

Persian translation of this paper entitled:
ارتباط فناوری و حفاظت در معماری معاصر، تحلیلی بر مبنای
بازخوانی تحولات نقش معمار در حفاظت معماری
is also published in this issue of journal.

Original Research Article

Relationship of Technology and Conservation in Contemporary Architecture An Analysis Based on Re-Reading the Role transformations of Architect in Architectural Conservation*

Mahnaz Peyrovi¹, Mohammad Bagher Kabir Saber^{**2}, Mohammad Reza Pakdelfard³, Adel Ferdousi⁴

1. Ph.D. Candidate, Faculty of Architecture and Art, Department of Architecture, Tabriz Branch, Islamic Azad University, Tabriz, Iran.
2. Assistant Professor, Faculty of Architecture, College of Fine Arts, University of Tehran, Tehran, Iran.
3. Assistant Professor, Faculty of Architecture and Art, Department of Architecture, Tabriz Branch, Islamic Azad University, Tabriz, Iran.
4. Assistant Professor, Faculty of Technical and Engineering, Department of Civil Engineering, Tabriz Branch, Islamic Azad University, Tabriz, Iran.

Received: 24/12/2019 ;

accepted: 25/10/2020;

available online: 21/03/2021

Abstract

Problem statement: The relationship between “Architecture” and “Architectural Conservation” based on interconnected common foundations, is a traditional issue. The problem of the present research, formed around a triple relationship among “Architecture”, “Technology” and “Architectural Conservation” parallel to technological evolution, has resulted in ambiguities in the architect’s role in the modern triple relationship, which has not yet been resolved in the developing societies.

Research objective: The purpose of this study is to investigate the architect’s role in architectural conservation following the technological evolution from traditional to advanced in Western developed societies to attract the attention of developing societies to this issue.

Research method: This paper was written by a combination of historical and causal methods that are the qualitative approach’s subsets.

Conclusion: “Architectural Conservation”, after challenges that have had by pure attention to the artistic or technical aspects of “Architectural Technology” as well as the neglect of social values, nowadays, has chosen a middle ground that considers both dimensions and social values, affected by culture-oriented paradigm. The connection of “architecture”, “technology” and “architectural conservation” to each other and society as a rule derived from the culture-oriented paradigm, has made the presence of the architect in architectural conservation inevitable in terms of covering architectural dimension in this triple relationship on the one hand and establishing a connection between this triple and the society’s culture on the other hand. Besides, considering the architect’s ability to establish a suitable interaction with the experts of “Technology” and “Architectural Conservation” and create a favorable balance between these two domains, it is the architect’s responsibility to take on the leadership of this relationship as a professional duty.

Keywords: *Technological Evolution, Architectural Technology, Architectural Conservation, Role Transformations Of Architect.*

* This paper is extracted from “Mahnaz Peyrovi”’s Ph. D. dissertation entitled “The challenge of high technology in the conservation of Iranian architectural heritage; with an emphasis on the role of the architect” which is done under the supervision of Dr. “Mohammad

Bagher Kabirsaber” and Dr. “Mohammadreza Pakdelfard” and advisement of Dr. “Adel Ferdousi”, at “Faculty of Architecture and Art” “Tabriz branch, Islamic Azad University” in 2020.

** Corresponding author: +982166409696, kabirsaber@ut.ac.ir

Introduction

Architecture is the art of space creating and architects are activists that have chosen this art as a profession. But the role of architects is not limited to designing and creating new architecture works and studying the background of this profession indicates the activity of architects in a different role but in line with the creation of space. This role is to repair, change and improve the architectural structures that have already been created by other architects. Because of the fundamental common mode of “created” and “being created” architectural structures are the element of space and the competent professional to manage the space has been the architect. Accordingly, changing architecture has always been an integral part of the architecture profession as a whole.

Therefore, epistemologically, the relationship between “architecture” and “architectural conservation” is a traditional issue, not a modern one. But the issue under discussion is rooted in the two-dimensional foundation of architecture; because architecture is knowledge, one dimension of which is art and the other dimension is technology and after the Industrial Revolution, due to the separation of these two dimensions, architecture has lost its totality (Benevolo, 2011, vol. 1, 38). Naturally, this issue also affected architectural conservation and due to the dichotomy of architecture, the threefold relationship between “architecture”, “technology” and “architectural conservation” emerged as a new issue in the field of architectural protection and followed by that the architect lost its former position in the field of conservation and challenges arose around this issue.

However, the purpose of the present research is not to prove the issue of contemporary architectural conservation. Because, nowadays, in western developed societies, the position of the architect has been fully defined in this field. However, in developing societies such as Iran, although the importance of the role of the architect as the leader of conservation measures is proposed, it is not a settled issue and the conservative interventions have a historical and archaeological approach, not an architectural one (Vatandoust, 2015, 33). Meanwhile, in traditional

architectural conservation of Iran, the architect as the director of conservative measures established an alliance between the various guilds involved in the conservation to continue the operation and increase the efficiency of the building. For instance, a masterpiece such as the Isfahan Grand Mosque has always had an improving cycle and at the same time continuity of function with interventions under the supervision of the architect, for several hundred years (Abbasi Harofteh, 2016, 176-177). However, after Iran faced scientific conservation, the former role of the architect in conservation measures was largely ignored. This is because the issues of scientific conservation are phenomena that are the result of the ideas and opinions of the last two centuries in Europe. Therefore, we are just importers and have not examined the changes experienced in the mentioned societies in this field (Abolghasemi, 1995, 41-40). For this reason, there was a need for research to re-examine the evolution of the role of the architect in the conservation of architecture in parallel with the evolution of architectural technology from traditional to advanced in developed western societies. Therefore, the purpose of the present research is to re-examine the architect’s role in the architectural conservation issue after the transition from traditional to advanced method caused by technological evolutions in the western developed societies and the question that arises based on this purpose is that how the architect’s role in architectural conservation has evolved in the western developed societies after technology evolution from traditional to advanced?

Literature review

However, based on this article’s question and purpose, the sources with a deeper look into how this role is played have been highlighted in this section as follows: In his book “Conservation Historic Buildings”, Feilden (2016, 14-15) emphasized the need for the architect to play a role as a leader of conservation measures concerning various specialties while recommending the need to play the role of various specialties in the field of conservation and

he draws an analogy between this position and the role of the conductor of an orchestra who must create a work of art with the help of musicians. Moreover, Salvador Munoz Vinas (2019, 101-104 and 150-152) in the book “Contemporary Theory of Conservation”, Orbasli (2008, 208-210) in the book “Architectural Conservation” and Fred Scott (2019, 25 & 189) in the book on “Altering Architecture” have recommended the necessity for the architect to pay attention to social needs and values in conservation measures in addition to emphasizing the importance of architectural specialization role-playing and the cooperation of different professions with this specialty. Some experts have also addressed the challenges that have arisen during a period in history in western societies due to the lack of architect’s proper role-playing in the field of conservation. In this regard, Siegfried Giedion (2011, 10-47) in his book “Space, Time and Architecture” has considered the separation of engineering and architecture from each other and from society as a factor in damaging the architectural heritage after the Industrial Revolution. Benevolo (2011, vols. 1-5; 2016, vols. 1-5) in his books “History of Renaissance Architecture” and “History of Modern Architecture” has repeatedly referred to the destructive effect of separation of engineering from architecture in the field of architectural conservation. Besides, Christopher Alexander (2015, vol. 2; 2016, vol. 1) in his book “The Nature of Order” has considered the trampling of a large part of the historical context in the twentieth century as a result of the separation of specialties and lack of attention to totality.

Regarding the discussions in this field in Iran, we can refer to the recommendations of Bagher Ayatollahzadeh Shirazi (2003, 11). According to this expert, the task of the architect is to coordinate the various specialties involved in the conservation project. Accordingly, the architect plays the role of a versatile expert in this field. Besides, while leading the specialties, the architect is obliged to lead the project in a direction that meets the needs of today’s society. Furthermore, Asefi and Radmehr (2014, 40), in the article “Promotion of improvement of physical heritage

in the technical area and architecture restoration with an attitude of reconciliation between the two attitudes” attributed the failure of most conservation projects in Iran to the lack of architects’ proper role-playing and believe that architects, due to the nature of their specialization, are aware of historical values and structural behaviors simultaneously and can play an understanding role between these two professions with interdisciplinary knowledge.

The focus of these studies has been the desirable role of architectural expertise about other disciplines involved in conservation. However, for developing societies such as Iran, where both the specialization of professions and scientific conservation are imported concepts from the beginning of the present century, as mentioned in the introduction, merely these recommendations have not been very effective. Therefore, the analysis and explanation of the evolutions of the architect’s role are of great importance that has been studied in the present research. These evolutions have resulted from the evolution of specialized disciplines’ relationship over seven centuries from the early Renaissance in western developed societies and eventually led to such an accepted rule about the role of the architect.

Theoretical foundations

An important issue to consider is the interdisciplinary nature of architectural conservation. This issue was neglected until several centuries after specialties separation in western societies and subsequently, challenged the role of the architect in this field. So that finally, from the end of the twentieth century, the intermediate nature of this profession was considered and emphasized in international charters. For example, one of the clauses approved in October 2003 in Zimbabwe states that “conservation, restoration and consolidation of architectural heritage require a multi-disciplinary approach” (ICOMOS., June 2020). In developing this issue, another strategy recommended in this International Charter states that “in a team with interdisciplinary expertise whose members are appointed following the type and scale of the architectural

conservation issue, cooperation must be made from the beginning of study process and conservation measure” (ibid., 2020). However, it is necessary that the product and output of this teamwork, be homogeneous and have a coherent whole, in terms of technical and artistic characteristics and also be integrated with society, i.e. meet the social needs (Fielden & Jokilehto, 2010, 19). The realization of such an issue that can result in an effective performance in architectural conservation is a serious matter whose necessity and importance must be explained to the government managers and planners (ICOMOS., June 2020). Now, based on the abovementioned cases, the criteria that the present study has considered for the separation of courses and as a support for examining the topics of each course are the evolutions in the type of relationship of specialties with each other and the society in the two areas of “architectural technology” and “architectural conservation” and consequently the evolutions of the relationship between the two areas in each period compared to the previous one, to examine the evolution of the role of the architect as a result of these causes and variables in different periods.

Research method

The present article is a qualitative study, in process of which the historical research method² was used in terms of examining the evolutions of the relationship between “architectural technology” and “architectural conservation” in different historical periods and the causal method¹ was used in terms of examining the cause of revolution in architect’s role affected by the variables defined in theoretical foundations of the research. Meanwhile, the data collection was used mainly done by the library research method.

Architectural technology and conservation in the traditional era (before architecture used the products of the industrial revolution)

• From the beginning to the fourteenth century A.D.

Although the period considered in the present study is

after the Renaissance period (i.e. after the beginning of the first advances in experimental science and early technological achievements) (Gardner, 2017, 348), to study the process of evolution, a review of pre-Renaissance conditions (i.e. before fourteenth century A.D.) has been done which is explained below.

- Architectural technology

Architectural technology from the beginning to the fourteenth century A.D., i.e. until about the beginning of the Renaissance period has been a set of cohesive and intertwined sciences without distinguishing between architecture and engineering. As Vitruvius, the engineer of the ancient Roman emperor, - believed that the design and construction of a building should be done under the supervision of the architect, taking into account the three principles of statics, usefulness and beauty (Margolius, 2012, 21). Although the gradual advancement of technology during this period - especially in the Late Middle Ages - made it possible to build buildings with better strength and quality over time, the creations continued according to this nature (ibid., 31-32).

Besides, the organization of project design and implementation was hierarchical, in a way that lower-level architects covered the relationship between the architect and the executive agents and thus, a coherent relationship was established between the architect’s thought and execution (Nari Qomi & Navai, 2019, 41-42). Moreover, the constructions were all in line with meeting social needs and values (Nari Qomi, Tehrani, Raja Qomi, Abbaszadeh & Mahallatian, 2016, 31-38).

- Architectural conservation³

Since the human-built a shelter for himself or a storehouse for his food or the like, to continue using the building, He was required to renew and rebuild them frequently (Nari Qomi et al., 2016, 32). These measures were also applied to public buildings on a larger scale, in reconstruction measures of which, in addition to continuity of use, values such as aesthetic value, belief value, etc. have been proposed (Jokilehto, 2009, 2-16). But the motivation for creating the works was nothing but this. Therefore,

architectural conservation was not something different from architecture, which itself was integrated with engineering (Table 1).

• Fourteenth to sixteenth centuries (Renaissance)

- Architectural technology

The Renaissance was the beginning of a transformation in the uniform process of using traditional techniques in human life. During this period, great technical discoveries and inventions took place (Benevolo, 2015, 64). Also, discoveries were made in the field of art, including the discovery of the concept of perspective (Ghobadian, 2005, 20). In parallel with these developments, architects were able to create architectural masterpieces by combining developed art and technique (Margolius, 2012, 21), among which is Brunelleschi’s masterpiece in designing and constructing the dome of the Church Santa Maria del Fiore in Florence (Mainstone, 2001, 125-129).

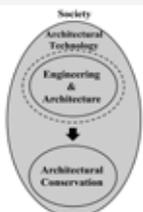
The beginning of humanism in this era and the value of works of art in the name of the artist were not ineffective in giving the field of action to show the abilities of these geniuses (Ghobadian, 2005, 19); but on the other hand, this issue, created a gap between the architect and the society. Moreover, in this period, following the introduction of principles based on the separation of the architect from the executive affairs, the first seeds of the separation of the user from the design and solution of the architectural problem were formed (Nari Qomi et al., 2016, 269; Nari Qomi & Navai, 2019, 43).

- Architectural conservation

During this period, a sense of admiration for the remnants of ancient Greece and Rome buildings and, a conscious cognition about these works, emerged as “heritage” (Orbasli, 2008, 16). In this regard, as stated by Jokilehto (2009, 17), “the Renaissance is a turning point in terms of attitudes towards ancient monuments”. This new attitude led to some measures for the maintenance and reconstruction of historic buildings. However, there was no framework for the mentioned measures and any manipulation in the building was allowed (Benevolo, 2015, vol. 1, 200-233).

Paying attention to classical works was not only for the preservation and maintenance of these works but also a model for modern architectural creations. Therefore, architectural conservation was a function of architectural classicism, which at the same time was not separate from engineering concepts. Besides, conservation measures, following architecture, began to disconnect from social values, in a way that the architect thought that he had the authority for any manipulation in completing and reconstruction of the works. One of the best and most creative examples of this period is the Capitoline Hill project designed by Michelangelo, which was built in 1537 A.D. This project is a successful example of architectural design and at the same time a reconstruction in the Renaissance, which was designed and implemented by prioritizing the principle of “respect for the remnants of buildings existing in the past periods” (Gardner, 2017, 437) (Table 2).

Table 1. Findings related to different period from the beginning to the fourteenth century A.D. . Source: authors.

The Relationship between Architectural Technology (Including Engineering & Architecture) and Architectural Conservation	Architectural Conservation		Architectural Technology	
	The Relationship among Specialties	The Relationship between Specialties and the Society	The Relationship among Specialties	The Relationship between Specialties and the Society
	- Conservation, a Function of both Engineering and Architecture Continuous	- Coherent Relationship with Executive Agents - Paying Attention to Social Values Continuous	- The Entanglement of Engineering and Architecture under the supervision of the Architect Continuous	- Coherent Relationship with Executive Agents - Paying Attention to Social Values Continuous

• **Seventeenth century**

- **Architectural technology**

The beginning of this era was almost simultaneous with the introduction of the rational thought of the famous philosopher René Descartes, who questioned the philosophy and worldview of the traditional world by uttering his famous phrase “I think, therefore I am” (Ghobadian, 2005, 23). Following him, the attachment of most philosophers to Cartesian reasoning - which rarely addressed artistic concepts - as well as the establishment of the Royal Academy and the use of Descartes’ guidelines by academics, provided grounds for the separation of engineering from architecture (Benevolo, 2015, vol. 4, 1104).

On the other hand, in this period, due to social, economic and political conditions, technological advances were often used for the construction of urban infrastructures such as communication routes, shipping channels, ports, lighthouse buildings and similar structures. The important point to be considered is that such structures could not be designed and implemented within the capabilities of the architect; therefore, technical men who had higher ranks than architects were employed (ibid., 1113-1105). Besides, in the continuation of the idea of separating the architect from the executive affairs, the architect’s assistants, instead of playing a role as a mediator between the architect’s idea and execution, gradually worked in architectural offices under the supervision of the main architects (Nari Qomi & Navai, 2019, 43).

- **Architectural conservation**

During this period, architectural conservation continued as a function of architectural classicism and with a nature similar to architecture, in a way that there was no difference between architectural creations and architectural restoration in this period. For example, the final body of the restoration of the Monastery of Santa Susanna by Carlo Maderno in 1603 and the construction of the Church of Santa Maria della Vittoria by Maderno in 1605 both had similar styles and belonged to the same period (Benevolo, 2015, vol. 4, 924).

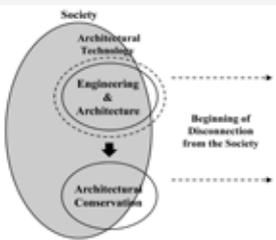
The only difference from the previous period was that the conservative architects in this historical period tended to pay attention to their character in the first place and not to the former architect. It seems that Bernini and Borromini in their restoration projects wanted the restored building to appear in the public sight like a newly published book so that people pay attention to their name (Benevolo, 2015, vol. 4, 963) (Table 3).

• **Eighteenth century**

- **Architectural technology**

At this time, a question had arisen in the minds of French philosophers stating that why technical advances did not lead to the fulfillment of the spiritual demands of the society (Monadi Noori & Taghavi, 2015, 115). But at the same time, the English model focused not on moral and spiritual excellence, but industrial and economic progress, that eventually, the impressive rise of British industrial progress led to the failure of the French model and the tendency of societies to

Table 2. Findings from the fourteenth to sixteenth centuries A.D. . Source: authors.

The Relationship between Architectural Technology (Including Engineering & Architecture) and Architectural Conservation	Architectural Conservation		Architectural Technology	
	The Relationship among Specialties	The Relationship between Specialties and the Society	The Relationship among Specialties	The Relationship between Specialties and the Society
	<p>- Conservation, a Function of both Engineering and Architecture</p> <p>Continuous</p>	<p>- Beginning of Conservative Architect’s Self-aggrandizement towards the Society</p> <p>Beginning of Disconnection</p>	<p>- The Entanglement of Engineering and Architecture under the supervision of the Architect</p> <p>Continuous</p>	<p>- Beginning of Architect’s Self-aggrandizement towards the Society</p> <p>- Beginning of Architect’s Separation from Executive Agents</p> <p>Beginning of Disconnection</p>

embrace the British model of progress and intensify the separation of technology from social values and demands (*ibid.*, 116-119) and also caused the importance of the industrial and engineering aspect in comparison to the artistic aspect in all aspects of technology, including architectural technology. Such conditions required more construction technical staff, which the academies could not provide. Therefore, the Faculty of bridges and causeways was established in 1747 and Mezieres Faculty of Engineering was established in 1748 (*Benevolo, 2011, vol. 1, 49*); and this was one of the most influential factors increasing the separation of engineering from architecture.

Furthermore, the continued inclination of mediocre architects to work in architectural offices, instead of playing the role of mediator between design and execution, led to the separation of the architect’s thought from society. Besides, the responsibility of these mediocre architects found a more prominent technical aspect with the advancement of science and technology that intensified the separation of engineering from architecture (*Nari Qomi and Navai, 2019, 43*).

- Architectural conservation

Although the absence of architecture from the technical advances of the time harmed this field, from another dimension, it provided an opportunity for the growth of ideas for the preservation and maintenance of architectural heritage; because by abandoning the technical dimension, the architects found more opportunities to study classical

works and began to examine more methodically, which led to the establishment of archeology (*Benevolo, 2011, vol. 1, 30-38; Rodwell, 2007, 1*).

Methodological studies of heritage were primarily aimed at discovering the rules and proportions for modern creations of classical architecture and a function of architecture in continuation of disintegration from the society and paying attention to the ideals of the conservative architects of this period (*Table 4*).

• Late eighteenth century

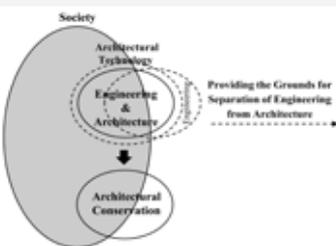
- Architectural technology

During this period, the continued superiority of the British model led to the increasing development of the civil engineering branches of technology and the specialization of these branches (*Benevolo, 2011, vol. 1, 45*). Besides, the process of gradual independence of the executive technicians guild in architectural offices was continued (*Nari Qomi & Navai, 2019, 43*).

- Architectural conservation

During this period following the previous one, parallel with moving away from the circle of science, the architect became more and more supportive of classical arts (*Margolius, 2012, 21*). Besides, the French Revolution and subsequently the government system supporting works of the classical period, played an important role in strengthening this attitude. Because Napoleon considered himself the successor of the ancient Roman emperors, so he emphasized caring for the works of that period (*Jokilehto, 2009, 77*). It can

Table 3. Findings related to the seventeenth century A.D. . Source: authors.

The Relationship between Architectural Technology (Including Engineering & Architecture) and Architectural Conservation	Architectural Conservation		Architectural Technology	
	The Relationship among Specialties	The Relationship between Specialties and the Society	The Relationship among Specialties	The Relationship between Specialties and the Society
	- Conservation, a Function of Classicism of Architectural Aspect	- Continuity and Intensification of Conservative Architect’s Self-aggrandizement	- Beginning of Separation of Engineering from Architecture under the Influence of Descartes’ Thoughts and Specific Social Situation	- Continuity of Architect’s Separation from Executive Agents
	Beginning of Disconnection	Continuity of Disconnection	Beginning of Disconnection	Continuity of Disconnection

be said that architectural conservation in this period, had a nature similar to that of the previous period and was a function of architectural classicism, which was intensified due to government support and the matter of conservation was more and more depleted from the engineering aspect (Table 5).

• **The first half of the nineteenth century**

- **Architectural technology**

During this period, the structures of historical buildings, especially the buildings of the Gothic period, became extremely important and the restoration of the appearance of the structure of these buildings with new materials and technologies was considered (Margolius, 2012, 13). This approach, called historicism, reduced architecture to pure decorative art. By dealing with formalist issues and expressing indifference to technical issues, architects introduced themselves as pure artists and left the construction and

technical part to others (Benevolo, 2011, vol. 1, 36). Although this caused the architect to completely ignore the executive affairs, on the other hand, it paved the way for the presence of new technologies in architecture.

- **Architectural conservation**

In this period, the conservation also changed its approach from paying attention and supporting the works of Ancient Rome and Greece to supporting the works of the Middle Ages especially the Gothic period (Jokilehto, 2009, 111-149). This movement became a prelude so that attention was gradually paid to the works of all periods and architectural styles and eventually led to the Stylistic Restoration in this area (Rodwell, 2007, 3). Therefore, it can be said that in this period, architectural conservation was still a function of the architectural aspect, which was on the verge of disintegration in terms of engineering and

Table 4. Findings related to the eighteenth century A.D. . Source: authors.

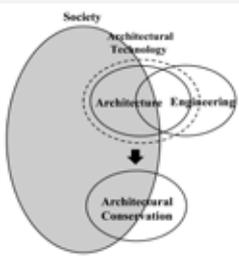
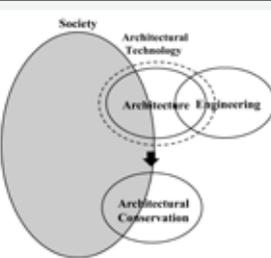
The Relationship between Architectural Technology (Including Engineering & Architecture) and Architectural Conservation	Architectural Conservation		Architectural Technology	
	The Relationship among Specialties	The Relationship between Specialties and the Society	The Relationship among Specialties	The Relationship between Specialties and the Society
	- Conservation, a Function of Classicism of Architectural Aspect Continuity of Disconnection	- Paying Attention to the Ideals of the Conservative Architects Continuity of Disconnection	- Excellence of Engineering Aspect, Continuity and Intensifying its Separation from Architecture following the British Model Continuity of Disconnection	- Continuity of Architect's Separation from Executive Agents -Separation of Technology from the Society following the British Model Continuity of Disconnection

Table 5. Findings related to the late eighteenth century A.D. . Source: authors.

The Relationship between Architectural Technology (Including Engineering & Architecture) and Architectural Conservation	Architectural Conservation		Architectural Technology	
	The Relationship among Specialties	The Relationship between Specialties and the Society	The Relationship among Specialties	The Relationship between Specialties and the Society
	- Conservation, a Function of Classicism of Architectural Aspect Continuity of Disconnection	- Paying Attention to the Ideals of the Conservative Architects and Government's Support of Architect' Classicism Continuity of Disconnection	- Specialization of Civil Branches of Technology and Separation of it from Architecture as Much as Possible Continuity of Disconnection	- Continuity of Architect's Separation from Executive Agents -Continuity of Separation of Technology from the Society following the British Model Continuity of Disconnection

also about to completely separate from society, in a way that the creativity of conservative architects has become the main basis of conservation in this era (Jokilehto, 2009, 167). For example, in the restoration of Madeleine Church in 1840, which was one of the projects carried out by Luduk, his ideas are evident in this action. In addition to rebuilding some of the backstays in the building, he added other backstays that have never existed before; even based on the belief in individual creativity, he added decorations to the church that the original building lacked (ibid., 157) (Table 6).

Architectural technology and conservation in industrial age (after architecture’s use of industrial revolution products)

• **Second half of nineteenth century**

- **Architectural technology**

From the mid-nineteenth century, as architectural technology was directly influenced by the achievements of the Industrial Revolution, governments turned their attention to construct buildings that were more effective in advancing their economic and political goals. These uses include railway station buildings, banks, factories, libraries and exhibitions (Tietz, 2018, 2; Parvizi, Mahdavinejad & Bemanian, 2016, 3). Most of the samples made for these uses, similar to what was common in the first half of this century, were created with the appearance of historical structures⁴ (Tietz, 2018, 3). Therefore, the issue of architecture in this period arose from

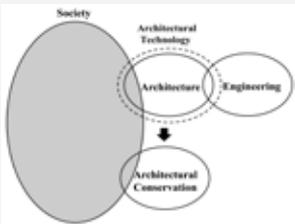
historical approaches and, in other words, the ideals of the architectural society, which is called the artistic paradigm (Nari Qomi et al., 2016, 50). On the other hand, the complete disappearance of the middle class of architects and the differentiation of array and executive plans brought the disintegration of specialties and the disintegration of architecture from the society to the final stage of development (Nari Qomi & Navai, 2019, 43-44).

- **Architectural conservation**

If architecture was affected by new technologies, centuries after their advent, this time lag was much greater in the field of architectural conservation, in a way that in the period being discussed, conservation was still alien to modern technologies. However, this does not mean that the science of architectural conservation has not been evolved. During this period, a movement criticizing stylistic restoration was spearheaded by theorists such as John Ruskin and Camilo Buito, who sought to restore the building to its previous status and this was the concept of conservation that gave rise to the new or modern concept of heritage conservation (Rodwell, 2007, 4; Stanley Price, Talley & Melucco Vaccaro, 2017, 282).

It can be said that the formation of the concept of heritage conservation in its present form was the result of a process of classicalism in architecture that began in the Renaissance and turned into historicism in the nineteenth century and reached its peak especially in the second half of this century, which eventually evolved to form the modern concept of heritage

Table 6. Findings related to the first half of nineteenth-century A.D. . Source: authors.

The Relationship between Architectural Technology (Including Engineering & Architecture) and Architectural Conservation	Architectural Conservation		Architectural Technology	
	The Relationship among Specialties	The Relationship between Specialties and the Society	The Relationship among Specialties	The Relationship between Specialties and the Society
	- Conservation, a Function of Historicism of Architectural Aspect	- Extreme Creativity of the Conservative Architects, the Main Basis of the Conservation	- The Architect’s Dealing with Pure Decorative Affairs and Assigning the Technical Affairs to Engineers	- The Architect’s Complete Disregard for Technical Affairs
	Complete Disintegration Threshold	Complete Disintegration Threshold	Complete Disintegration Threshold	Complete Disintegration Threshold

conservation. Although the separation of architecture from technological advances and the tendency towards classical styles, emptied architecture from architectural creativity, this trend is considered a success in the history of architectural conservation (Fig. 1).

Therefore, protection was a function of the architectural aspect of architectural technology, which in this period was completely disintegrated from the engineering aspect. Besides, protection following architecture has been against social values. Thus, the various extremist or moderate approaches of this movement, regardless of the needs of society, made comments only from the perspective of artistic viewpoint (Jokilehto, 2009, 191-234) (Table 7).

• **From the early to mid-twentieth century - Architectural technology**

For architects, the nineteenth century was a period in which their creativity declined due to the mere imitation of historical styles (Tietz, 2018, 3). On the other hand, the same century was an opportunity for engineers, due to their role in the construction of historic buildings, to become stronger (Benevolo, 2011, 83). Therefore,

in the first half of the twentieth century, the role and position of architects were threatened by engineers (Margolius, 2012, 21). Besides, the outbreak of World War I between 1914 and 1918 and the resulting damage, which required rapid reconstruction to get out of the situation, paved the way for the further advancement of the technological approach (Tietz, 2018, 28) and subsequently, the outbreak of World War II between 1939 and 1945 justified technological as much as possible (Benevolo, 2011, 925).

During this period, although architectural affairs still seemed to be under the control of architects, the nature of the agenda prioritized technology and method of construction over the artistic aspect. This view of the issue of architecture, which does not seek to form the desired body based on architectural ideas and creations, but mainly seeks to reduce construction time and cost and such cases as a result of the situation are called professional or technological paradigm (Nari Qomi et al., 2016, 57-59). Moreover, the replacement of the horizontal division of specialties instead of a hierarchical system - in the

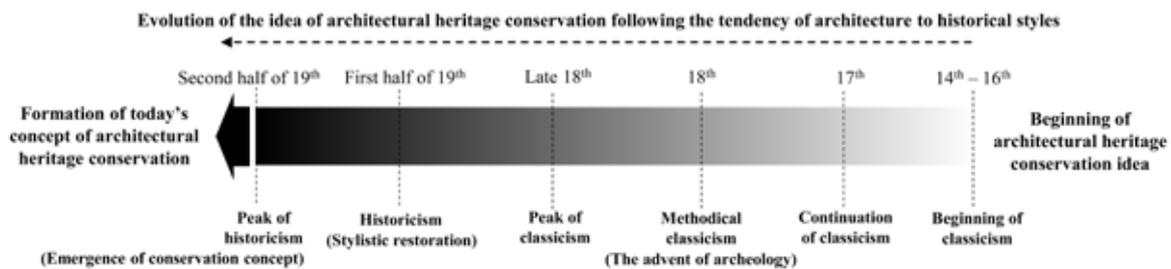


Fig. 1. The Relationship between classicism in architecture and the evolution of the idea of architectural heritage conservation. Source: authors.

Table 7. Findings related to the second half of nineteenth-century A.D. . Source: authors.

The Relationship between Architectural Technology (Including Engineering & Architecture) and Architectural Conservation	Architectural Conservation		Architectural Technology	
	The Relationship among Specialties	The Relationship between Specialties and the Society	The Relationship among Specialties	The Relationship between Specialties and the Society
	- Conservation, a Function of Historicism of Architectural Aspect Completely Disintegrated from Engineering Disintegrated	-Superiority of Mental Values and Desires of Artistic Conserver over Social Values Disintegrated	- Superiority of Architectural Aspect over Engineering Aspect and Distinguish between Array and Executable Drawings Disintegrated	- The Peak of Elitism and Superiority of the Historian Architect's Thought over Society -Complete Separation of Architect from Executive Affairs Disintegrated

continuation of the conditions of the second half of the nineteenth century - still kept the architect separate from executive affairs and the society (Nari Qomi & Navai, 2019, 43-44).

As it turned out, these conditions were the result of a centuries-long process that had begun in the Renaissance. Thus, with the emergence of architectural elitism and architect's self-aggrandizement in the Renaissance, architecture gradually moved away from social values and turned to the mental values of architects. Over time, this led to the architect's disregard for executive affairs and preoccupation with his mental goals, which in the nineteenth century appeared as the superiority of the historian architect over the society and after the world wars as the superiority of the technology-oriented architect over it Fig. 2.

- Architectural conservation

Following the devastation of World War I, the use of advanced technologies in architectural protection was finally considered and subsequently, with the issue raised at the Athens Congress in 1931, the use

of new techniques and materials, especially reinforced concrete was allowed in architectural protection (Jokilehto, 2009, 325). Paying attention to the use of new technologies become more important after World War II; because in this war, the historical centers of many countries, including the United Kingdom, the Netherlands and Germany were severely damaged (Rodwell, 2007, 5) and the importance of this was always confirmed in subsequent charters.⁵ Therefore, it can be said that if in the nineteenth century, the desires and mental values of art conservators prevailed over social values, this time, the ideals of technological conservators prevailed over social values (Table 8).

• Second half of the twentieth century

- Architectural technology

Since the 1960s, in response to the disregard for human values in a situation called "postmodernism", paradigms in architecture emerged around the centrality of the user; which can be referred to as the paradigm of "quasi-traditional" and "quasi-native" (Parvizi et al., 2016, 2; Nari Qomi et al., 2016, 93-112). However, due to the lack of

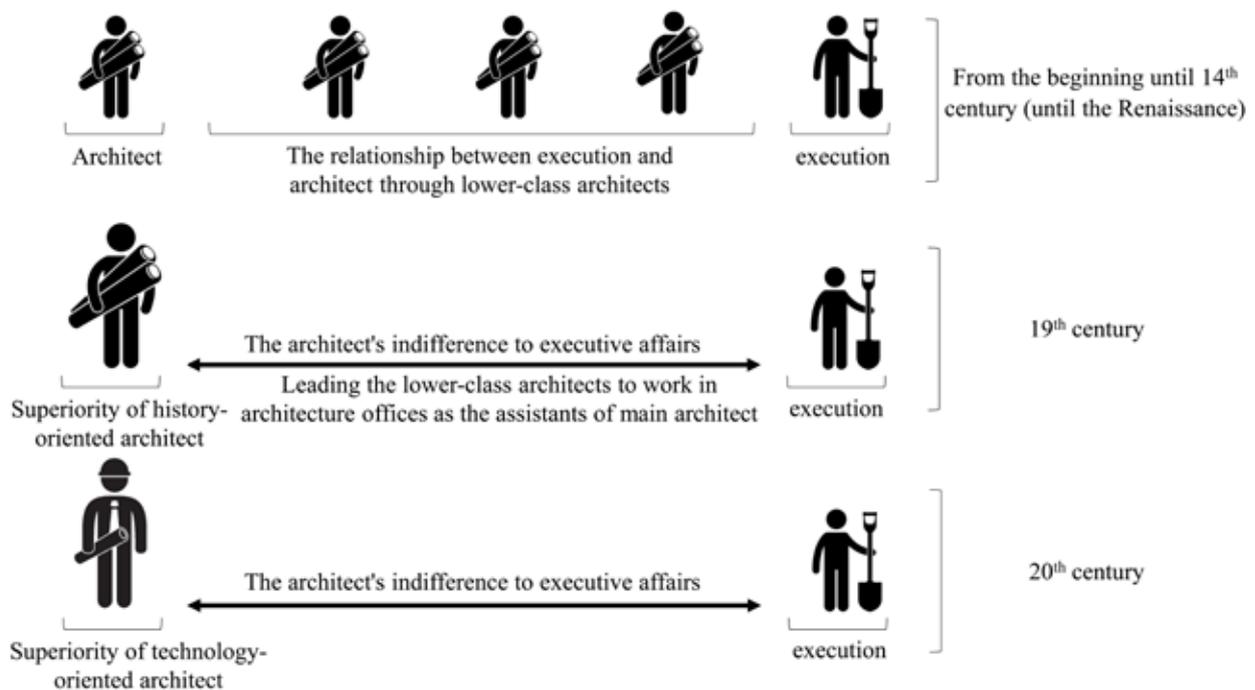


Fig. 2. Elitism and the elimination of the role-playing of lower-class architects, intermediate between architectural design and execution. Source: authors.

attention to the changing nature of technology and the inability to make connections between engineering and architecture, these paradigms finally found a concept imitating the past and lost their validity (Giedion, 2011, 13; Nari Qomi et al., 2016, 93-113). Besides, a major obstacle in these paradigms was that the architect’s attention was focused on a limited group of users, which could be very different from the general culture of the society (Nari Qomi & Navai, 2019, 76).

- Architectural conservation

In the second half of the twentieth century, in the field of architectural protection also, the attention of prominent figures shifted to the user-centeredness. In this regard, we can mention Renzo Piano as an architect that has carried out successful conservation measures in line with user-centeredness (Pizzi, 2010; Tibalds, 2015, 15). Nevertheless, the technological approach remained superior to the artistic aspect (Table 9).

• Late twentieth century until the present (Proposing the culture-oriented paradigm)

- Architectural technology

In response to the weakness of the “user-centeredness” paradigm approaches, the “culture-oriented” paradigm was proposed in the field of architecture in the late twentieth century. The science of psychology, which was the basis of the previous paradigms, shifted to the science of sociology and attention was drawn to the general culture of the society in the new paradigm (Nari Qomi et al., 2016, 125). Culture includes three areas: “history and heritage”, “society and current

lifestyles” and “geography and environment». The first area consists of components such as historical heritage and traditions; the second area includes components such as the current lifestyle, the contemporary pattern of work and recreation; and the third area includes components such as environmental protection and reducing energy consumption⁶ (Young, 2014, 114-252).

Furthermore, under this new paradigm, traditional and indigenous features were considered based on the changing nature of the twentieth century’s technology. Because according to the definition mentioned above, culture considers all traditional and historical areas as well as contemporary patterns and standards (ibid.). Accordingly, responding to the components of culture depends partly on engineers and partly on architects and requires the coherence of these two disciplines, which have long been disconnected.

- Architectural conservation

Following the introduction of the culture-oriented paradigm in the field of architecture, the attention of prominent figures in the field of conservation was also gradually attracted to this new paradigm. For example, Jokilehto (2009, 344) acknowledged that, nowadays, conservation must be based on simultaneous attention to cultural concepts and the use of rapidly evolving technologies; or, according to Giorgio Croci (2017, 163), today the selection of conservation techniques requires both technical knowledge and a broader cultural context. Besides, since the late twentieth century until now, several

Table 8. Findings related to the period from early to mid-twentieth century A.D. . Source: authors.

The Relationship between Architectural Technology (Including Engineering & Architecture) and Architectural Conservation	Architectural Conservation		Architectural Technology	
	The Relationship among Specialties	The Relationship between Specialties and the Society	The Relationship among Specialties	The Relationship between Specialties and the Society
<p>The diagram shows a large oval labeled 'Society' on the left. To its right are three smaller ovals: 'Architecture', 'Engineering', and 'Architectural Conservation'. 'Architecture' and 'Engineering' are connected by a double-headed arrow. 'Engineering' and 'Architectural Conservation' are connected by a downward arrow. 'Architecture' and 'Architectural Conservation' are also connected by a double-headed arrow.</p>	<p>- Conservation, a Function of Engineering Aspect Completely Disintegrated from Architecture</p> <p>Disintegrated</p>	<p>- Superiority of Mental Values and Desires of t-oriented Conservator over Social Values</p> <p>Disintegrated</p>	<p>- Superiority of Engineering Aspect over Architectural Aspect and Degradation of the Ability of Architects and the Conditions after World Wars</p> <p>Disintegrated</p>	<p>- Superiority of the Technology-oriented Architect’s Thought over Society</p> <p>Disintegrated</p>

articles have always focused on this important issue (Zeayter & Mansour, 2018). In other words, nowadays, unlike previous theories in this field, architectural conservation does not depend on the values and mental desires of conservators, whether artistic or technological ones (Yousefnejad & Flamaki, 2019, 10-11) and what is discussed is the connection of the architectural heritage atmosphere with the new world (ibid; Falahat, Kamali & Shahidi, 2017, 21). Today, due to the cohesive factor of culture, the aspect of architecture and technology engineering are considered concerning each other (Nari Qomi et al., 2016), so naturally, the architectural conservation in this new paradigm will be a function of both aspects. Besides, the architectural conservation affected by the attention to the general culture of society, is in integration with the society, too. Although the threefold relationship among “architecture”, “technology” and “architectural conservation” with each other and with social values, initially proposed as a rule of theory derived from the culture-oriented paradigm by experts in the profession, following the success of several architectural conservation projects carried out under this paradigm – that several examples of them were mentioned in the introduction – it gained credibility in the practical and executive dimension, too (Scott, 2019, 229-271). Paradigms gain their privileged position when they succeed in solving several problems, in addition to explaining new theories (Kuhn, 2017, 65). The culture-oriented paradigm also, after being presented as a theory, gained the necessary credibility and

position by providing the grounds for the success of several architectural conservation issues in the field of implementation and especially in recent decades, most conservation experts showed a tendency to the culture-oriented paradigm. (Scott, 2019, 229-251). As a result, numerous other projects - albeit less well-known - have been implemented based on this paradigm and we still witness an increase in the number of such measures in the developed western societies (Table 10).

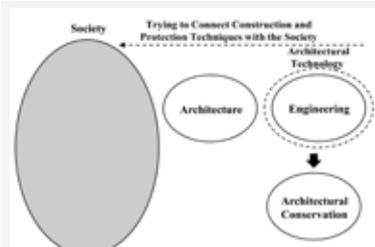
How to play the role of an architect in the contemporary architectural conservation

As it is known, nowadays the necessity of the threefold relationship among “architecture”, “technology” and “architectural protection” is considered by international communities. Therefore, the current role of the “architecture” specialty is examined in two areas.

• **The role of the architect in the field of Architectural conservation**

What is important for a conservator of the monument is the conservation of the original historical components and elements of the building and this often leads to a lack of importance to the expected spaces of the current society and leads to the elimination of the human dimension and finally abandonment of the building. However, the architect’s goal in architectural conservation is to respond to contemporary spatial values in addition to preserving historical elements (Ayatollahzadeh Shirazi, 2003, 11). Based on the ability to understand the space, the architect can provide new

Table 9. Findings related to the second half of the twentieth century A.D. . Source: authors.

The Relationship between Architectural Technology (Including Engineering & Architecture) and Architectural Conservation	Architectural Conservation		Architectural Technology	
	The Relationship among Specialties	The Relationship between Specialties and the Society	The Relationship among Specialties	The Relationship between Specialties and the Society
 <p>The diagram shows a large oval labeled 'Society' on the left. To its right are three smaller ovals: 'Architecture', 'Engineering', and 'Architectural Conservation'. 'Architecture' and 'Engineering' are connected by a double-headed arrow. 'Engineering' and 'Architectural Conservation' are connected by a downward arrow. A dashed line connects 'Society' to 'Architecture' with the text 'Trying to Connect Construction and Protection Techniques with the Society'.</p>	<p>- Conservation, a Function of Engineering Aspect Completely Disintegrated from Architecture</p> <p>Disintegrated</p>	<p>-Trying to Connect with the Society</p> <p>Attempts for Continuity</p>	<p>- Still Superiority of Engineering Aspect over Architecture</p> <p>Disintegrated</p>	<p>-Trying to Connect with the Society</p> <p>Attempts for Continuity</p>

sequences and viewing angles to meet the needs of the day and prevent the abandonment of the architectural heritage space (Scott, 2019, 189). However, this does not mean the elimination of the role of conservators - whose scope of activities is fully defined according to the guidelines of ICOMOS - (Fielden, 2016, 213), rather, the purpose is to explain the role of the architect in directing the work of conservators towards social values based on the culture-oriented paradigm.

• **The role of architect in the field of technology**
 What is important in the field of engineering for the conservation of heritage is the strengthening and consolidating the building and prolonging its physical survival. Therefore, the exclusive view of engineers, in another way, causes the loss of spatial desirability of architectural heritage. However, in interaction with experts in this field also, the architect can direct this exclusive view towards the values of society and this skill originates from the architect’s view of the primary creation technologies of the building. Although structure engineers also identify and evaluate basic technologies before conservative measures, engineers’ evaluation is performed solely to decide about body reinforcement methods. However, the evaluation of the architect to invent techniques following the basic ones is performed to increase the spatial desirability and value based on the culture of the society. The architect can innovate in technology due to his creativity (Simitic & Warke, 2018, 151-153) and

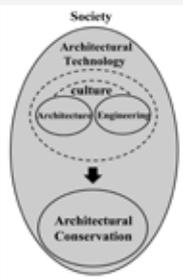
in facing architectural conservation as a subset of architecture as a whole, it has the same competence and ability too (Munoz Vinas, 2019, 152; Alana, Alhagle & Hasan, 2019, 334).

• **The cultural role of the architect in facing two areas of technology and architectural conservation**

According to what was examined, in facing the two areas of “architectural conservation” and “technology”, the architect has the skill of understanding historical and technical values together and also has the skill of directing the activities of experts in each of these areas towards the favorable spatial values of the society. This causes the architect to establish a desirable interaction with both areas (Fig. 3).

On the other hand, following the independence of the specialties related to the two fields of “architectural conservation” and “technology” and the exclusive view of these specialties to their professional ideals, there have always been tensions between these two fields regarding architectural conservation, the result of which, has been the dominance of the opinion of experts in one of the fields and leading the conservation to an undesirable direction (Asefi & Radmehr, 2014, 40). However, with the cultural insight and knowledge and understanding of the ideals of both fields, the architect is able not only to prevent tension but also to create a desirable balance between the opinions of conservators and engineers (Fig. 4).

Table 10. Findings related to the period from the late twentieth century until the present. Source: authors.

The Relationship between Architectural Technology (Including Engineering & Architecture) and Architectural Conservation	Architectural Conservation		Architectural Technology	
	The Relationship among Specialties	The Relationship between Specialties and the Society	The Relationship among Specialties	The Relationship between Specialties and the Society
	- Conservation, a Function of both Engineering and Architecture Aspects (the Threefold Relationship among Architecture, Technology and Architectural Conservation)	-Culture, the Cause of Integrity with the Society	-Culture, the Cause of Integrity of the Two Fields of Engineering and Architecture	-Culture, the Cause of Integrity with the Society
	Connected	Connected	Connected	Connected

• **Architect as the leader of threefold relationship among architecture, technology and architectural conservation**

The ability of the architect to interact with the two areas of “architectural Conservation” and “technology” and to create a balance between the two areas inevitably assigns the leading responsibility of this threefold relationship as a task to the architect. This is while conservation specialists and engineers play their effective role in achieving the cultural goals of the project in their position under the supervision of the architect. This is what Christopher Alexander (2015, vol. 2, 32) calls good architecture, which is the result of the architect’s interaction with areas, each of which pays attention to the main architectural goals and cultivates it as much as possible. Successful examples of architectural conservation based on the culture-oriented paradigm and led by the architect include the development of the Louvre museum (1993), construction of a glass dome on the Reichstag (1999), creation of the new museum of Acropolis of Athens on ancient remains

(2001), development of the British Museum (2003) and many others.

Discussion

Following the formation of the first foundations and themes of the Industrial Revolution from the Renaissance era, developments began in the field of architectural technology, including elitism and gradual superiority of the artist-engineers’ desires and mental values over social values and the subsequent beginning of disintegration process of engineering and architecture branches, which progressed to the complete disintegration of the specialties from each other and the society in the second half of the nineteenth century. Parallel studies in the field of architectural conservation indicated that the mentioned problems in this area also appeared in similar historical periods (Fig. 5, first and second columns), in a way that the superiority of the conservators’ mental values over social values, first appeared as the conservators’ excessive audacity in the reconstruction of works in the Renaissance



Fig. 3. The interaction of the architect with the conservator and engineer. Source: authors.

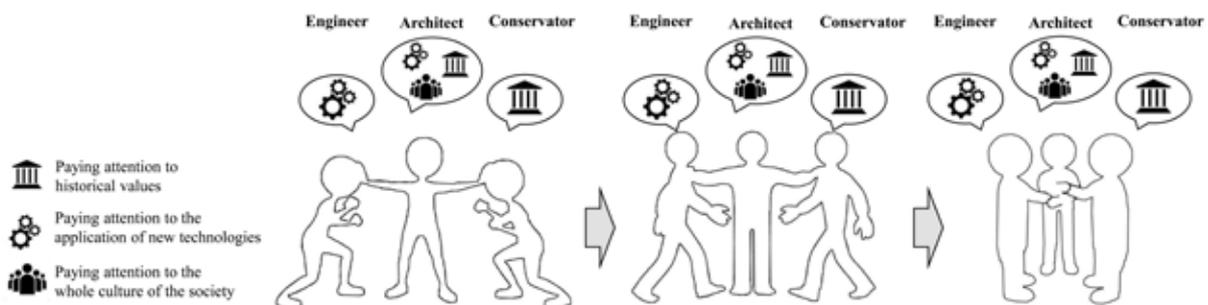


Fig. 4. The role of architect in creating balance and preventing tension between conservators and engineers. Source: authors.

and Baroque eras and reached its peak after the Industrial Revolution as the dominance of the artistic conservators' desires and then the dominance of technology-oriented conservators over social values. Besides, the growing alienation of architectural conservation from the advancement of technology from the late Renaissance to the early twentieth century and then, the mere proximity of architectural conservation to advanced technology in much of the twentieth century, influenced by the same spirit in the field of architectural technology, i.e. it has been a separation of specialties. But on the other hand, the separation of specialties that led to classicalism and subsequently historicism in architecture had a positive effect on the development of the idea of heritage conservation (Fig. 5, third column).

To compensate and correct the problems, in the middle of the twentieth century with the introduction of the user-centered paradigm and subsequently in the late twentieth century with the introduction of the culture-oriented paradigm in the field of architectural technology, integrity was established between engineering and architectural specialties and among the mentioned specialties and the society and

after that, it was achieved in the field of architectural conservation (Fig. 5, first and second columns).

Conclusion

This study aimed to review the role of the architect in architectural conservation after technological evolutions from traditional to advanced methods in developed western societies. To this end, during the study of the relationship between the two fields of “architectural technology” and “architectural conservation” in different historical periods, it turned out that “architectural conservation” has faced challenges due to pure attention to the artistic aspect and, subsequently, the technical nature of “architectural technology” as well as the neglect of the social values. Parallel to the evolution of technology from traditional to advanced, today’s “architectural conservation” considers both dimensions and social values achieved by approaching the culture-oriented paradigm. The relationship among “architecture”, “technology” and “architectural conservation” and that between this trio and the society, as a rule, derived from the culture-oriented paradigm, has made inevitable the need for the architect’s presence in architectural conservation

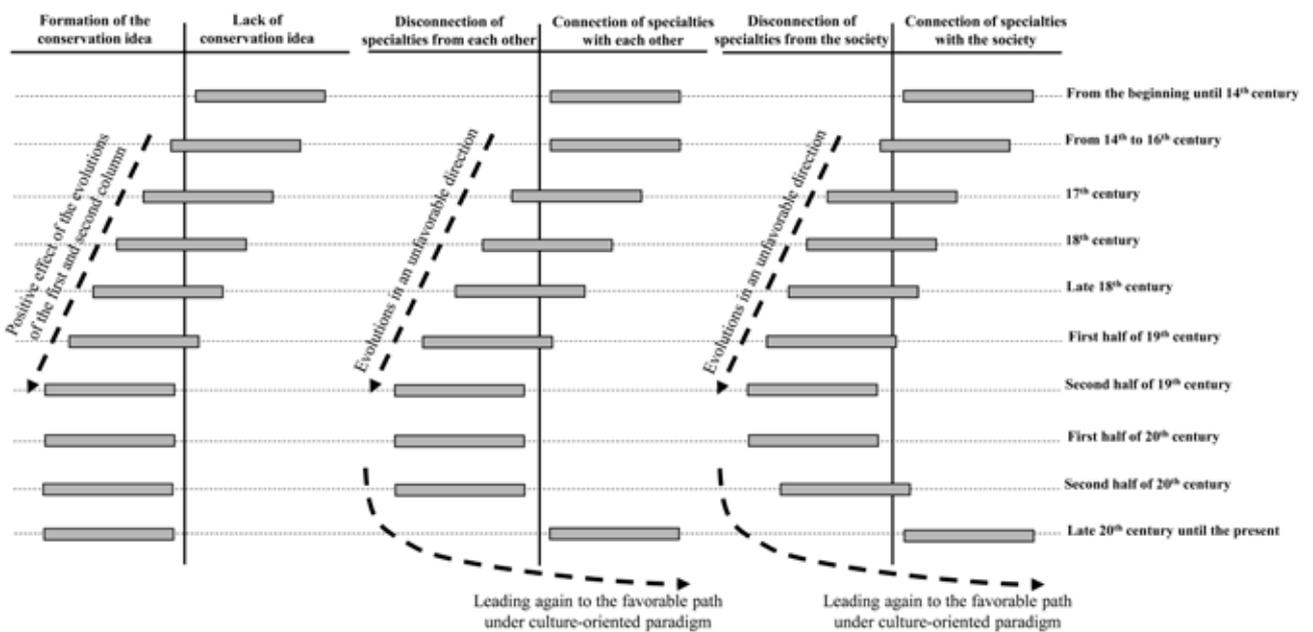


Fig. 5. The Evolution process of the two fields of “architectural technology” and “architectural conservation”. Source: authors.

because it covers the architectural aspect of this trio, on the one hand and connects them to the society's general culture, on the other hand. It was also known that with cultural knowledge and insight and understanding of historical and technical values together, the architect can establish a proper interaction with experts in both "architectural conservation" and "technology" areas and also a favorable balance between these two. Thus, the architect, as the activist who unites the triad of "architecture", "technology" and "architectural conservation", also leads this relationship not as a right, but as a duty and professional commitment.

Endnote

1. One of the sub-methods of qualitative type that examines and interprets past events using reliable sources (Barati, Davoodpour & Montazeri, 2014, 105)
2. Subset of qualitative type methods that seeks to investigate the relationship between variables in the current situation (Barati et al., 2014, 113)
3. It is obvious that in the historical period under discussion, the word «conservation» has no meaning; however, in order to avoid the multiplicity of words, this term has been used in this title, which will be repeated in the titles of later historical periods.
4. However, in the examples created in the last decades of this period, such as the Eiffel Tower, built in 1889, less historicism is seen; which were in fact the first whispers of the superiority of technology in the later period.
5. Following the charters, in various articles so far, the importance of using new materials and techniques in architectural conservation has always been emphasized (Sahmenko, Aispurs & Krasnikovs, 2015).
6. It should be noted that the definitions of most experts in the field of cultural studies, include these three areas, with a slight difference in the use of words.

Reference list

- Abbasi Harofteh, M. (2016). *Tradition of Architecture Conservation in Iran*. Yazd: Yazd University.
- Abolghasemi, L. (1995). Memari: rouyarou-ye marammat [Architecture facing restoration]. *Honar-Ha-Ye Ziba*, 1(0), 38-42.
- Alana, H. A., Al-Hagle, Kh. S. & Hasan, A. E. (2019). A framework for architects role in attaining sustainable community development in heritage areas. *Alexandria Engineering Journal*, (58), 333-343.
- Alexander, Ch. (2015). *The Nature of Order: An Essay on the Art of Building and The Nature of the Universe* (vol. 2, R. S. Sabri & A. Akbari). Tehran: Shahid Beheshti University.
- Alexander, Ch. (2016). *The Nature of Order: An Essay on the Art of Building and The Nature of the Universe* (vol. 1, R. S. Sabri & A. Akbari, Trans.). Tehran: Shahid Beheshti University.
- Asefi, M. & Radmehr, M. (2014). Promotion of improvement of physical heritage in the technical area and architecture restoration with an attitude of reconciliation between the two attitudes. *Studies on Iranian Islamic City*, 4(16), 29-41.
- Ayatollahzadeh Shirazi, B. (2003). Hefazat-e bana-ha-ye tarikhi [Protection of historical monuments]. *Haft Shahr*, 1(11), 6-13.
- Barati, N., Davoudpour, Z. & Montazeri, M. (2014). *Research Methods in Environmental Studies*. Tehran: Saco.
- Benevolo, L. (2011). *Storia Dell'Architettura Moderna* (vols. 1-5, A. M. Sadat Afsari, Trans.). Tehran: Markaz-e Nashr-e Daneshgahi.
- Benevolo, L. (2015). *Storia Dell'Architettura Del Rinascimento* (vols. 1-5, A. M. Sadat Afsari, Trans.). Tehran: Niloufar.
- Croci, G. (2017). *Conservation and Structural Restoration of Architectural Heritage* (B. Ayatollahzadeh Shirazi & M. Hejazi, Trans.). Tehran: Daftar-e Pajouhesh-ha-ye Frhangi.
- Falahat, M. S., Kamali, L. & Shahidi, S. (2017). The role of the "sense of place" concept in improving architectural conservation quality. *Baghe-e Nazar*, 14(46), 15-22.
- Feilden, B. M. & Jokilehto, J. (2010). *Management Guidelines for World Cultural Heritage Sites* (P. Hanachi, Trans.). Tehran: Tehran University.
- Feilden, B. M. (2016). *Conservation Historic Buildings* (M. M. Houshyari, Trans.). Tehran: Tahan.
- Gardner, H. (2017). *Art Through the Age* (M. T. Faramarzi, Trans.). Tehran: Neghah Publication.
- Ghobadian, V. (2005). *Theories and Concepts in Contemporary Contemporary Western Architecture*. Tehran: Daftar-e Pajouhesh-ha-ye Farhangi.
- Giedion, S. (2011). *Space, Time and Architecture: The Growth of a New Tradition* (M. Mozayeni, Trans.). Tehran: Elmi va Farhangi.
- ICOMOS. (2020 June). *ICOMOS Charter Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage*. (N.D.). Retrieved September 2020, from <https://www.icomos.org/en/about-the-centre/publicationsdoc/179-Articles-En-Francais/Ressources/Charters-And-Standards?Start=16>
- Jokilehto, J. (2009). *A History of Architectural Conservation* (M. H. Talebian & Kh. Bahari, Trans.). Tehran: Rozaneh.
- Kuhn, T. S. (2017). *The Structure of Scientific Revolutions* (A. Javadzadeh, Trans.). Tehran: Farhange Nashre No.
- Mainstone, R. J. (2001). *Developments in Structural Form*. Oxford: Architectural.
- Margolius, I. (2012). *Architects + Engineers = Structures* (M. Golabchi, Trans.). Tehran: Tehran University.
- Monadi Noori, S. & Taghavi, M. (2015). A historical review of the institutionalization of the liberal model of progress in the nineteenth century Europe: an emphasis on development of technology. *Iranian Journal the Knowledge Studies in the*

Islamic University, 19(62), 111-134.

- Munoz Vinas, S. (2019). *Contemporary Theory of Conservation* (Z. Raoufi & M. Khajepour, Trans.). Kerman: Jahad-e Daneshgahi.
- Nari Qomi, M & Navai, M. A. (2019). *Space of Humane Presence*. Tehran: Elm va Danesh.
- Nari Qomi, M., Tehrani, F., Raja Qomi, M., Abbaszadeh, M. J. & Mahallatin, A. (2016). *Paradaym-ha-ye Mas'ale dar Me'mari* [Problem Paradigms in Architecture]. Tehran: Elm-e Memar Royal.
- Orbasli, A. (2008). *Architectural Conservation: Principles and Practice*. Malden: Blackwell.
- Parvizi, E., Mahdavejad, M. J. & Bemanian, M. R. (2016). Investigating the process of technology's entry into modern architecture. *ARMANSHAHR*, 8(15), 1-14.
- Pizzi, E. (2010). *Renzo Piano* (S. M. Mousavi, Trans.). Tehran: Elm va Danesh.
- Rodwell, D. (2007). *Conservation and Sustainability in Historic Cities*. Oxford: Blackwell.
- Sahmenko, G., Aispurs S. & Krasnikovs, A. (2015). The use of high performance cement composite in renovation and restoration of architectural elements of buildings facades. *Procedia Engineering*, 117, 317-324.
- Scott, F. (2019). *On Altering Architecture* (A. Einifar & N. Golchin, Trans.). Tehran: Fekr-e No.
- Simitch, A. & Warke, V. (2018). *The Language of Architecture: 26 Principles Every Architect Should Know*. (M. R. Bemanian & A. R. Goudarzi, Trans.). Tehran: Avval va Akhar.
- Stanley Price, N. P., Talley, N. & Melucco Vaccaro, A. (2017). *Historical and Philosophical Issues in The Conservation of Cultural Heritage* (R. Vatandoust, Trans.). Tehtan: Research Institute of Cultural Heritage and Tourism.
- Tibalds, F. (2015). *Making People - Friendly Towns: Improving the Public Environment in Towns and Cities* (H. A. Laghai & F. Jadali, Trans.). Tehran: Tehran University.
- Tietz, J. (2018). *The Story of Modern Architecture* (M. R. Shababi, Trans.). Tehran: Tahan.
- Vatandoust, R. (2015). Introduction to *Historical and Philosophical Issues in The Conservation of Cultural Heritage*. N. P. Price., N. Talley & A. Melucco Vaccaro. Tehran: Research Institute of Cultural Heritage and Tourism.
- Young, G. (2014). *Reshaping Planning with Culture* (E. A. Keshavarz, Trans.). Tehran: Tisa.
- Yousefnejad, S. & Falamaki, M. M. (2019). Analyzing truth and time in the conservation and restoration of cultural heritage. *Baghe-e Nazar*, 15(69), 5-18.
- Zeayter, H. & Mansour, A. M. H. (2018). Heritage conservation ideologies analysis - historic urban landscape approach for a mediterranean historic city case study. *HBRC*, (14), 345-356.

COPYRIGHTS

Copyright for this article is retained by the author(s), with publication rights granted to the Bagh-e Nazar Journal. This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>).



HOW TO CITE THIS ARTICLE

Peyrovi, M., Kabir Saber, M. B., Pakdelfard, M. R. & Ferdousi, A. (2021). Relationship of Technology and Conservation in Contemporary Architecture, An Analysis Based on Re-reading the Role transformations of Architect in Architectural Conservation. *Bagh-e Nazar*, 18(94), 19-36.

DOI: 10.22034/BAGH.2020.212884.4395

URL: http://www.bagh-sj.com/article_120329_en.html

