

# Main stages of development of architectural science. Organization, methodology and updating of theoretical knowledge in the field of architecture and design

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**Abstract.** The paper focuses on research of the background and basic elements of complexity issue in architectural theory, and in the context of design practice. It also brings forth the question of introduction of complexity in didactics and education programs implemented in universities in architecture as a field of study. Paper contains critical analysis of limitations of traditional approach to architectural practice based mainly on intuition and confronts it with integrated design ideas. These ideas contribute to the development of wider application of the theory of complexity.

**Keywords:** architectural science, methodology, field of architecture and design, architectural theory

## Introduction

Architectural theory is today at an impasse. Not only are many print journals now gone, architectural theory courses have been eliminated in many schools' curricula in favour of technology cantered courses, research studios, history without theory, and autonomous theory. It's as if architectural theory, a field of inquiry developed and articulated over a few thousand years, filling archives and rare book rooms with beguiling works of architectural knowledge, was suddenly transformed in unrecognizable ways. This symposium asks, "What has happened to architectural theory and where is it headed?" What constitutes the practice of architectural thinking – or theory – today? Surely, even if earlier preoccupations now seem irrelevant, architects and students still seek to reflect on the greater purpose of their activities. Age-old architectural concerns about aesthetics, function, materials, and construction have not disappeared. Yet more comprehensive intellectual tools are needed to interpret, assess, and evaluate the long-term social and cultural implications of architectural work, the highly technological expansion of design and building. If little in architectural theory, as developed in recent decades, has prepared architects to thoughtfully engage in our contemporary challenges, it is perhaps time to make a new start in defining architectural theory now [7].

Architecture can and has been conceived as an intrinsically philosophical enterprise – grounded in aesthetics and ethics (including theories of human nature) – and in elements of social and political

philosophy. Architects, landscape architects, and designers are responsible for creating spaces and fashioning the world (materially and ideationally) in which people live and interact. In so doing they promote as well as undermine certain values, understandings, and ways of living [6].

Research goal and task is to find out the development trends and we can do to update knowledge of theoretical architecture and analyse state of architecture field in Latvia, its organizations and long – term priorities in the use of architecture:

1. Strengthening the national identity of a country using architectural values, assets and competencies.
2. Broad public engagement and education, as well as representation of the interests of all groups.
3. Promotion of the competitiveness of the architectural industry, improvement of its legal framework, creating favourable conditions for creative entrepreneurship and architectural services for export [1].

Used methods in research is primary data and secondary data. Primary data is data that is collected by a researcher from first-hand sources, using methods like surveys, interviews, or experiments. It is collected with the research project in mind, directly from primary sources. The term is used in contrast with the term secondary data. Secondary data is data gathered from studies, surveys, or experiments that have been run by other people or for other research.

These methods are chosen because it saves both time and money and avoids unnecessary duplication of research effort [8].

Latvian architecture is an integral part of national identity. Latvia is a country where the landscape, architectural heritage and new buildings create favourable conditions for life. Architecture contributes to the well-being of society, national growth and international recognition. The concept of architecture encompasses both the profession of architect and construction. Latvian architecture is an essential part of the culture of the nation and of Northern Europe as a whole. It forms the spatial identity of the region and presents qualities in the context of historical and contemporary architecture as well as successful examples of the interpretation of the archetypal values of the region. Latvian architecture is characterized by high interior design culture and traditions [1].

### Overview

The term theory of architecture was originally simply the accepted translation of the Latin term *ratiocinatio* as used by Vitruvius, a Roman architect-engineer of the 1st century CE, to differentiate intellectual from practical knowledge in architectural education, but it has come to signify the total basis for judging the merits of buildings or building projects. Such reasoned judgments are an essential part of the architectural creative process. A building can be designed only by a continuous creative, intellectual dialectic between imagination and reason in the mind of each creator [4].

The historical evolution of architectural theory is assessable mainly from manuscripts and published treatises, from critical essays and commentaries, and from the surviving buildings of every epoch (each of epoch styles are featured in picture nr.1). It is thus in no way a type of historical study that can reflect accurately the spirit of each age and in this respect is like the history of philosophy itself. Some architectural treatises were intended to publicize novel concepts rather than to state widely accepted ideals. The most idiosyncratic theories could (and often did) exert wide and sometimes beneficial influence, but the value of these influences is not necessarily related to the extent of this acceptance.

If we look at the way architects approach design today, we will find several different responses. Some of them are neo-modern (as we have entered the phase that is very distant from the modern period, so this revival is possible), some still remind us of post-modernism, and some we are not sure how to call – deconstructivism, perhaps, or parametricism as a possibly new type of universal language, or something else, that hasn't been named yet [2].

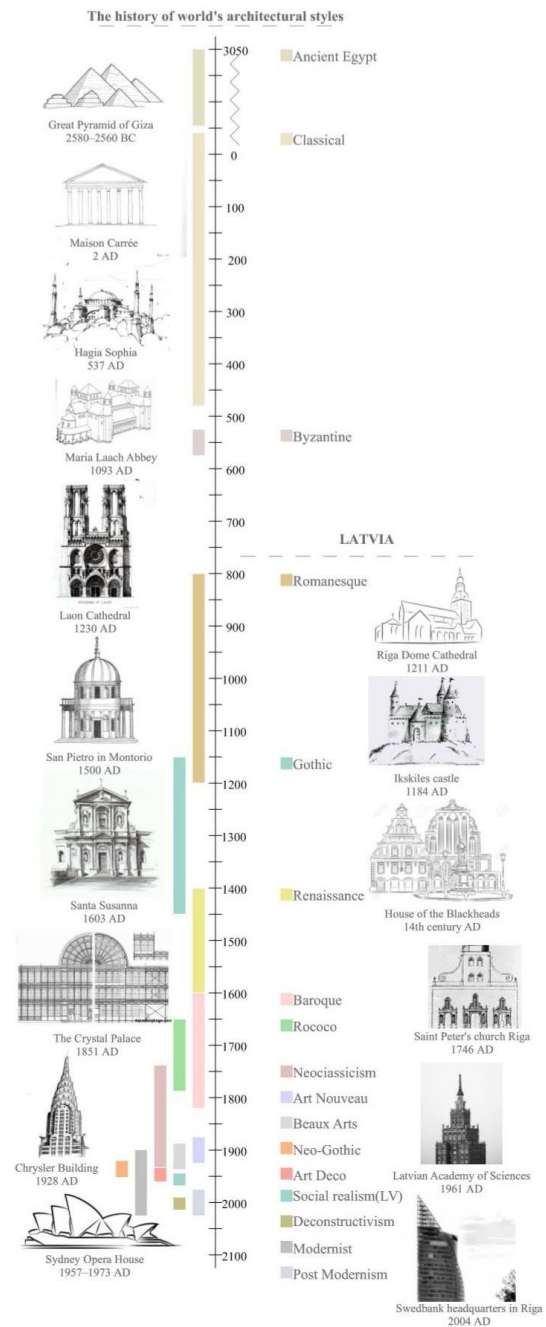


Fig. 1. Worlds architecture style timeline

Technological improvements, especially the computer programs but also the one that are directly related to construction, make almost everything seem possible. The only relevant parameter is the cost, and of course, ethics. But as mentioned earlier, architecture rarely escapes the imprints of the era it is being built in, and whatever becomes out of it in the next few decades, it will be the echo of our own generation. Another possible way of looking at it is adopting the idea that history reoccurs, which would mean that postmodernism was the contemporary version of the Baroque, and we are much likely to return to the new revivals.

### **Organization in the field of architecture and design**

Networking with one's fellow artists and engineers is extremely important for personal and professional development. Professional organizations sponsor conferences, publish journals, and serve as reviewers or editors. They set professional and educational standards and provide job and career services for their members.

The SWOT analysis puts a critical view on the strengths and weaknesses of the processes in the architecture in Latvia. It outlines the problems, potential and possible directions for development starting from 2015. Processes of architecture are in a constant development, which is why the SWOT analysis is not aiming to be an absolute and fixed representation of the situation. The mapping of the architecture field was created by acknowledging everyone involved in the architecture ecosystem (picture nr.2). SWOT Analysis of Architectural Sector in Latvia:

#### **Strengths:**

1. Qualitative architectural and spatial environment;
2. High creative potential, well-organized, consolidated professional environment, strong public organizations of architects;
3. Experience in international competitions and participation in international professional; competitions architects' organizations;
4. Internationally recognized professional architect;
5. Architecture as one of the most economically active industries in the creative industries is tight related to other sectors [1].

#### **Weaknesses:**

1. Improving industry governance;
2. Shortcomings in the regulations affecting the quality of the architecture;
3. Poor cooperation with local governments, state institutions and other territorial organizations development planning and architectural issues;
4. Weak self-initiative and insufficient communication with the public, lack of information the skills of the architect and the nature of the services rendered;
5. Lack of co-operation between professional and public organizations of architects and different generations of architects;
6. Weak regional architectural units; focus on topicalities and opportunities mainly in Riga and Riga region;
7. Insufficient quality of architecture education compared to the leading European architectural universities;
8. Insufficient further training of architects;

9. Poorly developed science and research in architecture and urban development;
10. Narrowly historically profiled architectural theory and criticism;
11. Inadequate quality of architectural competitions related to the client (including country and municipalities) lack of understanding of the role of architecture in environmental design the priority of economic criteria embedded in context and legislation;
12. The construction process inherited from the USSR and different from European practice, including architectural services organization [1].

#### **Options:**

1. The country's advantageous geopolitical location between different cultural spaces;
2. Participation in the integration of society, involving high-quality and attractive societies shaping every citizen;
3. Improvement of the competence in the field of architecture for a quality living space shaping;
4. Identification of export potential of Latvian architecture and favourable conditions for its creation;
5. Cooperation with cultural and creative industries, education and economic sectors;
6. Specialization and competencies specific to the Baltic Sea region and the Nordic countries strengthening;
7. International mobility of architects;
8. International accreditation of study programs and reorganization of study environment;
9. Strengthening the role of architecture in the international image of the country;
10. Harnessing the opportunities offered by today's globalization processes [1].

#### **Threats:**

1. The outflow of qualified architects and construction professionals to other countries; - Declining economic activity in the country and narrowing domestic market opportunities; - Lack of national development priorities;
2. Loss of professional qualifications and competitiveness of architects;
3. Disorganized legislation on architectural services and the construction process organization, including tendering (lowest price as values factor in state and municipal procurement tenders);
4. Depopulation of certain territories, degradation of landscapes and buildings, globalization the threat of losing the identity of the spatial environment [1].

The oldest Latvian architect organization is the "Latvian Association of Architects", founded in 1924. This organization unites 464 members

(data from 2015). Important investment from organization is that they approve architects and makes a unified environment in architecture field. LAA is actively involved in architecture, construction and spatial development drafting of regulatory enactments regulating the profession (Construction Law; Territories development planning law, Cabinet regulations and building codes) and encouraged development of new regulatory enactments regulating the field of architecture. LAS has actively participated in different countries institutional and municipal working groups and expressed professional views on society current issues.

Since 1995, the LAA has been organizing annual exhibitions of the best works of Latvian architecture and organising annual Architecture Awards by inviting an international jury to evaluate the projects. The works nominated for the Latvian Architecture Awards are exhibited at a traveling exhibition can be viewed also in other cities of Latvia, thus introducing inhabitants to the sectors achievements and understanding of trends in contemporary architecture and cultural history heritage conservation. LAA organizes the annual Architecture Days in the first week of October, involving not only Riga but also other cities of Latvia (for example, Cesvaine in 2015) municipalities, informing the public about developments in the sector, holding exhibitions and debates on professionals and the general public.

With the aim to offer high quality education in Figure 2 Architectures ecosystem Latvia [3].

architecture for youngsters in middle school, LAS have made informal education program called "School student. Researcher. Citizen", creative workshops have already received a positive response from educators and students.

LAA organizes discussion cycles on topics relevant to the organization, for example, formulating LAS guidelines of the Riga City Council, City Development, Department announced by the public in the discussion on the planning of the Riga Historical Centre and in a separate lecture cycle – on the promotion of the exportability of architecture.

*Other non-governmental organizations are active in the sector, such as the "Latvia Nostra", whose mission is to identify and preserve the wooden architectural heritage, Latvian Association of Landscape Architecture (LALA, [www.laab.lv](http://www.laab.lv)), Architectural Promotion Foundation ([www.a4d.lv](http://www.a4d.lv)), Foundation of Latvian Museum of Architecture, Contemporary Architecture Information Centre, Passive House Latvia ([www.passivehouse.lv](http://www.passivehouse.lv)), initiative "Free Riga" ([www.freeriga.lv](http://www.freeriga.lv)) and others.*

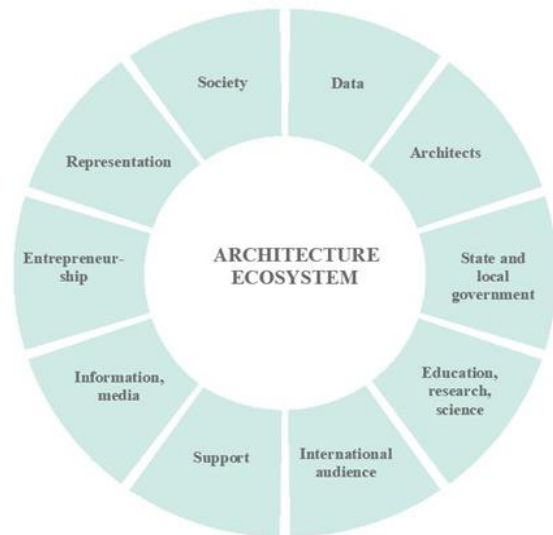


Fig. 2. Architectures ecosystem Latvia [3]

If a professional organization exists mainly to create value for its members, then it is a member-benefit professional association. If in addition, it offers one or more designations as a service to its members it is an association that offers a designation. If a professional organization offers a designation but does not have non-designated members and is mostly focused on its designation, it is likely a certifying body. If an organization has regulatory powers delegated to it by statute and has a mandate to promote and protect the public interest, it is a professional regulatory body [1].

Architecture is a complex system influenced by various factors. An architectural project involves a variety of stakeholders and people - users. Everyone has their own role and responsibility in project development. Successful communication and collaboration between these parties is needed to realize a successful architectural project that: within the limits of the funds allocated, it must satisfy the customer and the people who will use the building, the building must fulfil its intended function, etc. There for "Architectural Ecosystem" is essential.

#### **Methodology and updating of theoretical knowledge**

Throughout its years of development, the understanding of design problems and design process has been revised considerably but still our current understanding of design is incomplete. Yet architectural theory is the act of thinking, discussing, or most importantly writing about architecture. It is taught in most architecture schools and is practiced by the world's leading architects. It is often didactic, and theorists tend to stay close to or work from within schools.

It has existed in some form since antiquity, and as publishing became more common, then architectural theory gained an increased richness. Books, magazines, and journals published an amount of works by architects and critics in the 20th century. As a result, styles and movements formed and dissolved much more quickly than other modes in earlier history [6].

Something which architectural knowledge appears to lack is a theory of the relations between spatial orders and social orders. This may appear to be surprising regarding Bill Hillier's (Bill Hillier is Professor of Architectural and Urban Morphology in the University of London) statement that what distinguishes architectural knowledge is precisely its theoretical approach. Yet theory can imply many things. There is reason to look more closely at what is meant by theory in this context [2].

Hillier distinguishes between two types of theory within architecture, which are closely linked to two elements of what architects do and are expected to be good at. We can in general terms say that architects in design processes primarily do two things; on the one hand they devise architectural solutions – the generative phase – and on the other they make predictions about the outcomes of these solutions – the predictive phase. In practical work a continuous interaction naturally takes place between these elements. What is important is to see that architects need theoretical support in both these elements, but above all that the theory in both cases must be of different types. In the first case, it is theory that helps architects to see how the architectural solutions they are working with can be developed, renewed, put together in another way or be replaced by new ones. Such theories can be characterised as speculative theories in a positive sense, that is theories that attempt to see assumptions in a new way- or theories of possibility as Hillier puts it. Such theories we know amongst other things from art, where the various manifestos of modernism are good examples.

Yet architects also need theories to help them with the other element, namely the predictable outcome of the architectural forms and solutions that they propose. To make such predictions, there are only two ways to take, either to refer to previous examples, or to refer to some principle. Here we can see the advantages of vernacular knowledge: it can always follow the first path and refer to earlier examples within the building tradition to which it belongs. In principle, the outcomes of the solutions that are used are always known. Within architecture this is impossible as one generally wants to create what has not been seen before. An architectural building is, by definition, unique. This means that it is impossible to refer to earlier examples since they

simply do not exist. What remains is to refer to a principle to some form of architectural theory [5].

The different architectural theories that had been analysed in this paper, several techniques of measuring and evaluating could be applied to them, in order to be more understood and perceived, then more used by designers, or at least could analyse the meanings they carry, so that discovering how people interpret them. Conclusion could be summarized as follows:

1. Monitoring, measuring and evaluating architectural theories should be done, to be applied in the design processes.
2. Architectural theories had been elaborated to help in design, not as theoretical studies only.
3. Theory can change practice by legitimizing usages condemned by previous theories.

## Conclusion

In this article the role of enterprise architecture in general has been explored. As a result, the role of architectural theory that has been established for knowledge conversion is limited. The knowledge that is subject to the various modes of knowledge conversion is restricted to knowledge about the structural elements of an organization and their interrelationships. The knowledge in an organization that should be managed and is subject to knowledge conversion is much broader than the knowledge covered by architecture theory. But then, the architectural frameworks, that determine what knowledge is covered by their viewpoints, aren't designed for the discovery of all knowledge assets in an organization. From this it must be concluded that architecture theory can play a role in knowledge conversion but only partial. There are architectural frameworks that contain knowledge viewpoints. It would be interesting to find out if their role in knowledge conversion is different from the other architectural frameworks and how it is different. Further research in the field of knowledge conversion and architectural frameworks is required to establish whether the role of architectural frameworks that include knowledge viewpoints differs from the role of architecture theory in general.

Architecture for the society is wisdom of thought and action - meaningful activities and solutions for people, community and nation. Architecture and world building for social welfare develops and accumulates social capital. It increases the level of happiness and satisfaction of life in both micro and macro levels. A person is not only influencing the economy, but also the *society* and ecology in the long-term by changing the environment, lifestyle, habits, values and action.

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**Kopsavilkums.** Rakstā iekļauta arhitektūras teorija un arhitektūras zinātnes progresa apskats. Pārskats par vēsturisko attīstību un situāciju mūsdienās, plašāks organizāciju pārskats Latvijā, metodoloģija un teorētisko zināšanu papildināšana arhitektūras un dizaina jomā. Arhitektūras jomas analīze plašākā mērogā, ieskats faktoros, kuri ietekmē nozeres attīstību Latvijā. Autors ir apkopojis informāciju par Latvijas arhitektūras organizācijām un analizējis arhitektūras ekosistēmu, tradicionālās arhitektūras teoriju, teorijas nepieciešamību arhitektūras praktizēšanā.

Atslēgas vārdi: arhitektūras zinātne, metodoloģija, arhitektūras un dizaina joma, hronoloģija, arhitektūras teorija.

Zinātniskā raksta mērķis: koncentrēties, atpazīt problēmas un izpētīt pamatelementus arhitektūras teorijā un projektēšanas praksē. Kas izvirza jautājumu par sarežģītības ieviešanu izglītības programmās, kuras tiek īstenotas arhitektūras programmās. Rakstā ir kritiski analizēta tradicionālās pieejas, ierobežojumi arhitektūras praksē, balstoties galvenokārt uz integrētām dizaina idejām. Mērķis ir tās atpazīt un analizēt.

Metodika: pētījumos izmantotās metodes ir sekundāru datu analīze no astoņiem literatūras avotiem. Šī metode ir izvēlēta, jo tā ietaupa gan laiku, gan naudu un ļauj izvairīties no nevajadzīgas informācijas dublēšanās.

Galvenie secinājumi: Arhitektūra priekš sabiedrības ir domas un rīcības gudrība – jēgpilnas telpas radīšana, kura būtu funkcionāla un reprezentējoša. Arhitektūra un pasaules veidošana sociālās labklājības jomā attīsta un uzkrāj sociālo kapitālu. Tas paaugstina dzīves laimes un gandarījuma līmeni gan mikro, gan makro līmenī. Cilvēks ilgtermiņā ietekmē ne tikai ekonomiku, bet arī sabiedrību un ekoloģiju, mainot vidi, dzīvesveidu, paradumus, vērtības un rīcību.