

The place of the virtual workplaces in developing smart urban centres

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Abstract:

Purpose this study of the changing strategies cities with urban centres are adopting in order to adapt to the increasing influence of technology on the labour force looks at systems and structures been created to accomodate the virtual workplace in this cities. Urban centres are certainly a good place to begin this investigation and a look into how the virtual workplace can be embedded in plans and policies is timely. **Methodology/methods** This research adopts a qualitative research method to synthesize information generated from deskstop search for information that relate on a general level to theories and key terms in this paper. Furthermore, the framework design is a prelude to data collection and analysis which is in progress at this time and opens up the framework validation process. **Aim** The aim of the research is firstly to discuss the strategic changes in the design and deveopement of urban centres of cities at the current time with reference to the previous status quo, and explain this changes based on development theories (Network and System Theories Specifically). **Findings** Organizations today have little choice as regards the adoption of virtual workplaces, as one of the main goals of organization strategy is to remain competitive. Attracting the best talents and keeping ahead of competition in their industry. Cities therefore need to properly position themselves through planning and designs to make themselves attractive to these organizations. Hence recently, many cities have sought to develop smart urban centres which would incorporate systems, platforms and infrastructures around which the virtual workplace can be hinged. The the review of literature revealed that cities had began some while ago to adjust their policy and development strategies to allow for necessary condintitions organizations need for the adoption of virtual workplaces. This in turn has provided a return of increased localization of organizations, highier standings in city livability rankings and increased attractiveness to skilled labour. **Conclusions** Organizations as we know it today is changing, so is the composition and the structure of this organizations. Cities where these organizations are locating themselves are not excluded from this changes. More highly skilled professionals are attracted to work in organizations located in a different place from where they live and it is becoming increasingly possible to take up such offers as organizations tend towards the virtual work place. This

research has shown that this changes are already occurring, but there has been little effort to explain the role of cities in this change, and how cities themselves are changing and developing to facilitate this phenomenon. It is therefore an area that should be further researched and based on the theories and principles discussed in this paper, a framework/model can be developed to explain this phenomenal change.

Keywords: Smart cities,, Networks, Systems, Skilled human capital.

Introduction

Managers around the world are faced with having to lead an increasingly fragmented and geographically dispersed workforce (Koles, & Nagy, 2014), leading to the increased divergence of virtual workplaces into organization management strategies. The location of these organizations and where their employees are located is now of great importance as the tools and frameworks necessary for successful deployment of the virtual workplace paradigm cannot be found just everywhere. This attention to location of organizations and employees in the drive for increased productivity and wellbeing has brought the smart city discussion into the fore of discussion. And while Harrison, & Donnelly, (2011) argue that the current *ad hoc* approaches of Smart Cities to the improvement of cities are reminiscent of pre-scientific medicine, so while they may do good, we have little detailed understanding of why they are successful. There is a great need to understand how more and more people are able and willing to work virtually in some cities while other cities struggle to have significant impact on their working population.

Lin, Standing, & Liu, (2008). Found in their study of virtual work that social and task dimensional factors (i.e. relationship building, cohesion, and coordination) which had affected the effectiveness (performance and satisfaction) were the bedrock on which effective virtual work could be done. Large and small urban centers therefore are proposing a new city model, called "the smart city", which represents a community of average technology size, interconnected and sustainable, comfortable, attractive and secure (Lazaroiu, & Roscia, 2012). And organizations in a bid to remain competitive are looking to such cities which have the requisite policies and attract the needed talent pool from which they can easily employ. As it can be argued that a well-designed organization can expect to see better problem solving and increased productivity, effective use of company resources, better quality products and services, increased creativity and innovation, and higher quality decisions when the right crop of talents are employed in the organization (Lurey, & Raisinghani, 2001). Therefore, as information sharing between individuals who work together through ICT in the virtual workplace becomes more critical, the means and motivation to do so both in their immediate surroundings and everywhere around them as they move around their cities (i.e. Trains, buses, stations and bus stops, shops and even public parks and green areas).

The article begins with an exposition of Smart Cities which would be used also in the same context as smart urban centres in this paper, also it provides some insights into the inherent components of the smart city. It then reviews related work on what is driving the current expansions in urban centers and organizations roles and response to this phenomenon. A review of literature on virtual workplaces is then carried out and then a discussion on how the integration of virtual workplaces can support the goals of cities in practice as they drive to transform into smatter cities is attempted. Importantly, A comprehensive framework rooted in Systems and network theories is then proposed for promoting adoption of virtual workplaces with relative benefits in mind. The article concludes with a short discussion on the place of virtual work within the proposed frame work and accruing benefits to the workforce, organization and government.

1.1. Understanding smart urban centers (Smart cities)

Harrison, & Donnelly, (2011) tracking of the The phrase “Smart Cities” suggests that it has been adopted since 2005 by a number of technology companies including Cisco, IBM, Siemens, for the application of complex information systems to integrate the operation of urban infrastructure and services such as buildings, transportation, electrical and water distribution, and public safety making everything within cities that facilitates ease of communication, transactions and movement possible in just a click (Graham, 2002). Leading to an even more recent use of the phrase covers any form of technology-based innovation in the planning, development, and operation of cities, for example, the deployment of services for plug-in electric vehicles (Harrison & Donnelly, 2011). The European Union (2013) aptly states that Smart cities should be regarded as systems of people interacting with and using flows of energy, materials, services and financing to catalyse sustainable economic development, resilience, and high quality of life; these flows and interactions become smart through making strategic use of information and communication infrastructure and services in a process of transparent urban planning and management that is responsive to the social and economic needs of society. And according to Lombardi, Giordano, Farouh, & Wael. (2011) the main components and actors in the understanding of smart cities are; *Smart Governance* (related to participation); *Smart Human Capital* (related to people); *Smart Environment* (related to natural resources); *Smart Living* (related to the quality of life) and *Smart Economy* (related to competitiveness) as illustrated in the figure 1 bellow

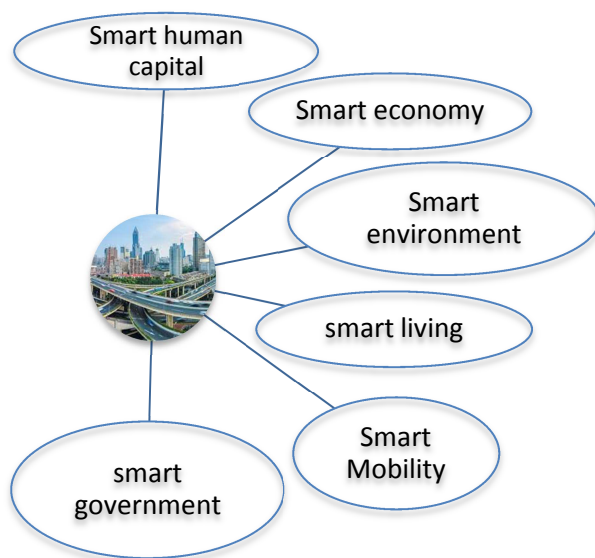


Figure 1. Components of Smart cities.

Source: *Smart cities – Ranking of European medium-sized cities (2014)*

Harrison, & Donnelly, (2011) suggest that the larger proportion of the world's population is moving towards congregating around urban areas. And this trend in itself could project some advantages as this process of densification of the global population could be fundamental to optimizing all kinds of efficiencies. The Sustainable urban development concept, which is development seeking to respond to: integration of conservation and development; satisfaction of basic human needs; achievement of equity and social justice; provision of social self-determination and cultural diversity, and; maintenance of ecological integrity (Jacobs, Gardner, & Munro, 1987) has been identified as the ultimate goal of many contemporary planning endeavors, and has become a central concept on which the urban development policies are formulated (Yigitcanlar, 2010). And as Söderström, Paasche, & Klauser, (2014) stresses, the *whys and hows* of smart urbanism has become a thing in the narrative of businesses. And due to the changes in demographic and geographic distribution of population around the world, challenges which range from planning, development and operationally of urban centers are weighing more on the minds of developers, planners, organizations and policy makers both at municipal and national and regional levels. Harrison, & Donnelly, (2011) in looking at "Smart City" from the point of view of elected officials argues that it has to do with creating an environment that is attractive to Generation Y and Z people. Which means it should be a digital city to match these Internet natives' experience. And beyond that, it should offer pervasive public wireless network access. As such the city should interact with its citizen through instant access, digital interfaces rather than through offices with long queues and paper forms. It should also appeal to the Creative Class' (which are the smart

human capital), and provide support for sustainability, especially “greenness” in all its forms.

There needs to be a look at the role² organizations and policy makers have for the virtual workplace when planning cities as most recently, information technology has assumed a rather important role in the planning and design of smart cities must especially urban centers. Harrison, & Donnelly, (2011) stress that one of the many roles Information technology plays in smart cities is being the thread that leads to closer integration of communities, most especially the high skilled human resources and as Graham, (2002) puts it, everything within the global economic, cultural and social space becomes equally accessible or ‘one click away’ (Graham, 1998).

The understanding of smart cities as can be seen in most literature sometimes do not emphasize that the larger proportion of city population are localized in the urban centres. In recent times researchers have began to look more closely at the framework and structures urban centres and with increased incentive from government and policy makers, this would grow to take a centre stage. As Lazaroiu, & Roscia, (2012). State that the sustainable urban model is incentivized by policy making bodies such as the European Commission, mainly as a response to energy issues and by extension environmental concerns.

1.2. Virtual workplaces

The fact that knowledge workers are becoming even more drawn to be able to work away from their desk, breaking away from the traditional work culture, many forms working away from the office has emerged such as teleworking (Hill, Ferris, & Mårtinson, 2003), hoteling and online work among others which mostly talks about working fulltime or partly away from the office at several degrees. We would consider virtual work instead which entails working nearly full time away from the office place. And conceptualise the virtual workplace, in which employees operate remotely from each other and from managers (Golden, & Fromen, 2011), adopting information and communication technology to carry out functions. As Raghuram, Garud, Wiesenfeld, & Gupta, (2001) Stresses Virtual work entails professionals working remotely from home, in cars, from hotels and satalite centres and non headquarters locations.

Lurey, & Raisinghani, (2001), found in their study of best practices for the virtual workplace that further efforts directed towards the specific technology and communication-related issues that concern dispersed virtual workers are needed to supplement the set of best practices. This technology would include transportation modules that allow people easy access to ICT technology even when in transit. This ensures smart mobility, which is one of the cardinal hallmarks of smart cities. In describing main characteristics of the virtual workplace, highlight is placed on Business processes are mainly related to the handling of information and data (Winther, & Achtenhagen, 2012), Not location specific (Daniels, Lamond, & Standen, 2001) and is knowledge intensive with use of ICT and electronic communication (De Klerk, & Hoffmann, 2002; Kumpikaitė-Valiūnienė, Duoba, Duobienė, & Žičkutė, 2014). In practical terms, the virtual workplace allows organizations to maintain

clear lines of authority and responsibility, leading to greater autonomy than in traditional organizations (Robey, Schwaig, & Jin, 2003) even though it may not be appropriate for every kind of job (Cascio, 2000) favoring more service and knowledge oriented.

2. Smart city systems and networks

The city as a complex system is certainly a valuable metaphor when views in the context of the evolution of information systems. The growth in complexity of both the hardware and software of information systems has generated communities of people, IT architects and software engineers, who are deeply familiar with methods to compose together vast networks of nodes, as well as tools for creating, managing, and navigating such networks. Indeed it is ironic that while Alexander's seminal book (Alexander, 1977) on patterns in urban architectures seems to have had little long-term effect on the development of urban planning, it became a core text in the development of pattern languages for software engineering (Gamma, Helm, Johnson, & Vlissides, 1994). The smart city concept has been expressed with some metaphors. Importantly, smart city has been viewed as a large organic system. As there could be a possible stress on the organic integration of systems. And it can aptly be said that the interrelationship between a smart city's core systems is taken into account to make *the system of systems* smarter as no system operates in isolation (Nam, & Pardo, 2011). One emerging thought is that for a city to function well as a healthy system it needs an appropriate level of complexity at all levels in its operations. This complexity is needed not just in its physical networks – its roads, its buildings and its communications, but also culturally, and economically. And these are all knitted somehow by 'smart transport' which is the design of urban environments, transport infrastructure and services, and communities to provide better accessibility to locations within the city (Yigitcanlar, Fabian, & Coiacetto, 2008) thus it is desirable to simplify the complexity of the system of transport by developing and integrating a reliable transport network into the design and planning of cities.

Along with smart mobility and smart human capital, smart environments which is mostly driven by ICT are very important components of smart cities and virtual work. And as Graham, (2002) stresses, ICTs are helping to facilitate processes of intensifying global urbanization firstly because they allow specialist urban centres, with their high-value-added services and manufacturing, to extend their powers, markets and control over ever-more distant regional, national, international and even global hinterlands. Secondly In an intensely volatile global economy, the growing speed, complexity and riskiness of innovation in all sectors—even those that can theoretically be pushed entirely on-line—seem to demand a parallel concentration in those cities with the assets and 'innovative milieu' to sustain on-going competitiveness. And finally Demand for ICTs—mobile and land line phones, satellite TVs, computer networks, electronic commerce, Internet services—is overwhelmingly driven by the growth of metropolitan markets, in other words the aggregation of the populace in a location drives investment in this sector in the bid to achieve higher competitiveness.

Smart transportation which ensures easy mobility around cities are critical for the adoption and success of the virtual work paradigm in organizations. Yigitcanlar, Fabian, & Coiacetto, (2008) Defines smart and sustainable transport to be that which satisfies current transport needs without jeopardizing the ability of future generations to meet these needs. With the integrating of virtual work in the planning of urban centres it would be possible to improve the possibilities of skilled individuals who live away from high concentrations of people, as they seek to escape the buzz of traffic noise, air pollution, and the unpleasantness of parking to continue to contribute economically and meaningfully even though they may not live in the urban centers while retaining the ability to come into this urban areas when there is a need to physically meet colleagues, clients or participate in meetings, the flexibility of transportation and the friendly nature of city design would serve as a motivation all the same to this high skilled individuals.

The knowledge of systems and network theories in context of the cities indicate that the smart city has been viewed as a large organic system. Dirks & Keeling (2009) stress the organic integration of systems. The interrelationship between a smart city's core systems is taken into account to make *the system of systems* smarter. No system operates in isolation. A smarter city infuses information into its physical infrastructure to improve conveniences, facilitate mobility, add efficiencies, conserve energy, improve the quality of air and water, identify problems and fix them quickly, recover rapidly from disasters, collect data to make better decisions, deploy resources effectively, and share data to enable collaboration across entities and domains. However, infusing intelligence into each subsystem of a city, one by one-- transportation, energy, education, health care, buildings, physical infrastructure, food, water, public safety, etc.--is not enough to become a smarter city. A smarter city should be treated as an *organic whole*--as a *network*, as a *linked system* (Moss Kanter, & Litow, 2009; Nam, & Pardo, 2011)

3. Virtual workplaces and planning smart cities

The importance of the need to plan urban centres of cities to be smarter and provide support and incentives for high skilled individuals has been established and the need for policy makers, city planners and managers to consider the way work is changing and how organizations are increasingly adopting the use of virtual workplaces by employees. As we also understand the that technology in smart city initiatives stresses integration of systems, infrastructures and services mediated through enabling technologies. As Nam, & Pardo, (2011) stress that technological innovation is a means to smart city, not an ends. IT is just a facilitator for creating a new type of innovative environment, which requires the comprehensive and balanced development of creative skills, innovation-oriented institutions, broadband networks, and virtual collaborative spaces. The onus therefor lie on policy makers and organizations to harness the potentials that exist by optimizing the smart human capital component of the smart city through work flexibility and optimization.

The proposed framework in Fig. 2. bellow locates the pivotal place of virtual work for organizations, government and the workforce in a system which if

promoted would bring about higher productivity in terms of value and output of their highly skilled employees, competitiveness also is positively affected as they would have the skilled workforce which can be harnessed using available technologies and frameworks irrespective of their locations. Furthermore attractiveness for organizations is enhanced when work is flexible and the emphasis is on employee wellbeing and productivity and not on work hours.

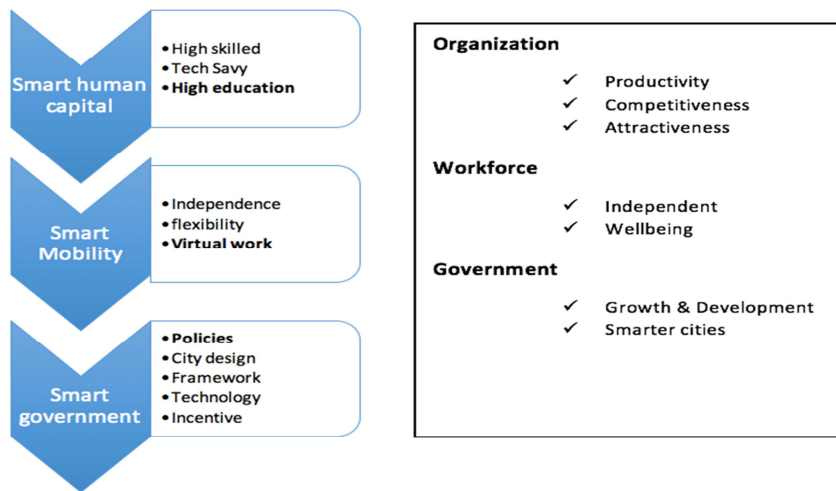


Figure 2. Proposed framework for virtual work in planning smartcities

Conclusion

The adoption of virtual workplaces in organization strategy is increasingly becoming important to ensure organizations maintain competitiveness and assure the wellbeing of employees in the long run. This paper has looked at the concept of smart urban areas and smart cities, established its important components and discussed virtual workplaces while also putting forward a framework for government policy development to encourage smart city development. This benefits organizations as they can attract high skilled human research and increase productivity while improving competitiveness.

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