System Planning and Design

System planning is the process of developing system requirements. The system requirements for developing the ILCD is determined in the following ways:

a. Functionalities and Features

The functional requirements were determined by reviewing the basic features of Comdisdome, the only literature database on communication disorders currently available in the world published by M/s Proquest. The Comdisdome shares common features and functionalities with other abstracting and indexing databases published by M/s Proquest. The Comdisdome database broadly categorized the domain communication disorders into speech-language pathology and audiology. Each of these sub-domains are further classified into a number of topics. The database facilitates both basic search and the advanced search. Also, it can be browse by applying filters such as publication year, type of source, document type, subject, language, publication title etc. The users can create personal accounts on the database using the tool, 'My Research' and avail personalized information services like saving, managing, and organizing search results. The personal account also facilitates email alert creation for receiving notification on database updates as per the user's choice. The database consists of mainly four types of resources: journal articles, books, theses & dissertations and conference papers. Each record in the database is provided with metadata fields such as Author, title, source journal (in case of joruanls), publication year, date and persistent URL or DOI. In addition, each record is provided with 'cite', and 'cited by' information. The database also facilitates the presentation of search results in variuos citation styles, save them as pdf and other document formats and export to different reference management tools. The Comdisdome like other Proquest databases incoporates a comprensive help and support manual. The following functionalities and features of the Comdisdome database are identified to incorporate in the ILCD.

i. Basic Search: This functionality will enable the users to search for documents using their own terms across the database.

ii. Advanced Search: This functionality will enable the combination of various fields to search the database

iii. Browse: The browsing functionality facilitates browsing the records in the database by fields such as Author, title, and publication year.

iv. Personal Accounts: This functionality enables the end-user to create and manage their accounts by providing their personal information and research preferences.

v. Help and support: This is to support the database users on how to use the system effectively.

b. **User-types**

The ILCD intends to address the scholarly information needs of a broad constituency of end-users such as students, full-time researchers, faculty, and clinicians in the field of communication disorders. In the future, the database will encourage user contribution of content. However, such user-contributed content needs to be verified for authenticity by the database administrator. Given the above, the user-types of the ILCD were segmented into three:

1. Viewer
2. Author
3. Administrator

The Viewer can only access and view the database content. The Author contributes to content, and the Administrator supervises and manages the submission of the content and organizing them.

c. Subject Organization

Organizing the database content based on the subject will always help the users quickly locate the content. The domain of communication disorders is constituted of two broad subject fields: Audiology and Speech-Language Pathology. Consistent with this classification, the ILCD content was organized into two subject domains: Audiology and Speech-Language Pathology. The resources under each of the domains were further categorized into Books, Book Chapters, Journal Articles, and Conference Papers**.**

d. Design of Work Flow

After the proposed ILCD requirements were finalized, a workflow was designed <u>using the **Data Flow Diagram (DFDs)** using the Visual Paradigm for UML software</u>. As discussed above, the ILCD has three types of users: Viewer, Author, and Administrator. Of these, the user type Viewer comprises all the end-users of the ILCD like faculty, students and researchers, and practicing clinicians. The **Author** is constituted of the contributors of content to the ILCD from among the end-users. The **Administrator** user type is comprised of the persons managing and administering the ILCD.

As mentioned earlier, the Reader can only be able to access the database, search/ browse for specific information, and view them. No account creation is required for viewing the content. Diagram 1 depicts the role played by the Reader of the LICD.

- Search / browse
- View/Read

Diagram-1

To play the role of Author and contribute content to ILCD, the end-user has to register with ILCD and create a personal profile. Diagram 2 depicts the role played by the Author.

- Request for registration
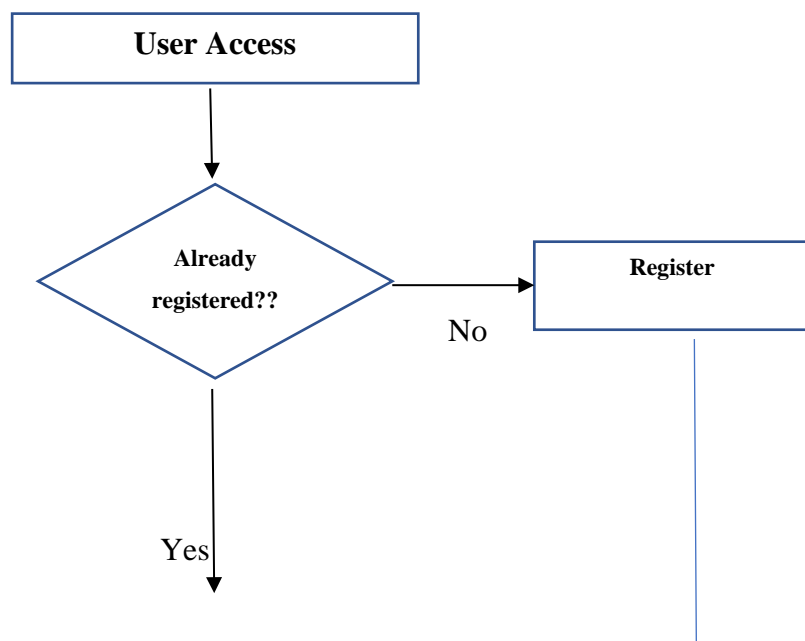- Receive the registration link

- Fill the personal details

- Set username and password

- Access the database

- Submit content

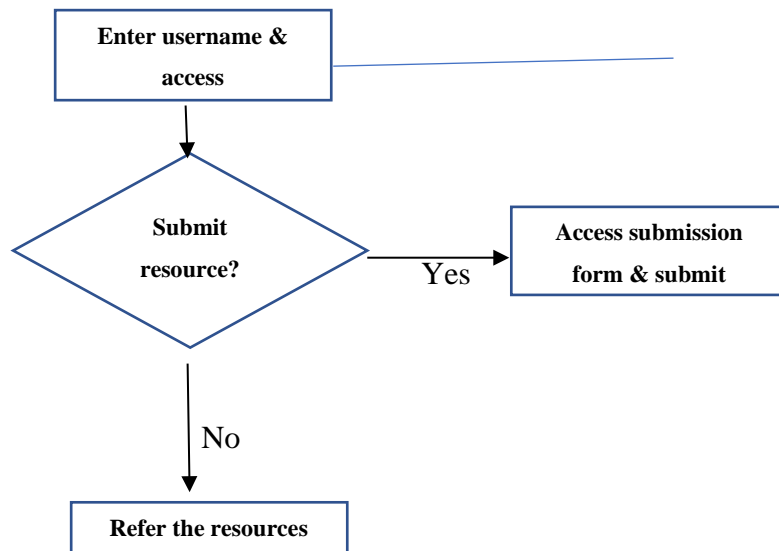- Search and browse the content

- View the content

The User Type, Administrator, will be registered by default. The role played by the Administrator is depicted in diagram 3.

- Access the database

- Manage and Organize the content

- Search for new content submission

- Check the authenticity

- Approve and accept the content if authentic

- Rejcet if not authentic

The overall workflow of the Indian Literature on Communication Disorders is depicted in diagram 4.

Work Flow

```
                    ┌─────────────────┐
                    │   User Access   │
                    └─────────────────┘
                             │
                             ▼
                        ╱─────────╲
                       ╱  Already  ╲          ┌──────────┐
                      ╱ registered??╲────────▶│ Register │
                       ╲           ╱    No     └──────────┘
                        ╲─────────╱                 │
                             │                       │
                          Yes│                       │
                             ▼
```

```
          ┌─────────────────┐
          │ Enter username &│ ────────────────────────────
          │     access      │
          └─────────────────┘
                   │
                   ▼
              ◇─────────◇
             ╱           ╲           ┌─────────────────┐
            ╱   Submit    ╲   Yes    │ Access submission│
            ╲  resource?  ╱─────────▶│  form & submit   │
             ╲           ╱           └─────────────────┘
              ◇─────────◇
                   │
                   │ No
                   ▼
          ┌─────────────────┐
          │ Refer the resources │
          └─────────────────┘
```

a. System Selection

System selection is the process of selecting the various hardware and software that are needed for developing the system. Generally, higher education institutions across the world use open source institutional repository software for developing for collecting, preserving and disseminating scholarly materials. With the progress in technology, the repository software applications have been used as an online platform for publishing and showcasing the entire spectrum of an institution's scholarly output, such as journal articles, journals, books, book chapters, theses, dissertations, and conference papers. The Institutional repository software is also used for developing subject-specific scholarly platforms spanning across the organizations. Hence, it is decided to make use the open-source institutional repository software for creating the ILCD.

OpenDOAR (Directory Of Open Access Repositories) is a global directory of open access repositories started in 2005. It is a collaborative project of the University of Nottingham and Lund University, funded by Open Society Institute (OSI), Joint Information Systems Committee (Jisc), SPARC Europe and Scholarly Publishing and Academic Resources Coalition and CURL. As of January 2021, the directory listed 5608 repositories worldwide, including subject repositories and institutional repositories. Of

these, 2192 repositories are built on the open-source software called Dspace, followed by Eprints (617 nos.). The complete list of software-wise list of repositories as per the OpenDOAR is given in table 1.

Table 1: Repository Software-wise list of OpenDOAR

Sl. No.	Repository Software	Number of Installation
1	DSpace	2192
2	EPrints	617
3	WEKO	532
4	Digital Commons	293
5	Islandora	145
6	CONTENTdm	100
7	OPUS	87
8	HAL	75
9	dLibra	64
10	Fedora	63
11	PURE	57
12	Greenstone	51
13	Drupal	36
14	Invenio	28
15	Earmas	24
16	Digibib	23
17	Wildfire	22
18	SciELO	19
19	Diva-Portal	19
20	VITAL	15
21	DigiTool	15
22	MyCoRe	13
23	Omeka	12
24	Fez	9
25	XooNIps	7
26	Cybertesis	6
27	Equella	6
28	Open Repository	6
29	Others	

DSpace and Eprints, the two most popular institutional repository open-source software applications as per the OpenDOAR were locally installed and evaluated for functionalities and features determined for the ILCD as discussed above. It is found that both applications support the necessary features and functionalities. Hence, the DSpace, the most heavily

used application, was selected for developing ILCD. It was decided to use the latest available version of the DSpace for linux. i.e. version 6.3. The supporting applications and tools were also finalized as given below.

a. Java jdk -version 8

b. Tomcat-version 9

c. Apache maven- version 3.6.3

d. Apache Ant - version 1.9.15

e. Postgresql - version 9.6

It is also planned to temporarily deploy the system on the Library and Information Centre server having the following hardware and network facilities.

1. 2-3 GB of Random Access Memory (RAM)
2. 20 GB of Storage (or roughly enough storage for all the files you wish to store in DSpace)