

# Preface

## Introducing: knowledge-based development of prosperous knowledge cities

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### BUILDING PROSPEROUS KNOWLEDGE CITIES

That this is the century of knowledge cities, is an insight many people have already experienced but many more have yet to realize (Carrillo, 2006; Yigitcanlar et al., 2008a). Once that insight takes place, the space of possibilities for urban development and for the upgrade of human experience, both leapfrog.

A critical and constructive adoption of the knowledge cities paradigm requires an understanding of the reach and depth of both urban life and knowledge-based experience in global futures. A recently released report by the McKinsey Global Institute (MGI, 2011) indicates the extent to which *urban economic history* (as the report calls it) is changing dramatically nowadays. According to this source, a mere 600 urban centers concentrating only a fifth of the world's population, generate more than half of global GDP. While stressing the emergence of cities as development engines, this fact might reinforce the received view that well-known megalopolises will continue to concentrate both population and production, and that today's major destinations around the world will consolidate tomorrow (Yigitcanlar et al., 2008b; Metaxiotis et al., 2010).

That is not necessarily the case. The McKinsey Report also shows that while in 2007, nearly half of global GDP came from 380 cities in developed regions, by 2025 one-third of these cities will no longer enter the top 600 and 135 new cities will make it to this list. To quote the report, 'over the next 15 years, the makeup of the group of top 600 cities will change as the center of gravity of the urban world moves south and, even more

decisively, east' (MGI, 2011, p. 5). According to its forecasts, these 600 cities will in 2025 be home to 2.0 billion people (25 percent of total global) or 735 million households, and produce 64 trillion US dollars of GDP (nearly 60 percent of global GDP).

This quantitative perspective is further reinforced by a qualitative one: most of the labour force from these global urban centers are bound to be knowledge workers. This basically means that their value-addition activities will be based on the transformation of one form or another of *represented realities* (e.g., figures, as in financial analyses, images as in creative media, texts, as in e-mails) as opposed to industrial-era manual transformation of matter and energy. This also – and most critically – means that the daily life of the vast majority of these people will be subject to the value dynamics characteristic of knowledge-based production and knowledge-based cultures. For example, they will not necessarily have to 'go to' the office or the school to work and learn respectively; furthermore, working and schooling may not be separate activities any more. And most probably, by 2025 people will have a much better idea of what exactly these dynamics are than we have today, when we are only able to characterize most of our findings about knowledge-based value production as mere counterexamples to conventional economic wisdom.

Aware of these circumstances, an increasing number of urban governments and city managers are looking into knowledge-based urban development to prospect their cities' futures. Many of them are becoming increasingly at ease with concepts and tools such as collective intellectual capital and capital systems to assess their present status and plan their future development. Whether included or not in McKinsey's *City 600* list (MGI, 2011), any single city is taxed today with the challenge of understanding, mapping, valuing and sustainably developing the total capital – both tangible and knowledge-based– that will determine its viability.

Perhaps for some of these cities, a full understanding of their unique capital base will help them develop alternative strategies to those pursued by most current *City 600* prospects. Prosperity is no longer confined to accumulating material and financial assets. Knowledge-based prosperity is open to innovative ways of balancing the total capital base. Melbourne, recently distinguished as Most Admired Knowledge City – MAKCi (WCI, 2010), also made it to Frommer's '10 Best Cities for Walking' (Frommer, 2011), and was second in the Economist Intelligence Unit's Most Livable City ranking (EIU, 2011). Whatever its profile and corresponding strategy, every city counts increasingly on its knowledge capital. This ultimately means all cities face the challenge of developing as knowledge cities.

Nevertheless, actual models, tools and cases in the emerging field of knowledge-based development (KBD) are still scarce. This book aims at

exemplifying policy-making, as well as planning and assessment practices in building knowledge cities from across the world. The emphasis on the diverse actions involved in knowledge-city building is indicative of the way intangible capital interplays with more traditional infrastructural and financial capital.

## INTRODUCTION

The book is structured in three parts, each comprising a natural block of practices, and is rounded up with an Afterword. Part I looks at Knowledge Cities policies, Part II at Knowledge Cities planning and Part III at Knowledge Cities metrics issues. In the following paragraphs the contents of each part in turn will be summarized.

In this Preface, the three co-editors Yigitcanlar, Metaxiotis and Carrillo argue for the relevance of a knowledge-based development approach to cities by looking first at the leading role of cities in economic, social and cultural development and then at the primacy of intangible assets in the evolution of knowledge cities.

Peter Franz's Foreword looks at competition as a trigger for knowledge cities strategies. Franz looks at diverse city competition practices as healthy arenas where cities strive for excellence in becoming knowledge cities. He argues that these competitive perspectives are critical to sound policy-making insofar as strengths and weaknesses become evident and also argues that scientific competition may help obtain strategic focus and institutional collaboration. Nevertheless, he also looks at some potential risks of competition particularly with regard to potential distractions from regulatory innovations.

## PART I: POLICIES FOR BUILDING PROSPEROUS KNOWLEDGE CITIES

Chapter 1 by Björn T. Asheim (Innovating: creativity, innovation and the role of cities in the globalizing knowledge economy) looks at cities as the new economic engines and as the cradles of creativity and innovation. In doing so, Asheim discusses Florida's well-known creative class approach, drawing a schematic line of argument for this perspective. He then moves on to characterize a knowledge-based development approach through a typology of k-bases and relates these to the creative class as innovation agents. From here, a fresh look at Regional Innovation Systems follows with reference to the urban context. On these grounds, a distinction (and

later integration) between two modes of innovation is drawn depending on the knowledge base type and the extent to which it is market-driven. Asheim concludes by offering some insights into collaboration and social capital as an urban milieu for effective innovation.

In Chapter 2, Mark Lorenzen et al. (*Creating: the creative class-based knowledge city models of Denmark*) proceed to analyze the application of creative class-based approaches to Danish cities. To begin, the authors provide a description of the characteristics and geographical distribution of the creative class in Denmark, thus testing two of Florida's key theses: technology and tolerance. Next, they develop policy implications by differentiating four city models with reference to Denmark: Big, Proximate, Specialized and Quaint, each discussed and exemplified. Such analysis enables them to draw some specific policy conclusions for further development of Danish knowledge cities.

In Chapter 3 (*Organizing: spontaneously developed urban technology precincts*) Gülnur Çevikayak and Koray Velibeyoğlu look at knowledge precincts (defined as new urban areas where knowledge is the driving force of the economic and urban development). The authors' goal is to clarify the potential of spontaneously developed urban technology precincts, by looking at the spatial and organizational characteristics of Izmir in Turkey as a case study. Hence, the first part of the chapter covers the transformation process of technology precincts. The second part involves examples of spontaneously developed urban technology precincts. Finally, the third part looks at the 'Izmir Technology Diamond' as a case study and its potential as a technology precinct.

In Chapter 4 (*Globalizing: what makes Australian information technology industry companies go global?*), Glen Searle and Kevin O'Connor aim at researching firm-level factors associated with information technology (IT) exports from Australia. In doing so, they use data from a random stratified sample of IT firms in Sydney and Melbourne. Drawing from these data, they identify company attributes associated with differing levels of exports and also explore factors associated with Australia's global location that are perceived to disadvantage Australian IT producers. Overall, their work shows to what extent the profile of the export activity in the Australian IT industry is connected to the knowledge base of cities. They conclude that the long-term development of the IT industry in both Sydney and Melbourne will depend largely on the further evolution of these as knowledge cities.

Kirsten Martinus (Chapter 5: *Attracting: the coffeeless urban café and the attraction of urban space*) looks at how public space adjacent to key transport infrastructure can contribute to innovation systems and new economy efficiency. The author offers a review of the literature on two

aspects: how urban form may contribute to knowledge productivity and the design characteristics of the urban systems required for innovation. These aspects are exemplified through field research examining human presence in and movement through a particular space outside a busy train station in Kobe, Japan. Martinus concludes by reaffirming earlier observations that attraction and retention of human capital is a critical function of urban space in knowledge cities.

In turn, Wesselmann et al. in Chapter 6 (Researching: key factors for the success of knowledge cities in Germany) deal with the following research question: Which strategic and operational measures do cities implement to try and raise their profile as a science city? In tackling this question, they carried out a study of the 'City of Science' annual competition in Germany. Following a typification and profile analysis of participant cities, they exemplify with a case-study of the North-Eastern German city of Oldenburg. Overall, they emphasize the positive effects from the competition, with best results shown by medium-sized cities wanting to be repositioned as knowledge cities.

To end Part I, Chapter 7 by González et al. (Participating: knowledge citizens' competences and knowledge city transformation), deals with a critical, yet often overlooked, element of knowledge cities: knowledge citizens. The authors identify a set of competences that will allow citizens to leverage the knowledge value of their city. They first look at existing literature, identifying existing competencies taxonomies, and related these to the Most Admired Knowledge City (MAKCi) framework. They go on to design a dedicated taxonomy and analytical framework. Finally, the authors specify implementation requirements and develop a tool for the assessment and development of knowledge citizens' competences.

## **PART II: PLANS FOR BUILDING PROSPEROUS KNOWLEDGE CITIES**

After such a wide perspective of elements for knowledge cities' understanding, analyzing and policy-making, Part II takes us into the planning phase. To begin with, Cathy Garner and Anne Dornan offer Chapter 8 (Piloting: knowledge-based development policy and practice in building a vibrant ecosystem). In their chapter, they propose a view of cities as modern open networked innovation centers. Furthermore, they identify a series of key attributes of an innovation ecosystem. They also offer an ample characterization of urban innovation and refer it to the case of Manchester as a test-bed. They conclude that while such an innovation ecosystem approach can be the basis for sound knowledge-based

development (KBD) policies, it poses special challenges for policy makers and practitioners in terms of leadership and entrepreneurship.

Chapter 9, by Kostas Metaxiotis and Kostas Ergazakis (Formulating: an integrated strategy for the development of knowledge cities) look at the challenge of building integrated knowledge city strategies. First they review and compare existing knowledge cities regarding the formulation of their strategies. Then they present a method aimed at containing an integrated strategy: KnowCis 2.0. This method is comprehensive of the major processes in policy management: diagnosis, strategy formulation, action plan, implementation and evaluation. Next, the authors exemplify the method with a case study of a Greek municipality. Finally, they assess the results of the case study and discuss the impact, constraints and lessons learnt of this experience. Overall, their work underlies the importance of systematic and comprehensive frameworks for knowledge cities planning, implementation and assessment.

In Chapter 10 (Designing: combining design and high-tech industries in the knowledge city of Eindhoven), Ana María Fernández-Maldonado approaches the case of this city in the Netherlands with a focus on ways to combine business- and people-oriented perspectives in practice. The chapter addresses the main assumptions of the business-oriented, the people-oriented, and the comprehensive perspectives of urban KBD. Next, it describe the problems of implementing comprehensive approaches. Then Eindhoven is presented as a case study. The author concludes that this city provides a good example of successful integration of technology and design on the one hand and of business-oriented and people-oriented perspectives on the other. Strong regional identity and organizational capabilities are credited as major KBD assets of this knowledge city.

Richard Hu with Chapter 11 (Clustering: concentration of the knowledge-based economy in Sydney) aims to make an empirical contribution to understanding the concentration of the knowledge-based economy in Central Sydney. The Location Quotient is used by the author to compare employment by industries in Central Sydney with Metropolitan Sydney in 1996–2006. According to Hu ‘The results indicate which industries are concentrated in Central Sydney, which industries with concentration fall into the category of the knowledge-based economy, and how the concentration patterns have shifted temporally.’ The author claims that a systematic measurement of employment in Central vs. Metropolitan Sydney may provide a holistic understanding of KBD concentration.

Chapter 12 by Ana Cristina Fachinelli and Janaína Macke (Connecting: community supported universities for knowledge city transformation) looks at the specific role of community supported universities or CSU (to be differentiated from community colleges) in social capital develop-

ment and community transformation. The particulars of the case are the University of Caxias do Sul and the corresponding city of Caxias do Sul in Southern Brazil. Several core dimensions of social capital are pointed out as parameters of universities' impact upon the communities they belong to. The authors identify the CSU as a reference for the development of Caxias do Sul as an emerging knowledge city.

In Chapter 13 (Promoting: programs for and challenges of the knowledge-based small business), Joan Kay Imukuka et al. reconstruct the concept of small knowledge-based business by looking first at alternative definitions of small and medium sized enterprises (SMEs) and then at the characterization of small knowledge-based businesses (KBB). In assessing the potential role of KBBs, the authors identify a series of barriers that may impair KBD policies: sector width, knowledge workers' availability, access to risk capital, technical expertise, entrepreneurial orientation and managerial characteristics. They conclude that these barriers should be dealt with for the effective implementation of policies aimed at consolidating the role of small knowledge-based businesses.

Chapter 14 (Enterprising: academics, knowledge capital and towards PASCAL universities) by James A. Powell provides a refreshing look at the emerging redefinition of the terms of integration of universities into their communities' life and work. The author starts by carrying out a review of global best practices in closing the gap between academia and their communities. A state-of-the art framework is exemplified by the 'Universities of the Modern Renaissance' consortium, which in turn becomes the model for the PASCAL International Observatory, an attempt to reach further in co-creation and community empowerment. The chapter concludes with a description of PASCAL key characteristics and short examples of practices.

Closing Part II, Caren Heidemann et al. (Chapter 15, Transforming: turning knowledge cities into a knowledge region) sketches out a recent initiative in the Ruhr in Germany, to turn an old industrial region into a knowledge region. The focus of this project has been to change the regional economy from coal mining and steel production to knowledge development, as the Ruhr in Germany found itself in a comparably weak position to compete with other metropolitan city regions such as Munich, Stuttgart, or Berlin. They move on to present the CampusRuhr Initiative, as a unique strategic bottom-up process of spatial policy integration, involving major stakeholders of the regional knowledge society. The main goal of this initiative is a spatially and mentally integrated network of modern institutions in the former industrial region, as a condition for the region to become an integrated knowledge environment. Although these efforts are reportedly still in a preliminary phase, it is concluded that such

an approach can prove useful in generating and sharing similar experiences across the region.

### **PART III: METRICS FOR BUILDING PROSPEROUS KNOWLEDGE CITIES**

Part III (Metrics for Building Prosperous Knowledge Cities) moves now further into the application realm by looking at some of the aspects involved in comparing knowledge cities' dimensions for purposes of explaining, comparing, benchmarking or assessing knowledge city models, plans, policies and program implementations.

First, Kevin Johnson explores employment self-containment (ESC) ratio in Melbourne's Knowledge Economy region (Chapter 16: Commuting: the geography of Melbourne's knowledge economy). Johnson uses Australian Bureau of Statistics Census data to map a workforce's employment and residential distribution at the geographical scale of the Statistical Local Area. Investigating different permutations of the knowledge economy (KE) workforce allow the author to identify preferences for residential and work locations as well as opportunities for influencing job distribution and transport use. As the author concludes, 'The more we understand what creates these patterns; the better positioned we are to shape their evolution.' The chapter ends with a listing of the main distribution and commuting patterns of KE workers in Melbourne.

Chapter 17 by Francisco J. Carrillo and Ricardo E. Flores (Measuring: knowledge-based development metrics, evolution and perspectives) provides a state-of-the-art review on progress made in understanding and designing scientifically sound and practically viable KBD composite indicator systems. A discussion on current practices and methodological issues is presented next, based on the landmark European Union knowledge economy index (KEI) study. Finally, the authors discuss some general considerations on the evolution of KBD measurements and describe an emerging research agenda in different countries that tackles some major common issues thanks to an active collaboration program in the KBD community.

Next, Chapter 18 (Comparing: knowledge-based urban development of Vancouver, Melbourne, Manchester and Boston) by Tan Yigitcanlar, provides a comparison of several well-known KCs. It first provides an overview of KBD and the emergence of KCs, including some of its core processes. The author then introduces his urban KBD framework and proceeds with its application to comparing knowledge-based urban development characteristics of Boston, Vancouver, Melbourne and Manchester.

He then concludes by discussing KC transformations and the benefits of the assessment framework for evaluating KBD strategies.

Finally, Part III concludes with Chapter 19 by Alicia Leal and Blanca C. Garcia (Benchmarking: knowledge-based development metrics through the MAKCi exercise). This chapter reports on first results from applying statistical modelling to emerging Knowledge-City benchmarking methodologies. The main objective is to put forward the Generic Capitals System (GCS) taxonomy as a methodological tool to identify how tacit knowledge conversion generates quantitative intangible indicators by means of simulation and pattern modeling. Next, authors expand on such research work and collaboration, elicited by the GCS taxonomy in recent years, and the metrical implications it has triggered. Finally, Leal and Garcia introduce a practical application of the GCS through recent research on the construction of a MAKCi index, built on statistical probability.

## AFTERWORD

The three sections in the book and the cumulative learning of all the chapters, lead to the Afterword (Chapter 20) by Joris van Wezemaal (Concluding: directions for building prosperous knowledge cities). The author points out, while acknowledging the wealth of contributions in the volume, the remaining need to clarify the key concepts common to these: knowledge and development. In doing so, he claims that in order to deliver an original contribution to urban development, the specificities of knowledge-based urban development should be both recalled and developed. He concludes that, in striving for the ideal involved in this book's title, a deeper inquiry into knowledge and self-organization, an appreciation of the deliberative potential of knowledge and a careful handling of KBD with regard to place diversity will be required.

Hence, a full conceptual and applied cycle is covered through all of the chapters contributing to this volume. In gathering these contributions from the global KBD community we hope that readers may gain valuable insights into the new space of possibilities for urban development and for the upgrade of the overall human experience.

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