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In the last few decades, urban and regional planning around the world experienced major changes associated with the extensive use of information and communication technologies in the different stages of the planning process, from data collection to communication of outcomes, from plan making to daily management, monitoring, and plan evaluation. These new planning methodologies, made possible by the widespread use of Web-based tools and other digital technologies, deeply transformed long-held practices and the relationships between urban governments and local citizens, offering new opportunities for innovation in the planning profession. At the same time, these changes created new challenges for city governments, citizens, and other stakeholders, namely risks associated with the digital divide, which tended to reinforce social exclusion along other social divides. As several chapters in this book show, the use of new technologies per se is not enough to change social relations and the impact planning has in society. The idea that the widespread use of information and communication technologies can boost public participation in urban planning is far from being always true, since civic engagement in the urban planning process is also dependent on numerous social, cultural and political factors.

Urban e-Planning is the application of the concept of e-government to spatial planning or, in other words, the widespread use of information and communication technologies, namely the Internet in all stages of the planning process. In practice, it represents the substitution of traditional paper based planning procedures by digital and online based activities. The use of computer assisted design, geographical information systems, database management systems, visualization applications and Web 2.0-based e-tools are just some of the technologies that support the changes associated with the move from conventional urban planning to urban e-planning. Besides these changes in the hardware and software, urban e-planning also requires organizational changes in the back-office of planning departments and related supporting administrative and technical services, as well in planning theory itself. Urban e-planning emerges then as a critical component of any urban policy. However, the increasing use of information and communication technologies in urban planning requires a critical analysis, since these innovative planning practices can have both positive and negative social impacts.

Urban e-Planning develops through four different stages, from mere information in the first level to fully functional integration in the fourth tier through the planning portal. In the first stage, the planning system only provides information through the city or municipal portal with very little or no transaction capacities. In the second stage of e-planning development, there is the possibility for interaction, typically in a single direction, consisting mainly in downloads from the e-planning portal. The planning department and related services do not contact the citizen through this online platform. The third stage allows transactions on both directions. Citizens interact with the planning department through the platform or by e-mail. It is possible to fill and validate planning forms in the planning portal. The fourth stage
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represents a complete move from paper based planning practice to a digital and online planning system. While this fourth tier in the development of urban e-planning is still far from being the common situation there are signs of rapid developments in that direction in the most developed countries and cities.

The provision of information on urban planning issues and related themes to all interested urban stakeholders is the basic function of the e-planning portal. It is possible to get information online prior to any planning application, to submit online planning application forms, to consult the development of the planning process or the development of each specific application, to communicate planning decisions to each concerned citizen or entity, and to publicize planning decisions, when appropriate or necessary, to inform about coercive planning measures, to notify all interested parts in a given planning decision, to announce decisions, to receive complaints, to pay local services, fees and taxes, among many other aspects that traditionally was necessary to be done in person in the planning office. Urban plans, the written reports and the urban design pieces, can be accessed online freely and at any moment. The portal can also host specialized online forums, blogs, and other social media, for each plan or area within the city or municipality. E-referendums and e-petitions can also be hosted and promoted through the planning portal on issues pertaining to each plan or to the overall urban policy.

Citizen e-participation in the planning process, monitoring and plan evaluation, 3D visualization, urban marketing, are some of the key areas on which the development of urban e-planning will be perhaps more challenging in the near future. The use of Web 2.0- and Web 3.0-based approaches in each of these areas represents to some extent the new innovation frontier in the field of urban e-planning. The book, Emerging Issues, Challenges, and Opportunities in Urban E-Planning, explores some of these most recent changes and how they are challenging the traditional practices in urban planning, in what appears to be the emergence of a new era in the history of spatial planning.

The essays included in this edited volume were selected in order to give an updated overview of those trends and ground-breaking innovations, even if this overview is only a partial vision of the ongoing renovation of urban and regional planning. The book offers an updated perspective of recent developments and modernization in urban e-planning in different regions of the world and is based on a selection of research papers previously published in the International Journal of E-Planning Research, which have been substantially revised and updated to take into account recent trends in the field of urban planning.

The main goal of the book is to bring in new findings on these recent changes and to provide new insights on future developments. In doing so, we seek to answer two main research questions: how is urban government making use of new urban e-planning tools? and to what extent the use of these new planning tools responsible for the emergence and consolidation of urban e-planning as the new planning paradigm for the 21st century?

The structure of the book is thematic with each chapter or group of chapters seeking to address a major emerging issue, challenge or opportunity in urban e-planning. The book is organized into four main sections or groups of chapters and has 14 chapters in total. A brief description of each of the chapters follows.

The first section, “The Role of Web 2.0 in Urban Planning”, with four chapters, explores the potential role of web 2.0 tools in urban planning affairs.

In chapter 1, “Smart Planning: The Potential of Web 2.0 for Enhancing Collective Intelligence in Urban Planning”, Ari-Veikko Anttiroiko examines the ability of new technologies to support collective intelligence, in particular the Web 2.0 tools. For Anttiroiko, crowdsourcing is the main characteristic of this emerging trend in urban planning, which will probably help to smart up urban planning. As Ari-Veikko Anttiroiko shows crowdsourcing and crowdsourced knowledge has been used in urban planning in the past decade in the forms of wikiplanning, participatory sensing, and co-creation concluding that
Web 2.0 tools can be used to increase various forms of social and collective intelligence and through that to smarten up urban planning. This positive view of Web 2.0 tools and their potential impact in planning practice, dependent nonetheless of fundamental re-engineering and democratization of urban planning processes, is complemented by the following three chapters.

In chapter 2, “There’s an App for That: Mobile Applications that Advance Urban Planning”, Jennifer S. Evans-Cowley and Brittany Kubinski chart how urban planners can use mobile applications to increase productivity, share information, and engage with the public, and explore a number of mobile applications that can add value to the work of urban planners. In addition, Evans-Cowley and Kubinski explore different types of applications that could be developed to assist planners and engage citizens in the planning process and that could help in the study of social dynamics in dense urban contexts. As the authors argue, mobile applications can help planners to reinforce the relationships with local citizens but are also confronted with several technological challenges, namely energy requirements of sensing applications or the detection of individual movements in dense urban areas.

In chapter 3, “Participatory Environmental Planning Platform”, Soon Ae Chun and Francisco Artigas investigate the possibilities offered by the Web to radically change the way planning in emergency contexts is organized, presenting a prototype system for environmental planning and response coordination. Although government organizations tend to adopt top-down planning operations, the authors argue that a different approach should be adopted, a participatory environmental planning platform where environmental planning is based on the data from high-tech sensors and “human sensors”. This would represent a shift from government-centric to a participatory environmental monitoring and planning paradigm in the field of natural and man-made disasters. In essence, what the authors propose is an incorporation of intelligent technologies to improve environmental situation awareness and to enhance citizen participation, including in the plan execution.

Sylvie Occelli in Chapter 4, “Socio-Technical Systems on the Move: Some Insights for Policy Activity”, the last chapter of this section, describes the emergence of new socio-technical systems made possible by the widespread use of Web 2.0 Internet-based services and mobile computing, and its potential impact in the delivery of social innovations and in the promotion of a smart urban growth. Due to the increasingly widespread use of information and communication technologies, it became possible and desirable to design and to develop Socio-Technical Systems. The chapter presents the findings of the Piedmont region in Italy where the ICT Observatory of Piedmont has been monitoring the dissemination of ICT among citizens, enterprises, and local government.

The second section, “Web-Based E-Tools, Urban Social Movements, and Public Space”, deals with the role Web-based tools focused on urban problems can play in the development of urban social movements, namely on planning issues, and the impact these technologies can have in the use of urban public space and the possible impacts they will have in urban planning practice.

In Chapter 5, “The Impact of Information and Communications Technology on the Rise of Urban Social Movements in Poland”, the first of this second section, Maja Grabkowska, Łukasz Pancewicz, and Iwona Sagan examine the relationship between the use of information and communications technologies and the emergence of small activist groups focused on urban agenda issues in Poland, concluding that Web-based media contributed to raise the profile of local initiatives and helped these social movements to achieve their political objectives. The evidence collected and examined in this study shows how and to what extent Web-based tools increase the ability of these groups to connect and interact in order to improve their ability to coordinate joint initiatives and to reinforce urban social movements.
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Arturo Di Bella in Chapter 6, “Smart Urbanism and Digital Activism in Southern Italy”, discusses the different approaches of the smart city model: the influence of neoliberal urban experimentation in the so-called top-down approaches; and the bottom-up approaches to the smart city associated with digital urbanism developed by active citizens, communities and urban social movements. Based on a case study, Catania, in southern Italy, Arturo di Bella argues that bottom-up approaches of the smart city model can potentially provide a more human-centered and socially embedded smart urbanism offering evidence of how the Internet can facilitate the organization and social mobilization of traditional off line collective actions.

In Chapter 7, “Planning for Urban Media: Large Public Screens and Urban Communication”, the last in this section, Scott McQuire, Nikos Papastergiadiis, Frank Vetere, Martin Gibbs, John Downs, and Sonja Pedell discuss a research project focused on public use of interactive gaming on the Big Screen at Federation Square in Melbourne whose findings raise important questions for urban planning in the context of omnipresent digital media. These findings challenge the prevailing view of large video screens situated in public spaces as commercial display surfaces, which tends to push planning towards a mere regulatory approach with the aim of minimizing the impact of advertising, when these screens can easily support a wide range of contents and new forms of urban communication.

The next section, “Modelling, Virtual Reality, and Geovisualization”, comprises four chapters dealing with different visualization issues in urban e-planning.

In Chapter 8, “Multi-Scale 3D Geovisualization of Urban Heat Island Data for Planning Dialogue in Toronto”, John Danahy, Jacob Mitchell, Robert Wright, Rodney Hoinkes, and Rob Feick investigate the use of 3D urban models as a visualization reference against which analytical models were visualized to identify micro scale mitigation scenarios of urban heat island effects based on evidence taken from a case study in Toronto. In other words, the authors explore ways of visualizing remote sensing heat island data in order to support the definition and implementation of urban and regional planning policies and programs.

This is followed in Chapter 9, “Indicator Modelling and Interactive Visualisation for Urban Sustainability Assessment”, written by Ruth E. Falconer, John P. Isaacs, Daniel Gilmour, and David J. Blackwood, by the presentation of an innovative framework for the integration of sustainable development principles in urban design and redevelopment processes, an indicator modelling and visualization tool, the Sustainable City Visualization Tool, with the aim to allow non-experts to become more involved in the urban design process.

In Chapter 10, “Urban Planning and Climate Change Mitigation: Using Virtual Reality to Support the Design of a University Master Plan Extension”, Amar Bennadji, Richard Laing, and David Gray explore the use of intelligent virtual transport modeling through the application of visualization techniques. The case study, the development of a university estate, shows that these visualization techniques can explain potential solutions, whilst simultaneously demonstrating the effects of design solutions on CO2 emissions, which is one of the key issues in contemporary urban planning. In other words, as Bennadji, Laing, and Gray argue that animated data allows decision makers to appreciate the real current and potential challenges, which, if correctly used, will certainly have a positive impact in the outcomes of urban e-planning.

In Chapter 11, “Sequential Experiences in Energy Producing Landscapes”, the third in this section, Ian D. Bishop explores the possible extent of landscape change under a move to 100% renewable energy sources. Ian Bishop, based on a case study in the state of Victoria in southern Australia, explores key
variables and tools for analysis and communication with the aim to identify the consequences and to support planning, proposing new policy approaches and modes of impact communication that urban e-planners ought to take into account in their daily decisions.

Lastly, in Chapter 12, “A Unified Building Model for a Real 3D Cadastral System”, written by Mohamed El-Mekawy and Anders Östman, is explored the creation of the 3D geometries corresponding to 3D property based on existing 3D building models with the aim to supplant the several limitations of conventional cadastral methods, especially when the property is complex. Mohamed El-Mekawy and Anders Östman argue that a unified building model developed for modeling complete and real 3D cadastre information system is a useful contribution to the development of urban e-planning and for 3D cadastral applications.

The fourth section, “The Role of Planners in Urban E-Planning Reforms in Developed Countries and the Challenges Confronting Urban E-Planning in Developing Countries”, offers a perspective on the role that urban planners play in the adoption of e-planning and provides an overview of the possibilities of urban e-planning development in less developed and in developing countries, as in the case of the Lusophone African countries. An important variable in the adoption and expansion of the urban e-planning paradigm is certainly the role played by urban planners and how they adopt and use Web-based planning tools.

In Chapter 13, “Planning Reform as a Catalyst to Advance E-Planning”, Wayne Williamson and Paul McFarland examine the attitudes of planners towards urban e-planning in Australia based on how planners perceive and use the e-planning recommendations issued by the government of New South Wales. The findings show that Australian planners use a wide variety of new technologies, are well aware of the e-Planning recommendations, and recognize the advantages of these e-Planning tools for the urban planning system.

In chapter 14, “E-Governance in Africa and the Challenges Confronting Urban E-Planning: Lusophone African Countries’, the barriers, challenges, and opportunities confronting urban e-governance and urban e-planning development in less developed countries are described and discussed, based on the case of Africa with a particular focus in the Lusophone African countries. Despite the overall negative picture of e-governance and urban e-planning in Africa, the chapter provides evidence that a gradual move from conventional urban planning to more advanced and comprehensive modes of urban e-planning in African cities is possible in the near future. In part, this positive perspective is due to the expected cost reduction in Internet access, to the rapid expansion of mobile technologies in the continent, the development of open source software, improvements in education and health all over Africa, and the expected sustained economic growth in the coming decades.

In sum, this collection of 14 chapters constitutes a coherent sample of the recent progress in the field of urban e-planning, suggesting at the same time some possible directions for development in the near future. The themes and issues explored in the book, the role Web 2.0 tools can play in urban planning, the part these tools can take in the development of urban social movements, the attitudes of planners towards the use of information and communication technologies in urban planning, and the use of visualization methodologies in urban planning and urban design, reveal urban planning as a fast shifting professional field, increasingly impacted by the use of these new information and communication technologies. At the same time, this is a process that reveals deep geographical asymmetries, as the African case examined in the last chapter so well illustrates, and a process that has the potential to increase social exclusion, as those associated with the digital divide along the multiple social divides. In
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other words, the adoption and the extensive use of new information and communication technologies in all tiers of urban government and in urban planning more specifically are essentially political decisions and as such can serve different aims and produce different outcomes. Besides the opportunities created by the widespread use of Web-based tools in urban planning, there are also numerous risks and challenges that ought to be considered by all those working in the field of urban e-planning. It is for them, planners, and policymakers working in the multidisciplinary field of Urban and Regional Planning, and for researchers and students working in this field as well, namely those interested to engage with new planning methodologies and with Web-based planning tools, that this book is intended.

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