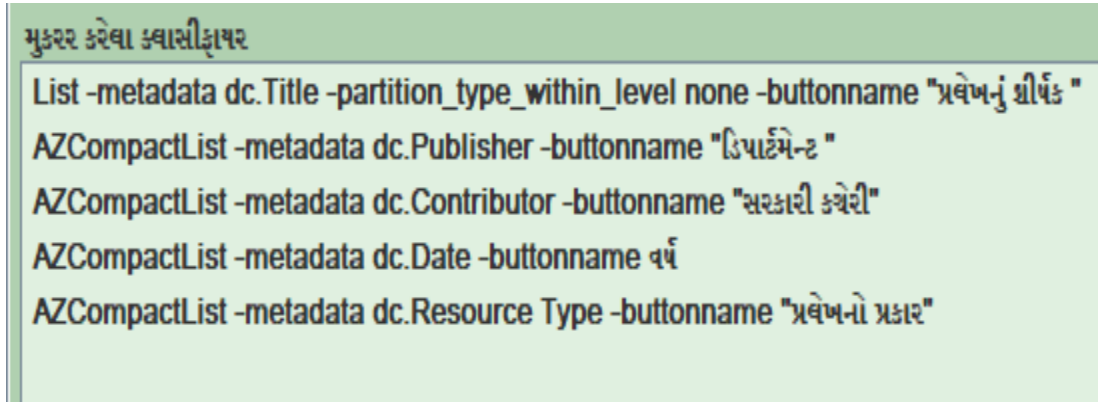


Image 9: The value of Browsing classifier in Gujarati

Visibility of Access Points or Search Index in Gujarati Language

Search can be made available through any field or metadata or data element. The item available in search menu may display the text value in Gujarati language

Item in search menu	Display text
Index: text,dc.Contributor,dc.Date,dc.Date^created,dc.Date^dateAccepted,dc.Date^date...	બધા દિવસોથી શોધો
Index: dc.Title	શીર્ષક
Index: dc.Publisher	ડિપાર્ટમેન્ટ
Index: dc.Contributor	સરકારી કચેરી
Level: document	document
Level: section	section

Image 10: Item in search menu displays the text value in Gujarati

Greenstone Reader or User Interface and its Features in Gujarati:

The Greenstone Reader or User Interface displays browsers, advance search options in Gujarati language. Within each browser, the bibliographical information of document is also visible in the language of in which the metadata value has been assigned. For example in this model, most of metadata value has been assigned in Gujarati language so each browser will display the bibliographical information of document in Gujarati language.

Accessibility of Browsers in Gujarati



Image 11: Reader or User Interface in Gujarati

The bibliographical information of document displayed under beneath of various browsers in Gujarati language.



Image 12: Browsers and the bibliographical information are displayed in Gujarati

Searching & Retrieval Mechanism:

Searching through Basic Search and Advanced Search is possible in Gujarati language.

Text Search

5 documents match the query.
 'અમદાવાદ' occurs 30 times in 5 documents

પ્રલેખનું શીર્ષક:અમદાવાદ મેટ્રોરેલ પ્રોજેક્ટ ઇસ્ટ-વેસ્ટ કોરીડોર અમરાઈવાડી મેટ્રો સ્ટેશન માટે જમીન સંપાદન કરવા બાબત.

પ્રલેખની તારીખ: 17/01/2020
પ્રલેખ નંબર:Not Published on Website
સરકારી કચેરી:અમદાવાદ જિલ્લા કલેક્ટર કચેરી, ગુજરાત સરકાર
ડિપાર્ટમેન્ટ:અમદાવાદ જિલ્લા કલેક્ટર કચેરી, ગુજરાત સરકાર
વર્ષ:
પ્રલેખના શીર્ષકની ભાષા:ગુજરાતી
શાખા:
પ્રલેખનો પ્રકાર:પરિપત્ર
પ્રલેખની લિંક:આ પરિપત્ર વાંચવા અહીં ક્લિક કરો

Image 13: Basic search through Gujarati

Advanced Search

Granularity to search at

Word or phrase	casefold stem	accentfold in field
<input type="text" value="આયુષ"/>	<input type="text" value="off"/>	<input type="text" value="off"/>
<input type="text" value=""/>	<input type="text" value="off"/>	<input type="text" value="off"/>
<input type="text" value=""/>	<input type="text" value="off"/>	<input type="text" value="off"/>
<input type="text" value=""/>	<input type="text" value="off"/>	<input type="text" value="off"/>

Maximum hits to return
 Hits per page

બધા ફિલ્ડમાંથી શોધો
 બધા ફિલ્ડમાંથી શોધો
 શીર્ષક
 ડિપાર્ટમેન્ટ
 સરકારી કચેરી

Image 14: Selection of fields in Advanced in Gujarati

Advanced Search

પ્રલેખનું શીર્ષક ડિપાર્ટમેન્ટ સરકારી કચેરી વર્ષ પ્રલેખનો પ્રકાર

Granularity to search at

Word or phrase casefold stem accentfold in field

<input type="text" value="આયુષ"/>	<input type="text" value="off"/>	<input type="text" value="off"/>	<input type="text" value="off"/>	<input type="text" value="બધા ફિલ્ડમાંથી શોધો"/>
AND <input type="text"/>	<input type="text" value="off"/>	<input type="text" value="off"/>	<input type="text" value="off"/>	<input type="text" value="બધા ફિલ્ડમાંથી શોધો"/>
AND <input type="text"/>	<input type="text" value="off"/>	<input type="text" value="off"/>	<input type="text" value="off"/>	<input type="text" value="બધા ફિલ્ડમાંથી શોધો"/>
AND <input type="text"/>	<input type="text" value="off"/>	<input type="text" value="off"/>	<input type="text" value="off"/>	<input type="text" value="બધા ફિલ્ડમાંથી શોધો"/>

Maximum hits to return

Hits per page

12 documents match the query.
'આયુષ' occurs 25 times in 12 documents

પ્રલેખનું શીર્ષક:કોરોના (covid -19)ની આયુષ સારવારનો દાવો કરતા લોકોને ચેતવણી આપવા બાબત.

પ્રલેખની તારીખ: 1/4/2020
પ્રલેખ નંબર:Z 25023/09/2018-2020-DCC(AYUSH)
સરકારી કચેરી:નિયામકશ્રી, આયુષ, ગુજરાત સરકાર
ડિપાર્ટમેન્ટ:આરોગ્ય અને પરિવાર કલ્યાણ વિભાગ, ગુજરાત સરકાર
વર્ષ:2020
પ્રલેખના શીર્ષકની ભાષા:ગુજરાતી

Image 15: Retrieval of search results through advance search

Future Planning:

This study includes only those documents which are available on various government organizations' websites which have been published on open access domain. Apart from that Government of Gujarat might have published thousands of such documents in print form but might not made available on websites may be included in future to make the collection and citizens rich with plenty of information.

Some entities do not provide complete important bibliographical information of such documents (e.g. title of documents, date of document released, link address of document etc) should be sufficed.

This Digital Library contains the Circulars, Government Resolutions and Notifications for specific period but the publishing such documents is a continue process and hence updation is very much necessary to provide live access of current documents though this Digital Library.

Many librarians or information specialists working with Government of Gujarat may not aware about the features of Greenstone Digital Library Software especially for managing information in vernacular language may required a training or workshop etc to spread awareness of GSDL among all departments and sub-divisions (entities) of government of Gujarat.

Conclusion:

Government of Gujarat is doing very good job to make its citizens rich with information through publishing more than 23000 documents (Circulars, Government Resolution and Notifications) and linking to the websites of various government organizations or entities. The main objective of government is to make the citizens much informed and knowledgeable. However, if government takes further step to create digital library of such documents in GSDL, it will become one the best digital libraries in managing the collection of vernacular language.

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