

# Foreword

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## KNOWLEDGE ECONOMIES AND URBAN PLANNING

Some commentators question the meaningfulness of the term *knowledge economy*: in what sense is the dependence on *knowledge* unique to the current era? It could be argued that societies have always depended on knowledge to build their economies, and that the current era is no different in this regard. However, there are four features of modern economies that make the term *knowledge economy* meaningful (Hearn & Rooney, in press), and point to a societal dynamic, which, whilst continuous with the past, nevertheless must be understood by all who seek to intervene in some way in the operation of modern economies. Urban planners, then, are wise to grapple with the term *knowledge economy* and reflect on their practice in relation to it. The four features are:

1. Innovation
2. Networks
3. Trans-disciplinarity
4. Cultural economy

### Innovation

Economies have always been built on primary industries such as resources and agriculture. And these industries are continuing to grow; in some cases, rapidly. However, the overall size of developed economies is growing faster than either of these sectors. This is because whole new categories of economic activity are constantly being invented (e.g., digital, biotech, services). Economic growth now occurs primarily via continuous waves of innovation. Industries that have existed for centuries based in the primary and secondary sectors continue to grow in absolute terms but shrink in relative terms as new industries emerge. These new industries are built around knowledge and products that, in some cases, did not exist a matter of decades ago. As such, there is a shift from an economy built primarily on tangible products to one built around intangible knowledge.

Economist Brian Arthur suggests that “the underlying mechanisms that determine economic behavior have shifted from ones of diminishing to ones of increasing returns” (Arthur, 1996, p. 100). Investments in primary resources run down over time as the resource is exhausted; whereas, investments in new knowledge (e.g., the Windows operating system) ramp up as more users subscribe. Increasing returns

eventuate because: the cost of product development is up-front (the overall unit cost of a product falls as sales increase); due to network effects, the likelihood of a product emerging as standard increases with greater use; and expansion into future markets becomes easier as more market is captured (customer groove-in) (Arthur, 1996). The new high-tech industries—computers, aircraft, and telecommunication for example—clearly illustrate this dynamic. Service industries, Arthur suggests, are characterized by a hybrid of both the old and the new: although demand for services is limited geographically and met by generally low-tech processing models, increasing returns can accrue to give market leaders an advantage—via brand loyalty for example. In this case it is the intangible resource of brand equity that accrues value.

Of course, older industries are continuously innovating and hybridizing with newly emerging knowledge. Innovation may occur not only in relation to technology and products but also in relation to processes, design, and markets. It is the ability to generate new ideas, concepts, products, and services, rather than deriving greater efficiency and economies of scale from existing production processes that has been a key factor in the transition from an industrial to a knowledge economy (Flew, 2007). Rapid cycles of innovation are thus a core feature of modern economies with which urban planning must come to grips.

## Networks

Our growing dependence on networks is another core feature of the knowledge economy that impacts on urban planning. One of the defining features of many *new* products and services is that they exhibit network effects. That is, the functionality of many new products depends not just on its functionality but also on how it connects to others' functionality. That is, its value derives from the total network of functional connections rather than any individual product. This is true in a technical sense (e.g., mobile phone networks); a service sense (e.g., credit cards); a software sense (e.g., operating systems), and a cultural sense (e.g., English language MBAs).

A process of economic evolution is generated in network economies by the development of new connections between tasks, technologies, firms, industries, and markets (Potts, 2000). As more of the economy becomes connected to previously unconnected parts, the scope and depth of innovation processes increases significantly (Morrison & Potts, 2007). Moreover, far from being a local process, new connections and networks form between regions, nations, and entire industries.

From an information science perspective, networks are ideal mechanisms of information resource allocation and flow; and this may be part of their growing importance. Structurally, they put people in direct contact via the provision of horizontal links across institutional boundaries, thus facilitating rapid information transfer. In addition to transmitting information, networks also help create it. New ideas may develop as each person in the network receives and synthesizes information; information easily builds on information. Thus, new ideas are both shared and created via networks. For example, Ahuja (2000) indicates that resource sharing and knowledge spillover benefits are primarily provided by strong ties. He also established that the network benefits of strong and weak ties are dependent on a number of other features and are limited to specific contexts.

The structural dynamics of networks are different from some of the other patterning mechanisms that urban planners take for granted; for example, hierarchies and grids. Barabassi (2002) and Watts (2003) show that the basic structure of what they term scale-free networks apply to many phenomena, ranging from cellular metabolism to the physical structure of the Internet, and protein regulatory networks to social relationships, as manifested by research collaborations, actors' appearances in different movies, or sexual relationship networks. Scale-free networks are composed of connected nodes. Most of these

nodes are connected by a small number of links, whereas some—called hubs— may have hundreds, thousands, or even millions of links whilst retaining the basic distributive characteristics of the network; hence the term *scale free*. Thus, the distribution of connections between nodes is not even or random, but rather obeys a power curve. This property makes scale-free networks very robust against failure (only coordinated attacks against a number of hubs will break down such a network). The consistent features of scale-free networks are evidence of the self-organizing processes at work; that is, they work via an internal *logic* that requires no external guidance. Modern economies are characterized by the proliferation of these scale-free networks—in transport and communication systems for example.

## Trans-Disciplinarity

Innovations that reach the market are rarely the products of single disciplines but rather involve compound multidisciplinary knowledge regimes. Modern corporations, for example, may be most distinguished by their ability to bring together composite knowledge (e.g., technical, marketing, legal knowledge). Commercialization depends on *whole product value propositions* not just basic research in one or two disciplines. Creativity is found across the scientific, technological, economic, and cultural domains, in diverse forms such as patents and designs, entrepreneurship, and artistic product: “no intellectual domain or economic sector has a monopoly on creativity” (Mitchell et al., 2003, p. 18).

Knowledge-intensive business services (KIBS) illustrate this well, combining generic knowledge from a broad range of domains with information from clients to diagnose problems, provide advice, and prescribe or implement solutions (Miles, 2007). The domains of knowledge on which KIBS may draw include, for example: those associated with social systems and institutions, especially administrative rules and regulations; supply chain management; educational, and clinical psychology and psychiatry; engineering; and IT services. As problem-solvers, KIBS are involved in generating new solutions and new knowledge, and their client can be understood as co-producer of this innovation. Technology-oriented KIBS assist in diffusing new techniques and systems throughout the economy, and R&D services are of course intimately involved with innovation, as they undertake knowledge-creation for their clients. Many KIBS are hybrid technology-oriented and professional services. For example, lawyers specialize in ICT or patent law, and financial advisors and market analysts provide expertise in high-tech or consumer innovation fields.

## Cultural Economy

Any discussion of the new knowledge economy needs to foreground the importance of cultural matters. The construction of identity in our society has become thoroughly implicated in the market economy. Most economic activity is driven by consumption (60-70%) and increasingly directed toward the pursuit of cultural goods or goods with cultural components. A techno/cultural economic paradigm has replaced the techno-economic paradigm. The cutting edge of the knowledge economy is no longer defined by technological innovation alone; it is defined by an amalgam of technology and culture, which creates new market spaces. And yet innovation thinking is lopsided, in its formulation and execution, toward the scientific/technological disciplines. Although science, technology, and engineering are essential for economic growth they are no longer a sufficient condition for future economic success. Technology + culture is the formula for 21<sup>st</sup> century problem solving, and, hence, for growing the knowledge economy. There are a number of reasons for this.

Those sectors that derive in large part from the applied social and creative disciplines (business, media, entertainment, education), represent 25% of exemplary economies, whilst the new science sector (e.g.,

agricultural biotech, fiber, construction materials, energy, and pharmaceuticals) accounts for only about 15% of these economies (Rifkin, 2000, p. 52). The former also are growing faster and, importantly, are more labor intensive and therefore better for employment.

In relative terms, science and technology expertise is developing faster in Asia (particularly China and India), making it difficult to compete on science and technology alone. Just as the industrial revolution automated manufacturing and global labor markets saw manufacturing move out of developed countries, the computer revolution is automating knowledge work from accounting to routine drafting, and making it vulnerable to global markets. Much of this analytical work can be outsourced to Asia where knowledge worker salaries are much lower. As manufacturing and analytical work is outsourced to Asia, one of the few sources of competitive advantage is the ability to sense, predict, and capitalize on new market opportunities in consumer markets. This requires abilities derived from the applied social sciences and creative disciplines.

Indeed, all scientific innovations eventually must feed into markets, and the disciplines that govern speed and access to, and exploitation of, markets all derive from the applied social and creative disciplines. This is particularly so as affluence increases, and functionality and price cease to be sufficient for market dominance. Consumers are increasingly influenced by the aesthetic and experiential components of products. New forms of innovation are therefore based on intimate knowledge of, and facility in, creating consumer culture. Lucrative *blue ocean* markets—where you have no initial competitors—are only created by radical innovation in consumer spaces, not by technology innovation alone. This kind of innovation requires technology plus design plus culture. (Computer games and ipods are good examples.) The digital wave that is transforming all industries is beginning to move through the service sector, particularly in health and education. The new interfaces between consumer and producer are virtual, interactive, and visual, and the core competencies needed to ride this wave are *creative cultural*, together with technological.

## Knowledge-Based Urban Development

A knowledge economy is one that is innovative, that understands and utilizes networks, that has the capacity to be transdisciplinary and has strong facility in *applied cultural* knowledge. Being competitive in this knowledge economy is not like running a race where all the competitors are independent or have an equal chance, and success depends on how good you are. Rather, it is like thriving in an ecology where everything is connected, and success depends on how you relate, how you build resources over time, and how every layer of the ecology supports you.

*The creative field that undergirds the new economy is constituted as a constellation of workers, firms, institutions, infrastructures, communication channels, and other active ingredients stretched out at varying densities across geographic space. This network of forces is replete with synergistic interactions variously expressed as increasing returns effects, externalities, spill-overs, socialization processes, evolving traditions, and so on, and it is above all a locus of extraordinarily complex learning processes and knowledge accumulation* (Scott, 2006, p.15).

As an ecology, the knowledge economy is dominated by a dynamic of connectedness. It is crucial for regions to understand their place in it and their interdependence with other elements of their environment. The emphasis on interconnectedness helps make “visible many of the less apparent and perceptible connections between. . . phenomena at a regional and even global level” (Heise, 2002, p.162), and their relationships of mutual independence with other industrial ecologies at the local, regional, national or global level.

Clearly then, urban planners have a significant role in helping to shape a city for participation in the knowledge economy, making this volume particularly pertinent at this point in time. Some time ago Landry (2000, p.140) summarized the conditions for a creative milieu that encourages innovation, suggesting it:

- Is a place with a level of original and deep knowledge coupled with a ready supply of skills, competence and people who have the need and capacity to communicate with each other.
- Has a sound financial basis allowing room for experimentation.
- Has the capacity to deal with complexity and uncertainty about future changes in cultural, scientific, and technological fields.
- Has good possibilities for informal and spontaneous communication internally and externally.
- Is a multidisciplinary and dynamically synergistic environment that links developments in the arts and science.

Interventions such as the Malaysia Multimedia Corridor Project and the Los Angeles garment district cultural upgrade, for example, illustrate the importance of urban planning in “enhancing the collective order of the creative field” (Scott, 2006).

*Cities in which high proportions of the labor force work in cultural-products sectors often express this state of affairs directly in their physical and social fabric. Landry (2000) has alluded to this phenomenon in terms of the encompassing notion of the creative city. Some of the most advanced expressions of this propensity can be observed in great city-regions of the modern world. Certain areas in these cities display a more or less organic continuity between the local physical environment (as expressed in streetscapes and architecture), associated social and cultural infrastructures (museums, art galleries, theaters, shopping and entertainment facilities, and so on), and the firms that cluster in adjacent industrial districts specializing in activities such as advertising, graphic design, audiovisual services, publishing, or fashion clothing, to mention only a few. Numerous cities have sought to promote this continuity by consciously re-organizing critical sections of their internal spaces like theme parks and movie sets, as exemplified by Times Square in New York, The Grove in Los Angeles, or the Potsdamer Platz in Berlin (Roost, 1998; Zukin, 1991, 1995). In these cities, work, leisure, and social life increasingly ramify with one another in synergistic interrelationship. The music scenes of Los Angeles and New York dramatically exemplify this trend, with their vibrant mix of live music venues, bars, restaurants, boutiques, and so on, and their associated recording industries (Scott, 2006, p. 14).*

Creative industry clusters are highly interdependent in nature, thus cultivating urban density and the development of healthy communities (Schoales, 2006, p 175). The degree of product innovation maintained by creative industry clusters in large centers such as New York tends to ensure these regions remain forever young. Product distinctiveness is crucial in these industries, and, as a result, they never reach a typical mature stage predominated by product standardization. This may help explain why New York, for example, stands in contrast to other cities that are troubled by decaying downtown areas.

The old economy style characteristics that traditionally dictate where a firm locates in a city (rent, labor supply, services, taxation) are being eclipsed by the ability to assist in a firm’s creation of value (Yusuf & Nabeshima, 2005). Factors include:

- Urban services and amenity
- Access to human capital



- Access to broad, stable, and sophisticated markets
- A diversified industrial structure, because the creative industries are interlined with other sectors and because a diverse base of interdisciplinary skills are needed for unforeseen technological advances and commercialization
- Openness to new cultures and ideas

Echoing Richard Florida's ideas, urban policies can have a significant influence on the retention and circulation of the highly skilled knowledge workers involved in creative industries. Yusef and Nabeshima (2005) emphasize the importance of cultural amenities, and educational and medical services to retain workers, and the development of transportation infrastructure as central to providing mobility and access to human capital. Other public sector tools that can have value include zoning and other urban policies that promote recreational and entertainment amenity, and the re-invigoration of inner cities.

*The creative field as identified here is representable as a nexus of locationally-differentiated, multiscalar interdependencies running throughout the domains of production, work, and territory. I have argued at length that attention to this tense force-field of relationships can help us understand a number of critical dimensions of the performance of modern economic systems. I have also suggested passim that very basic modulations of these relationships occur from place to place as a function of underlying spatial and locational processes. Geography, in other words, is not simply a passive frame of reference, but an active ingredient in economic development and growth* (Scott, 2006, p. 18).

However, it is important to remember that large cities are not the only places where knowledge industry dynamics manifest, and, hence, where urban planners interested in the knowledge economy should focus their attention. The knowledge economy does not exist in an enclave but rather is embedded in all sectors. Because these processes of innovation are integrated, capillary-like, into existing industry and service sectors, more creative and design professionals are employed outside the core creative industry sectors than inside them. The knowledge economy discourse is therefore relevant to many scales of planning activity. The impact of knowledge thinking occurs in concept as much as planning outcome. Network thinking implies connection. Innovation implies flexibility of use. Transdisciplinarity implies eclecticism of planning paradigm. The cultural imperative means freedom from technocratic dogma. Knowledge economy concepts can influence policy, strategy, and narrative models as well as planning outcomes. I recommend the current book as a very exciting exploration of the impact of knowledge economy thinking on the urban planning process.

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