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Position paper: redefining knowledge-based urban development

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ABSTRACT

The concept of knowledge-based urban development has first come to the urban planning and development agenda during the very last years of the 20th century as a promising paradigm to support the transformation process of cities into knowledge cities and their societies into knowledge societies. However, soon after the exponentially rapid advancements experienced, during the first decade of the 21st century, particularly, in the domains of economy, society, management and technology along with the severe impacts of climate change, have made the redefinition of the term a necessity. This paper, first, reports the findings of the review of the relatively short but dynamic history of urbanisation experiences of our cities around the globe. The paper, then, focuses on the 21st century urbanisation context and discusses the conceptual base of the knowledge-based development of cities and how this concept found application ground in many parts of the world. Following this, the paper speculates development of future cities by particularly highlighting potential challenges and opportunities that previously have not been fully considered. This paper, lastly, introduces and elaborates how relevant theories support the better conceptualisation of this relatively new, but rapidly emerging paradigm, and redefines it accordingly.

KEYWORDS

Knowledge based urban development; knowledge city; urban planning and development; urban management; urbanisation

INTRODUCTION

In the late 1990s, the academic, political and societal discourse about urban and regional development changed radically. After the shift from Fordist to post-Fordist economy and society, a new paradigm shift is witnessed around the turn of the century. According to Bontje et al., (2011, p.1), “[t]his upcoming [development] paradigm suggests that the economic future of cities and city-regions increasingly depends on the capacity to attract, generate, retain and foster creativity, knowledge and innovation”. This paradigm, namely *knowledge-based urban development* (KBUD), has first been introduced during the last years of the 20th century considering the impacts of the global knowledge economy on urban localities and societies (Yigitcanlar et al., 2008a; 2008b). In 1995, Richard Knight published his illuminating article, ‘knowledge-based development: policy and planning implications for cities’, arguing the need and emergence of a new approach to city development focusing on knowledge-based development (Knight, 1995). He defined “knowledge-based [urban] development [as] the transformation of knowledge resources into local development [which] could provide a basis for sustainable development” (Knight, 1995, pp.225-226).

Although not directly referred exactly as KBUD, since the beginning of the 21st century, OECD has been adopting knowledge management frameworks in its strategic directions regarding to glocal (global+local) development, and this strategy strongly indicates that a link to be urgently established between knowledge management and urban development (OECD, 2001; 2005). In 2000, KBUD was defined as ‘a crucial set of strategies for achieving quality of life’ (AEUB, 2000): “The aim [of KBUD] is to develop urban settlements that are gradually evolved to [become] more in line with sustainability objectives and improve [their] quality of life [by accommodating] knowledge-based urban development strategies as opposed to [exclusively] physical resource-based strategies” (AEUB, 2000, p.1). Later on in 2004, KBUD was defined, emphasising being a fundamental medium for the development of knowledge cities, as: “knowledge-based urban development is the perfect new medium in which to grow more liveable, stimulating, cleaner, intelligent, enlightened, tolerant and meaningful communities world-wide... [and] the knowledge city is the first new urban formation tailored for the needs of a knowledge economy where ideas rule and there are infinite recipes for innovation and new wealth creation” (ENTOVATION, 2004, p.2).

Mid 2000s was the period that KBUD was coined as an emerging urban and regional development phenomenon – by Tan Yigitcanlar – and started to be widely seen as a development strategy tool for enhancing the competitiveness of cities within the context of expanding knowledge-based economy and society, and forming prosperous knowledge cities. Yigitcanlar (2005, p.3) stated that “[t]he significant increase of the knowledge-based development strategies for the pursuit of metropolitan competitiveness of regions is encouraging city administrations to adopt these strategies for moving towards and establishing knowledge cities”. Along with the increasing popularity of knowledge cities, from mid 2000s onwards the term KBUD has started to receive larger attention and gained recognition. In late 2000s KBUD has, for the first time, started to be seen as a development process rather than solely a development strategy and defined as: “KBUD is [not only] a powerful strategy for economic growth and the post-industrial development of cities and to participate in the knowledge economy, [but also] is a strategic management approach, applicable to [creative urban regions]” (Yigitcanlar et al., 2008d, p.10).

In the rapidly changing world, KBUD is also rapidly maturing and getting widely recognised and becoming a new development paradigm (Yigitcanlar et al., 2007). However, there is still not a clear definition of KBUD. Hence, the central aim of this paper is to redefine KBUD by revisiting the changes happening from theory to practice particularly in the second decade of the century. In order to do so the following section of the paper reports the findings of the literature review on the history of urbanisation experiences of cities for us to understand the pattern of historical evolution of cities. Section 3 sets the scene for the 21st century urbanisation context and discusses the conceptual base of the knowledge-based development of cities and how KBUD took place in the exemplar best practices. Section 4 speculates on the development of future cities to provide us a vision about the future. Lastly, the final section provides a discussion on how relevant theories to KBUD support the better conceptualisation of this new development paradigm, and in the light of the theory and practice the section concludes by redefining KBUD.

THE HISTORICAL CONTEXT

Throughout the civilised history of humankind urban development and socio-economic development went hand in hand and supported by technologic developments. In other words,

society shapes and is shaped by the economic factors, advancing technology and the environment they live in.

Neglecting small tribal and nomadic shelters and settlements built by primitive '*hunter and gatherer society*', it would not be wrong to refer to the period around 3500 BC as the peak of the '*agricultural society*' that gave birth to the civilisation and led to the formation of the first cities' urbanisation processes. Around this period, in several fertile parts of the world, i.e. Egypt, Mesopotamia, Persia, India, China, city-states were established. These city-states not only built urban settlements, but also erected the greatest monuments of the ancient world, showcasing their technology, power and authority – e.g. the Great Pyramids of Egypt, the Hanging Gardens of Babylon. Besides the colossal public buildings of the early cities, generally architecture was modest, natural and built environments were integrated and cities housed only few 10,000s of people (Mumford, 1961; Van Doren, 1992).

Centuries later, around eight century BC, ancient Greek city-states continue to advance urban development not only with their famous urban planning principles – i.e. settlements were laid out on orthogonal principles, with streets forming a checkerboard pattern of identical units – but also contribute significantly to the knowledge pool of the human kind via forming the nucleus of many sciences – e.g. philosophy, mathematics, physics – which also triggered the appearance of a new social class – *bourgeoisie* (Van Doren, 1992). In its peak time around fifth century BC population of Athens was about 300,000 people and the city was fully integrated with the surrounding natural environment (Gomme, 1933).

From the early days of the Roman Empire, around first century BC, Romans adopted ancient Greek theory and thoughts, made effective use of them in their practice and formed the seedbed of today's western society norms. In terms of urbanisation, Romans brought three important innovations to urban development – law, citizenship and infrastructure. Urban planning and design of Roman cities followed clear regulations for the development of public and military services and cities were basically composed by a number of identical components, disposed in a special way – parallel and equal-distant – and separated by streets (Van Doren, 1992). In the second century, the imperial city of Rome was the largest urban centre of its time, with a population of about one million people. However, its population declined rapidly as low as to 50,000 people by the fifth century (Oates, 1934). No other city in the world reached to this level of urban population until the 20th century – i.e. London (Mumford, 1961).

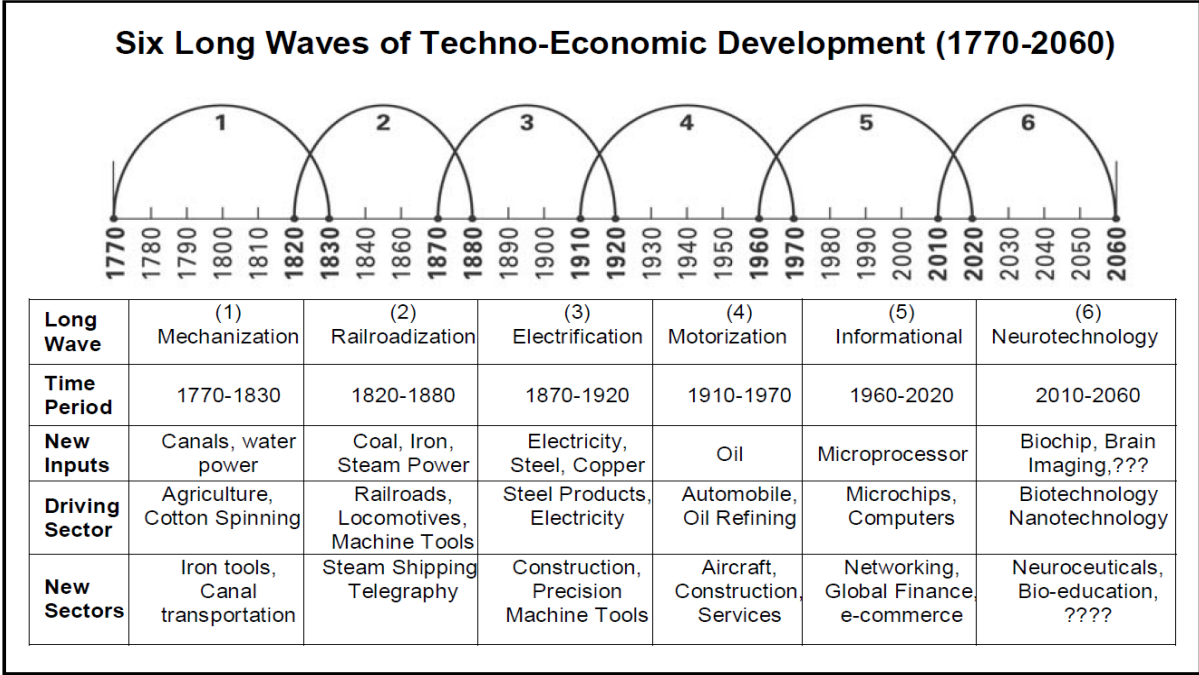
Until the industrial revolution and formation of '*industrial society*' in mid 19th century, cities continue to grow in a slow pace. During this time world's largest city was the imperial London, with about a million people in 1911. Industrial revolution increased the speed of the rural population migration to cities and led to vast urban and environmental problems – e.g. sanitary, insufficient infrastructure, and pollution. The birth to the modern urban and regional planning discipline was given during this period in order to cure the ills of the industrialisation and migration. Ebenezer Howard's Garden Cities of Tomorrow (1898) concept that describes a utopian city in which people live harmoniously together with nature found wide acceptance in many parts of the world – particularly in the British, North American, Australian cities. Unfortunately the concept did not provide the desired outcomes and have led to urban sprawl, low density suburbanisation and motor vehicle dependency causing vast environmental, economical and social problems of our time.

Since the beginning of the industrial era, in terms of population, most of the world cities have grown at least 10 fold, further strengthened their local economies, and moved on from a manufacturing-based economy and society to a new structure of economy and society mainly based on the provision of information, innovation, finance, and services – in other words a ‘post-industrial or post-modern society’ (Bell, 1974). In this era routine manufacturing jobs quickly moved to developing parts of the world, where the wages were low and environmental regulations were not restricted. The developed world paid further attention of the production of commercial knowledge that has high value, focussed on cleaning up the mess industrialised era brought to their cities, and reintroduced integration of natural and built environments in cities.

In the late 20th century impacts of globalisation, knowledge economy and technological advancements, particularly in the fields of information, communication and transportation, started to change post-modern society into ‘information or knowledge society’. Implications of these factors on economy, society and cities resulted in narrowing the information gap between some of the developing countries and the developed ones. Urbanisation rates particularly at some of the developing countries reached up to a rate that world’s rural and urban population figures came to a balance. Today around the globe in total 27 cities’ population reached to tens of millions (mostly being developing country megacities), largest being Tokyo with over 34 million people (for other cities see www.citypopulation.de).

This means more environmental problems to be caused by the rapid urbanisation and large vulnerable populations to be facing the consequences of any global economic or natural disasters. During the last quarter of the century many global action initiatives organised – i.e. UN Habitat Summits, UN Brundtland Report, UN Climate Change Convention, and Kyoto Protocol – to raise awareness and cope with the ever increasing global environmental, economic and social challenges. Along with these initiatives, during the last few years of the century, scholars emphasised on the need for a new understanding and urban planning and development paradigm to better deal with social, environmental and urbanisation problems, and development of resilient infrastructures for cities (Friedman, 1998; 2005).

Table 1. Long waves of economic development cycles (derived from Lynch, 2009)



Since the industrial revolution there has been a relatively consistent pattern of 50-year waves of techno-economic change, which impacted both societal and urban development. The fifth wave of information technology diffusion is nearing to end, while a sixth wave is emerging with converging advancements across the Nano-Bio-Info-Cogno (NBIC) space (Table 1). According to Lynch (2009), the sixth wave is neurotechnology, revolves around enhancing human performance, and will help in widening the global knowledge society.

THE 21ST CENTURY CONTEXT

Global financial crisis, terrorism, peak oil, increasing number of megacities, environmental disasters, climate change, Middle Eastern social unrest and many other global and regional crises marked the first decade of the 21st century as a difficult one. These problems also gave a wakeup call for us to rethink where the society is heading and how do we need to plan and manage our cities to avoid or minimise their impacts. Due to tough competition in the era of knowledge economy, cities are now required to become entrepreneurial, work in partnership with the private sector and find ways to deal with the new responsibilities given to them (Metaxiotis et al., 2010). Due to environmental matters, cities are now required to become eco-cities or eco-friendly cities, produce as little as possible carbon emissions, adopt sustainable transport and urban development approaches, and find ways to mitigate climate change (Yigitcanlar, 2010a). Due to social and governance issues, cities are required to become more transparent and inclusive in decision-making, support social equity, work together with the communities towards a common future, and manage institutions to work better with each other and prepare their vision and objectives and become more strategic and dynamic in nature (Yigitcanlar, 2010b). All these requirements are leading to the development of a new planning and development approach or paradigm for cities, one that is applicable for different geographic and political contexts. At this instance, KBUD shows itself as a new and promising planning and development paradigm for our cities' transformation into knowledge cities (Yigitcanlar et al., 2012).

Theoretical framework of knowledge-based urban development

In the era of knowledge economy, knowledge is accorded a pivotal role not only in economic growth and competitiveness, but also in societal and environmental development. According to May and Perry (2011), cities are positioned as critical places where the challenges of knowledge-based growth in the 21st century will be met. This is to say, undoubtedly, embedding knowledge in both tacit and explicit forms into urban planning, development and management is a critical aspect of success in this new era. Although, it is widely mentioned that “[t]he twenty-first century is witnessing a new type of city form, the knowledge city, and a new approach to its development, knowledge-based urban development” (Yigitcanlar and Sarimin, 2011, p.260), and KBUD has been a hot topic of scholarly discussion, still how to embed knowledge in all aspects of urban planning, development and management is quite ambiguous. The ambiguity is actually coming from KBUD not being fully theorised. Therefore, in order to redefine KBUD, the paper, firstly, focuses on establishing a framework to clearly conceptualise KBUD.

As the literature indicates, KBUD is a new form, approach or paradigm of development in the era of knowledge, which its ultimate goal is to produce a city purposefully designed to encourage and enable the production and circulation of abstract work – a knowledge city (Cheng et al., 2004; Yigitcanlar et al., 2008c). In order to achieve the goal of knowledge city (trans)formation, KBUD brings economic prosperity and environmental sustainability with a

just socio-spatial order to cities, in other words, establishes a secure economy in a sustainable human setting (Yigitcanlar et al., 2009). Hence, KBUD can be seen as a paradigm with four major development domains – economic, socio-cultural, enviro-urban and institutional development (Yigitcanlar, 2012). These four development domains form the key pillars of the KBUD – economy, society, environment, and management. Along with these four pillars, sustainability and strategic organisational capacities are also crucial for the successful knowledge-based development of cities and regions (Figure 1).

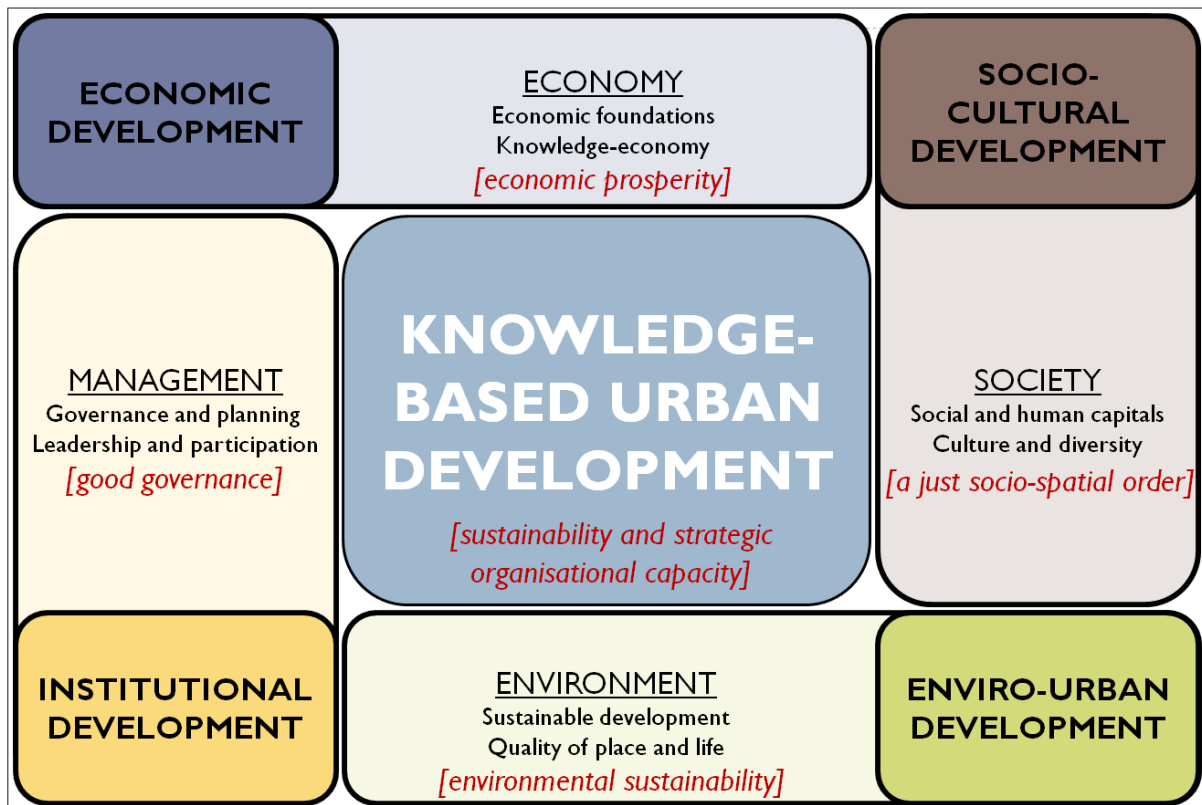


Figure 1. The contextual framework: four pillars of KBUD (derived from Yigitcanlar, 2012)

‘*Economic development*’, with a KBUD perspective, aims to form an economy – knowledge economy – based on creating, evaluating, and trading knowledge, meaning the use of knowledge to produce economic benefits especially in terms of high-technology businesses and services as well as education and R&D. In the era of knowledge, success in local economic development is highly correlated with cities’ ability to adapt in the knowledge economy (Nguyen, 2010). Therefore, for economic development, it is central to codify technical knowledge for the innovation of products and services, market knowledge for understanding changes in consumer choices, financial knowledge to measure the inputs and outputs of production and development processes, and human knowledge in the form of skills and creativity (Lever, 2002; Laszlo and Laszlo, 2007).

‘*Socio-cultural development*’, with a KBUD perspective, aims to progress towards establishing a society – knowledge society – in which the generation, distribution, diffusion, use, integration and manipulation of knowledge and information is a significant economic, political, and cultural activity. Therefore, for socio-cultural development, it is essential to work towards increasing the skills and knowledge base of residents as a mean for individual and community development (Gonzalez et. al., 2005). Social and human capitals of a society

are seen highly interrelated with the high level achievements in the domain of socio-cultural development (Frane et al., 2005).

'Enviro-urban development' (development of both natural and built environments), with a KBUD perspective, aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for generations to come. Enviro-urban development ties together concerns for the of natural systems with the social challenges facing humanity and builds a strong spatial network relationship between urban development clusters while driving an urban development that is ecologically friendly. Therefore, for enviro-urban development, sustainable urban development and quality of life, particularly in the knowledge community precincts (see Yigitcanlar et al., 2008d), play a significant role in the spatial formation of the city-wide sustainable KBUD strategies and achieving sustainable KBUD outcomes (Yigitcanlar, 2010c).

'Institutional development', with a KBUD perspective, aims to orchestrate the KBUD of the city and bring together all of the main actors and sources so that they are able to organise and facilitate necessary knowledge-intensive activities and plan strategically for knowledge city (trans)formation (Yigitcanlar, 2009). Therefore, for institutional development, it is critical to govern the KBUD via the principles of institutional leadership, good governance, strategic planning, targeting socio-economic and socio-politic equality, and branding the city as its promise of value in order to make a significant difference for the city in achieving its knowledge city status (Baum et al., 2007).

Knowledge-based urban development in practice

There is an increasing number of cities world-wide benefiting from KBUD in the transformation and orchestration processes of their cities. In this section, global perspectives and lessons from the international best KBUD practice examples of five prosperous knowledge cities are presented – Austin, Barcelona, Helsinki, Melbourne, Singapore (see Table 2 for the summary of findings).

Austin, Texas, USA: Austin made a reputation as the human and music capital of the world. The city was one of the first US cities to recognise both the emerging economic importance of knowledge work and the possibilities of attracting footloose industry. The city, led by business organisations, having decided to lure these new clean industries to the area, developed a plan to attract large corporations by touting the relatively low cost of living and the quality of university graduates. University of Texas at Austin has long been considered as an elite public university, comparable in quality to private Ivy League institutions such as Yale and Harvard. Austin starting from 1950s developed a vision for the future of the city and constantly updated its vision and strategic goals as changes occurred. This gave the city a competitive edge in becoming a leader among the ambitious cities thriving for attracting and retaining investment and talent (Yigitcanlar et al., 2007). Development experience of Austin also shows a perfect example of 'path dependence', which is about the time-dependent development of networks of relationships between actors and about historically grown 'embeddedness' that have their reflection in urban development (see Bontje et al., 2011). The secret recipe behind the success of the city was mainly coming from its human centred strategic long term planning that involves triple-helix model (public-private-academia) cooperation (Yigitcanlar, 2009).

Table 2. Achievements and success factors of global best practices (Yigitcanlar, 2009, p.232)

CITY	REPUTATION	ACHIEVEMENTS	SUCCESS FACTORS
Austin	<ul style="list-style-type: none"> ▪ The human capital of the World ▪ The music capital of the World 	<ul style="list-style-type: none"> ▪ 1950s – a leading city in electronics production sector; ▪ 1960s – a leading city in personal computing commodities sector; ▪ 1970s – a leading city in business and personal computing sector; ▪ 1980s – a leading city in technology and computer science R&D; ▪ 1990s – a leading city in creative industries; ▪ 2000s – a leading city in ICT, biotech, pharmaceutical sectors. 	<ul style="list-style-type: none"> ▪ Dynamic vision and sound strategic planning; ▪ Strong knowledge-based economy; ▪ Well connected university, industry, government relations; ▪ Significant investment on human capital; ▪ High quality of life and place; ▪ Efficient urban and transport system, including affordable housing; ▪ Watching its competitors closely; ▪ Investing on R&D and education; ▪ Good governance.
Barcelona	<ul style="list-style-type: none"> ▪ The culture capital of Europe ▪ The tourism capital of Europe 	<ul style="list-style-type: none"> ▪ A new culture and knowledge oriented economy; ▪ A rich variety of cultural institutions; ▪ A strong creative class of knowledge workers; ▪ Quality public amenity and services; ▪ Conserved heritage built environments; ▪ Conservation of natural surroundings; ▪ Strong global ties for knowledge exchange, particularly with Latin America. 	<ul style="list-style-type: none"> ▪ Sound vision and planning; ▪ Community involvement in urban transformation; ▪ Full leadership of the local public initiatives; ▪ Strategic urban marketing promotion; ▪ Building on historical and cultural strengths of the city; ▪ Successful KBUD practices – i.e. 22@Barcelona.
Helsinki	<ul style="list-style-type: none"> ▪ The telecommunication capital of Europe ▪ The technology capital of Europe 	<ul style="list-style-type: none"> ▪ First European country with explicit knowledge economy strategies; ▪ High level of educated population; ▪ High quality of life; ▪ High quality of place; ▪ High level of accessibility; ▪ Large investment in arts and culture; ▪ High level of social equity; ▪ Presence of a giant telecommunication company, Nokia. 	<ul style="list-style-type: none"> ▪ A sound vision and strategic planning mechanism; ▪ Targeting a dynamic world-class centre for business and innovation; ▪ A strong knowledge-based economy; ▪ Regional focus on development; ▪ Significant investment on telecommunication R&D; ▪ Developing high quality infrastructure and services.
Melbourne	<ul style="list-style-type: none"> ▪ The art and culture capital of the Asia-Pacific region ▪ The ICT capital of Oceania 	<ul style="list-style-type: none"> ▪ Local government, private sector and community partnership; ▪ Skilled training program for young people; ▪ Youth employment scheme; ▪ Community jobs program; ▪ Good governance; ▪ Support and incentives for creative industry and workers; ▪ Important international sports, art and cultural events; ▪ Programs to boost tourism, sports, art and cultural activities. 	<ul style="list-style-type: none"> ▪ Developing a gateway for biotechnology; ▪ Redressing skill shortage and building reputation as the ICT capital of Oceania; ▪ Attracting strategic knowledge-based and innovative start-up businesses; ▪ Developing a place of business culture; ▪ Promoting growth in tertiary education; ▪ Developing diverse and highly skilled workforce; ▪ Enhancing liveability and lifestyles; ▪ Developing affordable and high quality housing and educational centres.
Singapore	<ul style="list-style-type: none"> ▪ The knowledge capital of South-East Asia ▪ The constant change capital of South-East Asia 	<ul style="list-style-type: none"> ▪ An icon of the knowledge-based economy; ▪ A hub for knowledge and creative industries to merge; ▪ Spill over effect on the neighbouring knowledge milieu; ▪ A comprehensive large scale knowledge community precinct development; ▪ Bringing together the environments of work, live and play. 	<ul style="list-style-type: none"> ▪ All levels of government commitment; ▪ Quality universities and R&D institutions; ▪ International large private companies; ▪ Small and medium size companies; ▪ Public enthusiasm; ▪ Quality of life and place; ▪ Attracting knowledge workers; ▪ Becoming a city of constant change; ▪ Searching for the next new thing.

Barcelona, Spain: Barcelona made a reputation as the culture and tourism capital of the world. The city, during the late 1990s faced with the globally competitive environment of the knowledge-based economy, undertook a profound technological and cultural regeneration in order to position itself among the major metropolises of the global knowledge society. The city developed a strategic plan for the knowledge-based development of the city with an aim of transforming Barcelona into a ‘city of knowledge’. This plan emphasised the necessity of the cultural sector to become the motor of a new transformation of the metropolis, and; its strategies aimed at expansion of ICT, tourism, and culture to go hand in hand with efforts to facilitate creative industries (Bontje et al., 2011). Over 1.6 million residents and more than 200 public institutions were volunteered for the development and implementation of the knowledge city strategy. Private sector’s initiatives and actions, mainly in the development of infrastructures and knowledge businesses, played an important role in the success of the whole KBUD process (Yigitcanlar, 2009).

Helsinki, Finland: Helsinki made a reputation as the telecommunication capital of the world. Particularly, the telecommunication giant of Nokia contributed significantly gaining the telecommunication capital recognition. However, its single-layered ICT dominated economic structure and recent global competition on the mobile technology caused a serious risk of keeping the recognition as Nokia started to lose its leading ground against competitor companies – Apple, Samsung and HTC (Bontje et al., 2011). The primary lesson learned from the Helsinki case is the importance of diversification of the economy and continuously being innovative in order to not to lose the competitive edge. However, Helsinki still stands out as a thriving city in many recent international city comparisons concerning economy, competitiveness, research, knowledge and quality of life. Helsinki’s success is mainly originated from: early strategic actions taken at the national level; city being very strong in ICT; having a safe and well-functioning living environment; being strong in terms of its share of high-skilled people; being strong in R&D, and; having a high level of social equality, which would help to facilitate networking (Bontje et al., 2011). Helsinki is also among the one of the first cities to develop explicit knowledge-based economic development strategies in the world (Yigitcanlar, 2009).

Melbourne, Australia: Melbourne made a reputation as the arts and culture capital of the Asia-Pacific. In recent years, Melbourne’s urban process has been shaped by the rise of 21st century occupations based on knowledge work. City administration has been orchestrating the spatial urban change process and municipal strategies have been developed and applied for the KBUD of the city. One of the strategy tools for the KBUD of Melbourne is the city plan that aims to shape the future of the city as a prosperous, innovative, culturally vital, attractive, people focused, and sustainable knowledge city (Yigitcanlar, 2009). A key strength in the orchestration of the development is the Office of Knowledge Capital that is designated for managing the knowledge city transformation (Yigitcanlar, 2012). The city, by winning the World Capital Institute’s 2010 Most Admired Knowledge Cities Award (MAKCi), has been acknowledged as a thriving global knowledge city.

Singapore: Singapore made a reputation as the knowledge and change capital of South East Asia. The city winning the World Capital Institute’s MAKCi Award twice consequently in 2008 and 2009, Singapore proved itself in the global arena as a city of constant change and progress. Particularly its biggest KBUD project ‘One-North knowledge community precinct’ is a cutting edge project that propels the city state into the knowledge era and establishes it as a regional, if not global, centre of R&D. Although, Singapore is heavily criticised for its top-down KBUD perspective along with its authoritarian policy-making style, this provided an

ease and speed at the decision-making and management of the development. Singapore's success is not only limited to its science and technology parks and knowledge precincts: for example, Singapore's Changi airport is ranked top among the all international airports in the world; Singapore is also recognised as having top quality eco-efficiency strategies in the world that has made the city-state as a leader in the sustainable development area as well (Yigitcanlar, 2009).

Practice of KBUD in these five successful global knowledge cities has shown that a sound strategic vision with long-term planning is a must. These top-tier knowledge cities specialise in a few sectors only, but set ambitious goals for each, and they develop their KBUD policies carefully. This global best practice analysis revealed the following common KBUD strategies for building prosperous knowledge cities (Yigitcanlar, 2009, p.240):

- Political and societal will and good governance;
- Strategic vision and dynamic long-term development plan;
- Setting-up of agencies to promote KBUD;
- Strong financial support, partnership and strategic investments;
- International and multi-cultural character of the city;
- Creation of urban innovativeness engines;
- Research excellence – universities, R&D institutions;
- Metropolitan web-portal – E-government, E-democracy;
- Value creation to citizens – skill development, employment, social outcomes;
- Quality of place, life and affordable housing and urban services, and;
- Low-cost and easy access to advanced communication networks.

THE SPECULATIVE PROSPECTIVE CONTEXT

As the learnings from the literature and best practices prove that strategic visioning and long-term strategy planning are the integral parts of a successful KBUD process. Although, prophecy is a risky business and city planners, developers and managers unfortunately do not have a crystal ball or the powers of Nostradamus, however, if they still could be able to, more or less correctly, estimate the potential changes to happen, and challenges and opportunities to be faced in the future, this would for sure give that city a big advantage over the other competitors – as happened in the Austin case (see Yigitcanlar, 2009).

What life will be like in the 22nd century? Of course, no one can predict the future this far ahead with 100% accuracy. Nevertheless, there are few things that can be said about the next 100 years that have a fair chance of turning out to be true by tracking expected technology breakthroughs and adding a dash of imagination; a plausible scenario of how life could unfold in the 2100s can be created. For instance futurists of our time estimates the following potential matters to impact our cities and societies (e.g. Van Doren, 1992): (i) climate change; (ii) use of renewable energy resources; (iii) birth of new sciences; (iv) genetic engineering; (v) mapping the genome; (vi) advancements across the Nano-Bio-Info-Cogno; (vii) eugenics; (viii) the next generation computers; (ix) the moral problem of intelligent machines; (x) the birth of thinking machines; (xi) computer revolt; (xii) exploration of the solar system; (xiii) human as an extraterrestrial neighbour; (xiv) the Gaia hypothesis, and; (xv) democracy and war in the 21st century.

In order to keep cities' competitive edge, their planners, developers and managers should adapt strategic, dynamic and forward looking KBUD mechanisms into their decision-making

processes; not to rest on the past achievements, however successful, but to look forward to the next challenge, and; keep in mind that there is no such thing as too much research – new knowledge is the lifeblood of the knowledge city.

CONCLUSION

This paper provides a concise review of the urbanisation process in the historical context starting from 3500 BC and reaching to the 22nd century. The research highlights the importance of theorisation and redefinition of KBUD with an intention of a conceptual framework to be formed. The conceptual framework developed as part of this research is shown in Figure 2, which builds on the contextual framework provided in Figure 1 and bases its theoretical foundations on Relational Theory (Graham and Healey, 1999), Sustainable Urban Development Theory (UN, 1987), New Growth Theory (Romer, 1986), Actors Network Theory (Callon, 1991; Callon and Latour, 1992; Latour, 1992), Human Capital Theory (Becker, 1964), Social Capital Theory (Salisbury, 1969), and Creative Class Thesis (Florida, 2002).

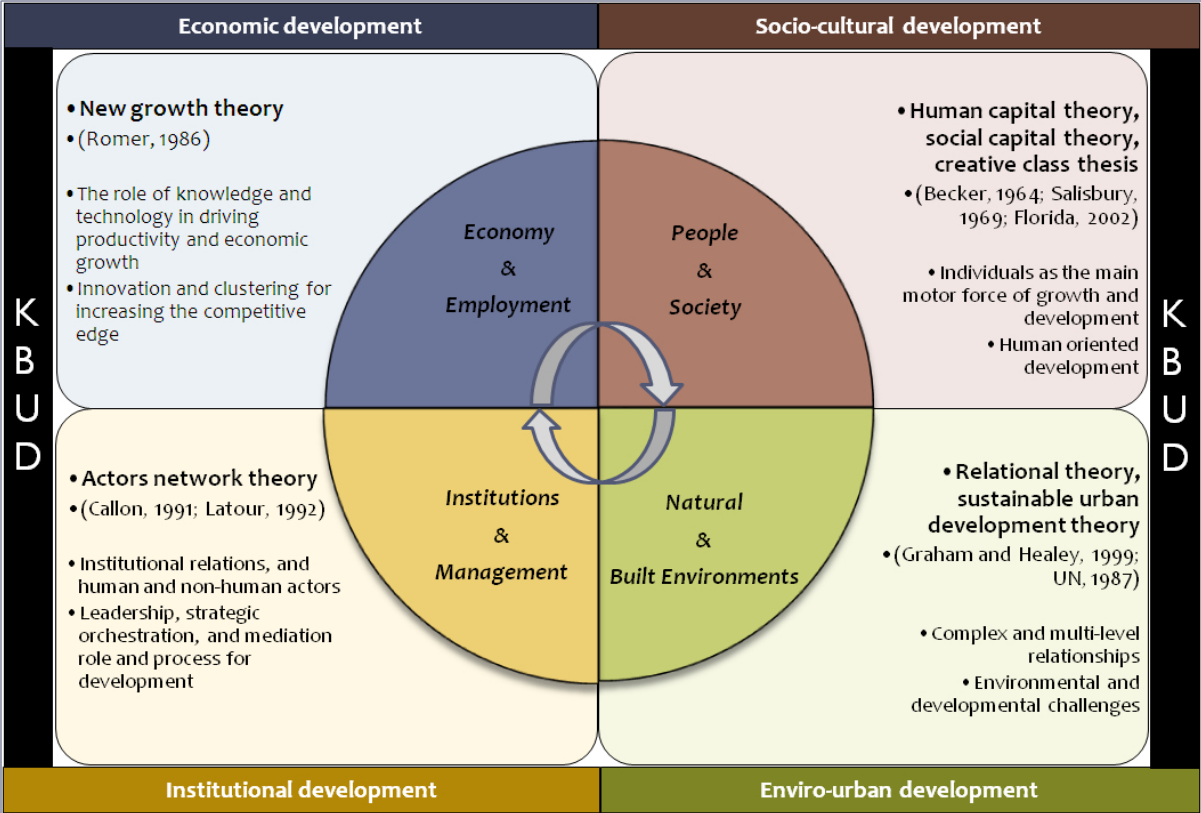


Figure 2. The conceptual framework of KBUD

Combination of the contextual (Figure 1) and conceptual (Figure 2) frameworks of KBUD give us a comprehensive view on the theorisation of KBUD. Thus, based on the research findings, the following redefinition of KBUD is put forward:

‘KBUD is the new development paradigm of the knowledge era that aims to bring economic prosperity, environmental sustainability, a just socio-spatial order and good governance to cities, and produces a city purposefully designed to encourage the production and circulation of knowledge in an environmentally conserved, economically secure, socially just and well governed human setting, a knowledge city’.

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