

Industrial Urbanism: Exploring the City–Production Dynamic

TALI HATUKA

Since the Industrial Revolution, cities and industry have evolved together; towns and metropolitan regions have grown around factories and expanding industries. Despite this shared past, however, popular notions of manufacturing tend to highlight its negative aspects: pollution, environmental degradation, and the exploitation of labour caused by growing industry, on the one hand, and – almost paradoxically – on the other, the blight, abandonment, and ‘shrinkage’ resulting from the more recent decline of manufacturing in cities in the developed world. In recent years, with the digitization of manufacturing, technological developments and environmental challenges, there is a growing recognition of the need to re-examine the interface between manufacturing and cities (Berger and Sharp, 2013; Helper *et al.*, 2012; Leigh and Hoelzel, 2012).

Supporters of such a re-examination, warn of self-destruction in countries that promote post-industrial policy. Relocating plants to countries where labour is less expensive, as a means of reducing production costs is not a viable strategy for the long term, and severing the connection between production and development impairs the ability to innovate in source countries (De Backer *et al.*, 2015; Manyika *et al.*, 2012; Pisano and Shih, 2009). This trend is also backed by research which, after neglecting the subject for a period, is investing resources in it, and especially in the topic of the relationship between manufacturing and regional development. Most studies emphasize different aspects of manufacturing of critical significance to the local economy, a paradigm that also receives support from political leaders who seek to

rethink the geography of manufacturing as a path that might be used to promote job opportunities.

The premise of this issue is that manufacturing, whether advanced or traditional, is much more than an economic challenge. It should be viewed as a complex socio-political project that includes four related dimensions:

1. *Economy*: the increasing global competition for investments and projects between cities and regions;
2. *Society*: unemployment as a side effect of globalization and the transfer of production to developing countries;
3. *Planning*: demographic growth along with a trend toward rapid urbanization; and
4. *Environment*: changes in consumption and the cost of energy in the transportation of goods.

Accordingly, industrial urbanism suggests that economists’ quantitative abstract framework be extended into a concrete comparative, multi-level analysis that includes the physical environment and addresses the future possible relationships between cities and industry and between current urban planning practices and the places that are being designed for and dedicated to the production of goods. More specifically, this issue focuses on the spatial implications and physical manifestation of contemporary manufacturing in the city addressing the following questions:

- ◆ What are the contemporary relationships between city and industry?

- ◆ Should contemporary manufacturing be subjected to the same rules and zoning regulations as its predecessors?
- ◆ What physical planning and design strategies should cities pursue to retain, attract, and increase manufacturing activity?
- ◆ What is to be done with vacant factories, neglected industrial sites?

These questions point to the limitations of the current planning and architectural paradigm in addressing manufacturing, and the need to conceptualize new planning strategies that would respond to and help cities adapt to current trends in manufacturing. Spatial adaptation to manufacturing is required at the regional, city and local scales, in both existing and new settings, taking into account, not merely the physicality of space, but also its social and political characteristics.

This issue opens with a paper, 'Industrial Urbanism: Typologies, Concepts and Prospects', by Tali Hatuka and Eran Ben-Joseph, which provides an historical and typological mapping of the evolving dynamics between city and industry. Exploring some of the key models of industrial cities, it shows how they have had an enormous impact on the landscape of cities, contributing to the development of three prominent spatial prototypes of city-industry relationships: the integrated, adjacent and autonomous. The integrated prototype implies a fusion or close proximity between residential and industrial uses; the adjacent prototype implies planned segregation between the industrial and residential areas of the city through zoning; the autonomous prototype refers to standalone industrial/business parks or large factories working autonomously from both spatial and managerial perspectives. The paper maps the key features of prototypes and suggests that in the face of emerging technologies, planners must sharpen the tools for industrial environment planning. It is argued, that a holistic view of city and industry is likely to produce a new

understanding of the relationship between working and living.

The following set of papers addresses the need for planning and policy-makers to adapt to the current profile of manufacturing. Advanced manufacturing technologies are seen as an opportunity that changes the cost equation of manufacturing methods, and, importantly, as an integral element in the innovation of new products, processes and services. As Elizabeth Reynolds says in her paper 'Innovation and Production: Advanced Manufacturing Technologies, Trends and Implications for US Cities and Regions', 'These technologies are central to the development of new, more complex products and processes, often "hybrid" products that combine hardware with software'. Her paper provides a wide overview of the trends in advanced manufacturing and their spatial implications. Exploring these trends by looking at manufacturing in US cities and metropolitan areas, Reynolds argues that, globally, countries and regions are investing heavily in advanced manufacturing technologies because of their important link to innovation and economic development. However, the implications of these trends for urban manufacturing are mixed and uneven. Mapping the opportunities and challenges for urban manufacturing, as well as gaps in our knowledge about investments in manufacturing, she proposes an approach for thinking about urban manufacturing that blurs geographic boundaries and looks more closely at the manufacturing innovation ecosystem as a whole and how land-use strategies might support this system.

Land-use and planning regulations are indeed one of the main obstacles barring a response to current manufacturing trends. Addressing the limits of zoning and the separation of the residential environment from manufacturing in cities, Timothy Love, in his paper, 'A New Model of Hybrid Building as a Catalyst for the Redevelopment of Urban Industrial Districts', suggests that mixed-use industrial zoning is one approach

for preserving districts in North American cities with a growing shortage of industrial and 'back-of-house' real estate. Mixed-use industrial development cross-subsidizes the construction of new industrial spaces with non-industrial and higher-value uses on upper floors. It supports a process of densification that results in hybrid buildings that may improve the walkability of industrial areas, thus promoting alternative transportation modes and neighbourhood retail. The paper frames the specific urban design and architectural issues raised by a mixed-use industrial building prototype and mixed-use industrial districts.

The limits of zoning practices are also addressed in 'Zoning and its Discontents: Integrating Old Industrial Parks with the City' by Dan Price, who presents the urban renewal of an industrial park in Kfar Saba, a town north of Tel Aviv in Israel. The paper describes the challenges in strategically regenerating an industrial park within the existing planning milieu. The project, a test case for diverse strategies involving architectural design, policy proposals and management reform, exposes the challenges in implementing 'hybridism'. Price argues that zoning regulations from the 1960s onwards have left a legacy of single-use domains within the cities of Israel. Thus, old industrial parks present a particularly acute challenge and, also, an opportunity for town planners to address issues of social justice, economic resilience and environmental sustainability while avoiding the trap of 'industrial gentrification'. Nina Rappaport further examines these ideas and, particularly, the concept of hybridity in her paper, 'Hybrid Factory| Hybrid City'. Rappaport argues that factories can now be built as hybrid buildings in mixed-use neighbourhoods because industry is smaller, cleaner, and quieter. Exploring these ideas at the city scale, she adopts a normative approach and proposes that a new hybridity – both spatially and economically – might lead to more productive and vital cities.

The question of adaptation refers not merely to the evolution of manufacturing in the twenty-first century, but also to numerous abandoned heavy industrial sites worldwide. Though a strategy of reuse is becoming more common, implementation often presents economic and spatial challenges. The paper, 'Historic Heavy Industrial Sites: Obstacles and Opportunities', by Sunny Menozzi, maps the obstacles and opportunities in the conservation and adaptive reuse of steelworks and other heavy industrial complexes. Menozzi asks what should communities take into account before choosing to move forward with conservation and reuse. Using cases from the United States, Mexico, Germany, Luxembourg, and Italy, she concludes that communities should pursue conservation and reuse when they are seeking a civic benefit, and when it is sufficiently important to justify a substantial long-term investment in a project that may never be commercially viable.

The dilemma posed by Menozzi is richly portrayed in the case of Engenho Central de Piracicaba, Brazil. In the paper, 'The Place of the Industrial Past: The Adaptive Reuse of the Industrial Heritage in the Engenho Central de Piracicaba, Brazil', Gabriela Campagnol tells the history of the site's preservation in the context of the political and urban history of the city. Since the 1980s, the site has been the subject of political controversy and stewardship debates, resulting in several adaptive reuse projects by renowned Brazilian architects, such as Oscar Niemeyer (1980), Carlos Bratke (1994), Fanucci and Ferraz/Brasil Arquitetura (2004) and Paulo Mendes da Rocha (2006). Although, as she argues, adaptive reuse has emerged as a common way to ensure the preservation of underused industrial buildings and landscapes, it should be seen as a political project.

In responding to the growing need, first, to develop new planning strategies that address current and anticipate future trends in manufacturing and, second, to reassess the reuse strategies of historical factories, it is also important to acknowledge the

dominant presence of the industrial park in metropolitan regions. The autonomous, standalone industrial/business park, which hosts large factories that are disconnected, spatially and managerially from the city, has had a dominant presence in the landscape of the metropolitan region and is the leading model in developing, contemporary industrial areas. In her paper, 'The Autonomous Industrial Park: A Global Model with Local Variations', Roni Bar assesses the spatial features of industrial parks. She analyses industrial parks, which are often in peripheral or suburban locations, in the context of the process of decentralization and agglomeration, associated with the rise of global economies and neoliberal ideologies. Highlighting the spatial effects of industrial parks through cases from Israel, she acknowledges the varied manifestations of the industrial park and discusses the possible opportunities its spatial evolution and adaptation offers.

The issue ends with some thoughts and ideas on the future of industrial urbanism. The epilogue, 'Facing Forward: Trends and Challenges in the Development of Industry in Cities', written by Tali Hatuka, Eran Ben-Joseph and Sunny Menozzi, outlines some of the developments and trends in the relationship between cities and industry, as were discussed in a symposium entitled *Industrial Urbanism*, which was held at the Massachusetts Institute of Technology (MIT) in October 2014. The paper focuses on the three interlinked dimensions of manufacturing that might have a major impact on city planning – proximity, localism, and planning regulations – and recommends their critical assessment to address the needs of industrial urbanism in the future.

A final point – manufacturing is also about people, their work, and their daily life. Instead of supporting single-use industrial parks and standalone factories, industrial urbanism encourages the convergence of users and activities to create vibrant economic clusters. Industrial urbanism could reintroduce human-centred design to manufacturing facilities.

These ideas require further research and study. Further research could analyse the changes in contemporary manufacturing sectors and the ways that they may influence future urban development, including the residential fabric and infrastructure. In addition, researchers could propose a new spatial model that re-establishes the connection between cities and industry, a prototype that meets the needs of the twenty-first century by promoting technological interfaces and advancing environmental concerns.

Manufacturing must be viewed with fresh eyes, while recognizing that it is central to sustaining thriving cities, to realize the potential of industrial urbanism. Doing so will be a major task for designers, planners, and policy-makers in the years ahead, but it is one that is sure to bear fruit and lead to better place-making.

At the end of the day, people spend most of their day in their work environment. And though we tend to discuss work and the industry as a means to achieve particular goals, seeing it as the source of all productivity, property or wealth, work, for most of us, profoundly contributes to our identity – who we are, our way of life, and what we are able to achieve in our lifetimes.

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