THE IMPLICATION OF ADVANCES IN COMMUNITY MAPPING THROUGH SPATIAL INFORMATION TECHNOLOGIES FOR URBAN REGENERATION PROJECTS

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This research explores the application of community mapping as a tool for supporting urban regeneration projects and the potential for its growing importance due to advances in spatial information technologies (SIT's). Despite advances in SIT's it is unclear how community mapping is evolving to aid both planners and construction professionals in enhancing community engagement and representation. The research explores the perceptions of planning officers engaged in urban regeneration projects to establish current practice and explore the potential and shortcomings for using community mapping and new information technologies. Eight semi-structured interviews were conducted with senior planning officers working with urban regeneration projects and these were supplemented by a questionnaire survey eliciting responses from a further eleven officers across Scotland. The results are explored in three parts exploring perceptions of: 1) the current practice during development planning and at the project level; 2) the utilisation and limitations of existing spatial datasets and 3) seven presented elements to survey through community mapping to better aid the representation of communities and explores their potential usability and relevance. The research concludes by proposing the need for a relational database to support the application of these seven elements in a format which can be integrated with existing datasets within SIT's.

Keywords: community mapping, urban regeneration, spatial information

INTRODUCTION

People-focused urban regeneration is often referred to as 'placemaking'. Placemaking gained centrality in the UK within the National Planning Policy with the publication of Designing Places and Designing Streets in 2010, and in Scotland it is defined as the "creative and collaborative processes that includes design, development, renewal or regeneration of urban or rural built environments" (Scottish Government, 2014) and it has, since become a guiding principle in the design of regional as well as local development plans with a view to guiding developers to shape construction projects. Placemaking recalls bottom-up planning techniques developed as part of collaborative and communicative planning theories (Innes and Boocher, 2015). Whether it is through conflict or collaboration, consultation involves understanding the needs and

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aspirations of people. As cities were historically constructed to respond to basic human needs, the gathering and understanding of what exactly such needs and aspirations are is critical, especially for the success of urban regeneration projects as they seek to deliver long lasting solutions for a sustainable community. A key criticism is that often these aspirations are not fully realised as consultation remains an act of compliance as opposed to being embedded in practice. One of the limitations to this has been the challenges of capturing the subjective lifeworld's of communities and reflecting this in a format that is valued within the decision process both at the planning and project levels. This research explores the role of community mapping and specifically the evolution of Spatial Information Technologies (SIT's) to aid representation in a visually recognisable and interactive format which can be viewed in tandem with abstract data sources.

The slum clearances of the 1950's illustrate key examples of urban regeneration projects which were strategically planned with local authorities and agencies partnering with developers to deliver mass housing. Widely acknowledged to have neglected the needs of the community they reflect two common failures: 1) for planners to adopt the 'heroic planner' approach by imposing their vision on a community and 2) for projects to be delivered by developers who see community consultation as burdensome, costly and time-consuming (Close and Loosemore, 2014). Indeed, criticism has been levelled at more recent regeneration projects associated with the Glasgow Commonwealth Games 2014 where the needs of the existing communities have been argued to have been overlooked in favour of the bigger picture and the needs of the "future community" (Gray and Porter, 2014). Placemaking has the potential to slowly change this, but it is apparent the theory and policy is moving faster than the practice. Indeed, in Scotland a planning approach focused on "social transformation" founded on consultation has become a statutory requirement for major and national developments. Despite this, planners still lack awareness of effective approaches to capture and reflect the subjective lives of the community due to the entrenched bias for positivistic indicators in decision making which hold even more importance in urban regeneration as they are linked to investment and funding allocation.

At the project level community consultation is largely tokenistic with Close and Loosemore (2014) revealing the construction professionals still view the community as a liability rather than an asset and that consultation remains the responsibility of the planners to establish prior to the project stage. A review of how community consultation is reflected in construction management research shows that it is placed within the wider stakeholder management, value management and corporate sustainability, with a dominant focus on 'managing' engagement with communities rather than actively developing projects which respond to the lives of the residents (Boutilier and Zdziarski, 2017). The emergence of social value is increasing the need to value community as an asset within the project (Troje and Gluch, 2020), but there remains a lack of effective techniques to represent the lifeworld's of the community within the dominant positivistic decision-making lens. Improving community consultation remains in its infancy at the project level but it is clear that it can't be viewed as the preserve of the planner and needs to be a project consideration (Boutilier and Zdziarski, 2017).

Community mapping is a technique which has been applied progressively over the last decade to capture the values, preferences, needs and spatial occupation of members of the community within their neighbourhood. This has remained a Cinderella activity

often ignored by decision makers both within development planning and in projects. The evolution of SIT's presents the potential to support the capture, storage and representation of communities through mapping and to integrate it within familiar digital environments such as Geographical Information Systems (GIS). The decisions which shape urban regeneration projects are traditionally supported by abstract data through a series of comparable benchmark indicators such Census or Index of Multiple Deprivation (IMD) spatially presented through maps but aligned with a top down approach to urban decision making. SIT's such as GIS are commonly applied to inform development decisions, investment and funding applications or strategic visioning (Holdstock, 2016) and is increasingly applied by clients and developers to support individual construction projects. Lefebvre (1994) argue that this abstract representation of communities supports funding decisions by allowing for comparison of deprivation levels. Without community consultation, this fails to reflect the needs and lifeworld's of the community.

The evolution of SIT's has provided the potential to enhance community consultation allowing subjective techniques such as community mapping to be digitally captured and stored within GIS. Sandercock (1998) argues that community mapping "engages and empowers citizens in making their voices heard thus creating radical ways of doing, knowing and acting" during consultation processes, and being able to enhance this process through the digital environment has greater potential for it to be considered in tandem with spatial representations of abstract data. This can help decision makers establish a better understanding of the lifeworld's of the communities (Masser *et al.,* 1996). Despite the rapid increase of community mapping, there is a lag in bringing more subjective forms of data and information into the decision-making process both at planning and project levels. This restricted the potential offered to represent an understanding of community assets, as well as problems, and support environmental or health decisions which may affect the community (Reeve *et al.,* 1999). However, despite calls by Innes and Simpson (1993) over the potential for GIS to capture and represent new types of information it has taken two decades for this potential to fully emerge with the recent advance of SIT's.

Recent years have seen the emergence of facilitators and mediators involved in the consultation processes employing a range of community participation tools and techniques which are evolving with the introduction of new SIT's and computational capacity. From simple Q&A sessions to brainstorming, sketching and paper mapping, to more sophisticated tools like Public Participation GIS (PPGIS), 3D modelling and digital or non-digital gaming techniques, the range of tools used during consultation processes vary by type and kind, and more research is required to identify the strengths and limitations of such tools and techniques (Kheir, 1999; Brown and Kytta, 2014). However, a lack of formal procedures leaves this process as arbitral and dependent on local circumstances, and the availability of knowledge and skills. Particular focus is put on SIT such as digital maps which can aid the consultation processes as well as conceptualising the routines and activity patterns within a social group shifting away from traditional socio-demographics variables like 'income', 'ethnicity', 'age' etc. These traditionally focus in the UK around the IMD, and whilst widely used to profile and represent communities they are criticised for their inability to represent values, behaviour and activity patterns, reflecting their lifeworld's. The potential exists to utilise these innovations in SIT's in the planning process to allow communities to be better represented, but also for developers to integrate this within the individual project stages. This would allow decision makers to support a more

holistic representation of positivist 'abstract' data as well as the subjective 'lived' data associated with the life-worlds' of communities presenting an exciting frontier for improving urban regeneration projects.

The evolution of SIT's in recent years is providing strong potential for developing community mapping and enabling the capture and representation of preferences, values, needs and occupancy patterns spatially through consultation. Evidence suggests that the technology is moving faster than practitioners are able to adapt so a need exists to establish an understanding of the status and requirements for realising its potential. The research focused on the perceptions of senior planning officers as they have the most experience of the role played by SIT's such as GIS in decision making through the development planning process but also can provide perspective on the nature of application by developers at the project level. Through their lens an understanding is established of current practice, awareness levels of current datasets and to establish a set of elements to survey through community consolation which can be mapped spatially aiding a more holistic representation within decision making.

METHODOLOGY

This research explores the perceptions of eight senior planning officers engaged in urban regeneration within six local authorities in West of Scotland. The interviewees were selected based on purposive sampling of planners: 1) who were within the boundaries of the Greater Glasgow Region, 2) who were available and 3) who had a senior role and experience of working across different teams dealing with varying aspects of development planning, working with construction teams, consultation and SIT's. This paper focuses on the experience of the planning officer as they have a strong overview of practice within both development planning but also an overview of how developers are engaging with community mapping at the project level. The findings provide the platform for further research to explore with a broader group including tool developers, GIS analysists, developers, community representatives etc.

The interviews were designed through a new materialist lens with attention paid to the interaction between practitioners and the things (datasets, technology) by which they represent the communities (Beaurigard, 2016). Through the planner's lens the extent to which subjective community data is considered during decision making, and potential of SIT's to support this and their views on community mapping in this context. The interview is split into 1) their experience of consultation within development planning and their perspective of its role at the project level. The later parts of the interview focus on 2) establishing their awareness of the current datasets available to support community representation, and 3) to gain their views on elements which can be surveyed to enhance community mapping. This reflects the structure of the discussion of results in the paper. The interviews were analysed following thematic analysis enabling themes to emerge through NVivo Software. The interviews provided the basis for a questionnaire survey of senior planners across Scotland sent to all of the 32 local authorities and 11 responses being received which were different to those interviewed and when added to the sample of senior planners interviewed a total of 19 participated across 17 local authorities. The survey was designed to sense check the emerging findings with a view to seeking to reflect coverage across Scotland.

RESULTS

Part 1: Current Community Representation Within Planning and Projects
Part 1 investigates perceptions of senior planners of the consultation processes with a specific focus on how community representation is currently obtained for urban regeneration projects. The interviews revealed this is largely the result of a web of relations between: 1) statutes and official procedures, 2) financial resources and viability, 3) funding applications, 4) consultation work, 5) spatial information, 6) expert knowledge and beliefs, 7) some digital and non-digital techniques and approaches, 8) organisational performance, 9) collaboration with other services, 10) government policy (e.g. Business Improvement Districts), 11) ad hoc maps and 12) the private physical experiences of planners as individuals within a community. One keyway which local authorities obtain information from communities is through the Household Survey questionnaire on a yearly basis. Nevertheless, no requirement or procedure exists on carrying out community mapping as part of consultation at either planning level or for projects.

Two initial themes emerged: 1) the presence of procedures in gathering people's view and opinion as part of a statutory processes and 2) the importance of the intuitive and expert knowledge in understanding communities. The first theme reflects the importance of the Acts and policies to enforce mapping as without this it remains a luxury in both planning and definitely in projects. The second is the relationship between the lived experiences of planners as individuals within the communities and their ability to understand it. "Planners already know" was felt to have importance in how strongly mapping was viewed in planning and the perception was felt to be even more acute by clients and developers when considering their projects. A further theme (3) emerged which related to a perception that there was already "too much data" and, although data is hyped and a buzz word, often most decisions in planning and within projects are made without using subjective data. It was also reported that there is also a common lack of awareness of datasets and how to access them especially related to smart city initiatives and smart governance.

Finally, a fourth theme emerged relating to the importance of the individual involved whether it be a planner or a construction professional as their world view and previous experience and relationship with the community significantly formed their opinions on what elements are important to be gathered to represent a community and which ones can be ignored making consultation processes everything but a science. Evidence also exits to suggest that surveys and consultation were found to be often carried out by external companies and this is seen to potentially have an effect on knowledge flows with decision makers not proactively being involved in the process of knowledge generation throughout the consultation process. Some questions remain about the quality of some of these consultant reports and as a result they often get discredited by decision makers. Despite increased priority placed on the community at the project level through the growth of social value, the planners overwhelmingly still felt that developers viewed their consultation with communities as being about managing a project risk and preserving reputation. Respondents felt that construction professionals would still view the use of community mapping as a planner's tool, even although its application is equally beneficial in projects.

Part 2 Application of SIT's in Representing Communities
Respondents were asked to list different SIT's which are currently used, and these included: Database Systems, Mapping Systems, Spatial Analysis System and Spatial

Modelling System. ArcGIS appears to be the dominant information system. It emerged that during decision making 70% or more of respondents, never or rarely accessed spatial information from PPGIS and platforms like Scotland's Opendata and Spatial Hub Scotland whereas often, or always, relied on Personal Knowledge, Colleagues, Online Searches, Excel Spreadsheets and Ordnance Survey mapping. The relationship was explored between development management, mapping, spatial analysis and modelling revealing the high versatility of GIS. 90% of respondents agreed or strongly agreed with the following statement: "Using Online Google Maps and other web-based mapping, make it easier to do my job" with 80% of respondents thinking online Google maps was 'easy to use'. The only other tool receiving a similar assessment was ArcGIS or other Desktop GIS with 70% of respondents finding GIS both easy to use and useful and all respondents believed there are benefits associated to them. An important factor determining technological diffusion in decision making is the level of commitment and implementation strategy adopted by management whether in a local authority or within a project.

Issues related to availability, accessibility and usefulness of information during decision making was explored which is core to the design and development of information systems. An extensive list of 103 datasets covering different themes (social, natural and built environment) was extracted from Future City Glasgow website published under Opendata license by Glasgow City Council. Respondents were asked to consider these and discuss the extent to which they were utilized during decision making to establish a better understanding of communities. The most popular data sets identified related to land use, but many respondents recognized that they should utilize the array of datasets stemming from community planning. This demonstrated that data sets are being established due to changing policies and priorities and that planners are becoming aware of their existence but that they haven't become part of their standard data practices and that project teams are still far behind in awareness.

Representations, Scales and Business Case

One planner explained "that for large urban regeneration projects it is increasingly important to use indicators and data to support the business case as significant public and private funding will be required and it is important that this reflects a range of social, economic and environmental criteria (e.g. City deals)". Another reiterated "data provides the evidence base explaining why we should get the investment, explaining what our needs are, helping to justify wider requirements for the project such as public transport and other infrastructure connections". Urban regeneration projects require data to help justify the wider benefits to as many people as possible and the rise of social value at the project level this will become an increasing consideration. The challenge is that traditionally this has been very much tied with abstract data sources such as IMD or Census, but there is an awareness that digital tools are enabling community mapping to create subjective data which reflects the lifeworld's and preferences of the community aiding a more holistic view.

Part 3 Bridging the Data Gap Through Community Mapping

Part 3 focuses on the specific tool of community mapping and the relevance -or irrelevance- of seven different elements proposed from the research for a subjective map in the context of consultation. These were established from the literature and were identified as gaps necessary to bridge the data gap which currently exists due to the reliance on abstract data sources. These were then presented to the planners to inform a tentative design of a subjective mapping procedure relevant to practitioners

at planning and project levels. Below, a summary of seven different elements could be used to create subjective maps and on which planners' opinions were sought:

1) The first element corresponds to the mapping of individuals' perceived neighbourhoods called gravitation as people would gravitate around the mental model of their neighbourhood;
2) The second, defined as entropy, would instead understand the element of instability the investigation of residential histories (does it preserve the stability, integrity, and beauty of the biotic community?);
3) The third is orientation and represents the willingness to move to a particular area or place, inversely related to place attachment;
4) The fourth is instead made of the photographs which represent the subjects own spatial awareness of his/her neighbourhood;
5) The fifth called dynamics is made of the perceived changes (both positive and negative) in space as individuals perceive them;
6) The sixth represents hierarchies, is used to investigate the location of primary and secondary ties and related to the idea of social capital;
7) The last element, everyday eight, is the spatial representation or individual's 'everyday eight'. More specifically: food shops, news agents, banks, post office, primary schools, supermarkets and secondary school.

All the respondents found element 1 perceived neighbourhood as the most interesting element, although one argued that "there is a lot of literature on this (perceived neighbourhood)" and argued that community mapping would make a big contribution because postcodes geography (reflected through the likes of IMD) doesn't match where or how people live". A planner who had a high level of GIS experience discussed the link to subjective perceptions of neighbourhoods and funding bids and drew on an example where "community mapping can play a significant role to better define in town the retail and business districts" indicating that this could have implications for funding and future land use patterns. Community mapping provides the opportunity for the users and residents of these areas to express where they see the boundaries and without it, decisions are made based on arbitrary lines on a map.

The second element exposed contrasting views around the need to represent the willingness to move and its ability to capture residential stability. For a couple of respondents, they argued that residential Housing and Needs Demands Assessments already look at this aspect by reporting on the number of houses sold every year but this merely identifies the history of the market. In terms of inward or outward migration, one planner argued that planners just worry whether residents are moving in or out the local authority and they are not too worried about the destinations and origins of the people. This is having a significant baring on the community but is not captured in the current approaches.

Representing the positive and negative changes which have happened, and which are being planned (element 3) provided again a contrast in views between the planners. One planner provided an example of a survey used to inform the open space strategy which sought to understand how people use parks and their perceptions on the health benefits of parks and open space with additional benefit emerging related to the ability to grade the quality of the park. One criticism which emerged was that this could encourage objections as a symptom of NIMBYism making it less likely developers

will seek to engage. A couple of planners felt that capturing community perceptions and knowledge through mapping provided the opportunity for expert knowledge to be used to help reflect this better in future plans rather than simply dictate to the community. However, scepticism was expressed as they argued that planners with local knowledge already had a strong feel for what was good and bad in an area. This shows that some planners are still dismissive of consulting with communities, and when explored in interviews the perception remains that if planner are sceptical then the likelihood is that those engaged at the project level would be even more so.

The established view of a strong community is that it has high social capital with residents having close ties to a number of others (element 5). For example, one of the planners argued that even in their own town 85% of people they grew up with still lived in the same town. Once again, a planner was bringing their anecdotal experience often not based on evidence and again illustrates that if we don't find ways to capture the experiences of the community through techniques like subjective mapping the potential exists for the planner to provide their own often unintentional bias. Diversely, another planner agreed that social ties are the most important including the ability to identify the 'everyday eight' (element 7) relating to what planners simply don't know around the everyday activities of the residents because the maps give an idea of how the community operates. The everyday eight would reveal different patterns between different age profiles listing in detail the routes and activities of groups while also being quite reflexive and allowing for stereotypes to be challenged and real patterns observed. An example used by one planner was the use of community mapping by her kids to capture how they experienced green space as it made her think in a different way. The interviews concluded that there was potentially even more value at the project level for this element as clients and construction professionals may be less familiar with the local area and knowledge.

Only one of the respondents was exposed to Public Participation GIS (PPGIS) and explained that: "although it was very impressive, it was not possible to do it again because there are no resources to follow up". Similar comments of financial constraints were received. Mapping seven different elements was found to be important to many in terms of customer segmentation and customer services. However, it is generally perceived that to resource this there needs to be a business case demonstrating what can be achieved by doing these surveys. Therefore, this would need to be driven by clients or as a requirement of both planning and funding.

Need for a Relational Database to Store Spatial Information from Community Maps

The interviews also confirmed with increasing participatory processes are designed to collect subjective spatial information using a wide range of methods (questionnaire, surveys, public hearing etc) concern exists that this data was not being stored preventing its access in the future. This has an implication in the overall resilience framework, and is a practice reflected at the project level with respondents outlining concern about the staffing and resourcing being one of the causes to the loss of spatial information collected. However, no procedure exists for scanning and digitizing the community maps and that the potential exists to develop this to transfer spatial information captured during community mapping and integrate it with the existing GIS enterprise of local authorities in such a way that could be shared across multiple organisations to ensure that the spatial information gathered during consultation

processes is not lost. At the project level, it was anticipated by the planners that this problem would be even more challenging.

CONCLUSIONS

This research acknowledges that it is limited in its sample to the experience and perspective of Senior Planners working in Scotland. However, they represent a strong starting point to understanding of the potential of community mapping across both development planning and regeneration projects given their role. Their perspective will allow future research to be explored with practitioners involved in community mapping, GIS, community representatives and construction professionals involved in managing projects. As SIT's enhance the ability to spatially represent subjective data at both planning and project levels this will support the dominant abstract data found in IMD and Census therefore better reflecting the community. Traditionally undervalued at both the planning and project levels, the subjective data is criticised for not aligning with traditional benchmarking associated with funding and investment decisions. However, to overcome this community mapping requires data collection to be better resourced with improved quality control procedures. This research shows that those who have had exposure to community mapping are able to recognise its potential, but it is apparent that those who don't remain sceptical of its value. It is clear that the potential offered through mapping is moving faster than practice is able to realise it. It is anticipated that placemaking will increasingly require this more holistic approach to data in development planning and increasingly at the project level through social value (Beaurigard, 2016), with community mapping able to represent both abstract and subjective data.

In exploring the seven elements for surveying for community mapping the respondents broadly recognised the rational for these, but concern exists about the additional resource required to support it, but also an inbuilt view amongst many that "planners know best" (and at the project level, the client or construction professionals) and that the maps tell decision makers what they already know or even confuse the process. This links to a broader discussion around the role of expert knowledge and its relationship with consultation, a debate which is equally applicable in development planning as it is within construction management (Chan, 2016). Professional judgement based on local knowledge of the community, their wider education and experience is highly valued by planners and reflects an inbuilt resistance due to concern that it can complicate or have unintended consequences for the decision-making process. Despite this, the direction of travel requires community consultation to be enhanced through both placemaking for planning and social procurement and value for construction projects (Troje and Gluch, 2020). This paper argues that community mapping is intended to view the community as an asset (Close and Loosemore, 2018) and contribute to the decision making process acting as a source for questioning the interpretation of abstract data sources and ultimately move towards co-creation with the community (Barraket and Loosemore, 2018). The research proposes that a relational database should be used to store the data and information gathered during consultation and, providing the basis to develop a 'proof of concept' or 'prototype' which is to be built and demonstrated which will allow for community based information to be stored in local GIS Enterprise of local authorities and accessible to planners and projects.

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