

Shared Visions, Local Realities: Industrial Architecture Model Exchanges across the Habsburg Empire*

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In the late nineteenth and early twentieth centuries, the Habsburg Empire experienced an accelerated process of urban modernization driven by industrialization and infrastructural expansion. These developments were shaped by the mobility of architects and engineers trained primarily in Vienna and Budapest, whose professional trajectories connected imperial centers with regional cities. Focusing on Brno, Pécs, Timișoara, and Rijeka, this article examines the circulation of industrial architectural models across the Monarchy and challenges linear center-periphery interpretations of modernization. It argues that architectural transfer operated through multidirectional exchanges facilitated by educational institutions, professional networks, public competitions, municipal administrations, state monopolies, and private enterprises. While standardized solutions were widely employed, their implementation was mediated by local economic conditions, administrative frameworks, and municipal initiatives. The article highlights how regional cities functioned as active sites of adaptation and experimentation rather than passive recipients of metropolitan models. The study contributes to a more nuanced understanding of industrial architecture as a key agent of imperial integration, while also addressing the tensions, negotiations, and local specificities that shaped modernization processes.

Keywords: Habsburg Empire, architectural exchange, industrial heritage, infrastructure development, regional adaptation

Introduction

At the turn of the twentieth century, the Austro-Hungarian Monarchy underwent a profound and uneven process of modernization, driven by industrial expansion and the rapid development of infrastructure. While earlier phases of urban growth had prioritized civic architecture in response to demographic and social

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change, the later decades of the nineteenth century were increasingly dominated by industrial and infrastructural projects. Railway stations, bridges, power plants, water supply and sewage systems, factories, warehouses, and workers' housing reshaped the urban fabric of both imperial capitals and provincial cities. These transformations did not follow a uniform or centrally imposed model. Rather, they emerged through complex interactions between imperial institutions, local administrations, and mobile professional networks operating across the empire's diverse territories.

Against this background, the article examines industrial architecture as a key medium of knowledge transfer within the Habsburg Empire, focusing on the circulation of architectural models, technical expertise, and professional practices between imperial centers and regional cities. Rather than interpreting modernization through a simple center-periphery framework, it argues that industrial architecture developed through multidirectional exchanges that combined recurrent typologies with local adaptation. Vienna and Budapest functioned as important reference points, but provincial centers were not passive recipients of metropolitan models. Instead, they acted as active sites where architectural and technical solutions were tested and refined in response to specific economic, geographic, and administrative conditions.

The study focuses on four regional cities that occupied distinct positions within the administrative and political structure of the Dual Monarchy, ranging from the Free Royal Cities of Brno (Brünn), Pécs, and Timișoara (Temesvár; Temeschwar) to the exceptional status of Rijeka (Fiume) as a *Corpus Separatum*. Geographically and economically, they represented diverse profiles: Brno as an industrial center and the capital of Moravia; Pécs as a mining and manufacturing city in southern Transleithania; Timișoara as the administrative and economic core of the Banat region; and Rijeka as Hungary's main Adriatic port. Despite these differences, all four were deeply embedded in imperial modernization processes through infrastructural development, state-regulated industries, and the circulation of architects and engineers trained in common educational frameworks. Moreover, the same architects and engineers appear recurrently, alongside other professionals active at the regional level, indicating dense and sustained circulation of expertise rather than episodic transfer. Figures such as Ferenc Pfaff, Szilárd Zielinski, Lajos Zobel, Eduard Ast, and Bruno Bauer contributed to major industrial and infrastructural projects in several of the cities studied. Their careers reveal continuity in design approaches rather than isolated acts of

imitation, underscoring how architectural models circulated primarily through professional practice rather than formal prescription.

Building on this observation, the analysis traces three interconnected processes. First, it examines how imperial economic policies, educational institutions, and infrastructure investments created structural conditions for professional mobility. Second, it analyses how architects and engineers developed typified yet flexible architectural solutions, particularly in sectors such as railways, utilities, and state monopolies. Third, it investigates how these models were implemented locally, revealing patterns of adaptation shaped by urban governance, material availability, and regional building traditions. By combining comparative urban analysis with biographical and institutional perspectives, the study reconstructs networks of knowledge transfer that operated both vertically, between capitals and provinces, and laterally, among regional centers.

By foregrounding industrial architecture as both a material outcome and an instrument of imperial integration, this article contributes to a growing body of scholarship that reconsiders modernization in the Habsburg Empire as a negotiated and relational process. It challenges narratives that privilege metropolitan dominance or national frameworks, highlighting instead the role of professional networks and technical expertise in shaping a shared yet differentiated built environment. In doing so, it offers a framework for an understanding of industrial heritage not as an isolated category of utilitarian construction but as a vital component of urban identity, the legacy of which continues to inform contemporary debates on preservation and adaptive reuse.

Industrialization and Urban Transformation in the Dual Monarchy

Guided by a mercantilist vision aimed at maximizing the exploitation of raw materials and consolidating internal markets, the Habsburg Monarchy experienced a prolonged and dynamic phase of economic expansion in the nineteenth century. Industrialization advanced alongside the development of transport systems, energy infrastructure, and modern urban services, reshaping the spatial organization of the empire and generating a sustained demand for highly qualified specialists. The mobility of architects, engineers, and technicians facilitated the transfer of knowledge and the adaptation of architectural models to diverse local contexts. Yet, while politically unified, Cisleithania and Transleithania pursued distinct trajectories. Austria, with its early industrial base, was slowed by the 1873 crash, whereas Hungary pursued a centralized strategy,

channeling investments toward infrastructure and industry in its still underdeveloped eastern regions. The result was a competitive but polycentric model of development in which imperial policies were reinforced by locally calibrated initiatives.

Legislative reform emerged as a key instrument to stimulate industrial growth, providing the legal framework for fiscal incentives and institutional support. While primarily economic in intent, these measures were especially significant in shaping the architectural scale, typology, and spatial distribution of industrial facilities. Local authorities actively guided industrial modernization through tariffs, tax exemptions, subsidies, preferential railway rates, and provision of land, materials, or utilities to attract investment. The scope, intensity, and timing of these measures varied across the Monarchy, reflecting both the uneven geography of industrialization and the initiatives of local elites, with general policies adapted to specific local contexts. In Brno, protectionist tariffs introduced from the 1850s supported textile production, while after the 1873 economic crisis duties were relaxed to stimulate recovery.¹ In Pécs, a subsidy program introduced in 1881 for mechanized factories was later extended from 1890 until 1907, alongside grants, preferential railway tariffs, and support for technical education.² Timișoara adopted a proactive mix of free land, tax exemptions, and reduced energy costs, later including building materials and electricity, conditional on reinvestment and local employment.³ Similarly, in Rijeka, the 1872 abolition of guilds and modern commercial legislation, combined with fiscal incentives and support for raw materials, fostered business growth, with state support increasingly targeting maritime industries, culminating in the 1907 law for naval construction.⁴

Legal and economic frameworks alone cannot account for the accelerating pace of industrialization without corresponding social reforms that expanded the urban workforce and transformed the demographic structure of cities. Three key legislative measures had a profound impact on urban growth in the Austro-Hungarian Monarchy: the abolition of serfdom in 1848, which released rural populations and enabled mobility towards towns and cities; the dissolution of the guild system, lifting long-standing restrictions on craftsmen; and the 1840

1 Mertová and Ryšková, *The Cultural Heritage of the Brno Wool Industry*, 32–35.

2 Kaposi, *Pécs gazdasági fejlődése, 1867–2000*, 48.

3 Borovszky, *Magyarország vármegyéi és városai – Temesvár*, 270; Hațegan, *Camera de Comerț, Industrie și Agricultură Timișoara*, 62.

4 Pelles and Zsigmond, *A fiumei magyar kereskedelmi tengerészet története*, 50, 146.

decision of the Hungarian Diet to permit Jews to settle in urban areas.⁵ Taken together, these reforms significantly expanded the urban labor force and created the social conditions necessary for rapid industrialization, generating sustained demand for technical and architectural expertise in emerging industrial centers.

Population movements driven by industrialization placed growing pressure on transport systems, making infrastructure a decisive factor in urban transformation. Early development relied largely on private capital, with entrepreneurs financing extraction and manufacturing facilities, but as industrial activity expanded, existing networks proved insufficient. This prompted large-scale investments in railways, stations, bridges, water systems, and power facilities. By the middle of the century, the increasing complexity of industrial and urban networks encouraged closer coordination between private enterprise and the state, exemplified by companies such as the First Danube Steam Navigation Company (Erste Donau-Dampfschiffahrts-Gesellschaft - DDSG; Első Duna-Gőzhajózási Társaság – DGT)⁶ and the Imperial-Royal Privileged Austrian State Railway Company (Kaiserlich-Koeniglich-Privilegirte Oesterreichische Staats-Eisenbahn-Gesellschaft - StEG; Osztrák Államvasút-Társaság – OÁV).⁷ Their expansion created a unified imperial network linking extraction sites, production centers, and export terminals, while also enabling the long-distance mobility of skilled professionals.

Budapest and Vienna set the pace for this modernization, both symbolically and institutionally. The opening of Pesti Indóház (1845–1846)⁸ and Wien Westbahnhof (1858)⁹ marked the symbolic and functional start of the railway system that soon expanded across the Monarchy. Over the course of the following

5 Horel, *Multicultural Cities of the Habsburg Empire*, 40.

6 DDSG/DGT was founded in 1829 following an imperial patent granted in 1828 to John Andrews and Joseph Pritchard, which conferred exclusive steam navigation rights on the Danube; organized as a joint-stock company with exceptional legal privileges, including a 15-year monopoly later extended to the Hungarian Crown in 1831, it ultimately merged in 1874 with the United Hungarian Steam Navigation Company (Egyesült Magyar Gőzhajózási Társaság – EMGT). See Gonda, *A magyar hajózás*, 24–26.

7 StEG/OÁV was founded in 1854–1855 by Viennese and French bankers, many also involved in DDSG/DGT, through the acquisition of former Austrian state railway assets, operating across Austrian and Hungarian territories to support the transport of industrial, mining, and forestry resources. Following the 1873 crisis, expansion slowed and nationalization advanced, with Hungary establishing Royal Hungarian State Railways (Magyar Királyi Államvasutak – MÁV) in 1868 and acquiring StEG's Hungarian network by 1891, while full nationalization was completed by 1909. See Gräf, *Domeniul bănăţean al StEG 1855–1920*, 49–50; Jancsó, *Bánát első vasútja*, 21; Strach, *Geschichte der Eisenbahnen der Österreichisch-Ungarischen Monarchie*, vol. 3, 148.

8 Sisa, *Hungarian Architecture and Design 1800–1900*, 655, 656.

9 Strach, *Geschichte der Eisenbahnen der Österreichisch-Ungarischen Monarchie*, vol. 3, 449.

decades, new transport facilities reinforced the integration of peripheral regions into the imperial flows of trade, finance, and labor. Within this dynamic, cities such as Brno, Pécs, Timișoara, and Rijeka gained the status of regional industrial centers, deeply embedded in the empire's economic and transport structure. For example, Brno's manufacturing sector relied on coal from the nearby Rosice-Oslavany basin, linked to the city by early rail connections later integrated into the StEG network.¹⁰ Similarly, Pécs's growth was fueled by Baranya coal, with DGT investing in mines, rail links, and worker settlements.¹¹ Meanwhile, Timișoara's industrialization was tied to the Banat Mountain mines, connected through the StEG railway and DDSG Danube routes.¹² Rijeka, on the other hand, strategically located on the Adriatic, was linked after 1867 to the Hungarian railway system, becoming a major export hub alongside Trieste.¹³

The physical evolution of these centers reflected broader urban modernization patterns. Although in many of the cities under study systematic urban planning in the modern sense had begun in the late eighteenth century, with the dismantling of fortifications and civic construction programs, industrial architecture only became a visible and consistent presence in the nineteenth century. Its emergence was reinforced by a wave of urban modernization measures, including the extension of sewage networks, the upgrading of water supply systems, the electrification of public spaces, and the introduction of tramway lines. The growing need to connect residential districts with newly developed industrial zones made efficient urban transport essential. Electric

10 The Brno-Rosice railway, initiated in 1851 by coal mine owners under Johann Ernst Herring to link Brno's industry with local coal resources, was operated by the k.k. Ausschliesslich Privilegierte Brünn-Rossitzer Eisenbahn and acquired by StEG in 1879. Matěj et al., *Cultural Monuments of the Rosice-Oslavany Industrial Area*, 27–31, 42–46.

11 DGT's arrival in Baranya in 1852 transformed small mining operations into large enterprises. DGT opened its first mine in 1853 and later built the Üszög-Mohács railway for coal transport. The company developed self-sufficient mining colonies and, by 1923, controlled all major mines in the region (Pécsbánya, Szabolcs, Somogy and Vasas), becoming the leading mining company in Baranya. Kaposi, *Pécs gazdasági fejlődése*, 48–56, 113–19; Kaposi and Vonyó, *Pécs története VI*, 115–21, 223–27.

12 The Oravița-Jasenova-Baziaș railway line, the first in Banat, was completed by StEG and inaugurated in 1854. The following year, StEG acquired two major domains, one in Bohemia and the other in southern Banat, which included the metallurgical plants and mines of Reșița, Bocșa, Oravița, and Anina, along with over 120,000 hectares of land. Jancsó, *Bánát első vasútja*, 38; Gräf, *Domeniul bănățean al StEG*, 50.

13 Railway expansion to Rijeka was delayed by Austrian dominance, which prioritized Trieste, but after 1867, Hungary regained control and pursued rail links connecting the Pannonian Plain to the Adriatic coast to facilitate the rapid export of grains and other goods. By 1873, Rijeka had been integrated into the Hungarian hinterland through lines built or acquired by MÁV. Pelles and Zsigmond, *A fiumei magyar kereskedelmi tengerészet története*, 18, 21–25, 28, 36–38.

trams offered a reliable, hygienic, and affordable solution, reducing commuting times and boosting productivity in industrial cities. This network expanded into the provinces from the late nineteenth century, with Bratislava (1895), Brno (1896), Budapest (1897), Rijeka, and Timișoara (1899) among the first to adopt it, followed by cities such as Pécs in 1913.¹⁴

Parallel investments in education and training sustained industrial and urban transformation, while providing systematic foundations for professional mobility and enabled the consistent application of similar architectural solutions across diverse regional contexts. State and municipal authorities expanded higher education, technical schools, and vocational training. Building on earlier European trends from Britain and France, in which engineering and technological disciplines had separated from craft-based methods,¹⁵ these institutions provided a scientifically grounded technical education, with curricula emphasizing mathematics, drawing, and applied skills to meet the practical demands of industrialization.¹⁶ Specialized higher schools were created in parallel with technical universities in cities such as Prague (Polytechnic Institute, 1806), Vienna (Imperial and Royal Polytechnic Institute, 1815),¹⁷ and Budapest (Royal Joseph Technical University, 1871),¹⁸ offering study programs aligned with the industrial priorities of the state. In parallel, state and local administrations promoted practical training through an extensive network of vocational schools and apprenticeship programs, especially in the cities in the provinces.¹⁹ Local adaptations

14 Horváth et al., *Ezzerarcú vasút II*; Weinreich, “Pfaff Ferenc legjelentősebb felvételi épületei,” 284–90.

15 Greinert, *Mass Vocational Education and Training in Europe*, 51–56.

16 In Hungary, drawing, as a core discipline within the curriculum of higher education institutions dedicated to training engineers and architects, was standardized through manuals published by the Ministry of Commerce and Industry (Székely, *Az ország tükei*, 36). At the Budapest State Industrial Higher School, the curriculum covered general architecture, building materials, construction techniques, architectural drawing and design models, as well as the design of basic residential and agricultural buildings. It also included a mandatory summer internship during the studies. Kelecsényi, “Tanszékek, építési irodák, építész-irodák,” 66.

17 Greinert, *Mass Vocational Education and Training in Europe*, 67.

18 Before the Royal Joseph Technical University was founded, Hungarian specialists trained at leading institutions, including *Technische Hochschule Berlin*, *Karlsruhe Polytechnic*, *Akademie der Schönen Künste Vienna*, *ETH Zürich*, and *École des Beaux-Arts Paris*, often supported by state scholarships (Royal Hungarian Scholarship) or professional grants (Engineers’ and Architects’ Union Scholarship).

19 In Cisleithania, the Imperial and Royal Ministry of Trade coordinated secondary technical education: *Realschulen* became seven-year schools for higher technical studies, two-year *Fachschulen* replaced apprenticeships, *Staats-Gewerbeschulen* unified vocational, craft, technical, and advanced training, and *Fortbildungsschulen* offered evening and Sunday courses. By the 1890s, sixteen such schools operated in Vienna, Graz, Prague, Chernivtsi, and Brno. The 1907 reform granted public status, standardized curricula and workshops,

included Brno's textile-oriented evening courses and the vocational systems of Timișoara, Pécs, and Rijeka,²⁰ while industrial secondary schools, trade schools, professional institutes, and even programs for women broadened access and linked training directly to industrial and urban growth.

Systematic standardization emerged primarily through state monopolies and large-scale infrastructure projects that required coordinated architectural solutions. Typical projects for infrastructure projects, such as railway stations, warehouses, factories, and worker's housing, were replicated in different areas, often developed by agencies subordinate to the authorities or large design firms.²¹ This approach created professional opportunities for architects who could develop flexible typological solutions while maintaining visual coherence across diverse contexts. Complementing these measures, architectural and engineering publications, journals, and technical manuals disseminated typified plans, practical guidelines, and shared professional standards. In addition, industrial and urban developments were made accessible to a broader public through extensive monographs produced in the late nineteenth and early twentieth

and created a proto-dual system combining school and workplace training. See Greinert, *Mass Vocational Education and Training in Europe*, 68–73. In Hungary, technical education expanded rapidly from 18 in 1884 to 230 by 1888, with industrial education organized into *higher industrial schools* (Budapest, Košice), *trade schools* (five by 1906), and *vocational schools* providing both theoretical and practical training in metallurgy, wood, textiles, leather, and construction. Székely, *Az ország tiükrei*, 33–36.

20 In 1852, the Chamber of Commerce and Industry in Brno laid the foundations for specialized education by introducing a vocational system based on three-year evening courses, completed in 1860 with the establishment of a higher weaving college. Timișoara established an industrial vocational school in 1882, offering training in metalwork, carpentry, and mechanical engineering, supported by municipal and private scholarships. Pécs expanded its industrial and apprenticeship schools after the 1884 Industrial Law, with major employers like Zsolnay sponsoring specialized training. Rijeka developed maritime and commercial education through the Maritime Academy and the State Higher Commercial School (1881), though industrial education remained fragmented due to frequent administrative changes. (Mertová and Ryšková. *The Cultural Heritage of the Brno Wool Industry*, 32; Munteanu and Munteanu, *Timișoara*, 369–79; Kaposi and Vonyó, *Pécs Története VI*, 281–305; Borovszky, *Magyarország vármegyéi és városai - Fiume*).

21 Carl Arnold Séquin-Bronner's firm (founded 1879) applied a rationalist approach across the Monarchy, designing 183 industrial facilities with modular metal structures, reinforced concrete floors, and standardized façades adapted to local contexts (Beran, *Bruno Bauer a industriální architektura*, 12–14). Similarly, Philipp Jakob Manz's firm prioritized serial production and typification, creating buildings from standardized steel, concrete, and masonry modules with only minor variations in form (Beran, *Industrial Architecture: Creators and Plans*, 44; Renz, "Philipp Jakob Manz (1861–1936): Industriearchitekt und Unternehmer"). As the first contractor in the Czech lands to independently plan and execute large-scale industrial projects, Viktor Beneš was particularly active in the sugar industry from the 1890s, leaving a mark on refineries and workers' housing in both Cisleithania and Transleithania (Beran, "Viktor Beneš, architekt a stavitel průmyslových závodů").

centuries.²² Together, these publications and professional networks favored the development of industrial building types that could be transferred and reused across different urban contexts.

Modernization required sophisticated financial mechanisms that connected imperial capital markets with regional development needs. Chambers of Commerce, first established in Vienna in 1848 and soon extended to centers such as Pest, Bratislava (Pozsony; Pressburg), Timișoara, Rijeka, Debrecen, Košice (Kassa; Kaschau), Brașov (Brassó; Kronstadt), Cluj-Napoca (Kolozsvár; Klausenburg), Sopron, Zagreb (Zágráb; Agram) and Osijek (Esseg; Essegg),²³ provided logistical and advisory support to entrepreneurs and municipal authorities. Complementing them, professional associations represented industrialists and workers, supporting vocational training, setting technical standards, and articulating shared interests across the Monarchy.²⁴ Modernization also relied on an expanding financial infrastructure: banks, credit cooperatives, and savings funds supplied capital for industrial and infrastructure investments. Large Viennese and Budapest banks extended branches into provincial centers,²⁵ channeling resources into key industrial projects and integrating local economies into wider imperial networks. Local and mixed-capital banks, often controlled by influential families or private investors, supported municipal initiatives, provided advantageous loans, and sometimes became direct shareholders in industrial enterprises, shaping strategic decisions and ensuring financial stability.²⁶ Closely

22 Examples from Cisleithania include *Die Gross-Industrie Oesterreichs* (Leopold Weiss, 1898), while Transleithania is represented by *Magyarország vármegyéi és városai* (Samu Borovszky, 1896–1914).

23 Hațegan, *Camera de Comerț, Industrie și Agricultură Timișoara*, 189–92.

24 Cisleithania saw the establishment of numerous such organizations, including Brno's Women Employment Association (1873), the Industrialists' Club (1875), the Central Association of Austrian Industrialists (1892), the Federation of Austrian Industrialists (1897), the Association of Czech Textile Industrialists (1902), and the Moravian and Silesian Industrialists' Association (1912). (Brünnner Frauenerwerb-Vereines, *Festschrift zur Erinnerung an den 40 jährigen Bestand*; Jindra and Jakubec, *Economic Rise of the Czech Lands I*, 19).

25 The first local branches of the Austro-Hungarian State Bank appeared after 1878 in cities including Cluj-Napoca, Bratislava, Szeged, Győr, and Nagykanizsa. In Pécs, the bank operated from 1880 as a subsidiary of Nagykanizsa, becoming independent in 1887, while in Timișoara it appeared only after 1890. In Rijeka, the first financial institution was the Municipal Savings Bank (1858), followed by Banca Fiumana, a branch of the Austro-Hungarian Bank, in 1870. (Hațegan, *Camera de Comerț, Industrie și Agricultură Timișoara*, 29; Pelles and Zsigmond, *A fiemei magyar kereskedelmi tengerészet története*, 210, 70; Hunyadi, *Szövetkezetek Erdélyben és Európában*, 40–41).

26 Local and foreign banks supported Rijeka's port development and related industries, including shipbuilding, processing, and consumer goods, notably backing the Oil Refinery Company, the Rice Mill Company, the Danubius Machine, Wagon and Ship Factory, supported by the Hungarian General Credit

tied to financial institutions and municipal policies, local elites also played a decisive role in industrialization and urban modernization efforts. Progressive mayors, merchants, bankers, and industrialist families frequently acted as investors and policymakers, holding positions on municipal councils and in Chambers of Commerce and professional associations.²⁷

These interlinked processes of legislative reform, infrastructure development, urban planning, education, financial support, and elite engagement transformed the Dual Monarchy's industrial and urban landscape, creating systematic demand for architectural expertise while providing mechanisms for its circulation. This process established the foundations for the professional networks and knowledge transfer mechanisms examined in the following section.

Professional Networks and Transfer of Industrial Architectural Models: Between Periphery and Economic Centrality

The spread of industrial models, design principles, and construction techniques in the Austro-Hungarian Monarchy was not an isolated or sporadic phenomenon but rather occurred through a complex and interconnected network of educational institutions, professional exchanges, publishing channels, and individual actors. Architects and engineers were highly mobile, often training at major academic centers and gaining experience through internships in leading design offices. Municipal architects played a key role, mediating between city administrations and external firms and facilitating the adoption of new stylistic trends and technical solutions. Professional associations, exhibitions, world's fairs, publications, and study trips further circulated architectural ideas. Many practitioners pursued commissions across the Monarchy, adapting their work to local conditions while following broader imperial currents. Vienna and Budapest provided principal stylistic and technical directions, but provincial cities such as Timișoara, Pécs, Brno, and Rijeka offered fertile ground for experimentation. This section examines the mechanisms through which technical knowledge and

Bank, as well as the Cocoa and Chocolate Factory, developed with the support of the Fiume Credit Bank (Pelles and Zsigmond, *A fumei magyar kereskedelmi tengerészeti története*, 159).

27 Notable names include Heinrich Offermann and the Löw-Beer, Tugendhat, and Stiassni families in Brno; Alfred Fränkel, Emil Gerhard Pick, Mór Weisz, Eduard Prohászka in Timișoara; Vilmos Zsolnay and Janos Hamerli in Pécs; Andrea Lodovico Adamich, Luigi Ossoinack, Robert Whitehead, Walter Crafton Smith, and Charles Meynier in Rijeka.

models were transmitted, identifying key actors, institutional mechanisms, and circulation patterns that shaped imperial industrial architecture.

A key element of this professional landscape was the academic training of architects and engineers at the Technical Universities of Vienna, Prague, and later Budapest, which pioneered modern technical education in Central Europe and inspired subsequent institutions in Brno, Graz, and Kraków. By the late nineteenth century, these state-funded programs had nurtured a new generation of architects and engineers whose training combined rigorous university courses, internships in leading design offices, practical experience on major construction sites, and scholarships abroad. Students learned from prominent professors, became familiar with emerging construction materials (such as iron and reinforced concrete), and explored stylistic currents ranging from Historicism to Secession. This shared academic environment forged a common professional culture, and it allowed graduates to adapt their knowledge to the specific conditions of their home regions. Architects and engineers educated at the Budapest Technical University, including Ferenc Pfaff, Andor Pilch, Lajos Zobel, László Székely, Mihály Kajlinger, and Szilárd Zielinski,²⁸ carried this knowledge into capital cities and provincial centers, while Bruno Bauer (Prague), Karl Schlimp (Prague, Vienna) or Josef Unger (Vienna) exemplify similar paths from other Central European polytechnics.

The dissemination of architectural models throughout the Austro-Hungarian Monarchy relied heavily on major architectural offices collaborating closely with the authorities, alongside specialists in state or private institutions responsible for large-scale infrastructure projects. Their activity, spanning civil, industrial, and infrastructural architecture facilitated the circulation of expertise and the adaptation of architectural models on an imperial scale, contributing to the development of a unified stylistic repertoire recognizable throughout the Monarchy. In this context, standardization emerged as a key mechanism, particularly evident in transport infrastructure and industrial facilities within sectors under state monopoly. As the railway network expanded into a backbone of imperial integration, it simultaneously became a prime site for the codification of architectural expertise. The repeated application of typological models for stations, workshops, technical facilities, and workers' housing created a coherent visual and functional identity across both capitals and provincial towns. In this context, railway architecture demonstrates

28 Kelecsényi, "Tanszékek, építési irodák, építészirodák."

that imperial standardization operated not as uniformity but as a controlled framework within which local variation was both possible and expected.

In Cisleithania, engineers such as Tomáš Novák (*Kaiser-Ferdinands-Nordbahn*), together with Josef Unger (*Österreichische Nordwestbahn*), contributed decisively to shaping a coherent industrial aesthetic in Moravia and Austria through the repeated use of templates for stations and workers' housing for railway employees²⁹. Karl (Carl) Schlimp was a particularly prominent figure. Schlimp began his career with the *Südbahn-Eisenbahngesellschaft* in Vienna before becoming chief architect and later head of the building department of the *Österreichische Nordwestbahn*. He oversaw the design of over 70 railway stations and associated infrastructural projects. He applied standard, symmetrical layouts for four size-based station classes, adapted to local conditions and operational needs. Moderate Renaissance elements and local materials for facades, cornices, and roof gables were often incorporated, while exposed brickwork became the defining feature of his work.³⁰ Key projects include stations in Vienna, Prague, Znojmo (Znaim), and Jihlava (Iglau).

A parallel and even more representative trajectory can be observed in Hungary through the work of Ferenc Pfaff.³¹ A graduate of the Budapest Technical University, Pfaff served as chief architect of the *Hungarian State Railways (MÁV)* between 1887 and 1909, where he designed and coordinated the construction of over 50 railway stations, employing a scalable system of typological models. While standardized in their functional logic, these stations were locally adapted through variations in plan layout, façade articulation, decorative vocabulary, and building materials, which often turned them into urban landmarks. Notable stations designed by Pfaff include Zagreb (1890–1892), Rijeka (1892), Timișoara (1898–1899), Pécs (1898–1899), Osijek (1898–1899), Szeged (1902), Cluj-Napoca (1902), and Arad (1905–1910). Pfaff's work extended beyond passenger buildings to technical facilities, repair workshops, residential ensembles for railway employees in Budapest, as well as emblematic projects, such as the Transport Pavilion at the 1896 Millennium Exhibition and infrastructural works in the port city of Rijeka.

29 See Miloš et al., *Cultural Monuments of the Rosice-Oslavany Industrial Area*; Prokop, *On the Jewish Legacy in Viennese Architecture*, 14–18.

30 See Korbel, "Profesní a společenský vzestup českých architektů a stavitelů v 19. století."

31 See Horváth et al., *Ezerarcú vasút II*, 128–31; Aničić, R.I.P. - *Riječka industrijska priča*; Sisa, *Hungarian Architecture and Design 1800–1900*; Weinreich, "Pfaff Ferenc legjelentősebb felvételi épületei"; Levardy, "Pfaff Ferencre emlékezünk halála századik évfordulóján."; Damjanović and Brajković. "Kompleks željezničkog kolodvora u Karlovcu"; Gelléri, *Az Ezeréves Országos Kiállítás Kalauza*; Palinić and Bjelanović, "Wooden Structures in the Historic Port of Rijeka."

A similar logic guided state-controlled industries, particularly tobacco production, where architects and engineers employed by central authorities designed and coordinated multiple factories across the Monarchy, often reusing architectural solutions to optimize costs and efficiency. Lajos Zobel, a Budapest Technical University graduate, embodied this approach as architect and financial advisor of the Royal Central Tobacco Excise Directorate.³² From 1902 to 1914, Zobel designed or supervised major factories, such as the Óbudai and Lágymányosi tobacco plants in Budapest, as well as the Pécs Tobacco Factory, likely collaborating with Szilárd Zielinski or his disciples for reinforced concrete structures. He was also involved in the construction or extension of factories in Timișoara, Rijeka, Miskolc, Carei (Nagykároly; Grosskarol), Sfântu Gheorghe (Szentgyörgy; Sankt Georgen), Vásárosnamény, and Spišská Belá (Szepesbéla). Beyond these works, Zobel is credited with the Pavilion of the Central Directorate of Tobacco Excise at the 1896 Millennium Exhibition in Budapest.

Private architectural practices developed parallel circulation systems focused on technological innovation and modular construction techniques. These networks operated through professional partnerships, licensing agreements, and collaborative projects that distributed advanced construction methods across the monarchy's industrial centers. In Transleithania, Szilárd Zielinski, a Budapest Technical University graduate trained in Paris at Eiffel's firm, pioneered reinforced concrete in industrial and utility buildings.³³ From 1889, his office produced works using the *Hennebique* system, including the Ericsson Factory, the Rolling Mill Silo in Buda, and the Albergo per gli emigranti in Rijeka, a transit hotel combining reinforced concrete engineering with Secessionist aesthetics. His most recognizable works are the water towers in the Kőbánya, Istenhegyi, and Margitsziget neighborhoods of Budapest, as well as similar edifices in Szeged, Timișoara, Beočin (Belcsény), and other cities across the Monarchy. Despite minor differences in scale or detailing, these structures form a coherent typological family, adhering to shared architectural and structural principles that ensure visual unity and construction efficiency. Although they cannot be considered exact replicas or the result of strict standardization, these towers employ

32 See Lővei, *A műemlékvédelem táguló körei*, 79, 83; Déry, “Budapest XI. Budafoki úti dohánygyár raktárépület”; Gelléri, *Az Ezredéves Országos Kiállítás Kalauza*.

33 See Hajós, *Szilárd Zielinski*; Jancsó, *A Temesvár-Lippa-Radna helyi érdekei vasút története*; Glavočić, *Arhitektura secesije u Rijeci*; Lovra and Bereczki, “Early Use of the Reinforced Concrete”; Holló, “Konceptióváltás a 19/20. század fordulóján az ipari építészetben”; Gudelj, “Grand Hotels Around the Kvarner Bay”; Gábor-Szabó, “100-Year-Old Water Towers of the Zielinski Engineers’ Bureau”; Márton, “Zielinski Szilárd az úttörő mérnök.”

similar construction solutions, tailored to the local context and the specific requirements of each site. Zielinski trained engineers such as Árpád Gút and Jenő Gergely, who continued his approach in projects like the Fehérhegy water tower and other industrial facilities in Pécs, often collaborating with architect Andor Pilch.

A similar logic of typification and local adaptation can be seen in Cisleithania. Bruno Bauer, a graduate of Prague Technical University who established his own industrial architecture office in Vienna, exemplifies this approach. Between 1907 and 1938, he designed over 380 industrial buildings, mainly using reinforced concrete, predominantly textile mills organized as single-story halls (*Shedbau*) or multi-story structures (*Hochausbau*). His projects were built across Cisleithanian and Transleithanian cities (including Vienna, Prague, Brno, Jihlava, and Mosonmagyaróvár), combining structural efficiency and modular construction with careful attention to aesthetics and visual coherence.³⁴ Many of his projects were executed in collaboration with structural engineer and contractor Eduard Ast, who developed a regional network of offices in Pécs, Brno, and Liberec to coordinate large-scale industrial works.³⁵ The company Ast & Co. specialized in adapting standardized *Monier* and *Hennebique* systems to local conditions, achieving a balance of structural efficiency and distinctive style. Their work included textile factories in Litvínov (Oberleutensdorf), Bielsko-Biala (Bielitz-Biala), and Brno, as well as the Schuckert & Co. industrial complex in Vienna. The firm was also involved in mining construction, designing and executing extraction shafts at the Kukla mine in Oslavany near Brno, and at the Szent István and Széchenyi mines in the Baranya region near Pécs, all commissioned by Joseph Schöngut's Viennese office. Another notable achievement was the water tower in Szolnok, the technical and aesthetic solutions of which closely paralleled Zielinski's works, reflecting not only the shared typological and structural principles circulating among professionals but also the subtle rivalries and exchanges that shaped industrial architecture across the monarchy.

Municipal authorities played a decisive role in shaping the translation of industrial and infrastructural architectural models across the Habsburg Empire,

34 See Beran, *Bruno Bauer a industriální architektura*, 22, 27–29; Beran, *Industrial Architecture: Creators and Plans*; Mertová and Ryšková, *The Cultural Heritage of the Brno Wool Industry*; Miloš et al., *Cultural Monuments of the Rosice-Oslavany Industrial Area*.

35 See Beran, *Bruno Bauer a industriální architektura*; Pilkhoffer, *Bányászat és építészet Pécssett a 19–20. században*; Béla, “Kiegészítés és bányászat”; Gábor-Szabó, “100-Year-Old Water Towers of the Zielinski Engineers’ Bureau.”

directly influencing how modernization took form at the urban level. Through regulation, fiscal policies, land allocation, and design competitions, they determined how metropolitan architectural models were adapted to local conditions. Municipal technical offices were central to this process, with chief architects and heads of engineering departments acting as key mediators between local needs and trans-imperial professional networks. Predominantly trained in Vienna or Budapest, these professionals brought contemporary technical standards and design principles into provincial contexts. Beyond mere transmission, they actively filtered, adjusted, and recalibrated metropolitan models, drawing on their familiarity with current architectural debates and personal connections to leading architects. In this capacity, they could either commission established designers or themselves oversee and reinterpret projects, influencing not only technical implementation but also the aesthetic orientation of urban development, while adapting designs to local stylistic traditions, available resources, and specific urban contexts.

The institutional position of the municipal chief architect emerged relatively late in most of the cities discussed here, generally after 1900, as part of broader efforts to impose greater coherence on urban development. This consolidation was driven primarily by the growing complexity of urban regulation and infrastructure management rather than by the immediate demands of industrial construction, resulting in distinct local configurations of municipal architectural authority. These differences may be partly explained by variations in the timing and industrialization patterns, as well as by prevailing modes of project commissioning in each city. Such differences also determined the degree to which cities could experiment with metropolitan models, with administrative, financial, and jurisdictional constraints shaping both the scope and form of architectural interventions.

In Rijeka and Timișoara, architects holding municipal positions operated at the intersection of municipal administration and private practice. By combining private commissions with responsibilities in municipal technical departments, they were directly involved in the planning and execution of industrial and infrastructural projects, allowing them to adapt metropolitan architectural models to local conditions. A notable example is Giovanni Rubinich, who obtained the title of engineer-architect from the Royal Joseph Technical University of Budapest in 1900 and was subsequently employed by the Municipal Technical Office in Rije-

ka.³⁶ From this position, he designed and oversaw an impressive number of utilitarian and industrial buildings in the region. Although administrative and linguistic challenges limited the scope of his practice, his municipal role allowed him to test and refine practical design solutions, developing a hybrid architectural language that combined functional rationality with Liberty-style elements responsive to local tastes. His contemporary and fellow graduate, László Székely, was appointed chief architect of Timișoara in 1903.³⁷ Considered the most prolific architect of the city, Székely played a decisive role in shaping the urban landscape during the peak period of modernization, designing an impressive number of civil and industrial buildings and often integrating Secessionist motifs into the edifices, from hydrotechnical works and factories to public utility buildings and workers' housing.

A different configuration can be observed in Pécs and Brno, where municipal technical offices played a more indirect role in relation to industrial architecture. Municipal architects and engineers focused primarily on public buildings, while their influence on industrial projects was exerted indirectly through regulatory oversight, technical supervision, and participation in advisory and evaluative bodies. In Pécs, they acted mainly as mediators and supervisors, adapting imperial models indirectly rather than engaging in direct design. Figures such as Kálmán Kovácsfi, József Némethy, Lajos Burgstaller, and János Rauch provided guidance, but frequent vacancies, low salaries, heavy responsibilities, and a shortage of qualified personnel, many of whom sought higher-paying work in the railways or private sector, limited municipal authority. As a result, urban development remained largely ad hoc, and without a comprehensive plan, modernization progressed in a fragmented and incremental pattern.³⁸ In Brno, the institutionalization of municipal architectural authority under through figures such as Franz Holik, trained in Vienna and appointed the city's first municipal architect,³⁹ favored regulatory and administrative roles over direct design involvement. Holik's responsibilities included the design and artistic aspects of public buildings, the assessment of submitted projects from an artistic perspective, and the development of urban and regulatory plans. Although he focused on public and residential buildings, Holik influenced the development of industrial and

36 Pustišek, *Giovanni Rubinič*, 3.

37 Pintilie, "Documente din arhive particulare – László Székely."

38 Pilkhoffer, *Pécs építésze a századfordulón*, 60–66.

39 See Filip, "Franz Holik (1874–1943). První městský architekt v Brně.>"; Králiková, "Kounicova ulica v Brne - Stavebný a urbanistický vývoj."

infrastructural projects through his role as a mediator, shaping how imperial models were interpreted, supervised, and adapted to Brno's Bohemian-influenced aesthetics.

This dual function exercised by municipal architects often intersected with another essential mechanism in the circulation of architectural knowledge: cross-regional professional practice within the Austro-Hungarian realm, driven by the dynamics of investment and the demand for both public and private projects. Figures like László Székely and Mihály Kajlinger were frequently commissioned beyond their official jurisdictions, extending their influence across multiple urban centers. Trained in Budapest, Mihály Kajlinger first distinguished himself through projects in the capital, contributing to the Central Pumping Station and overseeing major water supply facilities, including the Káposztásmegyer, Főváros plants, and the Buda pumping stations.⁴⁰ Building on this experience, Kajlinger coordinated water supply systems in cities including Rijeka, Timișoara, Târgu Mureș (Marosvásárhely; Neumarkt), Szombathely, and Miskolc. Similarly, László Székely extended his architectural practice beyond Timișoara, designing slaughterhouses and related facilities in Zrenjanin, Pančevo (Pancsova; PANTSCHOWA), Sombor (Zombor), and Arad.⁴¹ Their mobility underscores the permeability of provincial boundaries and the interconnectedness of urban modernization efforts within the monarchy.

This professional circulation often intersected with the mobility of architectural models and capital, driven by investors and entrepreneurs who reoriented their businesses in response to regional economic dynamics. Following the Viennese stock market crash of 1873, numerous entrepreneurs from Bohemia and Moravia chose to relocate their investments to territories within Transleithania, where industrial development was in full expansion. In this process, investments were systematically accompanied by the transfer of architectural and technological patterns specific to their regions of origin. A significant example is the Hat Factory in Timișoara, financially supported by shareholders Wilhelm Keller, Wilhelm Riecken, and Emil Gerhard Pick, all originally from the Bohemian city of Litvínov. Within the composition of the industrial complex in Timișoara and in the design of the administrative pavilion, one can easily identify

40 See Károlyi, *Víz-Rajz*, 14-19, 54; Pană, *Emil A. Dandea. Un moș primar la Târgu-Mureș*, 92; Hațegan and Vlaicu, *Alimentarea cu apă a Timișoarei*, 35.

41 Szekernyés, *Székely László*, 47.

direct influences from the factories previously owned by these investors in Bohemia.⁴²

Equally important is the fact that craftsmen and technicians also participated in regional mobility, contributing to the standardization of construction techniques and detailing, as well as to the technological and practical transfer of knowledge. Another relevant case is that of János Himerli, a specialist in glove production, who, after gaining professional experience in workshops and tanneries in Timișoara, Arad, Pest, Vienna, Graz, Salzburg, and Bohemia, founded a factory in Pécs.⁴³ The new facility would go on to become one of the most important glove factories in the region.

Study trips, documented in reports and travel journals, played a crucial role in the spread of construction typologies and innovative technologies. An illustrative example is János Krátky's 1898 report, based on systematic visits to slaughterhouses in France, Belgium, and Germany.⁴⁴ The report contains detailed documentation on organizational methods, technical equipment, and sanitation systems, and due to its thoroughness, it was most likely widely circulated within professional circles, surpassing the status of a mere administrative study. The impact of these exchanges is visible in the design of major slaughterhouses in Vienna, Budapest, and Prague which, although initially inspired by Western models, became references in turn for similar developments in provincial cities of the monarchy. These complexes often share common architectural traits: symmetrical plans, monumental architecture, dominant vertical elements, and gateways adorned with zoomorphic sculptures, frequently featuring groups of bulls, meant to combine functional coherence with symbolic gravitas. However, despite these recurring patterns, each architect applied local adaptations, balancing replication with personal reinterpretation.

Practical experience on various construction sites complemented these written sources. Visits to industrial centers in Western Europe exposed architects to best practices in infrastructure and public architecture, shaping designs

42 Trifa, "De la măiestrie la decădere."

43 Márfi, "A pécsi Hamerli család története és irathagyatéka."

44 János Krátky, an engineer employed by the Budapest municipality, was sent in 1898 on a study trip to Western European cities to examine the equipment and interior fittings of slaughterhouses and pig markets. His report, titled *Úti jelentés a külföldi (németországi) sertésközvágóhidak és sertésásárok belső berendezéseinek és felszereléseinek tanulmányozása céljából 1898. évi október hó 6-tól 28-ig tett tanulmányútról* [Travel report of a study trip from October 6 to 28, 1898, for the purpose of studying the internal equipment and installations of foreign (German) pig slaughterhouses and pig markets] was compiled to support the construction of a new slaughterhouse in Budapest, complementary to the existing one.

throughout the monarchy. This process is well documented in the specialized literature, with the chief architect of Timișoara serving as a notable example. Székely himself benefited from such exchanges. In 1899–1900, he received a scholarship for a study trip to Italy, gaining direct exposure to international architectural models and urban programs. During his studies, he also worked in several Budapest offices, including the Grünwald & Schiffer office on the Káposztásmegyer Waterworks, where he likely met engineer Mihály Kajlinger, later involved in Timișoara's water supply system. After graduation, Székely served as assistant to Professor Győző Czigler, coordinating construction sites in Budapest and remaining closely connected to major architectural developments.⁴⁵

Another essential vector in the dissemination of architectural and technical models within the Austro-Hungarian Monarchy was participation in national and international exhibitions. The Universal Exhibitions in Vienna (1873), Budapest (1896), Paris (1889, 1900), and Milan (1906), along with numerous industrial fairs (e.g., the Industrial and Agricultural Exhibition of Banat in 1891, marked by the presence of Emperor Franz Joseph in Timișoara),⁴⁶ offered the ideal platform for professional training and the exchange of ideas, presenting technological innovations and stylistic experiments to a broad audience. Architects and engineers from the monarchy were involved both as authors of pavilions and as active observers. Figures such as Lajos Zobel and Ferenc Pfaff served not only as designers of national or corporate pavilions but also as participants in architectural competitions dedicated to these structures.⁴⁷ In parallel, numerous other professionals visited the exhibitions as spectators, familiarizing themselves with the materials, construction systems, and spatial solutions presented at these major events. For many of them, contact with new models had a visible impact on their subsequent architectural language, contributing to the stylistic hybridization and formal refinement that characterize much of the industrial and civic architecture within the monarchy.

Professional associations and technical publications played a complementary role in the organization and circulation of knowledge within the Austro-

45 See Szekernyés, *Székely László*.

46 Hațegan, *Camera de Comerț, Industrie și Agricultură Timișoara*, 30–35.

47 See Székely, *Az ország tükréi*; Székely, *Ephemeral Architecture in Central Eastern Europe*; Székely, *Nemzet, ipar, művészet: A kolozsvári I. Ferenc József Iparmúzeum*.

Hungarian Monarchy. Specialized books⁴⁸ and journals such as *Die Österreichische Ingenieur- und Architekten-Zeitschrift*, *Wiener Bauindustrie-Zeitung*, *Wiener Baubütte*, *Allgemeine Bauzeitung*, *Zentralblatt der Bauverwaltung*, *Deutsche Bauzeitung*, *Der Industriebau*, *Betonszemle*, and *Építő Ipar*⁴⁹ circulated widely, offering detailed articles, visual documentation, and debates on technologies, materials, and construction systems. These publications contributed to the creation of a shared vocabulary and reference framework among dispersed professional communities, thus helping to overcome linguistic and regional barriers in the spread of architectural models. However, some of these journals were primarily oriented toward elite circles, paying little attention to practices and projects from the non-academic construction industry.⁵⁰

Together, the mechanisms discussed above formed a complex network of education, mobility, and mediation, facilitating the circulation of architectural and technological knowledge within the Austro-Hungarian Monarchy. This process contributed significantly to the development of a modern built environment, marked by a cosmopolitan influence carefully adapted to local particularities. Notably, architects and engineers left their imprint on cities that, at first glance, appeared entirely disparate, differing in size, geography, governance, linguistic and ethnic composition, economic role, and cultural context. Their work demonstrates how professional networks enabled the diffusion of knowledge and design principles, allowing individual practitioners to shape the urban and industrial landscapes of a diverse imperial landscape.

Conclusion

The circulation of industrial architectural models within the Habsburg Empire reveals a sophisticated system of knowledge transfer that transcended conventional center-periphery hierarchies. Rather than operating through simple dif-

48 Ludwig Utz, Engineer and Director of the Imperial and Royal Institute for Textile Industry in Vienna, presents numerous examples of industrial architecture in *Moderne Fabrikanlagen* (Leipzig: Uhlands technischer Verlag, Otto Politzky, 1907), with detailed attention to technical solutions and structural details, factory building types (including specialized solutions for textile, metal, chemical, food, and paper industries), and fireproofing strategies. Similarly, Georg Osthoff's work *Die Schlachthöfe und Viehmärkte der Neuzeit* (Leipzig: Scholtze, 1881), circulated widely at the time and served as the basis for the design of numerous slaughterhouses, including the one in Brno.

49 See Beran, *Industrial Architecture: Creators and Plans*, 41–43; Lovra and Bereczki, “Early Use of the Reinforced Concrete.”

50 Beran, *Industrial Architecture: Creators and Plans*, 39–41.

fusion from Vienna and Budapest to regional cities, architectural expertise moved through complex, multidirectional networks that connected educational institutions, professional practices, state monopolies, and private enterprises across the dual monarchy's diverse territories.

Industrial transformation thus can be understood not only as an economic process but also as a mechanism of imperial integration. Designed as an instrument of administrative efficiency and a strategic response to the empire's fragmented political and territorial structure, the standardization of industrial architecture played a central role in modernization. In state-controlled sectors such as railways or tobacco production, typified design solutions created a unified visual language that reinforced imperial cohesion while accommodating local building traditions, material resources, and construction practices. This apparently uniform approach did not suppress regional distinctiveness but actively encouraged it: architects and engineers developed modular systems that were both technically rigorous and flexible enough to respond to diverse topographic conditions, climatic zones, and cultural environments. The capacity of the Habsburg system to balance evenness and adaptation in equal measure created a unique framework of knowledge transfer that continued to operate even after the political dissolution of the monarchy.

Stylistic integration further reinforced this dynamic. The incorporation of the most fashionable artistic currents of the time (Historicism, Secession, and related aesthetics) reveals that these buildings were never purely utilitarian. Ornament, proportion, and spatial articulation were employed to elevate the status of industrial facilities and signal their integration into the urban fabric as symbols of progress and modernity. In parallel, the circulation of the most advanced construction techniques and materials, illustrates the efficiency and reach of professional networks. Within a relatively brief period, innovations such as reinforced concrete or standardized steel components spread from Vienna and Budapest to regional centers, enabling systematic industrial modernization while accommodating local construction practices and aesthetic preferences.

This integrated approach offers several critical insights that extend beyond architectural history. Imperial integration proved most effective when supported by institutional flexibility, rather than by the imposition of rigid uniformity. The strength of the Habsburg system lay in its ability to foster professional networks that could adapt systematically to a wide variety of local conditions. In this light, imperial integration depended less on enforcing a standardized cultural model

and more on cultivating shared technical competencies, which established a common professional language across the empire's varied territories. Within this framework, peripheral regions emerged as true laboratories of modernization. Far from being passive recipients of metropolitan models, cities such as Timișoara, Pécs, and Rijeka became active sites of experimentation, where architectural solutions were tested, adjusted, and perfected before shaping broader imperial development.

The case studies reveal, however, that local implementation was rarely straightforward. In various cities, municipal authorities often faced staffing shortages, limited authority, and budgetary constraints, leading to delays, partial adaptations, or even abandoned projects. The mobility of architects and engineers, while essential for the transfer of knowledge, required coordination across multiple cities and firms, sometimes giving rise to professional rivalries, competing interpretations of typologies, or deliberate replication of successful solutions. From this perspective, the dissemination of architectural models appears less as a smooth transfer and more as a negotiated process, where local actors and conditions left a visible imprint on the built environment.

The Habsburg case therefore offers a model with contemporary relevance. It shows how systematic knowledge circulation can accelerate technological progress without erasing regional traditions, a lesson pertinent to current debates on technology transfer, heritage preservation, and adaptive reuse in multicultural contexts. Recognition of industrial architecture as the product of such networks allows for more informed conservation strategies, situating these structures not as isolated monuments but as integral components of the urban fabric shaped by shared expertise across an entire region.

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