Development of Software for Project Information Centres (SPIC) in DRDO

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ABSTRACT

In Defence Research and Development Organisation (DRDO) Project Management plays a key role in design, development and production of weapons for defence services. Project Information Centres look after various aspects of documentation. This paper broadly covers digitization issues related to project information centres, need and role of Software for Project Information Centre (SPIC). SPIC is an in-house software development for taking benefits of digitization to various project information centres in DRDO by Research Centre Imarat Library.

KEYWORDS: Project Management, Project Reports, DRDO, SPIC, Digital Library, Digitisation

1. INTRODUCTION

Documentation practices play a vital role for success of various activities in Project Management. Digitisation has become the driving force behind all R & D activities. The success of any project is crucially dependent on the documents produced, stored and retrieved as per user needs. DRDO, Ministry of Defence, Government of India is the largest Government-Funded Research and Development Organisation in India, with a chain of over 50 laboratories and establishments spread across the country which are deeply engaged in developing defence technologies. (1) Its Mission can be stated as design, development and production of weapons and allied equipment for Defence Services. (2) This paper broadly covers digitization issues related to project information centres, and needs for digitization of various documents held by them. It also covers the need and role of software for project information centres (SPIC) and in-house development of SPIC software to meet requirements of digitization for DRDO Project Information Centres.

2. CURRENT PRACTICES

Project Information Centers hold various types of Technical Reports both Internal and External Reports, Material Management Reports, Financial Reports, Progress Reports, Status Reports, Feasibility Reports and Technical Manuals, etc. All these reports are held in paper format. The collection, storage and retrieval of information poses a number of problems in day to day use. The problems get multiplied because of number of agencies namely R&D labs, private sector, Ppublic sector, universities and DRDO headquarters are involved as users of their information sources.
Digitisation of various documents is essential due to the following reasons:

- Documentation forms the basis for the design plans and delivery of quality products/services in any project environment and thus it is of highest importance.
- It helps in gauging project progress and makes change management much easier.
- It also improves the quality of work, increases efficiency and ensures timely output of products/services.
- Lack of digitisation leads to waste of time and money, and lowers timely output of products/services. (3)
- The primary constraints faced in project management are scope, time, quality and budget. To overcome these factors, information technology-based services are essential. (4)

RCI, Library has conducted a survey of the nature of documents, problem areas and needs for digitization in project offices of Hyderabad-based labs of DRDO using a questionnaire method. The findings of the survey are as follows:

- Numbers of documents are growing in leaps and bounds.
- Nature and format of documents are varying.
- Classified documents form bulk of technical reports.
- Documents are mainly generated due to in-house developments, contract research, collaborative R&D and technology transfer.
- Timely retrieval of required reports often poses problems due to lack of systematic approach and control.
- Digitisation of project documents supported by in-house software development is the need of the hour.

DRDO has recently issued “Guidelines for Writing and Assignment of Uniform numbers to Technical Reports in DRDO” (5). The Guidelines have given a complete picture of various types of reports generated in Defence R & D. These Guidelines and the needs of Project Information Centres, formed the basis for RCI Library for the design and development of an in-house software, namely ‘SPIC’, to provide complete control of digital assets for easy and fast access to information.

3. RCI INITIATIVES

The Research Centre Imarat (RCI) Library has started development of Digital Library of Missiles during the last eight years. It has developed in-house software namely Digital Assets Management [DAM] software to serve as integrated platform providing access to born-digital objects and made-digital objects on intranet. (6) The SPIC can be defined as a software tool developed in-house for effective management, organization and control of digital assets as per DRDO requirements. The need and role of SPIC are:

- Growth of digital assets is in leaps and bounds
- Improves decision making
- Decreases costs and increases productivity
• Software developed by outside agencies do not meet project requirements
• In-house development always has strong foundations of domain knowledge and software skills as per project requirements
• Provides platform for reuse of digital assets

4. KEY FEATURES OF SPIC

The key features of SPIC are as follows:

• The software is developed using SQL Server and Asp.net
• It is a web based and runs on support of IIS web server
• IIS 7.0 plays vital role in achieving better performance, reliability, scalability and security of websites
• SQL server is a fully featured RDBMS that offers a variety of tools for database development, maintenance administration. (7). The main components of SQL server include Enterprise Manager, Query Analyzer, SQL Profile, Service Manager and Data Transformation Services (DTS).
• The Enterprise Manager services as the main administrative console for SQL server installation and Query Analyzer offers easy methods for performing queries against SQL server database
• The SQL profile provides a window into the inner working of the database and the role of Service Manager is to control the SQL server.
• The DTS plays a vital role for import and export of the data between SQL server and a large variety of other formats. Import and export wizard is commonly used data transformation applications
• The .NET framework provides environment for building, deploying and running web applications. Asp.net is a server side scripting technology that enables scripts (embedded in web pages) to be executed by Internet server.

The Table1 shows the main differences between DAM Software and SPIC Software, and Figure1 shows Architecture of SPIC software giving clear picture of SPIC, Admin interface, User Interface, DRDO Guidelines regarding technical reports, and user manual, etc.

<table>
<thead>
<tr>
<th>S.NO</th>
<th>DAM</th>
<th>SPIC</th>
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<tbody>
<tr>
<td>1</td>
<td>Developed for Digitization needs of Library and Various Divisions of RCI</td>
<td>Developed for Digitization needs of Project Information Centers of DRDO</td>
</tr>
<tr>
<td>2</td>
<td>It provides Access to unclassified Documents and images consisting of made digital and born digital objects</td>
<td>It provides access to classified documents related to Project mainly consisting of made digital objects</td>
</tr>
<tr>
<td>3</td>
<td>DAM Runs on Intranet System</td>
<td>SPIC is locally hosted system for security considerations.</td>
</tr>
<tr>
<td>4</td>
<td>DAM Provides four search options</td>
<td>SPIC Provides Nine search options</td>
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</tbody>
</table>
4.1 Advantages of SPIC

The key advantages of SPIC software are:

- Creation and addition of digital objects is made simple
- Supports text, html, word, pdf document, pictures, audio, and video
- Ability to perform search by Author, Title, Keyword, Project Report Number, Corporate Author, Sponsor’s Name, Year, Category and Project Name.
- Supports Boolean search
- Choice of plugins is automatic
- No need to depend on outside agency for software installation, maintenance, and upgradation of software

![SPIC Architecture Diagram](image)

Figure 1. SPIC Architecture

To illustrate the importance of SPIC software for providing the required information in a suitable way, Figs. 2-6 show some of the enunciated screen visuals which are self-explanatory.
Figure 2. Home page of SPIC

Figure 3. Search Options in SPIC
Figure 4. Keyword wise Search

Figure 5. Full Text View of Digital object
5. CONCLUSION

Project Documentation takes a new turn once it is digitized and all project resources can be properly managed, providing good governance in project environment. SPIC Software provides easy and fast access to digital information of Project Information Centres. It is presently implemented in project Offices of RCI. In the present era of digitization, SPIC is a small step to bring the fruits of digitization closer to all Project Offices in DRDO. SPIC Serves as an effective Solution to improve growth of digital libraries in a project environment and allows for standardization of DRDO projects.

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REFERENCES


7. SQL Server features, http://databases.about.com
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