Libraries:
From the Classical to Cloud-Based Era

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ABSTRACT

A Library is an organized collection of resources made accessible to a defined community for reference or borrowing. It provides physical or digital access to material, and may be a physical building, or a virtual space, or both. During the last decays, the Libraries had witnessed a continuous revolution and still do. This paper reviews the main milestone of such revolution starting from the classical up to the current Cloud-based era passing by the intermediate digital transformation period. It reviews the library types, services, problems and drive of changes from the classical form. The paper then tackles the transformation of the library to the digital form. It discusses the characteristics of the digital library, the web-based library, and the library 2.0 through their advantages and limitations. The paper finally focuses on the current Cloud-based ear, where most of the library cloud platforms, services management, innovative products and opened environments are addressed through their features, add values, pros and cons. The paper also provides a comparative study on such solutions coming up with opened research issues. Hereby, the paper provides a comprehensive overview on the development of the library till now.

Keywords: Cloud Library, Cloud Platforms, Digital Library, Library, Web-Based

1. INTRODUCTION

Libraries are the repositories of knowledge and form an integral part of education; an organized collection of resources made accessible to a defined community for reference or borrowing, providing physical or digital access to material, and may be a physical building, or a virtual space, or both. Traditionally, libraries have been divided into four groups: academic, school, public and specialized, where each of them has its own structure and purpose. With the rise of higher education, increase of mobility and fast advancement of technology the library has started to migrate to the next era; the digital era.

Rapid advances in information processing, storage, and communication technologies have revolutionized the role of the libraries and information centers all over the world. Developments of digital technologies have increased the possibility of horizontal and vertical integration of knowledge and information. The term "Digital Library" has a variety of potential

meanings, ranging from a digitized collection of material that one might find in a traditional library through to the collection of all digital information along with the services that make the information useful to all possible users.

The library service has witnessed in this era the raise of two important developments: the web-based library service, and the Library 2.0. The web-based library service is a digital one that manages and develops electronic services. There are different kinds of web-based reference resources and services for accessing information from libraries such as OPAC, Gateways, Portals, Subject Portals, Electronic Journals, Online Databases, Subject Directories and Search Engines. On the other hand, the Library 2.0 is a user-centered change. It is a model for library service that encourages constant and purposeful change, inviting user participation in the creation of both the physical and the virtual services. Each of the above development of the digital library is by itself a step toward better service provisioning.

However, Libraries that automate find their power consumption due to increased heating and air conditioning needs, rising beyond the anticipated levels. In addition, they find a huge burden of IT maintenance and updating cost. The noise and heat levels generated by people and many machines costs more than what a library is used to paying for its maintenance and power costs.

Based on such limitations, the Library Cloud-based era has started, where new features, services, platforms and solutions are invading the old library's approaches. This paper comprehensively overview and discuss most of the library Cloud-based platforms, services management systems, innovative products and opened environments. It covers Platforms like "WorldCat and "DuraCloud", Service management systems like "ExLibris Alma", innovative products like "Millennium, Sierra Services, Encore Synergy, Content Pro, AirPAC, and Campus Computing", and opened environment like "Kuali Open Library". The paper includes comparative studies on such new paradigm and discusses in details all of its pros & cons.

The rest of this paper is organized as follows. The first section covers a background on the library including its definition, types, services, advantages, disadvantages, and drivers of change. Section 2 describes the rise of the digital transformation passing through the digital library, web-based library, and Library 2.0. It also provides detailed explanation of the characteristics and limitations of such era. Section 3 presents the emergence of the Cloud Computing in the Library domain. It comprehensively addresses the platforms, the services, the products and the environments. The whole paper is finally concluded at the end of this paper.

2. BACKGROUND

This section covers the definition and scope of libraries along with their different types, advantages and disadvantages. The library services are also addressed along with their problems and the drives of change.

2.1. Library Definitions and Types

Libraries are the repositories of knowledge and form an integral part of education; an organized collection of resources made accessible to a defined community for reference or borrowing, providing physical or digital access to material. A library's collection can include books, periodicals, newspapers, manuscripts, films, maps, prints, documents, microform, CDs, cassettes, videotapes, DVDs, e-books, audio-books, databases, and other formats. The success of libraries depends upon their ability to utilize information knowledge of its staff to serve the user community (Aswath & Gupta, 2009).

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