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The effect of architecture design as the non-digital component to the digital industry development—case study ‘Brick Factory’ in Prishtina, Kosovo

A. Basha-Jakupi, G. Kuleta and V. Navakazi*

Abstract

Buildings that were once the machinery of production, and influencing not only the economic but also the social relations of the inhabitants, and while now those spaces remain ‘dead,’ it questions and at the same time strives for contemporary intervention to restore vitality and give more to the neighborhood. Neglected industrial facilities of the ‘Brick Factory’ in Prishtina will be the objective of this study. This research will attempt to give a new function to the current state of the building and its surroundings and new opportunities around it for the Kosovo young generation trying to fight the high unemployment and migration rates. Digital technologies have spread speedily in the world. In many instances, digital technologies have boosted growth, expanded opportunities, and improved services, and, at the same time, have provided an excellent basis for employment (World Bank, World development report 2016: digital dividends, World Bank, Washington, 2016). However, the advantages of digital technologies will be understood better when knowing how digital technology relates with other non-digital components, such as architecture, that are equally important for development. This study aims to connect them coherently and create a stimulating dialogue. Bringing the appropriate digital and non-digital components into the underdeveloped neighborhood enhances its inhabitant’s economic development and social and emotional growth.

Keywords: Tech Hub, Revitalization, Architecture, Industry

Introduction

There are many cases of buildings constructed some time ago that no longer fit the purpose. ‘Brick Factory,’ in Prishtina, is a case that strives for re-creation and revitalization of the building. The new and contemporary intervention would help the community to promote improvement in economic and social aspects and recall the times of the formerly developed and well-urbanized space. This research will attempt to give a new function to the current state of the building and new opportunities around it. The rapid spread of digital technologies in the

world has boosted growth, expanded opportunities, and improved services and, at the same time, has provided an excellent basis for employment (World Bank 2016). However, the advantages of digital technologies will be understood better when knowing how digital technology relates to other non-digital components, such as architecture, that are equally important for the development.

The impact of industrialization and then deindustrialization left its mark on the city’s social, economic, and urban development. Therefore, by analyzing all relevant information on ‘Brick Factory’ and impacts it had on the social, economic, and urban development of the city, will be able to understand the needs and anticipations of citizens of Prishtina, as well as support the progress of the project on revitalization and transformation

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of the factory. According to the latest heritage protection list of Kosovo, the Brick Factory is not listed (MCYS 2018). However, the originality of the heritage buildings should be preserved, and the adaptive reuse strategies for heritage buildings should be applied. In addition, the producer should respect the cultural significance of the heritage building; however, in this case, regulations authorities under certain classification degrees are not the main actors.

The investigation line of this study will revolve around the following research questions: How can architectural design influence the development of digital centers in underdeveloped neighborhoods? How can the revitalization of an old industrial building affect the alteration toward healthy urban space?

The city - The urban journey of Prishtina began in the thirteenth century when identified as a settlement, developed further into a specific urban-architecture style of the time and the influences of the regimes. Prishtina was an important political, economic and administrative center, which caused Prishtina to experience significant growth during the nineteenth century (Buxhovi 2012). The end of the century marks a particular development, bringing European influences, the railway, printing house, and other actions which make Prishtina a vital city in Kosovo and the region. In 1912, Kosovo was invaded by Serbia, while after the Second World War, Kosovo remained part of Yugoslavia (Buxhovi 2012). After 1948, Prishtina took on the role of the capital, where during these years, the urban area of the city expanded, with new neighborhoods built, thus experiencing organizational, economic, and educational transformation. Also, all this urban and economic development during the twentieth century makes Prishtina an industrial center with influence in the whole region (Municipality of Prishtina 2013). However, by the end of the twentieth century, the political situation is deteriorating. Kosovo is experiencing war which brings significant losses in people, destruction of infrastructure, education, economic collapse by extinguishing many factories to an irreversible state. After the war until today, Prishtina and other cities of Kosovo have left these industrial facilities at the mercy of fate, only as empty buildings that reflect unpleasant urban areas for both residents and visitors.

The architecture - Abandoned industrial buildings are currently an essential part of urban neighborhoods worldwide, especially in traditionally developed countries. Given the growing need for a sustainable environment and urban regeneration, there is the problem of rehabilitating abandoned industrial buildings, which may take on a strategic role in the city transformation process (Villacampa and Poli 2017). Therefore, the central theme of urbanism and architecture is no longer the

new construction, growth, or expansion. Still, it is that of the existing transformation, "the building built," "to give meaning and future through constant modifications of the current city, space, and materials," looking for new design methods, awareness of the problem of relationship with the context, country specifics, feelings of recovery (Bianchi and Federico 2017).

Digital Technology - Inclusion, competence, novelty are the primary tools by which digital technologies stimulate growth. However, they also demonstrate a high failure rate and varying degrees of success (World Bank 2016). This research examines the architecture arrangements, the non-digital supplements that they provide to the digital technologies. Digital hub's goal is to improve the local digital setting available to the local people, businesses, or local authorities and offers further opportunities to transform the way people live and work in underdeveloped areas (Ashmore et al. 2019). Good architectural design transcends itself by bringing about the proper function and design and sustainability based on the principles and concepts of healthy urban spaces.

Literature review

Determining the new usage of a heritage building is challenging in the decision-making process since there are many factors in the course. Finding the most suitable function within the setting is critical to preserving the cultural importance of the heritage building (Stratton 2000). There have been different opinions about the usage of the Brick Factory and still are in search of its function. The proposals have ranged from war museums to temporary interventions in which the community decides and contributes to establishing which intervention should be preserved and consolidated for the future of the Kosovo capital. The digital hub is one of the proposals considered to be elaborated in this article. It should be taken as one of the stances that should encourage the elaboration of other functions to be argued on the same level of examination. Therefore, this article should be used as a basis for the discussion and future development of the site. The study analysis revealed that industry used to be a vital economic resource of the city.

Consequently, the proposal attempts to replace industrial development (2nd industrial revolution) with digital technology development (4th industrial revolution). A successful adaptation respects the existing building and its historical context by adding a contemporary layer to the heritage building rather than destroying its character (Reuse DEH 2004). A fundamental argument is that we have digitalization implications in today's every aspect of our lives. Unfortunately, the digital divide is real from transport to healthcare, education to shopping. Improving internet access and digital skills is crucial to

ensure that no one is left behind (EU-WeBalkans 2021). The fragmented digital market, underdeveloped infrastructure, low levels of digital literacy, and a significant urban–rural divide in broadband cover pose substantial digitalization challenges in the Western Balkans. According to the Digital Economy and Society Index (DESI) 2019 report, the development and use of e-services in the region lag significantly behind the EU. The percentage of the population using e-government services ranges from 9 to 21% compared to the EU average of 59%. The region needs large-scale investment to catch up, fully exploit digital business opportunities, and reach the EU's targets of universally accessible connectivity by 2030 (EU-WeBalkans 2021).

Unemployment remains the biggest challenge for Kosovo's development. The unemployment rate in Kosovo is around 45%, whereas the age group of 25–39 years constitutes about 60% of the unemployed in the Municipality of Prishtina (Kosovo Agency of Statistics 2017). Another element of assessing the situation is the mismatch between job demand created by educational institutions and job demand generated by local and foreign businesses (Palmer 2017). As they fail to integrate into the labor market, the younger generations engage in informal economic activities or emigrate. On the other hand, there is a growing opportunity in the digital technology domain, which can benefit the unskillful youngsters and help prepare locals for jobs in the tech economy, foremost by improving tech education. Prishtina tech companies are working together to promote a concept of "techquity" to help drive the city's tech opportunities and the right location, space, and facilities. Digital hubs can target digital awareness, help tackle digital competency gaps, provide new ways of accessing services, create new opportunities for local businesses, and foster more robust social and business networks (Ashmore et al. 2019). The 4th Industrial Revolution offered further opportunities to transform the way people lived and worked in underdeveloped areas. Still, there is a continued risk of those areas being left further behind without digital skills. The chosen topic is part of the larger initiative that will impact Kosovo and the whole region. Europe's 'Digital Decade' finds the EU moving up funding to spread the digital transformation to the Western Balkans. An endeavor that will bring the region of the Western Balkans closer to the EU integration; and the cooperation between each other (EU-WeBalkans 2021). It is a significant impetus for the region's stability and prosperity when considering the unrest dispute history of the Balkan.

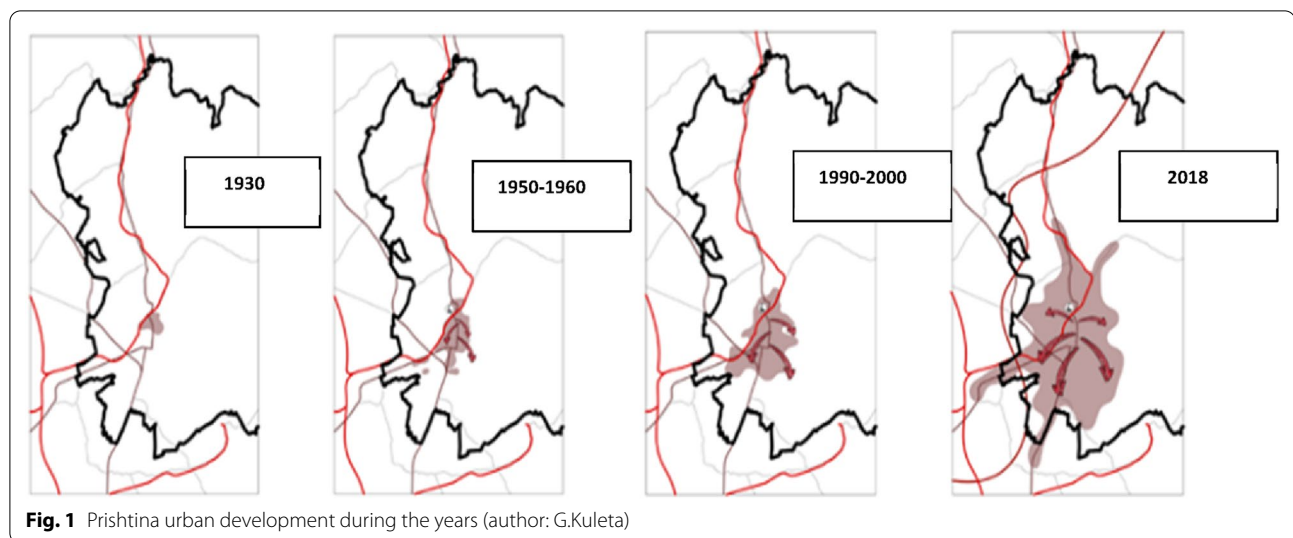
As a center of various activities, Prishtina attracts a high number of inhabitants from different municipalities, so with it comes the number of buildings built, which has affected the expansion and inclusion of some areas

within the municipality of Prishtina. The destruction of many houses during the last war increased the displacement of inhabitants from other municipalities, consequently the population of Prishtina. This demographic movement caused pressure and burdened the social infrastructure, devastated by the lack of investment for many years (Basha-Jakupi and Nushi 2017). While some existing neighborhoods in the city managed to retain their volumetric structures, others drastically changed by unplanned and suspicious constructions that have destroyed the landscape. Areas such as 'Kodra e Trimave,' where the 'Brick Factory' is, have been constantly in difficult infrastructural and economic conditions.

Some neighborhoods' lack of regulatory plans, especially the pressure from citizens' demands to resolve the housing issue, has often resulted in unplanned and illegal construction and poor quality, thus reaching informal settlements (Ministry of Environment and Spatial Planning 2005). The informal settlement is being treated for the sole reason that the 'Brick Factory' is an integral part of one of the informal neighborhoods of Prishtina (Ministry of Environment and Spatial Planning 2005). It is 'Kodra e Trimave,' with the complex social and economic situation and a high rate of unemployment and poverty of the neighborhood. About half of households do not have a secure income, but even that income is not enough to provide the necessities of life, which indicates a high level of poverty (OSCE 2011). The problems of these settlements are due to a lack of proper planning. Although Prishtina has already adopted a Strategic Plan, issues with essential services are still pending. Rapid population growth makes infrastructure systems already obsolete and dysfunctional (OSCE 2011).

Study analysis

Based on the history of urban development of Prishtina, the city has expanded on all four sides even with solid momentum after 1999. As a result, Prishtina underwent extraordinary transformations. However, the most critical development focus is in the southeastern part and southwest of the municipality (Fig. 1), thus leaving the northern part of the city neglected, with no identifying or recreational space. Specifically, neighborhood 'Kodra e Trimave' lies in the north part of the city and comprises 9.16 ha. According to records, this neighborhood existed in the 60 s and occupied a minimal space. However, from the data of the 80 s, this neighborhood has developed in an uncontrolled way, not having adequate social and technical infrastructure. Today, this neighborhood has witnessed a significant increase, with different structures of buildings, different shapes and heights, high density, individual and public housing and use of facilities for commercial activities, and remaining a sizeable



non-urbanized location of the city (Fig. 2c) (Ministry of Environment and Spatial Planning 2005).

The "Brick Factory" included approximately 6.5 ha (Fig. 2a) and was among the first factories to produce construction materials from baked clay in Kosovo. The '70 s to '90 s were the years of mass production, making that area perceived as an area of industrial development and as a working space. In 1990–1993 the factory bankruptcy decision was approved, under the riots and under the influence of that time regime. Thus leaving the factory abandoned, but with the end of the 1999 war, the factory resumed production in 2000, significantly reducing capacity. However, despite the goodwill and tireless work of the factory workers, in 2007, it was finally closed, and its rights were passed to the Privatization Agency of Kosovo, thus significantly harming all factory workers (Municipality of Prishtina 2013). In 2014, the decision was made to liquidate the company, but without final results yet. Although in serious condition, today they are used as warehouses of various companies managed by the Privatization Agency of Kosovo. The heritage building is neglected and can be reused by just some maintenance and rehabilitation works, can be a partly

demolished building that needs restoration and consolidation works and adaptations such as remodeling and addition (Mısırlısoy and Güncü 2016). Therefore, building requires a more holistic and in site evaluation. Professionals who will find the best criteria for the conservation and intervention of the heritage buildings must evaluate both the exterior and the interior. The assessment of an existing building must be done comprehensively (Rabun and Kelso 2009). However, these criteria remain relatively undefined, based on the idea that each heritage building has its unique conditions, which make its problems different from the others, due to the lack of a dependable methodology (Robles 2010). Today, chimneys that once gave direction and drew attention to an active, industrial workspace only bring back memories. Chimneys that once symbolized work, dedication, sacrifice translate into a developed economy, a dignified life to which different generations have contributed. With the phase of deindustrialization, like many countries in transition worldwide, Kosovo had a significant decline in terms of industry. As a result of the delay in the privatization of these socially-owned enterprises, in the post-war period, most of them suffered market losses. Reduced employment or total



bankruptcy, or some are in the hands of the Kosovo Privatization Agencies. Many buildings and industrial complexes have been abandoned and relocated to the city outskirts following deindustrialization and urban growth. Thus, under the pressure of population growth worldwide, the value of land in urban areas is growing, questioning the fate of industrial facilities (Lever 1991). In recent decades, in the international context, the phenomenon of abandoned industrial buildings is becoming significantly more extensive, with social, urban, and inevitable economic consequences. The main problem is to make proper use of these buildings, structures, and spaces, bearing that most of them offer opportunities for reuse. Well thought out, their adaptive reuse can contribute to social and cultural capital building, environmental sustainability, and urban regeneration (Bianchi and Federico 2017).

The study tends to elaborate on the revitalization of industrial heritage throughout this study, bearing that these buildings provide information about the city's economic, architectural and technical achievements. The three basic revitalization principles are, a) *the principle of continuity*, where the building is integrated into contemporary usage; b) *the principle of proper destination* where the new role must correspond to its structure, typology, and adaptive possibility; and c) *the principle of preserving authenticity* where the volume and changes of the new destinations need not infringe on the authenticity and monumental values of the building (Bianchi and Federico 2017).

Proposal

The study analysis revealed that industry used to be a vital economic resource of the city. Consequently, the proposal attempts to replace industrial development with digital technology development. Hence, the designed spaces endeavor to have an innovative and recreational character by positively influencing urbanization and the socio-cultural life of the neighborhood.

The site analysis discovered that access to the location is very favorable by all means. The cars can use the main street "Zagreb" which tangents the site and the other secondary roads presented in the diagram (Fig. 3c). While at the same time, the railway station and urban public transport line (Fig. 3f) are within proximity. Having a close connection with the city center through secondary roads, pedestrians can access the site from all four sides (Fig. 3b). In a radius of 10 min are Arberia park, primary school, and the city center (Fig. 3a), factors which attribute to the excellent and easy access to the location. Sufficient green spaces (Fig. 3d), which are considered as potential for future development. It has a good orientation for the proper functioning of all types of destinations. Many factors affect adaptive reuse decision-making, and for a successful adaptive reuse project, they must be comprehensively considered. According to Mısırlısoy adopted model (Mısırlısoy and Günçe 2016), all of the proposed factors have been conceptually elaborated in this paper. Such as the analysis of existing fabric, original function of the building, physical character, heritage values, needs of the district, adaptive reuse potentials, and functional changes have been addressed. In comparison, the conservative actions that need to be considered with a more comprehensive site examination should be elaborated into four categories. In this proposal, there is a combination of them due to several buildings—foremost the emergency measures of the building, where there is no complete restoration. In contrast, the second step comprises the building's complete restoration, including consolidation and completion of missing parts, by continuing with new additions and remodeling proposals. To preserve the collective memory and the spirit of the place, initially, it was decided to protect the two smokers of the brick factory complex by following the same principle on some parts of the façade of the 1st building (Figs. 3b, 4, 5), which will preserve the architectural value of a prominent former building. Thus adding new



Fig. 3 Brick Factory volume: **a** actual state, **b** proposal (author: G.Kuleta)

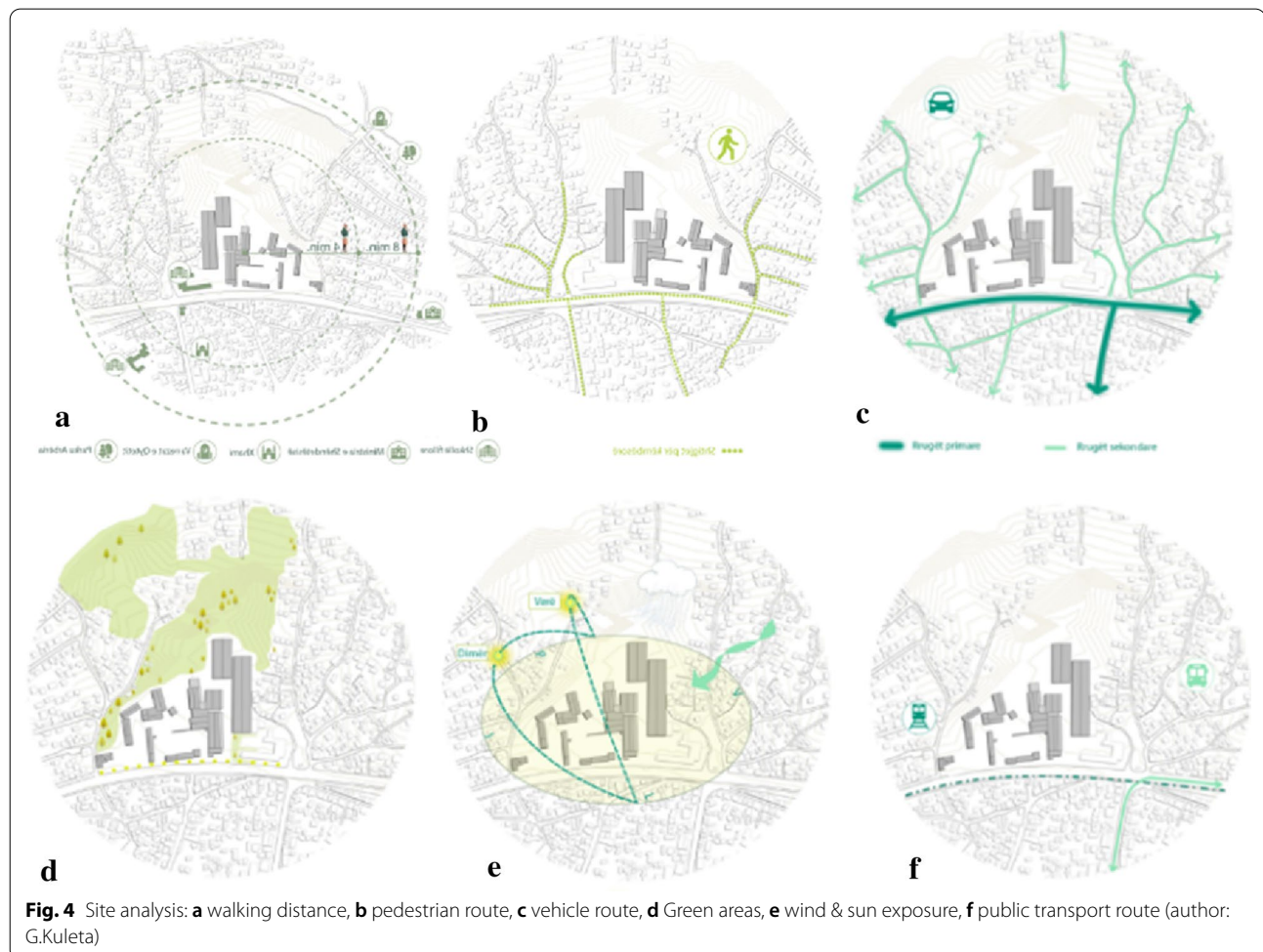
spaces will meet the settings and standards of a Tech Hub. Revitalized 2nd building has preserved its architectural integrity with all the construction, allowing small interventions in the facades and the building envelope. While in the 3rd and 4th building, it is anticipated to use the same metal construction as built in the '80 s, considering its good condition. All four buildings have very easily accommodated the activities of the Tech Hub, which aim to provide digital connectivity, support the development of digital skills and encourage the use of emergent digital technologies. Digital hubs aim to enhance the local digital environment and be available to the public, businesses, or local authorities (Ashmore et al. 2019). This research attempts to give new opportunities for the Kosovo young generation trying to fight the high unemployment and migration rates.

The antidote of the technology and digital world has been widely considered recreation and greenery. Therefore, this study tries to integrate greenery into a large plot area, thus enriching the neighborhood and softening the

big grey concrete mass of the overbuilt neighborhood, attempting to give an excellent example of the proper planning and encouraging such behaviors among the community.

Conclusion

While digital technologies can make repetitive and transaction-intensive tasks low-cost, faster, and more suitable, most services also have a non-automatable part, whose execution requires human judgment, intuition, and discretion (Kelly and Firestone 2016). For example, in Tech Hubs, the non-automatable part involves choosing the right location and developing appropriate architecture and inspirational places. Therefore, an essential aspect is how digital technology with a very idealistic and universal aim is to be implemented on the ground and embedded in the context of a place. The proposal for the tech hub function was defined as the most appropriate strategy for the heritage building of the brick factory foremost by interpreting the physical, economic, functional, environmental,



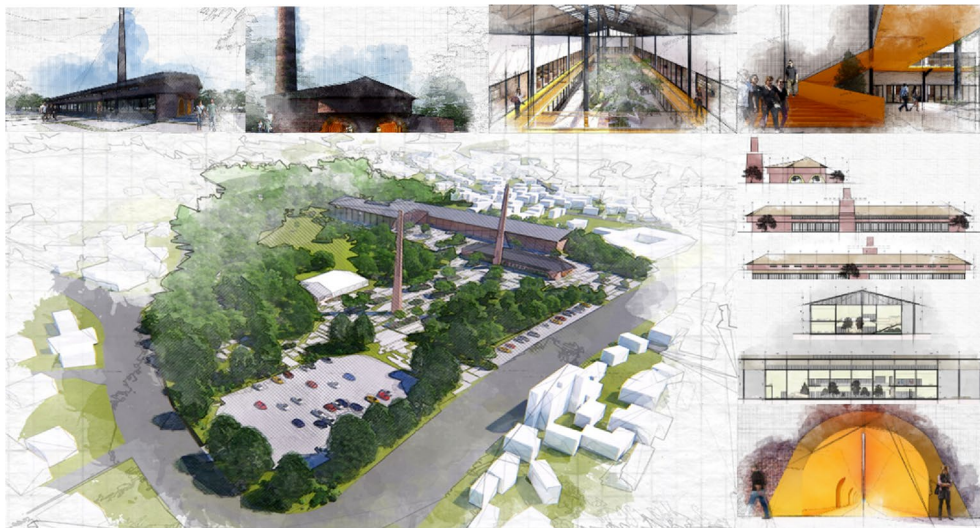


Fig. 5 Brick Factory architectural design proposal (author: G.Kuleta)

political, social, and cultural potentials it has on the city itself.

On a global scale, many industrial buildings have experienced a series of changes and unstoppable abandonment, which due to the outdated process of production, are not able to adapt to the new conditions. The ruins of the industry include obsolete buildings, plots, boundaries, and structures that influence with their characteristics the cities and neighborhoods, giving them a unique character. The idea is not just to reuse them but to revive them in a way that makes sense, and it is about creating an interesting dialogue. Its usefulness is to be re-imagined. Bringing the appropriate digital and non-digital components into the underdeveloped neighborhood boosts economic development and its inhabitant's social and emotional growth. Different stances use the digital component as the principal and more important than the non-digital component /architecture, or vice versa. Still, this study suggests that both components have essential roles to play, so long as their development plans match the needs of their working environment. While digital technology development presented different ways of working and living and profoundly changed society, in the same manner, the facilities that are to accommodate these activities need to offer equal impact on the city and its inhabitants.

Thus, the result combines today's digital technology with different architectural periods, giving the building unique. Precisely, the 4th industrial revolution attains to accommodate into the 2nd industrial revolution structure. Thus, today's intangible unites with the tangible

of the past by creating great potential harmony for the future of the cities.

Author contributions

The studies reported in this article are extensions of master thesis done by GK, mentored by AB-J and supplementary observations by VN. All authors read and approved the final manuscript.

Authors' information

Arta Basha-Jakupi obtained her Dipl. Eng. of Architecture at the University of Pristina (UP). In 2006, she pursued postgraduate studies in Bauhaus-Dessau, Germany and finished her PhD in 2012 at the Bauhaus University-Weimar, Germany. Currently, she works as a Vice-Dean and Professor in the Faculty of Architecture, UP. She previously held the position of Head of the Unit of Architectural Representation and Spatial Visualization, as well as a Coordinator for Academic Development in the FCEA. She was a member of State Quality Council at the Accreditation Agency in Kosovo (2018–21) and currently serves as an international external evaluator for the Higher Education Institutions of different EU accreditation agencies. She has won numerous scholarships and fellowships, which enabled several research stays and guest lectures, in: USA, Japan, Hungary, Austria, Italy, Germany, Netherlands, Croatia and BiH. She has completed her postdoctoral research at the Technical University of Vienna, and in 2018 carried out a research at MIT | USA, as a Fulbright Scholar. She has written one monograph, a number of scientific articles and implemented a number of architectural projects. She acts as a blind reviewer to different well known scientific journals of the SCOPUS and Web of Science database.

Gresa Kuleta has finished her BSc and MSc studies at the Faculty of Architecture, University of Pristina | Kosovo. She has taken part on different architectural workshops such as Bar CAMP and Center for Contemporary Art and executed different architectural projects. Her latest design has caught public attention for the Preservation of Architectural Heritage of the "Saint Pietro" Church in Mitrovica. Gresa currently works at the ArchiEDU office which offers architectural design and visualization services. Gresa is a BIM/CAD specialist and offers different professional trainings.

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Consent for publication

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