From 'Digital' to 'Smart': Upgrading the City

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ABSTRACT

In this paper we seek to reflect on the way in which 'digital cities' later re-emerge as 'smart cities' (both in terms of the approaches and also the actual cities) and what lessons can be learned about the role of ICTs in how they shape urban space. We will focus on looking at how the lack of understanding of the city as a 'place' is often a common factor in the lack of longevity in 'digital city' initiatives and discuss the corresponding implications for the emergence of 'smart cities'. We draw on a study of the city of Bristol, UK in order to look at the variety of initiatives that took Bristol from a 1990's digital city to the current 'smart' projects. We conclude by reflecting on what can be learnt from the lessons of the failed Digital City projects of 1990's and discuss the role that placemaking could play in the development of socially and spatially sustainable smart cities.

CCS Concepts

Human-centered computing~Empirical studies in ubiquitous and mobile computing

Keywords

Digital, smart, city, infrastructure, ICTs, placemaking, urbanism

1. INTRODUCTION

The nineties saw the emergence of a range of 'digital city' initiatives, which sought to enhance the city through implementation of early web based platforms for civic information and communication systems [4]. Theses digital cities took the form of Web or Virtual Cities and early projects included America-On-Line cities [20] the digital city of Kyoto, Japan [12] and the digital city of Amsterdam [17]. These projects, despite sharing the same – or similar – label of digital or virtual city, varied greatly in breadth, sophistication and above all in the extent to which they were connected and grounded in the local reality of their host cities [2]. In the last ten years the digital city has evolved, mainly as a result of emerging technological devices and infrastructures in the city. A number of authors have sought to characterize and understand this changing nature of ICTs in the city and more recently authors have sought to address the emergence of the 'smart city' concept and smart urbanism as well IoT's in urban space [11] [10] [16].

Yet there is currently little literature that reflects on the digital city heritage in the context of more recent smart city developments. Amsterdam case was the first to use the word 'digital city' in their De Digitale Stad (The Digital City) [6], an early experiment with civic networking and virtual community-making. According the Bessellar and Deckers 'De Digitale Stad' can be seen in four stages of development from 1993 to 2000, but ultimately concluding with its 'death' in 2001; 'firstly a successful experiment (mid 1993 – early 1994); then a the period of the institutionalization, and growth (late 1994 – 1996); from stabilization, to increasing competition, and decline (1997 – 1999); privatization, the struggle around ownership, emerging alternatives, and the end (2000 – 2001)' [6]. In their study they reflect how 'De Digital Stad' (DDS) was initially seen as a success but in the end it 'failed to become a sustainable local information and communication infrastructure' [6]. Lovink also highlights how 'the once so valuable website had turned into an empty lot. Despite an overall growth of Internet use, the Digital City had lost its attractiveness for users' [15]. The general consensus is that DDS was less about Amsterdam as a city, and more about DDS as a testbed for a new digital platform. The disappearance or failure of the DDS seem to be based around the fact that once the underlying technology developed the 'users' lost interest. This suggests that the 'glue' of the city as the place for the digital was not sufficient to keep people experimenting with Amsterdam as the relevant context of the technology.

According to Hollands 'in today's modern urban context, we appear to be constantly bombarded with a wide range of new city discourses like smart, intelligent, innovative, wired, digital, creative, and cultural, which often link together technological informational transformations with economic, political and socio-cultural change' [11]. What this reveals is not just the extent to which the smart city discourse has become fairly pervasive in discussions around the city in the last five years, but also the 'newness' of these discourses and the corresponding failure to put these in context of what has gone before. In the next sections we review a series of initiatives in the city of Bristol in UK, firstly those characterised as 'Digital City' in the 1990s and more recently 'smart city' initiatives, in order to understand not only the links between the two strategies but also the contextual role of the city.

2. BRISTOL: FROM DIGITAL TO SMART

2.1 The 'Digital City': Digital Bristol

Bristol is the eighth biggest city in the UK, and has a long and rich background of engagement with ICTs and media technologies. In 1990's Bristol initiated a 'Digital City' R&D project 'whose main purpose was to study ways of creating highly interactive, grounded Internet sites' [2]. This was part of an approach that aimed for the city to be recognized internationally as a leading edge, high tech city riding on the first wave of internet technology [1]. 'Digital City Bristol' was a public, web-based information and communication system for the city developed out of a partnership between the city council, a city university and Hewlett Packard Laboratories (which had research labs in the city).

Digital City Bristol aimed to provide "a virtual meeting place and an electronic communication network for the City of Bristol" (Digital City Bristol, 2001). It was directly inspired by the Amsterdam 'De Digital Stad' and aimed to create an online communication platform where "The main theme is people to people communication (…) The DCBI [Digital City Bristol Initiative] will be the main site for Bristol. It will be the place where people can get information on the city, and a place where they can communicate with other people in the city" [19]. The site for Digital City Bristol focused on providing a 'civic layer'

through a series of electronic 'spaces' for local debate and to connect different sections of the community (see Figure 1.). The site used a visual interface metaphor of a 'harbour' with ships containing sub sites (mirroring the actual characteristics of Bristol as a harbour city) [9].

Figure 1. Early interface of the Digital City Bristol Initiative

Above all it was supposed to support the creation and deployment of innovative services for the management of the city and the economic development of local small enterprises as well as boosting the cultural and creative industries sector. Yet the city imagined in the Digital City Bristol project was not one that directly included much of the actual physical city. For instance, local urban planners ended having no involvement in the project, which at the time was not considered problematic. According to City council planner in 1997 'Planners can identify the themes, but cannot see them happening yet. With a lack of hard evidence of what the implications really are, they have difficulties putting this into planning policies' [1]. The digital city was not seen as something spatial in urban terms, and as long as its materialisation in the 'real' world could not be clearly defined, then there was no role for urban planners. The opportunity to proactively embed the civic ICT initiative within a strategic perspective for the city's development was overlooked. The 'digital city' was therefore shaped and managed mainly by IT officers and computer scientists, and lost much of the potential for enhancing planning strategies and contributing to the creation of social capital it could have easily embedded. It turned rather quickly into yet another portal aimed at broadcasting information. Instead it became a news and information portal, with very little potential for input or interaction from citizens. An attempt was made to address this through the rollout of 'access points' (38 multimedia kiosks and computers) that were installed in the city in 1999 in order to encourage public participation. In the final stages of the project, Digital City Bristol even lost the word 'city from its name. 'City' was dropped to leave it as 'Digital Bristol', something very different from the DDS-like environment initially envisaged by the project founders [3]. The core aims of the project in terms of a 'digital city' were no longer present or accessible.

2.2 The 'Smart' City: Bristol is Open and Playable City

2.2.1 Bristol is Open
Bristol is Open project is a £73 million investment programme, launched in 2014, to deliver a high performance network infrastructure to the city centre; linking business, academia and (to some extent) the general public. Bristol is Open is a joint venture between the University of Bristol and Bristol City Council that allows for the collaboration of diverse sectors of society, such as universities, media and communication industry, local communities and local and national government, towards the creation of what is being defined as an 'open programmable city region' [8].

Figure 2 Bristol is Open Operating system (Bristol is Open)

The underlying approach of the project is for Bristol to offer a 'flexible fluid playground' where companies and institutions worldwide can pilot smart solutions in a real-world urban environment, by re-programming it as wished before intended solutions are implemented in their original locations (see Figure 2). The approach of 'Bristol is Open' is to offer the model of the 'city-as-a-service', through the establishment of a CityOS and tailored packages of infrastructural access exclusively for research and development projects. It also creates an open data platform, with the promise that all data gathered from the sensors installed in the city will be made available through the website.

2.2.2 Playable City
In parallel to the hard infrastructural networks of Bristol is Open, Bristol launched an annual international digital arts event called Playable City in 2013. This specifically aims to provide a counter approach to technologically deterministic smart city projects through a focus on interaction and bottom-up, informal play in the city. The event is led by Watershed, a pioneering film culture and digital media centre, but also involves the University of West of England (UWE), the University of Bristol and Bristol City Council. The initiative is described as 'a framework to think differently about the city, generating a social dialogue by creating shared experiences through play' [18]. According to Watershed's website: 'A Playable City is a city where people, hospitality and openness are key, enabling its residents and visitors to reconfigure and rewrite its services, places and stories'. Playable City claims to adopt an 'anti-smart' agenda in the way it questions and challenges the focus of governments and tech companies towards the collection of data for achieving efficiency, and calls for the use of digital technologies to generate more livable, open and human cities through artistic interventions in the built space. In a recent study [14] a number of positive aspects of the initiative were identified; mainly related to the level of public participation and the enhancement of the participants' relationship with the places that staged the various installations.

3. UPGRADING THE DIGITAL CITY

Twenty years on from Digital City Bristol, the Bristol is Open and Playable City projects in many ways re-appropriate and 'upgrade' earlier approaches to the digital in order to respond to the smart city agenda. These strategies aim to develop a media-based economic model that reconfigures and re-launches that early tradition through existing assets and technological capabilities. The approach is based on offering the city as a tech-ready platform, with a programmable set of components or toolkit, whether these be the high speed network of Bristol is Open or the performative digital arts model of Playable City. The general message is: the city is here for you to experiment with; it sees the city as an experimental digital testbed. Bristol's long-standing trajectory of development in the creative industries and related entrepreneurial activities is reconfigured through the smart agenda. The Digital Bristol relied on creative small enterprise, much which was related to the successful music scene, animation and broadcasting industry, supported by a relatively loose joint venture between the University of West of England, HP Labs and the City Council [9]. Smart Bristol positions itself as an ideal environment for universities, tech companies, arts and media professionals to experiment on, but does not seem facilitate mutual or shared experimentation. Rather, tech companies are invited to 'book' the infrastructure and experiment on it. More literally, Bristol is Open is a project that actually reuses a failed media infrastructure; a defunct citywide cable network that serviced a now bankrupt cable TV operator. The Bristol is Open project re-appropriates this network and upgrades its capability to align it with a series of 'smart' objectives and aspirations; digital upgraded and repackaged as 'smart'.

3.1 Citizens vs. audience

The existence of a 'playable' aspect of the Bristol smart scene could be seen to filling the de-contextualisation gap by adding localized interactive initiatives, produced in Bristol for local people. However, it could be argued the juxtaposition of such playground (the 'Playable City') and the infrastructural, semi-commercial 'open city' fails to become more than the sum of its parts. In Playable City a range of artistic projects are showcased to local participants as well as a global specialized audience. In this sense, smart becomes a mobile international arts event/installation, where citizens are given "permission to play" in specific (and often pre-determined) ways, within a game that normally has a very limited duration, and unclear impacts at the everyday scale of the city.

3.2 Global vs. local

The two 'playgrounds' provided: 'Open' and 'Playable', cater for different needs of different actors. However, the focus ends up being given to the overall aim of positioning Bristol on a global scene. It can be argued that this comes at the expense of any sense of local needs or problems as drivers. Some actors are given more importance over others in the unfolding of the open

programmable city which, as it comes out to be, seems to be open only in certain, commercial or semi-commercial directions. Citizens are considered end-users of services, or an audience to attract, and do not have agency in the shaping of initiatives, and as such they can end up disengaged from the political and social spheres of technological development. Some of the services envisaged will not even directly impact on citizens in their everyday, as it is mainly outward-oriented, aiming at renting tech real estate and establishing Bristol's position as a global player.

3.3 Smart vs. Place

An example that is being used to demonstrate the value of 'smart' to the city of Bristol is the focus on smart parking solutions and a driverless car project testbed being developed by Bristol City Council in conjunction with industry partners BAE. Whilst the progressive Mayor of Bristol, George Ferguson, has a widespread programme to limit the use of cars and vetoed the construction of a new car park [5], smart is presented as a solution that addresses city parking problems. The smart solution is enable drivers to park more 'efficiently' in the existing streets through a real time parking space interface, basically contradicting the very principle of a car-free environment. This shows the disconnection of the discourses around the city as a place that aspires to be 'car free' and a smart 'solutionism' which instead aims to solve parking problems through efficiency. Whilst spatial planning and urban design visions for Bristol suggest adopting strategies for the reduction of cars in the city, and moving towards alternative mobility, the digital strategy seems to reinforce or remediate [7] the role of cars in town, offering opportunities to make these more efficiently managed, rather than discouraging their use. These seemingly divergent attitudes in how the presence and dominance of the car in the city is dealt with demonstrate that the smart city is seen as an abstract 'space' with solve-able problems, at odds with the 'place' off the city. Despite its increasingly physical infrastructure and its claims of being grounded, it was still fundamentally interpreted as a high-tech add-on set of pre-determined solutions that override place-based visions and strategies. In this sense, smart can be seen as potentially divergent from the notion of place, as it moves into dealing with place imposing a set of pre-determined values and visions.

3.4 THE DECONTEXTUALISED SMART CITY

It could be argued that the issue here is the crossing of the threshold where 'context', with its richness of layers and meanings, simplifies into a 'platform'. The positioning of Bristol as a neutral testbed for other cities, organisations and companies to pilot their technological solutions de-contextualises not only the problems analysed, but the Bristol smart city projects themselves On the one hand, the focus on infrastructure in Bristol is Open renders the algorithms impenetrable to debate, challenge and forms of participatory shaping due to new forms of black-boxing. The artistic interventions of Playable City, on the other hand, allow for some degree of interaction with the black box through play, but not necessarily its de-codification. In both cases, technology becomes central rather than people and place. Bristol is Open is conceived as a powerful vehicle for reinforcing Bristol's image and competitively positioning the city as a leading, life-size smart lab and experimentation ground. The city lab is made available to a variety of external actors first of all, to the point of presenting mechanisms of market segmentation of its globally-available urban smart facility offer. Naturally a series of good reasons can be identified for such an approach, particularly from the point of view of the self-sustainment of the initiative and

related systems. But it is also clear how this makes this important aspect of the smart city mainly functional to allow the city a global outreach and the attraction of external (global) partners and capital. This can certainly benefit the city as a whole, so it should not be discounted, yet the local dimension of designing and implementing a system to focus on truly local and place-grounded issues ends up looking like a secondary feature rather than a priority.

Bristol offers elements to reflect on three aspects of how the smart city engages in those contextual relationships. These are the mainly outward-looking perspective of 'Bristol is Open', or the balance between global and local focus; the relatively specialised field of people engagement of the 'Playable City', which has consequences on inclusivity and social impacts and mission; and the overall connection – or potential lack of – with spatial policies and physical space, urban design. The two sides of the smart city discussed so far, could be in fact strongly complementary: a series of more localised projects supported by a self-sustaining, high quality infrastructure, connecting the augmented place with the wider world and attracting interesting partners. This could be a powerful combination in the presence of a coherent strategy where smart and place work together converging towards and realising the same values and aims, and where the city as a physical, inhabitable entity – and still one of the very reasons why so many people might want to move to and live in Bristol – is allowed to improve and thrive. There seems to be however little evidence of such strategic convergence, with instances where what has been defined as desirable in terms of spatial planning are not reinforced at all by the smart layer.

3.5 Questions

In summary we open up some questions arising from the study of the digital and smart city initiatives in the city of Bristol over the last two decades. It seems clear that tensions remain unresolved in terms of what place designers or place makers would describe as the importance of working with–and-for context. The question that our study of digital and smart initiatives in Bristol presents is whether the smart city is actually interested or even capable to becoming grounded in the reality of the everyday city? Making a parallel with architectural theory and history, it appears that the smart city is being conceived following paradigms of relative indifference to place, which have parallels with the modernist ideal of the 'city as a machine'. The 'city as a machine' vision evokes what Jencks defines within the field of architecture as 'the overpowering faith in industrial progressivism and its translation into the pure, white International Style (or at least the Machine Aesthetic) with the goal of transforming society both in its sensibility and social make-up' [13]. The challenge is for 'smart' to find ways to specialise and target its conception and design towards local issues, memory and sensibilities. This opens up some important questions such as: How and to what extent does it include local people? How does it engage with the existing scene, that is, the history, wisdom and complexity embedded in its physical spaces? And, ultimately, how does it connect with local spatial strategies and the aims and values informing them, thus augmenting those strategies rather than driving parallel city initiatives?

4. ACKNOWLEDGMENTS

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