



KDD based System Making Information Assessment Sustainable for Web Application

Anshu Srivastava

anshu_qrat@yahoo.co.in

S. Sahay

sulabhsahai@gmail.com

ABSTRACT-The introduction of leading edge assessment technique that allows assessors to identify risks and estimate the competence of controls over vital information systems in the organizations, has remote success consequences for many domains of organizations' activities. Many of the organizations are focusing to have a computer-based assessment system that can be adapted to extend and improve the incessant assessment process. Such approaches are practiced to assess risk and to support an IS assessor's decision to perform either compliance testing or substantive testing. In a computer based assess approach, Information Systems assessors are not only depending on risk. These people are also depending on internal and operational controls as well as understanding of the organization. The considered type of computer based assessment decision can assist relate the cost/ benefit analysis of the control to the well-known risk, allowing realistic choices. A knowledge based method or system to an Information Systems Assessment will enable us to build up an overall, efficient and effective IS Assessment plan which will reflect on all the possible weaknesses and/ or deficiency of Controls and settle on whether such system could lead to a significant dearth or material weakness. With an attempt to perform an effective risk assessment, it is required to have a proper understanding of the Customer's business environment, organizational behavior, and its operations.

Keywords: *Proficient System, Information Communication and Information Systems Assesment Technology (ICISAT), Knowledge base systems, Information assessment techniques*

1. INTRODUCTION

Modern cities face many challenges and opportunities because of this. The challenges range from providing a good quality of life for citizens to ensuring appropriate socio-economic development year on year, while the chances can be seen in businesses becoming more efficient and innovative, to the reduction of crime through the use of ICTs in the act of policing. The perception of making cities "smart" has grown out of the need for cities to meet these challenges and opportunities. Depending on an analysis of the literature on Smart Cities, Future Internet and Open Living Labs, this paper examines, from the perspective of Information communication and information system assessment technology (ICISAT), and knowledge based system usage, what the needful elements are for making a city 'Smart'. It outlines some significant ICISAT elements ending with Information assessment techniques implementation that cities need to acquire or develop on their path to becoming smarter. The paper then comments on the non-material essentials that also make up a good ICISAT

strategy for smart cities. It argues that along with the six ICISAT essentials outlined in this paper, cities must develop sustainable partnerships and cooperation strategies among main stakeholders to ensure the effective sharing of common city resources among citizens and businesses along with focusing on knowledge base system and information assessment techniques. If it's accomplished, regional innovation ecosystems can develop, in turn, speeding up the process of changing into a "smart city".

Information Technology is altering the evolution of cities. The concepts of "growing" cities depending upon implementing accurate urban planning are being replaced with the ideas of making a city "smart". The internet is changing the conventional urban planning model and convincing planners not only to consider the physical planning of a city but also to consider the use of Information Technology and Information Systems Assessment to make the economy, environment, and governance of a city more effective and efficient.

Even though the term "smart city" is comparatively new, the development of a smart city can differ dramatically based on the approach that is taken regarding policymaking for the urban growth of the city [4]. A number of definitions for the term "smart city" exist [2]. Smart cities are defined as "cities that utilize information communication and information systems assessment technologies with the aim to increase the life quality of their inhabitants while providing sustainable development" [2]. From this definition we can see that ICISAT plays a pivotal role in making a city more adapted to the contemporary needs of its citizens. Other definitions of smart cities may not place such an emphasis on the central role played by ICISAT, nevertheless many definitions include some reference to the use of ICISAT for making modern cities more suited to the needs of citizens [4]. For example, Cities viewed as smart when "investments in human and social capital and traditional (transportation) and modern (ICISAT-based) infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory government" [3]. A city is said to be smart when it manages to connect the physical infrastructure, the IT infrastructure, the social infrastructure, and the business infrastructure to leverage the collective intelligence of the city [5]. Regardless of whether ICISAT takes centre stage in the development of a smart city or not, it is clear it is a key driver of smart city initiatives and thus



attention from city planners and the various stakeholders interested in sustaining and improving quality of life in urban areas.

In this whitepaper, we examine the essential building blocks that a city needs to put in place in order to make the best use of ICISAT for making a city smart. We argue that there are five essential ICISAT elements that are needed to ensure a solid ICISAT foundation exists for nurturing the “smart” agenda of a city.

2. REVIEW OF LITERATURE.

A. Embedding Broadband Networks Deployment

When considering the implementation of a smart ICISAT plan for a city, the first step for any policymaker is to foster the development of a rich environment of broadband networks that support digital applications, ensuring that these networks are available throughout the city and to all citizens [8]. This plan for easy access to broadband should include a broadband infrastructure that combines cable, optical fiber, and wireless networks. This will offer maximum connectivity and bandwidth to citizens and organizations located in the city. The latest broadband service is fibre-optic, which is the fastest Internet connection available. However, in many places this type of Internet service is still in its infancy [12]. Expanding this service across the city is an essential part of any smart city agenda. With these fiber-optic cables connectivity increases in critical areas around the city such as universities, business centres, technical and research institutes, government offices and emergency response units. These fiber-optic networks are fundamental in acting as a backbone for ensuring high-speed access to the Internet. Additionally, they facilitate the installation of sensors, which are keys to the development of intelligent solutions for the city. They also ensure access to any electronic public services that the city plans to offer its constituents [2]. The long term goal of setting up such an infrastructure is to facilitate, once broadband access is widespread enough, an open broadband network that the entire city population, i.e. organizations, companies, municipalities and individuals can use. This widespread availability of fast Internet speeds has often been shown to lead to the development of innovative approaches to particular social challenges and to the establishment of new businesses and business models [8].

In addition to the wired broadband networks that are necessary for smart cities, wireless broadband is becoming ever more in demand, especially with the explosive popularity of mobile applications, smart phones, the increased connectivity of smart devices, the Internet of Things, as well as the drop in costs of sensors and radio frequency identification (RFID) technologies.

Cities can use broadband wireless networks to enable a wide range of smart city applications that enhance safety and security, improve efficiency of municipal services and promote a better quality of life for residents and visitors. This mobile infrastructure has already become an essential element for smart cities.

B. Embedding Smart Devices and Agents usage

The second step for smart city planners to consider when implementing a smart ICISAT plan for a city is to ensure that the physical space and infrastructures of the city are enriched with embedded systems, smart devices, sensors, and actuators, offering real-time data management, alerts, and information processing for the city administration. The presence of these devices combined with wireless connectivity throughout a city facilitates a richer and more complex digital space within the city, which in turn can increase the collective embedded intelligence of a city. This collective embedded intelligence allows relevant stakeholders of the city to be informed about the city's physical environment and facilitates the deployment of advanced services like spatial intelligence. It also paves the way for developing other innovative ecosystems that help to link the city with its people and visitors through technology.

The embedded intelligence, created by the use of embedded systems and other ICISAT intensive solutions, is becoming the nervous system of modern economies through making cities smarter. They say that ICISAT is already at the heart of many current models for urban development, such as for revamping a city's critical infrastructure and enabling new ways for city transport management, traffic control or environmental pollution monitoring.

Additionally, the extensive and ubiquitous use of ICISAT is empowering the development of essential services for health, security, police and fire departments, governance and delivery of public services.

C. Embedding Smart Urban Spaces Development

Following closely on from steps one and two, developing smart urban spaces, by connecting the embedded systems, sensors and smart devices located across the city together to form a cohesive and integrated ICISAT infrastructure for the city, is the third essential step along the way to smarter cities. Smart urban spaces are areas of a city that leverage ICISAT to deliver more efficient and sustainable services and infrastructures within that specific area. The spaces can sometimes be as large as entire city districts and these districts can include services like electric car charge points, energy-efficient buildings that use ‘smart’ meters and smart heating and cooling systems. WI-FI hotspots and information kiosks that allow people to connect to the Internet on the move through these districts are also common services available in smart urban spaces. Free WI-FI hotspots are becoming more and more common in most European cities. These smart urban spaces comprise a wide range of innovations that can be of enormous environmental and economic benefit to both the district and the city at large.

Similar to step two, this step allows for the creation of applications, which enable data collection and processing, web-based collaboration of the collective intelligence of citizens. The latest developments in cloud computing and the emerging IoT, open data, semantic web, and future media technologies have much to offer cities looking to become



These technologies can assure economies of scale in infrastructure, standardization of applications, and turn-key solutions for software as a service (SaaS), which dramatically decrease the development costs while accelerating the learning curve for effective functioning of smart cities [10].

However, challenges involved in developing these smart spaces still exist. Particular importance is being placed on building partnerships between the public and private sectors within these districts, as well as between the ICISAT and energy industries of the city. This is as a result of a growing concern, with respect to developing region/city-wide infrastructures, that the commercial approach taken by many city planners in developing these smart spaces is leading to too many proprietary systems that do not interoperate with each other [7]. From the point of view of the European Commission, there is a need to reach an agreement within cities at an industrial level to overcome this increasing market fragmentation.

Such fragmentation may significantly delay existing solutions from becoming efficient, scalable and suitable for supporting new generations of services that are not even envisaged yet [7]. As a result, a number of EU initiatives are being rolled out to overcome this infrastructural challenge. One such EU initiative is a large scale project entitled the Electronic Simple European Networked Services (ESENS) project. This project aims to develop an infrastructure for interoperable public services in Europe. It intends to support the creation of a Digital Single Market by facilitating the delivery and usage of electronic public services. This topic of e-services is explored in more detail in the next section.

D. Embedding Web-based Applications & e-Services Development

The availability of ubiquitous ICISAT infrastructures like those discussed above stimulates the development of new services and applications by various types of users, and allows for the gathering of a more realistic assessment of users' perspectives by conducting acceptability tests directly on the infrastructures already in place and functioning in the smart city. To this end, Living Lab networks can help to make the testing of new applications and e-services easier and should be used as building blocks for the more efficient development of smart cities.

Smart cities commonly deploy online services across different sectors of the city, for instance a city airport will require different e-services to a city hospital. Smart city e-services include services for the local economy and its development, tourism, the city environment, its energy and transport services, security services, education and health services and so on.

The platform will enable them to communicate and engage with each other, to share their skills and knowledge with each other and with their customers, to stay informed about funding opportunities, and to increase their customer-base by selling their products and services via the community platform.

Sensors can be used to manage the mobility needs of citizens with an appropriate Intelligent Transport System (ITS) that takes care of congestion, predicts the arrival of trains, buses or other public transportation options; managing parking space availability, expired meters, reserved lanes, and so on. ICISAT can be also used for environmental and energy monitoring such as using sensors to detect when waste disposal pick-ups are needed, or to measure energy consumption and emissions.

As previously touched upon other services may include building management services like smart meters and monitoring devices to help monitor and manage water consumption, heating, air-conditioning, lighting and physical security. ICISAT can also be used in improving the health of citizens through telemedicine, electronic records, and health information exchanges and in remote assistance and medical surveillance for disabled or elderly people. When providing public Safety and Security, sensor-activated video surveillance systems can be employed along with location aware enhanced security systems, and estimation and risk prevention systems (e.g. sensitivity to pollution, extreme summer heating). ICISAT services can change the way citizens work by providing remote working and e-commerce services for businesses, entertainment and communications for individuals. Integration of the e-services is a key-factor, enabling the above processes to work together and create environments more efficient in collaborative problem-solving and innovation [7]. Innovative entrepreneurs and start-ups should be encouraged and supported to leverage these original technologies and adapt them to offer novel services to the citizens and businesses of the city.

E. Embedding e-Governance and Government Data Accessibility

Open Government Data (OGD) initiatives, and in particular the development of OGD portals, have become widespread since the mid-2000s both at central and local government levels in Europe and indeed across the globe. Understanding the preconditions that enable the efficient and effective implementation of these initiatives is essential for growing cities and especially cities looking to become smart. This is true in terms of the role played by OGD in relation to Open Government policies in general. The effective use of government data can precipitate the smart evolution of a country's cities, creating national competitive advantage for the country in question. Two civil society movements are campaigning for greater openness of information, documents and datasets held by public bodies. The first is the *Right to Information* movement, which promotes a public right of access to information from a human rights perspective. The second is the *Open Government Data* movement, which uses predominantly social and economic arguments to encourage the opening up of government data. The latter claims that putting such information into the public domain can benefit society by creating conditions for more social inclusive service delivery and for more participatory democracy. They also argue that it can stimulate the economy by allowing the



ability for third parties (e.g. individuals, private enterprises, civil society organizations) to create new products and services using public data [1].

There is significant overlap between both movements, in that both aim to increase the transparency of government so that all members of society can enjoy the inherent social and economic value of information that has been generated and collected with public funds. Public agencies are trying to increase the transparency of government processes and performance by publishing relevant data online and sharing it with the public. Government data, made available in machine-readable, linked datasets that can also be searched and manipulated using standard tools, is a critical new resource for fuelling changes in value creation (economic, social and political) of a city or region. The OECD has identified following benefits government data of a city, region or country accessible:

1. Ensuring effective e-Governance
2. Improving government accountability, transparency, responsiveness and democratic control
3. Promoting citizens self-empowerment, social participation and engagement
4. Developing the next generation of empowered civil servants
5. Nurturing innovation, effectiveness in government services
6. Creating value for the wider economy

The above mentioned six benefits place a great emphasis upon the need for a city's governing body to engage with its citizens and listen to their needs when developing the city. In general, (public) governance has been defined "as regimes of laws, administrative rules, judicial rulings, and practices that constrain, prescribe, and enable government activity, where such activity is broadly defined as the production and delivery of publicly supported goods and services." [9]. Thus, based on the five benefits outlined above, opening up government data to citizens encourages *good* governance. Good governance, in turn, encourages public trust and participation that enables services to improve [13]. However, it is not only engagement between government and citizens that is essential to the success of a city becoming smart, all stakeholders need to engage and work together towards growing the city to meet their own needs [4]. This argument is explored in more detail in the next section.

3. PROFOUND ANALYSIS

In addition to the five essential ICISAT elements listed in 'Review Literature' part of this paper, there are many other issues and factors which have an important role play in making a city smart. Several of these issues and factors have been identified and traced in the smart city literature [2]; [3]; [4]. However, there is a significant factor which needs further argument is the role of policy making and mechanism of city governance. We agree upon that Governance not only engages the implementation of procedures for constituents but also for all the individuals or stakeholders within a city. The major opportunity lies on finding the challenges of key projects

which have to be studied within e-government, and concluded that stakeholders' relations is really the critical factors to establish success or failure of such smart city projects [11]. If we think about smart city projects as strongly related to e-government projects then it is not impractical to gamble that stakeholder relations might also play a significant role in the realization of smart cities for community.

One way of ensuring all stakeholders have access to digital e-services within a city is to ensure all platforms offering public e-services are open and available to the entire population. Creating a community platform with proprietary software very often creates barriers for certain sections of a community to participate [6]. This could be due to the expense of connecting to the platform dictated by the proprietors of the software, or simply the proprietors not allowing direct competitors to participate within the community via the platform. By using a fully integrated open system, which allows application developers *within* the community to develop software applications *for* the community based on the demand of the community, all stakeholders in the community can participate on an equal footing.

Such an integrated system, when deployed by local government, can provide an open space for government, businesses and citizens to interact at a community level. This would allow each smart city or region to adapt their interaction between stakeholders according to their specific needs and the needs of the city, as voiced or demonstrated through the community platform. This in turn will foster innovation and increased participation from local stakeholders as they reap the benefits of their initial inputs.

4. CONCLUSION

This profound study research paper describes what information communication and information systems assessment technologies (ICISATs) are required significantly to develop, maintain and nurture a smart city. This study focuses on five vital elements needful for any smart city planning policies. These essential elements are intimately related and build upon each other and also to eventually provide a complete ICISAT solution. ICISAT solution takes the form of a omnipresent digital platform, and it is available though out the city (with WI-FI hotspots, private networks and/ or local information kiosks) to all individuals of the smart city or community. ICISAT solution facilitates association at a confined level in a rationalized digital manner, reducing cost and effort with respect to energy and time for all participants and growing quality of life (i.e., living standard) within the community/ society.

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