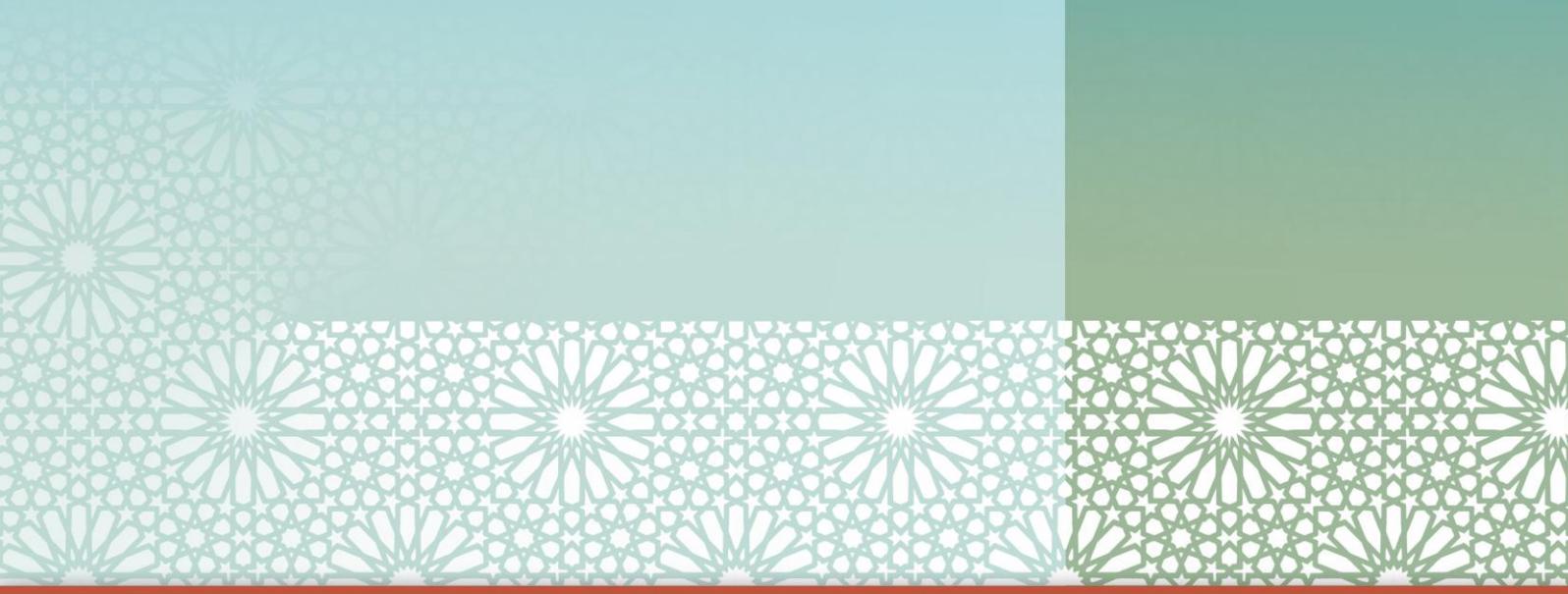


Smart Data & Well-being

Muscat/October 29th,2014



Introduction

In today's world, knowledge is the source of value-creation, for individuals as well as companies and organisations. The present project, Smart Data and Well-Being, aims to structure, test and research how the modern tools for data collection, processing and use can be applied in a smart manner to create awareness and induce positive behavioral change in response to major outstanding social challenges, in support of improved well-being for citizens and society as a whole.

The approach builds on the newest developments in big data, smart city development and the rise of interactive services directed to working and living conditions in modern societies. In terms of measurement tools, it applies participatory urban sensing, with users who are invited and consent to take part. The project prepares tests and operationalises a novel approach to sharing data under conditions of high trust, applying it in three specific action areas, one each in regard to health, energy consumption and mobility/transport.

The project combines methodology for collecting, processing and using data in an interactive way, with adjustment in real time and on conditions that are safe and secure for participants. The scheme offers participants positive incentives for adjustment along the way, on terms that are decided by participants themselves. The project further applies a combination of traditional and newly developed content organised so as to offer participants educational quality blended with entertainment.

The project is carried out in consultation with high-quality international partners which themselves face similar issues and harness related ambitions. At the same time, while building on best practice, the models developed and tested in this project are adapted and pursued on terms that harmonize - and are in sync - with the special nature and culture of local Omani society, and the Arab Gulf.

The project offers the tools to address critical outstanding problems, such as: i) the worsening of non-communicable disease that leads to multiple pre-mature deaths and human suffering; ii) the waste of energy and lost opportunities for improved living and working conditions in modern buildings, and; iii) congestion, loss of time, road accidents and pollution on the roads.

The results of the project will relate and add to the existing science literature in health sciences, energy studies, and transport studies respectively, while enriching our understanding of the link between ICT and behavioural sciences. In doing so it will generate generally valid observations and insight as well the understanding what applies and can work out in the special national and local context. Apart from scientific evidence, the results aim for high practical importance. The project is prepared and will be implemented in consultation with key authorities, partners and stakeholders in a way that allows for immediate application of the results in each of the studied areas. On the more general level, it aims to gain new ground in guiding practical action how smart data can be used to support higher wellbeing in a range of areas where gradual behavioural adjustment is essential.

Box 1: Coordinating organisations

The Middle East College (MEC), founded in 2002 to provide its graduates a firm footing in the digital age, currently has 5,000 students. Located in the Knowledge Oasis Muscat (KOM), MEC is in the processing of establishing pioneering research activities, crossing the borders of different scientific disciplines and in collaboration with domestic as well as international partners.

The International Organisation for Knowledge Economy and Enterprise Development (IKED), founded 2002 in Sweden, is a non-profit association engaged in research and action-oriented projects aimed at tackling the issues and realizing the opportunities of the knowledge era. It mobilises diverse partners and network points spanning more than 40 countries and all major societal spheres.

On International Partners

The project draws on several international mandates and partnership arrangements. This includes the CAP Identity mandate launched at the World Economic Forum in Davos, 2014, to champion new approaches for users to exercise better control over their identities and personal data (put a "cap" on their identity") while benefitting from active sharing of information for high-priority exchanges associated with trusted e-services. In this context it also draws on the EU-funded GINI (Global Identity Networking of Individuals) project, with links to various ongoing international projects on authentication, authorisation, privacy and security in digital communication.

Currently in the phase of securing core project funding, the project brings together a number of collaborating organisations with involvement from main societal sectors, for the development of new innovative tools and services in support of better health, energy and mobility in the urban environment of tomorrow.

In Oman, preparations have been made for partnership with, e.g., the health villages' project of the Ministry of Health, Corporate Wellbeing Oman on work place change, and the Oman Royal Police on transport and data on car accidents. In the wider GCC region, the project links to the EU-funded Inconet-GCC project. Supporting collaboration between the GCC and the EU in research and innovation, this project has Smart City development as one of its two priority areas, with Masdar, Qatar University, PEIE, IKED and ITEMS among the active partners.

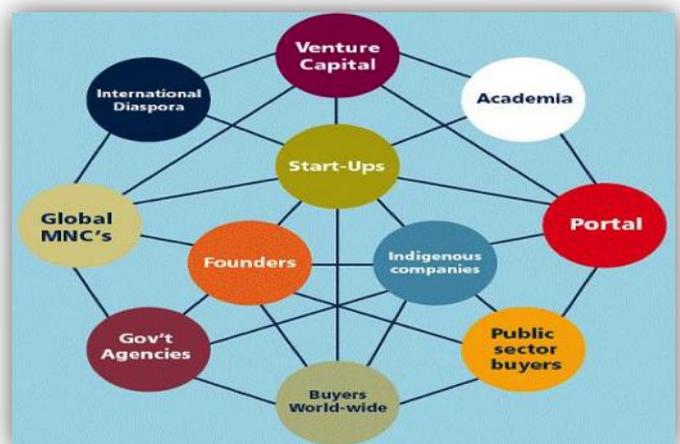
Through national and international collaboration, the project will make use of and adapt the most suitable technical and measurement tools, research methodology and comparative empirical testing. Here, the project exercises links with leading smart data processing projects in other parts of the world, such as; Barcelona, London and Siena in Europe, along with King's College and

Karolinska Institute in Stockholm providing input to the "Learn-for-Life" model for behavioural change; in the US, Harvard University in the area of cultural agents, and; China's national Smart City projects (see Box 2 for examples of relevant agendas).

Through exchange of experience and partnership with such players, the project aims to build a dynamic meeting space for diverse competences to join forces in engage in networking activities for the purpose of identifying, fostering and breeding new innovative ventures offering new solutions and growth opportunities in the areas addressed.

An International Expert Committee with both domestic and international expertise is set to provide guidance and assist in evaluating the results.

Corporate partners play a key role for operationalisation of the results. All data generated through the project will remain thoroughly protected in Oman.



Smart City projects with which collaborative linkages are under development

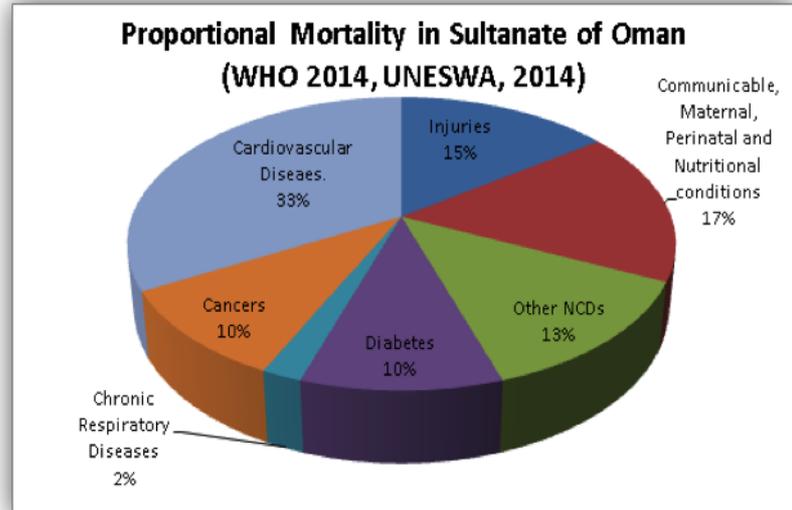
- Barcelona, launching smart city functionality based on unique collaboration between the technology provider Abertis, the city authorities and the University of Barcelona, see <http://smartcity.bcn.cat/en/>.
- ICRI Cities (www.cities.io) engages Imperial, UCL and Intel, which relates to the "Sensing London project", with the Future Cities Catapult, see https://futurecities.catapult.org.uk/project-full-view//asset_publisher/oDS9tiXrD0wi/content/project-sensing-london.
- The City of Siena, through its bid for "European capital of culture 2019", advances smart data for value creation around cultural heritage, in collaboration with The University of Siena (the no. 1 ranked university in Italy) and Harvard University's Cultural Agents Program.
- China's National Smart City projects, run under the Ministry of Housing and Urban-Rural Development (MOHURD) of China Digital City Council of the Chinese Society for Urban Studies (CSUS), include some 200 cities that collaborate for the purpose of guiding urban-planning and city-design.

Application Areas

The project applies an interactive model for user engagement in health, energy and mobility/transport, as a basis for identifying ways forward for smart data use and processing to increase:

- Issues contributing to high levels of obesity and non-communicable disease, notably diabetes, cardiovascular disease and cancer. A combination of diet and physical activity is addressed for countering deteriorating health
- Against the backdrop of high carbon emissions and lack of innovation in use of renewable energies, solar technology usage and associated services are introduced to offer enhanced functionality for cooling and reduced energy consumption combined with an improved indoor living and working conditions complement new solutions
- In the face of mounting congestion on the roads, time wasted, increasing space devoted to roads, high rates of death and injury on the roads, and pollution, individuals are offered the opportunity to engage in transport and communication through personalised car pooling.

In each of these areas, our approach will be devised to match a particular user community, enabling gradual build-up of awareness followed by the careful introduction of positive and consistent incentives for behavioural adjustment. On this basis, the project will identify which factors are successful in raising well-being under varying circumstances, with different control factors (e.g. age, gender, income, profession region) taking into account.



Methodology and User-Participation

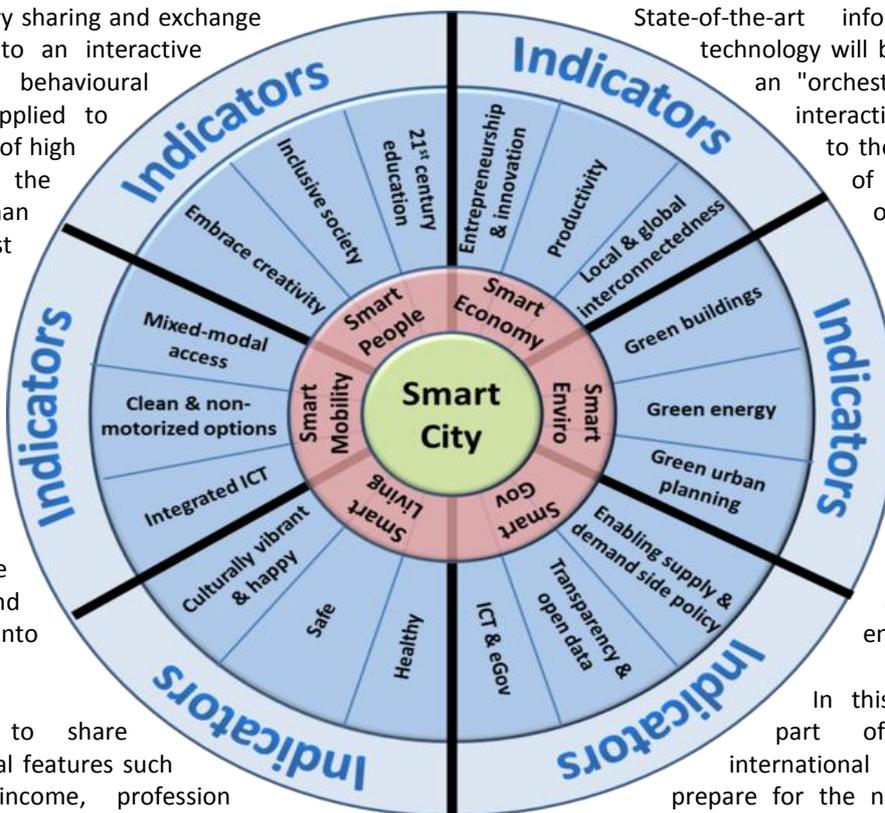
The project brings together leading experts and relevant stakeholders in devising a combined research, testing and implementation activity. Structured experimentation and systematic assessment will be applied to examine the effectiveness of various tools to motivate user engagement. Voluntary sharing and exchange of data will feed into an interactive learning and behavioural adjustment model applied to target selected issues of high relevance, both to the local context of Oman and the Middle East and to the world community.

In carrying out the project, participants join on an individual basis while also forming part of a social context. Understanding the role that culture and mindset actors come into play is key.

Participants agree to share information on general features such as age, gender, income, profession (including status as employed/ unemployed) and region (including urban/rural area). All those need to be accounted for in working out an effective approach for smart data to support well-being. There will be no requirement for changed behaviors, but it will be up to individuals what to eat, how much to move, what to invest in new cooling equipment, what temperature to set, whether to drive a car alone or on what terms to share a car with someone else.

Measurement will be implemented by means of sensors, applied in smart phones, accelerometer and GPS enabled

trackers along with other applications that will capture and transmit multimodal data streams in regard to physical activity, diet, stress levels, office and living environment, energy waste, and car pooling.



State-of-the-art information processing technology will be applied along with an "orchestrator" for managing interactive exchanges tailored to the needs and interests of individual users, operating in sync with the new era of communicating devices. Those users who take part will have their private information and their identities protected through the deployment of appropriate security and privacy-enhancing practices.

In this the project forms part of a collaborative international research effort to prepare for the new era of big data, convergence and the Internet of things. It has been devised so as to help engineer the rise of a new generation of electronic new services, capable of addressing our outstanding needs with regard to health, education, commerce, energy, the environment, logistics, mobility, and so forth, through a combination of means for users to be engaged in developing, testing and scaling them in ways never seen before.

Privacy by Design is embedded into architecture of Information Technology systems and business practices making Privacy an integral part to the system that is compatible with emerging technological advisements. User friendly Privacy enhancing technologies (PETs) will be used that enable users without technical knowledge to interact with the system and still have control over their personal data.