THE SPATIAL AND NON-SPATIAL REQUISITES OF A NETWORKED PUBLIC DOMAIN

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Abstract
This paper investigates public spaces and their performance in relation to the urban embedding, aiming to identify factors that may influence the way in which the public realm is perceived. To that end, the paper sets to analyze a range of variables that could show why public spaces are perceived and used in different ways by different groups of people. The present study is based on a preliminary report of the Demos group which provides a large sample of spaces classified according to their capacity to be used and shared by most members of community into comfort zones, trading zones and discomfort zones. The study focuses on a sample of public spaces chosen from the city of Cardiff. It explores the possibility of superimposing a spatial network on top of the trans-spatial public domain network defined by Demos and to integrate the qualitative analysis gathered by Demos into the spatial analysis methodology in the theoretical framework of Space Syntax, which is usually based on quantitative data in explaining the functionality of spaces. In doing so, one second aim of this paper is to explore the extended areas in which public spaces are most likely to operate and be influenced by. It attempts to refine a conclusive and complete approach to the notion of “catchment area”. Catchment areas are defined combining metric, topologic, and morphologic limits, followed by a comparative analysis of their characteristics. The measures used in this paper to characterize the catchments areas are derived from three different approaches; the first being their metric properties and composition, second the syntactic configurational analysis, and third the social variables, such as employment density, population density and mix and land use. The results of the research suggest that the embedding of the public spaces in the spatial configuration is a factor that influences their sharing capacity and even more a precondition to establishing any usage pattern. Additionally the research proposes a series of variables that will influence the perception of spaces on top of their strictly spatial configuration and placement in the whole system. At the end a multi variable matrix is proposed including the factors that were found to be relevant for the characterization of the public spaces: the social profile of the users, the function of the space, and the spatial morphology of the public space.

Introduction: Public Spaces: Present Concerns
In relation to the city’s growing diversity, often the capacity of the city to promote real interfaces between its inhabitants is being questioned. As Richard Sennet describes the public life of the modern city is reduced and neutralized “The spaces full of people in the modern city

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are either spaces limited to and carefully orchestrating consumption, like the shopping mall, or spaces limited to and carefully orchestrating tourism" [Sennet,1990, p.XII]. Bernard Tschumi, although he believes that the open public spaces rely on the creation of events that would support their existence he recognises that there are spatial factors that guide the evolution of functional programs and the ways in which events take place.

It often happens that areas designed to work as gathering places, in environments where they are needed (such as housing estates or office developments) become the opposite: dangerous and derelict places. Others will naturally evolve to be busy, lively places but their imitations will never work. So what are the ingredients that make a street or a square successful?

This is no longer an issue that concerns only architects and urban designers. Authorities, government and planning committees (i.e. The Greater London Authority, Planning Officers Society of Wales, CABE Space), and voluntary groups (i.e. Demos) are ever more engaged in producing planning strategies for the open public spaces recognising their importance in the regeneration and development policies of urban areas. Taking the challenge of understanding the principles able to create successful public spaces several researches were also conducted under the Space Syntax methodology framework looking particularly at their spatial and configurational properties.

### The Present Research Question and Methodology

The objective of the study will be to explore a spatial network in addition to the trans-spatial public domain network defined by Demos, exploring the possibility to superimpose a spatial understanding of the spaces on top of the qualitative description of it. It is proposed that the embedding in the spatial and social configuration would be a factor that influences their sharing capacity. This paper aims to refine the approach to the notion of “catchment area” referring to the influence area of a space, and to find characteristic factors that may be proved to influence the way in which the public realm is perceived.

The first step is to introduce the theoretical knowledge available and the background Demos research on the public’s qualitative appreciation of public spaces in Cardiff. Next it aims at understanding the global system of the city and in that context the spatial network that can be created between the public spaces. The research then proposes the comparative analysis of the spatial characteristics of areas identified as comfort zones, trading zones and discomfort zones in the Demos report. A sample of spaces was chosen trying to cover as much of the diversity of spaces.

The catchment areas in which the public spaces are embedded are first defined and then analysed as a spatial system with a social role. The spatial description is based on Space Syntax methodologies using axial and segment analysis. Different characteristic values were tested in order to illustrate quantitatively the qualitative categories. Last the research focuses on demographic measures based on the Census data of 2001 trying this time to look at the users that the spaces are catering for.

The results of the different types of analysis will be discussed at each step with their possible explanations. To conclude the public spaces will be evaluated combining their qualitative appreciation with the quantitative measures. Various differentiating factors of the public spaces could thus be identified next to the three categories and the (essential) spatial configuration. This paper will suggest a multidimensional matrix taking into account all the variables.
The Structure and Functioning of Public Spaces

The aim of this chapter is to briefly recall the main theoretical ideas developed in recent history that forms the grounding for this paper. Previous studies done under the Space Syntax framework have revealed one of the key aspects that were given little attention over the history in analyzing the success of public spaces. Campos [1997] proves that the embedding in the urban fabric seems to help in explaining some of the difficulties in creating lively places or generating high occupancy rates. That is based on Bill Hillier’s theory of natural movement, which states that the patterns of generic functions (the basic forms of usage of space: static occupancy and movement) are primarily generated by the urban grid and how easily each space is reachable from any other space using the laws of minimal topological distance [Hillier, 1996]. More precisely Hillier argues that the performance of public spaces depends on the correct balance between movement and static occupancy and that the number of people that use the space (informally, not related to the regular functions of the buildings that surround it) is directly determined by its “strategic value” which is calculated as the sum of the integration values of the axial lines that pass through the space [Hillier,1996,p.165].

On the other hand morphological elements often generate ‘frontier zones’ in the urban tissue marginalizing spaces which are located next to centrality nuclei. Therefore it can be argued that it will never be enough to assume that providing leisure facilities will simply attract life into an area, making it absolutely necessary to deepen the study on patterns of usage of public open spaces. Furthermore, in the documentation that serves as guidance for the authorities, the embedding of public places in the broader system refers to purely the size and the area that is considered to be catering for. But this raises two questions. Can the catchment area be redefined looking at topological measures next to metric ones? And how can we describe it?

The Background of the Study

Previous data was gathered by the Demos group in a project called ‘Public Spaces, Shared Places - Monocultural to intercultural the networked public domain’. There were several key points developed in the Demos Second Interim Report (Nov.2004): One is the network approach to the public spaces. The public domain is introduced as a network that includes the classic open public spaces (parks and green spaces, markets and shopping streets, formal civic spaces and squares) as well as the semiprivate ones like shopping malls, cinemas, bars and cafes. In order to promote the interaction and the diversity of the Cardiff society the spaces were valued according to their capacity to host shared experiences. The report identified certain factors that influence the ‘sharing capacity’: resources (who can afford it), authority (social codes) and functional structures (opening hours). But are these all that is necessary to know in order to measure the performance of a space, or is there more to reveal related to the physical configuration of it and of its surroundings?

As a result of the Demos analysis, three kinds of public spaces were identified: comfort zones, trading zones and discomfort zones. ‘Comfort zones’ are described as spaces and where people said they went to regularly and mixed with people like themselves: “non-threatening and safe”. ‘Trading zones’ are comfort spaces with an added value. People mix with people unlike themselves or might talk to a stranger. ‘Discomfort zones’ are places and spaces were people feel uncomfortable or unsafe for any reason [Demos, 2004]. Their research focused on three cities in England and Wales, one of which...
was Cardiff, developed in the current study. Focus groups were conducted with the following groups of people: people aged 65 and over belonging to socio-economic groups A, B, C1, C2, and D; gay and lesbian people aged 25-45 from socio-economic groups B, C1, C2, D; people from ethnic minorities aged 18-30 from socio-economic groups C1, C2, of a balanced range of gender. Also 150 interviews were taken in classic public spaces in order to identify the three categories. A sample of cases is further referred to in the current paper.

A second reference point for this paper was found in documents like the ‘Guide to preparing Open Space Strategies - Best practice guidance of the London Plan’ (2004) and the ‘Draft guide to preparing play strategies’ (2004) by Greater London Authority as well as ‘Urban Design - the challenge to the planning system’ by Planning Officers Society of Wales. One of the interesting issues raised by the planning strategies of local authorities with regards to the spatial planning of the public spaces is the discussion about their catchment areas. This seems to be one of the first preconditions for understanding the usage of the spaces and therefore the present research will try to tackle the definition of this area and find the more realistic and maybe more precise limits.

**City Profile and Public Life**

Cardiff is remarkable for its broad mix of different types of urban environment, which relate to the stages of development and redevelopment. The historical evolution of Cardiff can be described as a repetitive cycle of eras of prosperity and boasting development followed by periods of stagnation, from the Roman fort to the industrial evolution and the arrival of The Butes – family of lords – bringing Cardiff to its economic peak as the biggest coal trading port. In just 100 years after the opening of the first dock the population had risen almost hundredfold. Once the industrial activities slowed down, the inheritance left by it leads to a series of problems during the next 100 years and left its footprint on the configuration of the city. During the last ten years Cardiff has faced another one of its radical transformations. “Once more the city is a Mecca for migration and settlement” [Isaacs, 2004]. The city has a population of 310,100 out of which 69,800 commuters in and 23,100 out per day demonstrating its attraction as a job market. Nevertheless, average gross weekly earnings prove the employment market of Cardiff to be close to the average calculated for Great Britain in 2003.

Most importantly for this study, next to new jobs and new flats, there are also new public spaces. “The Millennium Stadium, the Bay Area redevelopment and a slated ‘shopolis’ for the City Centre symbolise this current vibrancy, but also beg questions about whether the bubble will burst and how inclusive the city’s resurgence has been” [Demos, 2004, p.10]. It may be worth mentioning that the public space in Cardiff is very much seen as a controlled space, with strong regulations of public behaviour. “Cardiff is the only city in the UK where Big Issue sellers must only sell where there is a designated plaque” [Demos, 2004]. The 100 interviews showed generally a positive perception of the atmosphere in the public spaces of Cardiff.

| Table 1: |
|----------|----------|----------|----------|----------|
| comfortable | 16.67% | friends | 11.33% | poor | 4.00% |
| Safe | 14.67% | private | 4.67% | posh | 4.00% |
| Free | 13.33% | corporate | 4.00% | isolated | 3.33% |
| Shared | 12.67% | strangers | 3.33% | |

Table 1 showing the percentages for the adjectives out of which the interviewees were asked to choose in order to characterize their city [Demos, 2004, p.16].
Analysis of the City as a Setting for the Network of Public Spaces

Analyzing the main morphological elements that shape the city, it can be easily seen that the three and the finger-like parks are stretching radially from the fringes all the way to the centre. Similarly to many British towns and cities, the railroads are also cutting through the very centre of the city from north to south and from east to west. As a result radial extensions linked to the city centre are created. They are also linked to each other through a system of main roads that has also the effect of creating another degree of separation. Encircled pockets seem to be created. Cardiff still keeps a big industrial area since it was one of the biggest coal exporting ports, that is apparently abandoned between Cardiff’s new central developments and the bay area (Figure 1).

So, quoting this author’s conversation with Prof. Simon Lannon (Welsh School of Architecture) and a small sample of local people, would it be legitimate to describe Cardiff as a fragmented city?

To support such an affirmation a syntactic analysis was deployed exploring the possibilities of defining the global and local centrality of the system. The performance of spaces was previously explained in
Space Syntax theory by their spatial configuration and its relation to the spatial network of the city as a whole. It has been proven that the potential of destination spaces is depicted by integration measures and movement of people passing through by the choice analysis. Therefore both measures were used in this research. An analysis was also run combining the two measures of spatial accessibility. The measure used was \( \log(\text{Choice}+2)*1/\text{MD} \) for each one of the radii (n, 2000, 1200, 800, 400). In this way the information tends to combine the effects of centrality and the potential given by it (“close to close is close”) with the specific local configurational effects. The global accessibility core is drawn towards the main through roads, as well as the real live centre marked by the observed density of usage and land use pattern. Yet the deprived residential neighbourhoods, sweeping from west to east between the most prosperous redevelopment areas of the centre and the Bay, still appear as globally well integrated being close to main integrator routes.

The through movement analysis accurately shows higher accessibility values for the highly used two pedestrian ways (Queen Street and St. Mary street) in comparison to other automobile routes and lower values for the residential neighborhoods. In the local accessibility analysis the central shopping spine has always high values as well as the shopping area in the newly developed bay (Figure 2).

The last city scale analysis is using a different morphological measure meant to help explain how different systems are formed and combined together. It uses the calculation of the orientation angle of the grid,
considering as 0° the orientation of the main axis of the centre of the city. The analysis previously used by Italian morphologists is capable of graphically showing the points of tension joining two systems, highlighting the potential of that particular common/encounter line.

We can see how the system is changing along the long axis. Using this method the relatively unitary central area was selected. Looking at the relation between local and global measurements as synergy\[\text{ synergy}\]—the potential of co-presence between local community and strangers it was noticed that it forms a very distinctive system; cutting the regression line of the whole city in a steep angle towards the high range of global integration value [Hillier, 1996, p.174] (Figure 3).

Introduction of the Case Studies

After having analyzed the main features of the entire system, explaining the ways in which its major parts would work the next stage in the analysis will be to map the spaces identified through the Demos research and select the study cases. According to the Demos report a sample of spaces was chosen trying to cover as much of the diversity given by the category relative to its sharing capacity. The limitations and differences in the sizes of samples of each category was a result of the difficulties encountered in qualitatively describing the spaces and the interest in some particular places. The first five of the case studies are chosen from the comfort zones, the next three from the trading zones and the last two are considered discomfort zones (Figure 4).

Comfort zones

Brewery 1/4 is a newly designed passage, like the many galleries that are a characteristic feature of the city centre. It is very close to the highly integrated city core and included in the central ‘pocket’ formed by the railroads, the park and main circulation roads. It has one of the entrances on one of the main integrators and historically significant axis: St. Mary Street. *Queen Street is situated in the centre of Cardiff and is the city’s central shopping district. The street is wide, recently refurbished and flanked by large buildings. There are seats and

![Figure 3:](image-url)
benches in the middle. There are indoor shopping malls to both sides.” (Demos, 2004, p.17) It is important to notice that it is the most integrated line in the segment angular analysis. “Roath Park is one of Cardiff's signature parks. It is situated in a middle class suburb to the north east of the city and is close to the student district of Cathays. The park has a large lake, botanical green house, children's play area and a series of managed walkways. It is used by a variety of people, but little sport is played in the park” (Demos, 2004, p.17). It is also close to the main highly integrated thoroughfares.

Cardiff's main civic centre is located to the North of the town centre. The buildings for Cardiff University, a large museum and the offices of the Welsh civil administration are opening on to the square. At the forefront of the buildings stands Cardiff City Hall. The gardens are often used in summer. The square lies directly on a main road and from the centre can be accessed through an underground passage but is very open to the north. The Western Leisure Centre is situated in a much quieter suburb area with slightly lower values of integration, mainly residential, with no close accessibility barriers.

**Trading zones**

The Bay (6) area is central to Cardiff's regeneration with apartments and high value commercial developments and new buildings as Welsh Millennium Arts Centre and the Welsh Assembly. It is linked to the centre by a wide road that has the disadvantage of passing by the industrial area to the east. The Central Market (7) is again one of the reference points in the busy pedestrian area and it is functioning as well as a passage from it to St. Mary Street.
The Chapter Arts Centre (8) in Canton, west of the City Centre, is the flagship for the contemporary arts in Wales. Even though it is quite successful in a wide range of the population, as proved by the interviews, the management is complaining about its ‘poor’ location.

**Discomfort zones**

Callaghan Square is one of Cardiff’s newest public spaces. It lies between the town centre and the bay area, and it is encircled by traffic. The main groups of people “using” the square tend to be people from the homeless hostel next to it, office workers on breaks, skateboarders.

Splott recreation ground is in the arc of deprived wards that sweeps from west to east around Cardiff’s southern reaches. The majority of users are young people during the evening and older dog walkers during the daytime. It contains a swimming pool, skate ramps, children’s play facilities, football pitches and bowling greens. The park is in a poor state of disrepair, strewn with litter, vandalised in high proportion; fences are broken, bins emptied on the grass and aerosol tagging covers the tarmac.

**Analysis of the Local Structure of Particular Public Spaces**

As earlier mentioned, the notion of catchment area is often used in planning strategies. But is it realistically defined? That is considered 400m for local parks, 1200m for district, 3200 for metropolitan scale [Greater London Authority, 2004, p.21]. However open spaces may have smaller or larger catchment depending on actual walking route, actual entrance points and barriers of accessibility for certain groups (i.e. older people). It seems that this measure could benefit by taking into account topological measures as the ones used by Space Syntax (as well as the effects of visual accessibility though this topic was not touched in the current paper). A walkable distance can be calculated along each segment reducing the “crow flies” distance. It can be noticed that in this way the street pattern will determine the real area covered in a given distance expressed as a percentage of the circular area with the same radius. The direction in which it extends will also be affected.

Another definition that is considered sometimes in Space Syntax practice is a two step depth (changes of direction) from the place [Hillier, 1999]. But that was found to be deceiving in situations as the one of Challagan Square, catching very long lines that in reality go far beyond the 15 minutes acceptable walking distance. Therefore the two measures - metric and topological distance - were combined in order to delimitate and then characterize the catchment areas for the public spaces (Figure 5).

This method will detect and exclude areas that even though they are close are too difficult to reach as well as those that even if they are easy to find they are too remote to be influenced or used. The real walkable distance is also giving account of the possible accessibility barriers. The same process was repeated for all the case studies (Figure 6).

Looking at the resulted influence area we can notice that for the spaces that are either comfort or trading zones they form a complex system including rings and choices whilst for the cases of discomfort zones it is a simple tree like structure with very few ramifications and therefore few choices (though in the case of Challagan square seemed very far reaching). Differences can also be spotted regarding the convexity of the two steps depth area which holds account of the process of centrality; the more convex the area covered by step depth, the bigger the potential of the space considered as a root for the
calculation to become a central area [Hillier, 1999]. Intrinsic qualities of the space and the qualitative interpretation similarities and differences between comfort, trading and discomfort zones were searched also in their morphologic attributes. Moreover findings of previous studies [Campos, 1997] were considered, according to which measurements of local and global integration of the lines that cross through the space are able to explain the rates of movement and static occupancy. Of course because of the reliance on qualitative (interviews) and not quantitative data (real counts of users) the correlations cannot be tested, but they were considered to be able to give a hint on how the space may be proved to work. Therefore only relations between the spaces of same categories were tested looking for similarities (Table 2).

Out of the analyzed sample the results were not showing a variation strictly according to the performance of spaces. Therefore one suggestion is that different functions rely on very different foot-drop rates, certain spaces may count on trans-spatial means of attraction,
as well as the people that appreciated the space in one of the categories is very important.

Nevertheless some consistencies could be observed by regrouping them according to the categories/functions of ‘classic public spaces’. The following graph shows the values earlier calculated for each space reorganized by their belonging to one of the three categories (Figure 7).

<table>
<thead>
<tr>
<th>Space Type</th>
<th>Area</th>
<th>Nr of lines</th>
<th>Line Density</th>
<th>Mean Int RR</th>
<th>Mean Int R3</th>
<th>Mean Int Rn</th>
<th>Mean conn</th>
<th>Mean MD Rn</th>
<th>Mean MD 400m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brewery 1/4</td>
<td>C1</td>
<td>2769</td>
<td>722.28</td>
<td>1.18</td>
<td>2.75</td>
<td>0.69</td>
<td>2.91</td>
<td>7.14</td>
<td>4.33</td>
</tr>
<tr>
<td>Queen Street</td>
<td>C2</td>
<td>12795</td>
<td>234.47</td>
<td>1.22</td>
<td>4.49</td>
<td>0.73</td>
<td>2.84</td>
<td>6</td>
<td>3.93</td>
</tr>
<tr>
<td>Roath Park</td>
<td>C3</td>
<td>243232</td>
<td>131.56</td>
<td>0.98</td>
<td>2.27</td>
<td>0.61</td>
<td>2.78</td>
<td>10.07</td>
<td>4.55</td>
</tr>
<tr>
<td>Civic Centre</td>
<td>C4</td>
<td>26205</td>
<td>190.80</td>
<td>1.04</td>
<td>2.48</td>
<td>0.86</td>
<td>3.14</td>
<td>7.28</td>
<td>4.63</td>
</tr>
<tr>
<td>WLC</td>
<td>C5</td>
<td>26204</td>
<td>190.81</td>
<td>0.91</td>
<td>2.33</td>
<td>0.51</td>
<td>2.96</td>
<td>10.09</td>
<td>4.49</td>
</tr>
<tr>
<td>Bay Area</td>
<td>T1</td>
<td>174613</td>
<td>326.44</td>
<td>0.95</td>
<td>2.23</td>
<td>0.56</td>
<td>2.3</td>
<td>11.09</td>
<td>4.58</td>
</tr>
<tr>
<td>Central Market</td>
<td>T2</td>
<td>853</td>
<td>1172.33</td>
<td>1.19</td>
<td>3.12</td>
<td>0.71</td>
<td>4</td>
<td>6.83</td>
<td>4.38</td>
</tr>
<tr>
<td>Chapter Arts Centre</td>
<td>T3</td>
<td>5163</td>
<td>581.06</td>
<td>1.01</td>
<td>2.25</td>
<td>0.62</td>
<td>2.93</td>
<td>7.62</td>
<td>4.5</td>
</tr>
<tr>
<td>Challagan Square</td>
<td>D1</td>
<td>7452</td>
<td>154.19</td>
<td>1.208</td>
<td>2.89</td>
<td>0.686</td>
<td>4</td>
<td>7.45</td>
<td>4.52</td>
</tr>
<tr>
<td>Splott Rec. Ground</td>
<td>D2</td>
<td>64095</td>
<td>93.61</td>
<td>0.95</td>
<td>1.8</td>
<td>0.58</td>
<td>2.99</td>
<td>9.3</td>
<td>5.03</td>
</tr>
</tbody>
</table>

It could be noticed that values of connectivity or local integration of the axial lines in shopping areas and civic centers are highest, followed by leisure facilities and parks and gardens, regardless of their appreciated sharing capacity. Other similar variations could be further explored for a more extended sample. Explanations for it could be that the expectations from a comfortable park are different than the ones from a comfortable market; qualitative classifications may mean different things for different groups of people according to age, disability or culture (i.e. older people generally found city centers to be uncomfortable unlike the rest of the younger population).

The relation between its local structure and the global structure was analyzed. The analyzed measure of intelligibility\(^{\text{vii}}\) can account for the consistency of the relation between local information given by the built environment and the real role of the space in the context of the whole system, while synergy informs about the interface between global and local users. Generally it was noticed that the measures of intelligibility and synergy are high for the comfort areas and lower for the discomfort areas. Even more the measure of ‘distinctivity’\(^{\text{viii}}\) is also higher [Stegen, 1999] accounting much for the presence of people in the area.

Demographic analysis

The maps of the catchment area as defined in the beginning of the analysis were also superimposed on demographic data gathered from the Census 2001 with the purpose of profiling additional, different dimensions of the area other than the spatial one. Analyzing the public that is supposed to be addressed to as opposed to those whom it can...
actually affect most directly should be a vital part of strategy of planning. Possible compatibility relations will be searched between the social profile of an area, the spatially determined local movement patterns and certain utilities assigned to it. Densities, employment percentages and households were looked at in order to establish a standard of economic power and interest of the inhabitants of an area, which could influence for example the interest of investing in the quality of public facilities or the consumption capacity (Figure 8).

**Figure 8:**

*Overlay of density maps and catchment areas (1,2,5,6,8,9)*

*Overlay of employment maps and catchment areas (1,2,5,6,8,9)*

*Overlay of owner occupied households and catchment areas (1,2,5,6,8,9)*
Out of the demographic analysis conclusions can be drawn as to what kinds of functions are feasible to propose for some neighborhoods depending on their density. For example, apparently a high density of inhabitants is not necessary for the successfullness of a well integrated shopping street, because that is rather counting on the movement that it can attract from a wider environment, but a low density seems to be negatively affecting a leisure facility (Splott compared to Western Leisure Centre) which has a smaller catchment area and lower values of global integration (will not attract global movement). In a next stage a more detailed analysis of data as age of population, education, means of transportation that they use can be relevant to establish their daily patterns, shopping opportunities, etc.

**Discussion and conclusions**

It was noticed that the public domain extends very much, including spaces around the edges of the city, and from a configurational point of view in all the ranges of accessibility, probably due to the differences between the usage patterns of the groups that identified them. The analysis of the city seems to support the prior hypothesis of the “segmented city”. Several systems are linked to the core by long lines crossing through dividing buffers that do not always have the capacity (and the connectivity) necessary to gather a real centrality and functions according to it all along their length.

Looking at the urban embedding, the catchment area was redefined in order to include both metric and topologic distance from the space. The morphologic analysis of it for the entire sample clearly exemplifies the differences between the spatial configurations: from very complex systems (convex and including rings) for the comfort and trading areas to very simple tree like extensions for the discomfort zones. Also the character of the spaces could be explained by their ‘strategic values’ as defined by Hillier [Hillier, 1996]. Through the illustrated analysis it was detected that for the comfort and trading zones the interfacing lines were belonging to the 10% most integrated in the whole system, whilst this was not the situation in the case of the discomfort zones.

As a result of this first analysis it could be concluded that difficulties appeared due to the limitations of the qualitative methods of investigation of the public spaces. The appreciation of a space depends very much on the group of people using the space. A comfort or trading zone can easily become a discomfort zone. Time of day is important as well. Comfort zones or trading zones can change into discomfort zones at night, or after a certain time of day (i.e. parks were mentioned as uncomfortable by old people after school hours). The interaction levels on which the qualitative categorization was built also relies very much on a common ground or a props to mediate the interaction. Typology was observed to determine/require spatial configurational values: parks and gardens, civic centres, shopping areas can belong to any of the three categories, yet they will be intrinsically different.

Also not all the value has physical or spatial reasons. Some of it is given by its reputation. People in Cardiff were reported as being very proud when talking about the Bay Redevelopment, the Stadium or a historic park. It is clear that understanding the different towns and cities involves having some understanding of the emotional attachment of its inhabitants. Generally, it could be concluded that a qualitative assessment can bring an interesting vision as a first phase of analysis, and quantitative investigation is a necessary follow-up. The demographic data has also proven that the local social factor can influence the performance of different facilities offered by the public spaces. Some amenities require a certain density of population, or
even certain circumstances of age, occupation or economical affluence.

For the current stage various explanations were suggested by the combination of factors that were included in the analysis, yet in light of the current research a more inclusive sample that will cover all the variations or a limitation to one typology or to one group could be proposed to draw a more complete and accurate result. A multivariable matrix could be proposed for a next stage including as a minimum the functionality of spaces, the group of people that nominated the space (represented in the graph by different colours) and check the consistency against the qualitative categories of spaces (Table 3).

<table>
<thead>
<tr>
<th>Classic public space</th>
<th>Comfort zone</th>
<th>Trading zone</th>
<th>Discomfort Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parks</td>
<td>■ ▲ ●</td>
<td>■ ▲ ●</td>
<td>■ ▲ ●</td>
</tr>
<tr>
<td>Shopping/Market</td>
<td>■ ▲ ●</td>
<td>■ ▲ ●</td>
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<td>Civic Areas</td>
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<tr>
<td>Mixed use/leisure</td>
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**Table 3:**

**References**


ii. The Demos group developed a project called ‘Public Spaces, Shared Places - Monocultural to intercultural the networked public domain’. The first results of it that were used for the current paper were published in the Demos Second Interim Report (Nov.2004).

iii. The catchment area of a space is the generally considered the area of most direct influence of a space regarding its movement pattern. In different documents it is considered either as a metric distance or topologic distance, and in the particular case of the current analysis is combining the two together for further investigation.


vi. Synergy expresses the potential of the system to create an interface between the local movement and the global movement patterns. It can give information “about the quality of a neighbourhood, due to the predictability of the social environment, seen from the local point view” (Stegen, 1999). It can predict the potential of an interface of co-presence between local community and strangers, and that would be the raw material of social interaction.

vii. Intelligibility measures on a scale from 0 to 1 the information that can be inferred about a complex relational system from the locally available visual information. As described by Hillier, 1996, in represents “the relation between what cannot be seen and what is available”.

viii. Distinctivity, as synergy, concerns the local and global integration patterns. Plotting local integration versus global integration values, “the more the set of dark points (…representing the lines of a particular subarea) forms a line crossing the regression line for the whole city, but tending to greater steepness, then the subarea is distinctive” (Hillier, 1996, p.174). A steeper regression line expresses the fact that the local integration pattern accounts for much of the variations of presence within the virtual community, in the conditions of poor differences between the global integration values of all the lines in the cluster. “A distinctive area is possessive, and makes it hard to the natural movement to escape towards other areas” (Stegen, 1999, p.7)