

## **Microcosmic *intelligent City Centre***

An inception note on smart city analytics

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## **Intelligent Cities in the ‘New Urban World’**

The world population is – despite ageing processes in many developed countries – still rapidly increasing in size. To accommodate several billions of additional inhabitants on our planet calls for new settlement systems and creative perspectives for human habitat. Rapid urbanization is one of the most visible responses to the global population rise. At present, already more than one half of the world population lives in urban areas (with a share of up to 70 to 80% in OECD countries), and this trend is expected to continue in the decades to come. This emerging ‘urban century’ puts a high stress on the economic, social, technological, cultural, health, safety and environmental capabilities of large cities. Urban vitality and sustainable urban living is one of the great challenges of the ‘New Urban World’ (Kourtit). In the light of the critical importance of urban areas for sustainable and innovative development, a new fashion word has in the past years been introduced, viz. ‘smart’ (or ‘intelligent’) cities. A smart city aims to improve its performance (social, economic, environmental, technological, etc.) – relative to other cities – by using advanced knowledge and cognitive principles – mainly through access to and use of digital technology – for strategic urban policy and city management.

## **Scope and Aim**

Cities are new magnets and house nowadays the majority of the people in many countries. They face many challenges (e.g., transport, energy, amenities, land use, climate change, poverty, housing) which call for appropriate and informed policy responses. Information systems may vary from individual to aggregate information, with different degrees of accuracy. There is however, no systematic architecture for transforming unstructured urban data into a coherent and measurable data system that is suitable for policy making and policy analysis. The current wave of ‘big data’ (e.g., from personal mobile devices, social media, sensorization of urban space) offers not only a challenge, but also an unprecedented and innovative opportunity for balanced and effective city strategies. To meet this new challenging opportunity, modern cities need to develop advanced expertise on complex city dynamics, urban informatics and analytics, smart urbanity and cyber civil participation (Batty).

## **Ambition and Position**

The Microcosmic intelligent City (M-i-City) Centre aims to become – as a full-fledged part of JADS – an advanced international knowledge hub on the analytics of modern cities all over the world. It will act as a multidisciplinary centripetal and centrifugal node for generating and disseminating new analytical insights regarding the fundamentals of a contemporaneous city, in particular on: (i) the micro – statistical and conceptual – foundations of city life and urban public space, (ii) spatial choices of urban actors and relevant stakeholders involved, (iii) the dynamics in city formation, morphology and urban land use, (iv) the supply of and access to amenities and services in urban agglomerations, (v) the architecture, planning and governance challenges of modern intelligent cities, (vi) and the new data metrics (including advanced geo-science and data mining research tools and methods) in contemporaneous urban sciences (‘the city as a data engine’). It will serve both the scientific community and society at large, with a view to supporting sustainable, livable and inclusive cities in our world. M-i-City will not function as an isolated and ad-hoc initiative, but will act as a long-term oriented scientific

fly-wheel for acquiring, developing and distributing original and sophisticated research tools and analytics in the urban domain, through both education and research. It will be anchored in – and liaise with – world-wide scientific expertise of well-known scholars, in order to become an internationally recognised knowledge hub in analytical urban science for young talent.

## **Vision and Focus**

Cities are adaptive and resilient organisms, which form a complex evolutionary system, with many actors and diverse multilevel network connections. *M-i-City* will address the functioning and governance of modern self-organizing urban agglomerations, characterized by multiple layers of rich architectural design and historical heritage, a multidimensional pattern of many individual and collective interests and behaviours, a dynamic interaction between economic, technological, knowledge and business stakeholders, and a great variety of internal and external network linkage patterns. The *M-i-City* initiative departs from a systemic decomposition paradigm, starting from a micro-based analytical perspective on urban space use towards a macro-oriented integrative view on the essence of the city and its (public and private) space. This approach is coined here a microcosmic perspective on the city and serves to get a better understanding of the genesis, evolution, functioning, organisation, governance, and resilience capacity of cities in the 'New Urban World'. This novel methodological approach ties in with recent behavioural and experimental approaches in cognitive urban sciences, as mirrored inter alia in micro-economics (well-being research), attitudinal psychology (happiness research) or behavioural sociology (quality-of-life research). Indeed, the city becomes nowadays increasingly the platform for new theory development and advanced ('big') data application in the modern social sciences. The *M-i-City* Centre aspires to play a leading role in this fascinating development, by focussing in particular on data analytics for the microcosmic city, including a focus on the very essence of a city in the digital era. In the Dutch research landscape, the *M-i-City* initiative will liaise with NWA (National Science Agenda), the digital cities and *M-i-City* Centre Microcosmic intelligent City Centre communities theme of VSNU (Association of Cooperating Dutch Universities), and the Knowledge & Innovation Initiative on ICT (KIA ICT).