

Reflection of Paradigm Change in Information Technology to Library Architecture: The Helsinki Oodi Library

Ayşe Sirel*

Istanbul Aydın University, Faculty of Architecture and Design, Istanbul, Turkey

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Abstract

Since the late-20th century, there has been a transition from an industrial society to an 'information network society'. 'The production, organization and dissemination of knowledge' began to change rapidly at the start of the 21st century, whereas this situation was met by the more effective search, use and evaluation of all kinds of information by library users. This work has focused on how the paradigm shift in information technology differentiates the functions and architecture of the 21st century 'next-gen' libraries from the traditional sort. Constituting the sample area of the study, the Oodi Library and its architectural features was examined within the context of 'new architectural design criteria', such as accessibility, symbolism, spatial organization, access to collections, self-study and integration, both in situ and by means of literature research. In research, it was observed that libraries need to be designed in line with new architectural design criteria, keeping the digitalization of information and integrating new information technologies in the forefront. The paradigm shift in information technology with digitalization has been the catalyst that transforms the libraries of the 21st century into centres of intellectual life, while reinforcing their role as a symbol of education, equality, transparency and civilization.

Introduction

Libraries have been institutions that serve the society by outfitting its citizens with the right information since antiquity. In bringing its users together with knowledge and science, the book collection has been the most essential element that defines libraries [1]. Up until the start of the 20th century, printed materials in book format occupied a certain physical space in libraries and librarians provided access to said materials. In these institutions, which may be defined as traditional libraries, the 'paradigm of acquiring knowledge through the librarian' was a matter that had a direct impact on the spatial organization and architectural formation of the library buildings. Until the same period, 'librarian-oriented library buildings' were official venues offering static architectural forms [2]. Having emerged in the early 20th century with the transition to the open shelf system, where users were able to access the books they

wanted directly, modern library operations influenced and improved the architectural form of the library buildings of the period. The "production, organization and dissemination of knowledge" began changing rapidly with the transition from the industrial society to the "information network society" since the late-20th century. With rapid progress in information and communication technologies that began to occur at the start of the 21st century, the widespread use of the Internet and the increase in digital resources facilitated more effective search, use and evaluation of all kinds of information for library users. This situation has elevated libraries to a different level with a new mission beyond storing and serving books and documents [3]. As a result of the paradigm shift in information technology, libraries are now obliged to take on new roles and equip themselves with new skills and competencies. The new 'user-oriented' and 'multi-functional' identity has brought with it 'new architectural design criteria' to make libraries

* Corresponding author. E-mail address: aysesirel@aydin.edu.tr

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more pleasant and attractive [1], [4]. 'Next-gen' library buildings began to be built with innovative design criteria that prioritize 'work and learning-centred' spaces for user activities, by reducing the spaces that house physical collections (information materials) [5].

The aim of this study is to evaluate how the paradigm shift in information technology differentiates the functions of the new generation libraries in the 21st century from traditional libraries and how this differentiation is reflected in the new design criteria of the library architecture. In the study, first of all, the concept of paradigm, paradigm shift and the paradigm of acquiring knowledge in libraries are explained methodologically. The change in the paradigm of acquiring knowledge in libraries has been revealed by literature research. Regarding the reflection of the change on the library architecture, on-site observations and investigations were made by the author in five new library buildings built after the 2000.

In this context, the architectural features of the new generation Oodi Library (Helsinki), which was chosen as the sample area of the study, were examined both in situ and through literature research in the context of 'new architectural design criteria'. The contribution of the paradigm shift in information technology to the architectural design has been determined. The important contributions of the development in information and communication technologies, the increase in digital resources and the use of the internet to the 'learning and teaching' mission of the new generation libraries, especially Oodi Library, were discussed. As an important object of the city with the iconic architecture of Oodi Library and other 21st century new generation libraries the vision of adding value to the socio-cultural life of the city, participation, citizenship and environmental awareness has been put forward.

I. Change in the Acquisition of Knowledge Paradigm at Libraries

The word 'paradigm' is explained in many dictionaries as the generally accepted viewpoint of a particular discipline at a particular time. The paradigm, which sheds light on certain problems and offers suggestions for their solutions, is also expressed as a set of perspectives and values accepted by scientists. Problems that cannot be solved within the framework determined by a presumed paradigm may reveal the search for a new paradigm and solutions suitable for the era in which it is found, in which case a different paradigm, offering a new understanding and perception, emerges. A change in paradigm occurs when the ground for success disappears for the old paradigm [6], [7]. As can be seen, the paradigms which are written or unwritten rules and practices have been a model or solution for a certain period of time in any field

(for example, in obtaining information). Paradigms are not fixed values. In the changing world, paradigms can change and be renewed along with changing values. The paradigm shift experienced may also cause differences in current solution proposals and designs. For example, approaches that were valid for a period in the architectural design of library buildings can be planned with new design approaches depending on changing values.

The development of writing throughout the history of humanity has brought with it the opportunity to produce and record (storage) information, thus the accumulation of knowledge has come into question. The storage conditions of text and thus recorded information have also rendered the means and environment of access to said information as determining factors [8]. Since antiquity, library institutions have emerged that collect, preserve and protect recorded information and serve society by equipping people with correct information. Bringing the user together with knowledge and science, the book collection has been the most essential element that defines libraries [1].

Having written the first comprehensive library organization and proposal to establish a library in his book entitled *Advice on Establishing a Library* in 1627, Gabriel Naudé did a great job not only to organize library collections, but also provided sophisticated instructions to equip library buildings and make them open to the public. Naudé envisioned the rationality of the 'modern library' with his recommendation that emphasized the actual function of the library as a place to read books [4]. Within the process, libraries have become an integral part of societies in the developing world. Libraries that have developed in accordance with the cultural and economic characteristics of societies throughout history have also revealed architectural typologies to respond to functional and symbolic needs with factors such as the size, variety, user characteristics of the collections, the social purpose and mission of the institution [1].

From an historical perspective, objects defining information in libraries until the early-20th century were printed and manuscript materials in book format that existed physically, that could be catalogued, and access was controlled by librarians as they occupied a certain area in libraries [9]. The information paradigm in these institutions, which could be defined as 'traditional library,' is the presentation of printed books (book collection), magazines and reference works (*reference collection*): *encyclopedias, dictionaries, handbooks, guides, etc.*) to the user through the librarian. This paradigm deemed it necessary for users who wanted to access information (research material) to come to the library, which was a physical space as an information medium [3]. This situation in the information paradigm, which includes the perception of libraries as 'information resource repositories' focused on just books and similar materials, has been a subject that directly affects the spatial organization and architectural

formation of the library buildings. Up until the early-20th century, reading, study halls and large magnificent book warehouses and 'book-oriented library buildings' were official environments/places featuring a static architectural structure [2].

The years around the turn of the 20th century were when libraries took on a steadfast role in education, enlightenment and democracy. Ideally, it was a time when all library materials were made available to the public, regardless of class, race, origin, or language. As with the Roman-era libraries, the aim was to create libraries with the opportunity and comfort where readers could visit at any time, stay as long as they wished, read and take notes [4]. The information paradigm in these institutions, which could be defined as modern libraries in the mid-20th century, was the availability of open shelf or 'open access' systems, where users could directly handle the book material (collection). In the information paradigm of this era, while users who wanted to access information had to personally visit the library, the role of the library staff had been greatly reduced. It was a time when spatial requirements related to factors such as the size of the collection, the purpose and mission of the institution (symbolic representation), and user characteristics affected and developed the architectural form of the library buildings.

Starting from the late-20th century, the industrial society began to transform into an 'information network society.' The growth and development of information technologies began to alter the library concept starting from the early-21st century. The intense social-economic-technological transformations experienced with globalization, widespread use of the Internet and the increase in digital (electronic-digital) resources has also changed the act of reading books [10]. The role of libraries and the profile of users also began to change with the new paradigm in which the concepts of 'information literacy' and 'lifelong learning' gained importance [11]. In beginning, to strain the functioning organization of the library and its physical space, these circumstances led to the transformation of the role of libraries in the network society and the redefinition of its mission. Thus, new library buildings have started to be built in this direction by adopting new user-centred architectural design strategies [1], [4].

What were these new information technologies that caused a paradigm shift in acquiring information in the 21st century libraries and thus changing and transforming the traditional library concept and even its architecture? While the rapid progress in information and communication technology (ICT) affected every aspect of life in the 21st century, including education, training, culture, health, scientific communications, etc., it has also been the main impetus behind the change in libraries. Thanks to the multi-hypermedia system called the 'World Wide Web' – web-based digital services (*analog data / written and printed*

resources being digitized and made to be processed, stored and managed by computers), a system has been created which enables us to access data (information) of a multitude of different structures in a compact and interactive manner. The Web is one of the services on the Internet. The Internet is an ever-growing worldwide communications network in which many computer systems are interconnected. It transmits documents consisting of text, graphics, pictures, audio and motion video over the Internet to remote computers. With the help of a user-friendly graphical interface, it presents the right information wherever those seeking the information are located, at the right time, in the right format, and delivers it wherever it is deemed necessary [12]. In this regard, three important processes of the scientific world, 'the production, organization and dissemination of knowledge' have begun to change ICT and the new digital information paradigm rapidly since the 1990s [3]. This change in the knowledge acquisition paradigm, injecting the libraries with a different mission by removing them from being institutions that store and serve books and documents, has also caused major alterations in the architecture of the library buildings.

II. A Reflection of Change in the Knowledge Paradigm in Library Architecture: The 21st Century Library

Although the role of libraries as the main resource provider in accessing all kinds of information necessary for science and education is ongoing, it has begun to undergo some radical transformations with the change in the information acquisition paradigm. The transformation of traditional libraries, whose main material (collection) is comprised of books and magazines, with their physical environment limited to walls, that operate within certain hours, utilizing card cataloging systems for material search, with silent reading areas, and offering standard reading and research opportunities to their users, into a different world of information has begun [3], [13]. New digital resources, the development of information and communication technologies (ICT) and their integration into libraries and the emergence of Internet have caused the paradigm shift in information acquisition, leading information and documents to be disconnected from the physical space they have previously inhabited. Challenging the importance of the collection (printed information material) as was hitherto understood has altered the role and spatial requirements of the library. The changing perception of libraries and new sources of information, both printed material and digital, has led to the need to redefine and reorganize the architectural design of library buildings [14], [15]. The features and functions of traditional and 21st century academic libraries are provided in comparative fashion in Table I.

TABLE I

Comparison of Traditional and 21st Century Libraries [3]

Traditional academic libraries	21 st century academic libraries
Selection and acquisition of library information materials (books and journals) was done from the publishers' catalogues	Selection is based on users' demands and deals with such issues journal licensing and publishers' big deal offers for open access journals
The main collection included books and journals	Today there are institutional repositories, online databases, multi-media information resources
Librarians worked as collection specialists	Librarians work as faculty liaison
Management of information systems was limited to a four-walled physical library	In modern age, there are digital libraries, digital repositories and cloud information management system
Information model was scarcity and limited access of information	There is information explosion in both quantity and formats of information
Manual interlibrary loan system	Electronic interlibrary loan
High dependence on print resources	High dependence on e-resources and digital resources
Availability of services only during library opening hours	Most services are available 24/7
Use of card catalogues to retrieve information	Use of Online Public Access Catalogue (OPAC) to retrieve information
A traditional reference desk service	24/7 online and virtual reference services
Traditional cataloguing	Resource Description and Access (RDA)
Library as a quiet reading place	Information/knowledge/digital commons to make learning common
Library users had easily identified information needs	Library users have diverse information needs
Library budget spent mostly for book purchase	Budget is spent on e-resources, including hardware and software resources
Librarian mediated searching	Web-based searching
Print journals	e-journals and open access journals
Preservation of books (mainly), serie and grey literature	Digital curation
Traditional broacher	Media marketing
Traditional library users who had no other choice but to come to libraries	Diverse library users and assorted options to access information
From MARC and circulation desk	To metadata and web information
From book keeping	To support education

In the enthusiastic early days of the digital information revolution, many people questioned whether we were on the verge of a paperless society and the Internet would replace books and the library buildings would consequently lose their importance. When in fact, debates about the broader cultural and educational role of libraries are compounded by the determination of many librarians to 'get used to the digital program.' Libraries should continue to be valuable and important places for the community, for learning and for teaching. Senior librarian and lecturer Sam Demas noted the importance of libraries saying that they [16]:

- offer security, comfort, and quiet;
- are complimentary and commercial-free;
- provide a place to be with other people in a learning/cultural environment;
- offer opportunities to learn, search, inquire, and recreate;
- afford opportunities for choice and tranquility.

The massive digitization of library material and the integration of new information technology have not diminished library use, but rather have been the catalyst, by providing excellent opportunities to transform libraries into intellectual living spaces. This situation is

the focus of library institutions, meaning they have evolved from preserving collections to offering new services in providing users with access to information. The new digital information paradigm has significantly changed the way we acquire knowledge and learn, as well as the way we consume culture and leisure. The creation of audio-visual interaction environments amongst library users has also reflected the importance and new role of libraries as institutions that support access to information. In addition to being an environment for acquiring information and learning, 'next-gen' libraries have also started to function as a 'third place', which is an important concept in the 21st century. Put forward by sociologist Ray Oldenburg in 1999, this concept refers to places outside the home (first space) and workplace (second space) to catch a breather from the routines of daily life and provide social interaction. These spaces are innovative in that they provide an uninterrupted service network, information gathering and study areas, social areas, cafes and even leisure activities [17]. According to this concept, libraries began to function as comfortable venues or 'homes away from home', which are accepted as accessible, neutral, inclusive and easily accessible places for citizens [18]. The 21st century library has become a social community centre, a producer of

collective identity, as well as a producer of new content and information products. Adopting these changes has led to innovative 'user-oriented' library architectural design that prioritizes new 'work and learning-centred' spaces for user activities, reducing the spaces that house physical collections (informational materials) [1].

Also known as lifelong learning centres, the 21st century library buildings undertake the role of being a socio-cultural meeting place for citizens, changing both their interior design and exterior form. The outer transparent shell (glass surfaces) that separates the interior and exterior of the building is further increased, enabling visual contact both from the exterior and the interior. Vast open spaces with an attractive and comfortable atmosphere inside, interesting structural elements and escalators are perceived from the outside. The building's architecture program features reading halls, workshops, special event areas, rehearsal and recording rooms for musicians, entertainment and cultural venues, such as a concert hall, exhibit hall, bookstore, museum, cinema, cafe and restaurant, and interesting architectural forms, all of which have begun to transform and add value to the city and its immediate surroundings [19]. Thus, many 'next-gen' libraries with unusual architectural forms, as well as protecting, increasing and providing access to their collections that were built in the last two decades, have started to become a centre of attraction that revitalizes the cities in which they are located [4], [20]. By encouraging collaboration and learning for a wide range of users, including diverse working and activity environments and disadvantaged groups, this new vision also represents the 'sustainable architectural product' that starts with the creation of a building requirement program. The use of features such as recycled materials, natural lighting, sun shading, high performance glass, energy efficient interior lighting, low flow plumbing fixtures, etc. throughout the building also constitute the sustainable design principles of 'next-gen' libraries. New contemporary public and university library buildings that were built from the late 1990s onwards, such as The Royal Library / Black Diamond (1999), Sendai Mediatheque (2001), Seattle Central Library (2004), Turku Public Library (2007), Helsinki Kaisa House (2012), National Library of Latvia (2014), Freiburg Library (2015), Oodi Helsinki Central Library (2018), can be specified as examples that reflect the development and architecture of 'library operations' in connection with the modernization of society [21]. Further there are stated new design criteria that provide research and creativity in the architectural design of these 21st century contemporary libraries [5], [22].

Examples of the new design criteria for libraries are as follows:

- **Accessibility:** In terms of pedestrian and public transportation accessibility in the city, they should be located centrally.
- **Visibility, aesthetics and symbolism:** With its bold and magnificent architectural form and façade that reflects the value that society attaches to knowledge, education and research it should have a monumental stance at the focal point of the city.
- **Spatial Organization:** As learning centres, libraries should have flexible, bright and easily perceived spaces for both individual and group work (reading rooms with shelves, resting and comfortable reading-living rooms called 'third place', play and reading for children, workshops, etc.).
- **Access to collections:** In terms of their functions, libraries are information space that plays an important role in education, enlightenment and democracy with their books and electronic resources. Therefore, all library materials should be organized in such a way that everyone can access them, regardless of class, race, origin, language or education.
- **Self-study:** Users should be allowed to use libraries at convenient times (in the evenings and weekends).
- **Integration:** Libraries should be venues and meeting points with ambience and style that motivates the user to go to the world of books, media and research without feeling any obligation (special event spaces, music recording rooms, concert hall, exhibit hall, bookstore, museum, as well as the existence of multi-purpose activity areas such as cinemas and restaurants).
- **Sustainability:** Libraries should address environmental values by using recyclable materials such as steel, glass and wood, as well as innovative lighting, energy and air conditioning concepts. Indoor and outdoor continuity should be ensured.

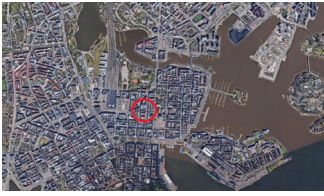
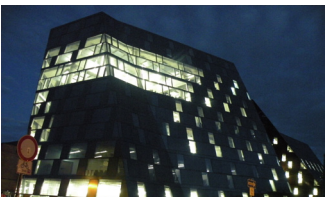
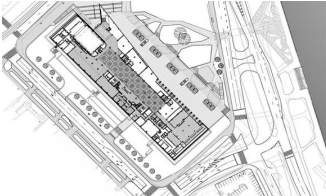
III. The Helsinki Oodi Library

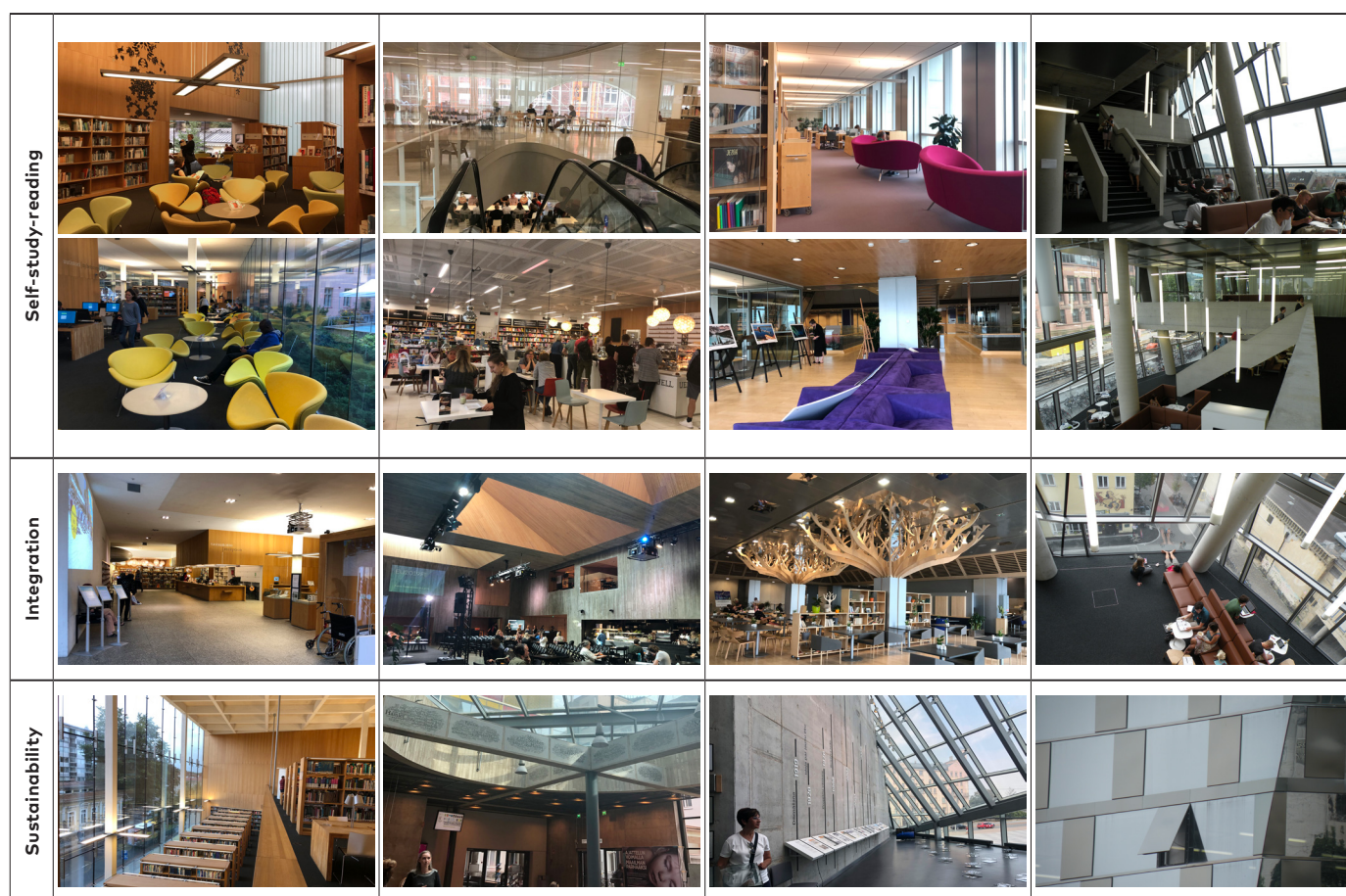
A. Historical Evolution

Access to libraries is a free and legal right for all citizens in Finland, where libraries have had a very significant place in civic life since the 1800s. When the country gained independence in 1917, libraries were regarded as an investment in human capital, and education was adopted as a tool to promote social and economic development. In the country where the literacy rate is very high, library use is also very high. After World War I and II, and until the 1980s, many new libraries were built and the number of users continued to increase rapidly [24]. The transformation process into 'an information network society', which has been taking place since the 1990s, has also had an impact in Finland. The widespread use of the Internet in the early 2000s, as well as the rapid increase in digital resources has also changed the act of reading books. While the rapid progress in information and communication technologies has affected every aspect of life, it has been the main

TABLE II

Examples of Contemporary Libraries (Kaisa house spatial organisation [23], other images are by the author, 2018–2019)

Design criteria	Public Library/2007 Turku, Finland	Main Library Kaisa house/2012 Helsinki, Finland	National Library/2014 Riga, Latvia	University Library Freiburg/2015 Freiburg, Germany
Urban accessibility				
Visibility, symbolism	 	 	 	 
Spatial organization				
Access to collections	 	 	 	 



impetus behind the change in both the functional and architectural form of libraries in Finland. The initiative to build high-tech and multi-functional modern libraries that represent equality, participation, citizenship and freedom of expression according to the conditions of contemporary Finnish culture was put on the public agenda. In 2011, an international architectural project competition was held for the construction of this building, slated to become the centre of the country's library network, as part of the 'World Design Capital of Helsinki 2012 Program'. Of the 544 projects that participated in the competition, the design submitted by the Finnish 'ALA Architects' firm was selected and implemented [19]. It was completed in 2018, the 101st anniversary of the country's independence, and opened its doors to its users the same year.

B. Contextual Location

Situated in a special area in Helsinki – Kansalaistori Square, the Oodi Library building is surrounded by fine arts and culture buildings designed by many famous architects – The Finnish Parliament Building (Johan Sigfrid Sirén), Congress Hall (Alvar Aalto), Music Centre and Sibelius Academy (Marko Kivistö, Mikko Pulkkinen, and Ola Laiho), and Kiasma Contemporary Art Museum (Steven Holl) (Table III).

C. Features of the Plan and their Functional Distribution

Led by Architect Alvar Aalto, Finland's strong tradition of modernist architecture, the building with simple forms and wood is one of the key locomotives of the country's modernism. These features are clearly visible in the design of the Oodi Library. With a construction area of 16 000 m², the architectural program of the building creates meeting and socializing spaces such as reading halls for adults and children, workshops that encourage creativity, special event areas, rehearsal and recording rooms for musicians, cinema, a cafeteria, and a restaurant. The spaces specified in the architectural program are functionally solved in the building's three floors (levels), namely the active ground floor, the social mezzanine floor and the quiet reading hall floor [25], (Figs. 1–3).

With a transparent and curved surface that draws Kansalaistori Square into the building, the ground floor is an active public space open every day of the week for quick visits and excursions and is accessible to all the library's facilities. Complete with a multi-purpose hall, cinema, a restaurant and cafe, its spacious lobby serves as a venue to meet, discuss and present ideas. The library's additional services include photography and video workshops and venues with special functions such as a music studio,

TABLE III

Position of Oodi Library Among Cultural Institutions [by the author, 2018]

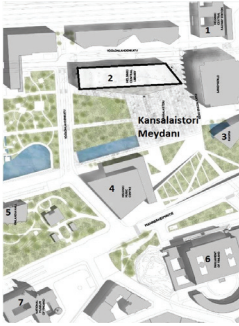
Contextual location of Oodi Library		
 1. Helsinki Garı 2. Oodi Kütüphanesi 3. Kiasma Çağdaş Sanat Müzesi 4. Helsinki Müzik Merkezi 5. Finlandia Hall (Kongre M.) 6. Parlamento binası 7. Milli Müze Kansalaistori Square	 Oodi Library	 Kiasma Museum of Contemporary Art
 Finnish Parliament House	 Finlandia Hall	 Helsinki Music Centre



Fig. 1. View of the Oodi Library [photographed by the author, 2018].

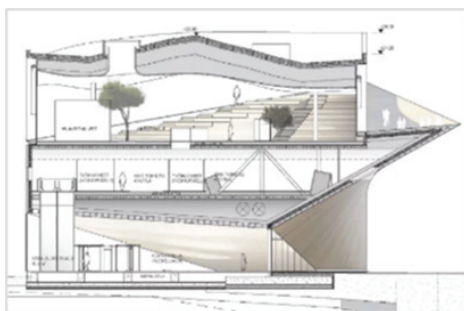


Fig. 2. Cross section of the Oodi Library [26].

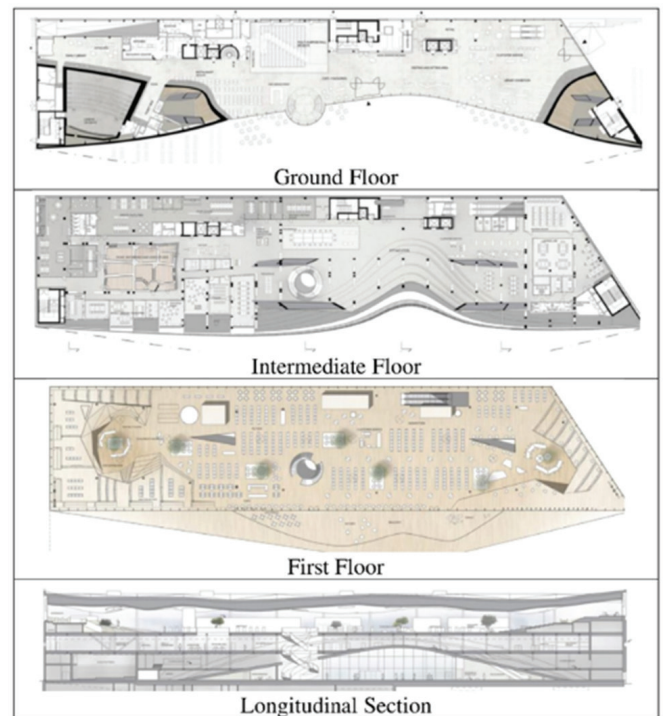
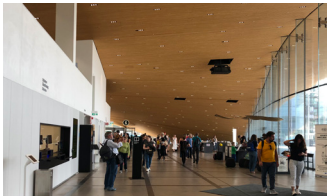
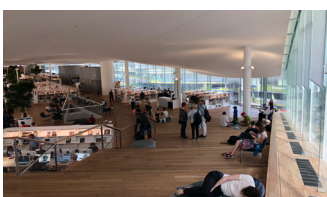


Fig. 3. Layout and longitudinal section of Oodi Library floor plan [26].

TABLE IV

Functional Distribution on Different Floors [developed by the author, 2018]

Functional layout of Oodi Library		
Floor plans	Images	Functions
Ground Floor: Active public space	 	Meeting and discussion: • lobby, • multipurpose hall, • cinema, • restaurant, • cafes
Middle Floor: Visual and auditory interaction area	 	Collaboration, and learning: • Photography and film workshops, • 3D printing workshops, • rehearsal and game rooms, • music recording studio, • model workshops
Upper Floor: Reading area for adults and children	 	Reading hall: • adults reading, • adults rest-comfort reading, • games and reading for children, • viewing the city from the 'city balcony' terrace
Architectural form	 	• Simple • Soft • Flexible • Striking • Geometric

rehearsal and game rooms. Finally, there is a reading hall on the upper floor, which can be only defined as a 'book paradise.' The circular skylights and cloudlike white undulating ceiling of the reading hall provide excellent natural light and appearance to the space. The raised wooden floor areas at either end of the reading room are particularly functional. While one of these areas is designated as play and reading section for children of different age groups, the other is arranged as resting, watching and comfortable reading area for adults. Both areas are arranged in the form of large stepped auditoriums, while accessibility is bolstered via long ramps. Referred to as the 'city balcony', the terrace accessed from this floor, overlooks Kansalaistori Square and provides a panoramic view of the city [25], (Table IV).

D. Design Criteria

The architecture design criteria of the Oodi Library that enables learning, research and creativity are presented in Table V.

E. Sustainable Construction Technology

Building Information Modeling (BIM) was used for the structurally sculptural geometric form of the Oodi Library in both the design phase as well as the on-site application and operation-use process (for some on-site modifications). The BIM incorporated in the building's versatile project facilitated close cooperation between the designer and suppliers (steel-concrete-wood-glass), thus structural and mechanical difficulties were solved, and the construction was conducted without compromising architectural integrity from the aspects of function and form (Table VI).

F. Sustainable Architectural Features

The sustainable architectural features of the Oodi Library, which were revealed by both on-site determinations and literature studies, are listed as follows [21]:

TABLE V

**Architectural Features of the Oodi Library
in Accordance with the New Design Criteria
[developed by the author using [5] and [22]]**

Design Criteria	Suitability
Urban Accessibility:	
Mass transit accessibility	✓
Downtown location	✓
Pedestrian accessibility	✓
Public transport accessibility	✓
Handicapped accessibility	✓
Visibility-Symbolism-Aesthetics	
Contributes to the Community	✓
Iconic form	✓
Iconic facade	✓
Transition symbol from 'Knowledge' to 'Learning'	✓
Participatory planning	✓
Awards (IFLA)	✓
Spatial Organization	
Easy perception	✓
With shelves-open reading	✓
Comfortable reading atmosphere	✓
Children's reading section	✓
Restive – cafe	✓
Balcony – outdoors reading	✓
Access to Collections	
Accessible to everyone	✓
Self-study and Reading	
Open at night and on weekends	✓
Integration – collaborative learning	
Group study rooms	✓
Photography and video workshop	✓
3D Printing workshop	✓
Rehearsal and game rooms	✓
Music recording studio	✓
Model workshop	✓
Sustainability	
Ecological-Economic-Social	✓

- Built with recyclable (environmentally friendly steel-glass-wood) and local building materials.
- Has an energy-conserving building envelope.
- High quality and energy efficient lighting and mechanical systems have been used.
- Energy savings are achieved in areas such as lighting, heating, ventilation.
- Renewable active and passive energy systems have been used.
- Indoor air quality, acoustic and humidity control is ensured.

- Spatial comfort is provided by using materials and products which require a minimum of maintenance and repair.
- Urban residents (users) were included in the design process from the very beginning.
- It has revitalized the urban living environment where it is located.
- Accessible learning-entertainment-socializing activities are provided free-of-charge for users of all ages.
- Emphasis is placed on the concepts of equality, participation and citizenship.

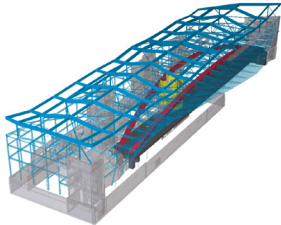
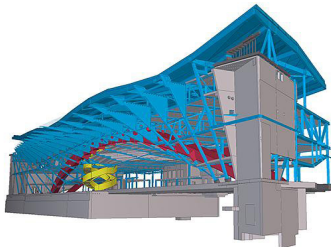
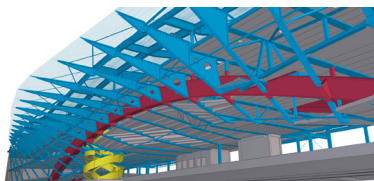
IV. Discussion

With the integration of information and communication technologies into libraries, the connection of information and documents with the traditional physical space has been partially cut off. This situation has led to questioning whether the Internet will replace books and as a result library buildings will lose their importance. In the changing world, it is clearly seen that paradigms shift with changing values and each new paradigm brings its own solution proposals and designs. The change in the knowledge acquisition paradigm also required the initiation of major changes in the design of library buildings and new architectural solutions. Prior to discussing new architectural solutions, the question shall be asked whether the libraries will continue to play a valuable and important role in learning and teaching or not? [16]. Subsequently, the question of 'as an intellectual living centre, how should it keep up with the changing paradigm?' must be answered. The answer to this question may be that libraries that provide access to information must assume new roles in line with the changing paradigm and be equipped with new skills and competencies in order to survive in the 21st century. The answer to the same question may be redefining and reorganizing of the architectural design of library buildings.

In the 21st century, intellectual life centres are audio-visual interaction environments for consuming culture and leisure as well as information acquisition and learning processes. These environments are innovative environments that provide information gathering and study spaces, social spaces, cafes and even leisure activities [19]. The mentioned environments, the inclusion of the newly constructed library buildings in the architectural needs program can also represent a sustainable architectural product. Urbanek presents in his work such 'new architectural design criteria' as accessibility, symbolism, spatial organization, access to collections, self-study and integration [5], [22] that can provide resources for newly built libraries. Examining the Oodi Library, which constitutes the sampling area of this study, according to the above-mentioned 'new architectural design criteria'

TABLE VI

Sustainable Construction Technology of Oodi Library [21], [27]

Sustainable Construction System		
		
		
		

showed us that libraries will continue to play a valuable and important role in learning and teaching after the paradigm shift in information technology with digitalization.

Conclusions

The rapid progress in information and communication technology and the massive digitization of library material brought debates to the fore as to whether the importance of libraries would diminish or not. However, many of the libraries use new information technologies, thus acquiring a new vision by combining social, educational learning, teaching and research models with new user-oriented services. Libraries have changed from being a venue to distribute information to one where information will be produced, thereby taking on new roles as a communications space. As it was back in antiquity, this role includes discussion and the exchange of ideas, socialization and cultural enrichment amongst citizens.

In going beyond the pale of being venues that present materials on shelves and in quiet working environments, the 'next-gen' libraries of the 21st century are places that display their materials in different and interesting styles. They have now begun to operate as cultural centres where

art, music and cinematic activities are made available and various activities are organized. This situation rendered redefining the architectural design of library buildings, rearranging them with 'new architectural design criteria.' Some researchers have revealed that many library buildings were designed and built with 'new architectural design criteria' such as accessibility, symbolism, spatial organization, access to collections, self-study and integration. Over the past two decades, 'next-gen' libraries incorporating interesting architectural forms have become a centre of attraction that enlivens the cities where they are located. The functions and architecture of one of these libraries, the Oodi Library, has been examined within the scope of new architectural design criteria. With its digital information technology, sustainable construction technique, comfortable-flexible-safe spaces that encourage research and creativity, while offering an exchange of ideas and information, which Oldenburg defines as the 'third place', it is seen that this library successfully reflects the 'urban living room' function while reflecting the new architectural design criteria in superb fashion. In addition to its iconic architecture with high craftsmanship, it has projected a vision of participation, citizenship and environmental awareness, as it makes positive contributions to urban life.

In conclusion, while the paradigm shift in information technology with digitalization was the catalyst that transformed the 21st century libraries into centres of intellectual life, it also reinforced its role as a symbol of education, equality, transparency and civilization.

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Ayşe Sirel, Ph.D. (Turkey)
Assoc. Prof. Dr, Istanbul
Aydin University, Istanbul.
Dr Sirel completed her
undergraduate education in
Architecture Department
of Mimar Sinan University
in 1980. She received her
Master's degree from Yıldız
Technical University in 1982.
In 1993, she completed her
doctorate in Mimar Sinan

University City and Regional Planning Department. She worked as assistant at the same university from 1983-1993 and was an Assistant Professor with Trakya University Faculty of Architecture from 1994-2008. Since 2009, she has continued her academic studies at Istanbul Aydın University. Sirel became an Associate Professor in 2017. She has written a number of articles, symposium papers and a book chapter in national and international editions and on the field of architectural design and urban design. She is currently the editor of the IAU Architecture and Design Faculty journal "A + Arch Design".

Contact Data

Ayşe Sirel

Department of Architecture, Faculty of Architecture and
Design, Istanbul Aydın University, Istanbul, Turkey
E-mail: aysesirel@aydin.edu.tr