THE ROLE OF THE BUILDING LAYOUT IN THE DELIVERY OF SOCIAL WORK SERVICES

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Abstract

This paper examines the relationship between spatial layout and patterns of space use in three existing social work services buildings: an Area Services building, a day care centre for adults with learning disabilities and a day care centre for older people. The aim of the study was to understand how the spatial layout of buildings affects the delivery of social work services and, based on these findings, to draft design guidelines for similar social services facilities. Towards this end, visibility graph analysis and data on movement flows, static activity, and staff and users interaction collected for the three buildings were utilised.

In the case of the Area Services building, the study showed that the delivery of service is severely constrained by its layout. Its long and narrow rectangular form aggravated by a kinking circulation system maximizes the separation of its functions and occupiers. There are only a few common areas for staff to socialise in, and those that exist are segregated. Overall, wayfinding throughout the building is problematic and informal interaction among staff members, which is key in any organisation, is minimal. In sharp contrast, the day care centre for adults with learning disabilities has a simple and legible circulation system: all the service users' activity rooms are easily accessible. It brings together both the local and global circulation structures, making most of the building easily accessible from any given location. This also makes the surveillance and control process between staff and users easy and efficient to implement, without being overly oppressive to service users. Likewise, the layout of the building fosters communication between staff and service users, which is paramount for the type of service provided. The centre for older people is essentially a single room building which is used for all activities. The one-room approach facilitates natural surveillance and control of service users, increasing the levels of co-presence amongst users. Paradoxically, movement and interaction amongst users is very low. As a result, the building does not offer its users any possibility for unplanned encounters or quiet conversation. The spatial layout of the building enforces routine. Being in the same space undermines the efforts of staff to stimulate users by organising different activities.

In summary, using the space syntax methodology, the study found that the ability to provide social services is significantly affected by the layout of each building. It also underscored the fact that a well-designed building allows for a more efficient service delivery. Buildings with a clear and intelligible spatial layout, where service users and staff can understand the way the building is organised, are easier to manage and provide a more comfortable environment for service users. Circulation, in particular,

plays a key role in this dynamic. It influences the patterns of co-presence between staff and service users throughout the building, and as a consequence affects the level of informal surveillance within the building. Lastly, through understanding the specific issues inhibiting satisfactory delivery of care and staff interaction in each of the buildings, recommendations are made on interventions to the existing buildings and on general design guidelines for future social services facilities.

Introduction

Glasgow City Council commissioned Space Syntax to carry out a study on patterns of space use in social work services buildings. The aim of the study, which this paper is based on, was to understand how the spatial layout of buildings affects the delivery of social services and, based on these findings, make suggestions for design guidelines for similar facilities. To this end, three buildings were selected as case studies: an Area Services building, a day care centre for adults with learning disabilities and a day care centre for older people.

This question demands firstly, a better understanding of the role that the social work services plays in the community and secondly, an understanding of the way in which the social work services functions as an organisation.

The social work services in Scotland is a relatively new public service which has been moving progressively towards an integrated approach consolidating services into generic social work departments as set out in the Social Work (Scotland) Act, 1968. A key objective of social work services is to provide information and access for support and protection of vulnerable individuals. It aims to deliver this service efficiently and as an employer, the aspiration is to provide a work environment that enhances communication and innovation (Glasgow City Council 2005) [i]. There has also been a continuous move towards increasing care in the community (Great Britain Department of Health, 1990, 1989).This shift includes schemes such as the promotion of domiciliary days and respite services that allow people to continue to live in their homes by providing support for carers and by aligning with other public, private and independent sector partners.

The buildings designed today need to adapt to more flexible delivery of services by professionals and to a more consumer-oriented user. More importantly, there is a desire to empower users and involve them in the design and delivery of services by making social services more accountable. As a result the buildings have to be accessible, in the widest sense of the word, integrating into the local community and providing the setting for the efficient delivery of social services.

This increase in the accessibility of social service buildings to service users has brought to the fore a range of issues that relate to the staff/service user interface as there is a need to control the environment, while maintaining a welcoming and normalised atmosphere.

Movement is an aspect of space use which is subject to the imposition of rules as well as the constraints of space (Peatross, 1997). This is particularly the case in institutions where due to the user's age, disposition or fragility, their movement must be restricted to prevent them from harming themselves, others or causing damage to the facilities. Therefore, one of the aims of the study was to understand how the spatial layouts of social care facilities have adapted to changes in social care delivery, and how they have otherwise dealt with their shortcomings through the imposition of rules and other means of control. Research by Hanson and Zako (2005) on caring environments for older people also showed a clear correlation between spatial design and performance variables such as the proportion of residents' active time, frequency of enjoyable activity and the residents' choice and levels of control over the environment.

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While acknowledging that service users are the principal beneficiaries of adequate care facilities, another important element of the study was the need to provide an adequate work environment for staff. A well-functioning work environment will allow for effective communication between members of staff, which will facilitate an efficient care delivery. Previous research has shown that patterns of movement are produced by spatial patterns. In an office environment, these patterns of movement also tend to correlate to patterns of interaction (Penn et al., 1999). Through the study of spatial layouts and observation, it is possible to gain a better understanding of the way in which an organisation works (Space Syntax 1995), and assess whether the buildings an organisation occupies are allowing for unprogrammed or opportunistic interaction as well as programmed meetings (Space Syntax, 2002, 2001, 1997, 1995).

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The three cases presented in this study - an Area Services building, a day care centre for adults with learning disabilities and a day care centre for older people - deal to different degrees with the issues mentioned above. Although they have different programmes, scales and levels of interaction between staff and service users, their aim is to provide first-rate social care to clients who may be in a vulnerable position.

The Case Studies

From early visits to the three buildings prior to any formal study, it became apparent that it would prove a difficult task to adapt complex programmes to buildings which have not been purposefully designed with that aim. The techniques of the space syntax methodology were used to find an objective description of the building layouts, in addition to carrying out a cross comparison of the spatial configuration and patterns of space use in the selected buildings. Additionally, the space syntax methodology was used to evaluate the merits of alternative layouts in so far as the design requirements of the social work services were met.

The following section provides a brief description of the three buildings in terms of the services they provide, their location within Glasgow, and their physical and architectural properties. After a short description of the buildings, the methodology used is presented followed by a quantitative analysis of their spatial layout.

Area Services Building

The Area Services building is the largest and most complex building among the three case studies. It provides social work services to the southeast area of Glasgow with 2540 registered service users at the time of the study and approximately 160 staff.

It is shaped in a long, narrow rectangular form over two stacked floors, occupying an area of approximately 2,000 sqm. laid out symmetrically from the main entrance. Its key function is the provision of a variety of social services including physical disabilities care, mental health care, older persons' care, a methadone clinic and a children's hearings tribunal. However, the floor area allocated to service users occupies only 20% of the building with access restricted to certain areas on the ground floor.

The main entrance to the building is shared by service users and staff and leads into a waiting area and reception. From the waiting area a series of interview rooms can be found to either side, which are some of the few areas accessible to service users. The waiting room gives access into an open plan office space for general clerical staff behind reception. On each level, a corridor runs in a series of chicanes along the length of the building. There are two staircases at either end and a

lift in the south section, all of which are used by staff only. Off the corridor, one finds a mix of cellular and open plan office spaces and support areas.

Day Care Centre for Adults with Learning Disabilities

The day care centre for adults with learning disabilities provides day care services to adults with learning disabilities within the southern area of Glasgow. It houses an Area Service Team and an Area Learning Disabilities Team. Each has different working relationships with service users; the first works directly with service users and the latter deals mainly with a range of administrative issues [ii]. The centre provides a range of social, leisure and rehabilitation activities to 93 registered service users (at time of the study), with 50 to 60 users attending the centre on a daily basis. The total number of staff is 56. In contrast to the Area Services building, over 80% of the floor area is allocated to service users.

The building is constructed on one level and has a total floor area of 1,300 sqm. Access to the building is via one main entrance, which leads into a waiting area. From the main entrance, most of the activity rooms and support facilities are found to the left. To the right, in addition to a courtyard, one finds the administrative areas and dining room. The spatial layout is organised in a simple circulation system based on a race track layout or 'ring' around the central courtyard, giving direct access onto most users' areas, in particular the activity rooms.

Unlike the Area Service building the day care centre operates an "open door" policy where service users have freedom to access all areas of the building with the exception of the areas occupied by the Learning Disability Team (for reasons of confidentiality of data) and the kitchen (for reasons of health and safety).

Day Care Centre for Older People

The day care centre for older people Partick Day Care Centre can be described as a building which lacks spatial variety and flexibility. It is a day care centre catering to people over 65 years of age who have problems such as isolation, physical disability, mental disability including mild to moderate levels of dementia. It has a capacity fir 25 users during the week, 15 over the weekend and evenings, and there are 15 members of staff.

The building is relatively small, occupying approximately 300 sqm. on one floor. It has two entrances, one that fronts the street and is used by staff and service users, and a secondary back entrance which is used mainly by clients when leaving the building.

042-04

Figure 1:

Building plans: Area Services building (left), Day care centre for adults with learning disabilities building (centre) and Day care centre for older people building (right)

First floor

Ground floor

main entrance

0m 5m 10m 20m

main entrance
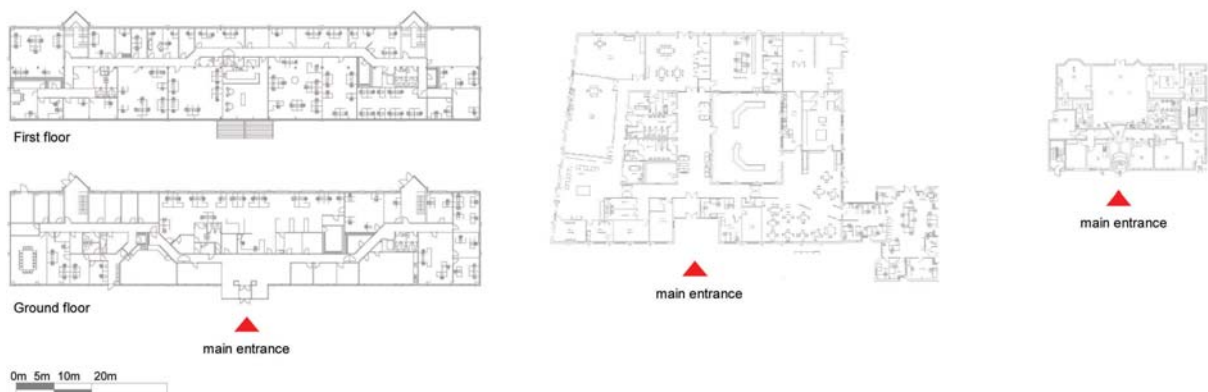
main entrance

The main entrance leads to a waiting area and to an all-purpose common room beyond. Administration and support areas are found at

either side of the waiting area. Service users spend most of their time within the main common/dining room area, where they have tea and lunch and are offered a range of activities. It is essentially a single room building used for a variety of activities.

Methodology

In order to investigate the relationship between spatial layout and the delivery of social work services, space use patterns were directly observed and subsequently correlated against spatial visibility measures as an output of Visibility Graph Analysis – VGA (Turner 2001).

To build a picture of the spatial culture of the building, the direct observations were distinguished according to stationary activities, movement flows, and staff and service users' interaction patterns [iii]. The direct observations were carried out on two consecutive working days in August 2005 from 8.00am to 6.00pm, with data collected once every two hours.

Stationary activity data was collected using the snapshot technique. People were differentiated according to service users, staff and visitors [iv]. In addition, people were distinguished according to the activity that they were involved with at the time the data was collected, i.e. being available, carrying out a task (such as writing a letter or helping a service user with their meal), talking on the phone and working on the computer. Patterns of interaction amongst staff, service users and visitors were also recorded.

Movement flow data was collected by tracing people's routes over a period of five minutes. That way, it was possible to collect information on both movement levels and routes. While recording data on people's routes within the building, stops were noted as either a task or interaction (conversation only) between staff and/or service users. Likewise for stationary activity, people were distinguished as staff, service users or visitors.

042-05

Figure 2:

Visibility Graph Analysis of the three case studies showing global accessibility: Area Services building (top left), Day care centre for adults with learning disabilities building (top right) and Day care centre for older people building (bottom left)
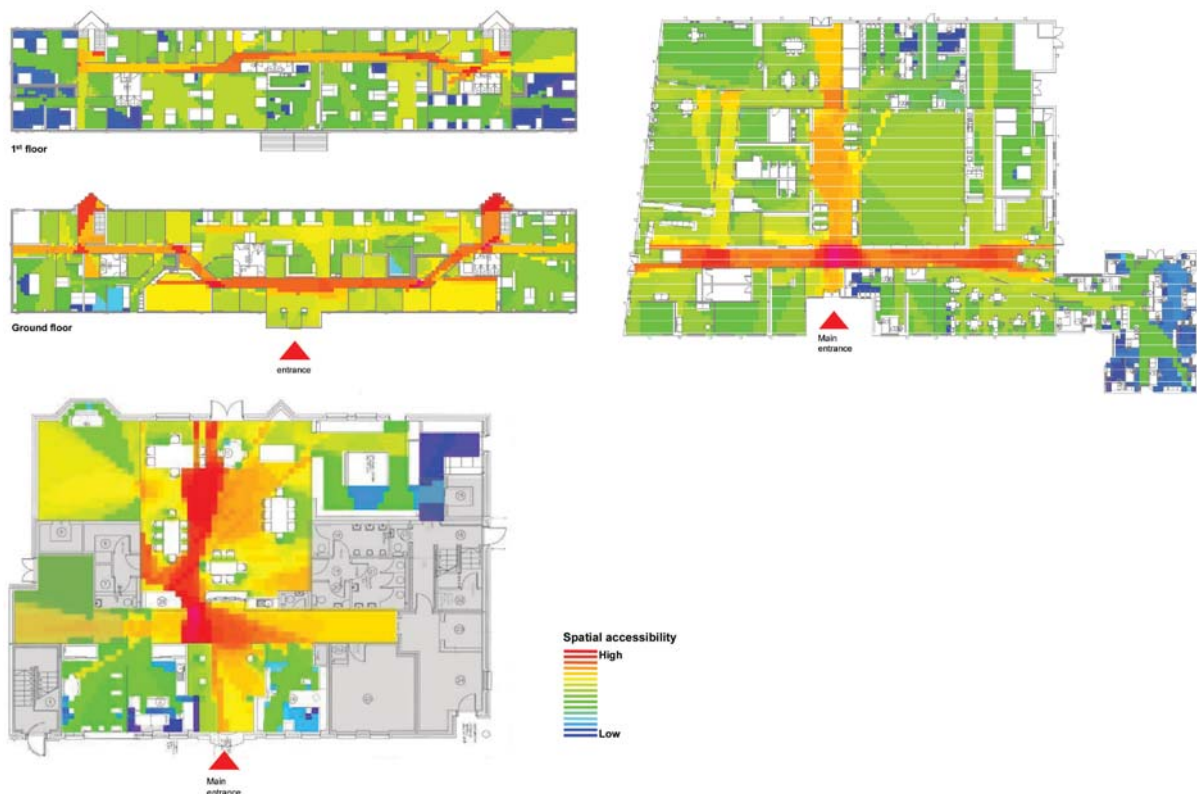
Visibility Graph Analysis was used to calculate the visual integration of each building [v]. Apart from storage areas, all spaces were included in the analysis [vi]. The analysis involved the quantification the selected buildings' local and global spatial accessibility, accessibility from the entrance [vii] and intelligibility [viii].

Findings

Despite differences in programme and building layouts, the spatial analysis, direct observation and communication with staff and service users [ix] highlighted some common morphological characteristics which are fundamental to the delivery of social work services.

Area Services Building

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The spatial analysis provided strong evidence that communication and interface patterns were largely hampered by the spatial structure of the building. The building's long and kinking circulation system maximizes the separation of functions and occupants.

'Back of house' areas lacked sufficient interdepartmental interaction. Areas designated as staff social spaces were not well used. This resulted from their location in the building: rather than being close to areas of high staff movement levels - for example adjacent to reception or a central staircase - social spaces lay in relatively segregated areas. Likewise, accessibility amongst the several departments [x], in particular the ones located on the first floor, is severely limited. Consequently, the level of informal and inter-departmental interaction, which is paramount in any organisation, was negligible to the detriment of social work services.

Figure 3:

Area Service building: pedestrian routes, shown in white, superimposed onto the spatial accessibility map (left) and social interaction related to stops, shown by the triangles (traces data), superimposed onto the spatial accessibility map (right)

On the ground floor, surveys with service users and staff revealed that in 'front of house' areas, the reception and waiting areas did not offer adequate privacy. The spatial accessibility map shows their location at the centre of highly accessible local and global routes. The main administration area (on the ground floor), also at the intersection of these routes, suffers from an imposed lack of privacy (figure3).

Additionally, corridors leading to interview rooms lay beyond the controlled entrances, giving interview subjects access to restricted areas, creating a security problem. The lack of natural surveillance meant that service users would have to be escorted throughout their stay, enhancing the perception of an overly-controlled environment.

Day Care Centre for Adults with Learning Disabilities

This building can be described as a building which adequately fulfils its purpose. From the observation data, interviews with staff and clients, and questionnaires, the picture that emerged is that the staff is

able to provide effective care for adults with learning disabilities. Users were unanimous about enjoying the centre, feeling safe and well looked after.

A key aspect to the success of the building is its spatial layout which facilitates natural surveillance of service users by staff. As a consequence, staff either know or can easily find out where service users are and what they are doing. The surveillance and control processes, an intrinsic part of the service provided, are easily established in an informal way. Simultaneously, the layout of the building fosters interaction and communication between staff and service users, which is paramount for the type of service provided.

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As shown by the VGA analysis (figure 4,) the spatial layout is well organised with a simple circulation system based on a race track layout or 'ring', giving direct access onto most users' areas, in particular the activity rooms. This brings together the local and global circulation structures, making most of the building easily accessible from any given location. The flexibility of this spatial layout makes the building more easily adaptable to changes in programme or operational policy. In addition, the main circulation system is directly connected to the building's entrance rendering the spatial layout of the building easy to understand for the first-time visitor. Unlike the Area Services building, point depth analysis shows the number of visibility steps from the entrance to be 5, highlighting how shallow the layout is[xi].

On the negative side, the two administrative areas [xii] in the building are separated from each other. This limits levels of co-presence and interaction between the different staff groups thereby inhibiting communication between the two teams. In particular, the Area Learning Disability Team is located in a segregated part of the building thus limiting the communication between care managers and service users.

Figure 4:

Day care centre for adults with learning disabilities building: pedestrian routes, shown in white, superimposed onto the spatial accessibility map (left) and social interaction related to stops, shown by the triangles, superimposed onto the spatial accessibility map (right)

Additionally, conflict arises at the reception and waiting area where service users, staff and visitors all enter. Service users like to use the waiting room as a social space, which can cause congestion and confusion for visitors at the entry. The courtyard, although central, is inaccessible and can neither be enjoyed as a public space nor utilised for circulation.

Day Care Centre For Older People

Due to its size and layout, service users' occupancy is generally limited to the dining /multi-purpose room in this building.

The VGA analysis shows this room as the most integrated space in the building, easily physically and visually accessible from the

administrative and support areas. This one-room approach facilitates natural surveillance of service users and increases levels of co-presence amongst users. Paradoxically, interaction amongst users was low. Recorded movement was also low. As a result, the building does not offer its users many possibilities for unplanned encounters or quiet conversation. The spatial layout of the building imposes routine, and being in the same space undermines the efforts of staff to stimulate users by organising different activities.
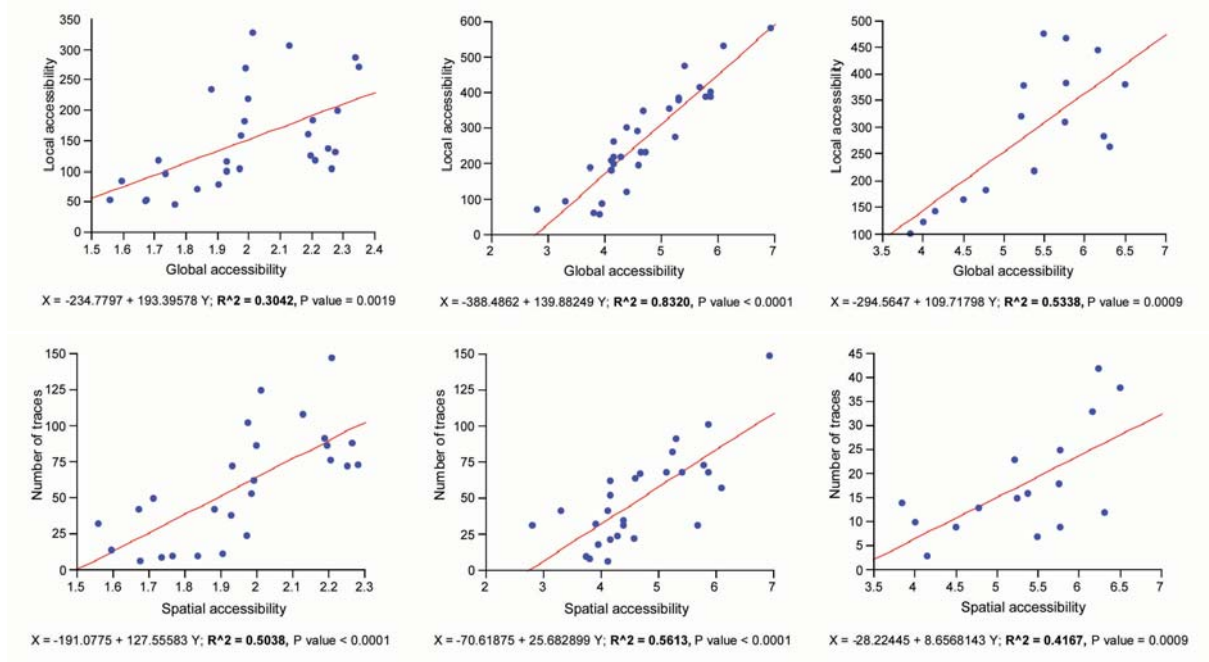
Comparison of Buildings

The difference in levels of accessibility and way-finding for the case studies becomes very clear when examining the correlation between local and global accessibility, i.e., intelligibility [xiii], and the correspondence between spatial accessibility and levels of movement for the three buildings.

Hillier (1987) points out that patterns of pedestrian movement are strongly associated with the intelligibility of the system, that is, the more intelligible the building, the better the correlation between movement flows and spatial accessibility is. This becomes very clear when comparing the scattergrams below (figures 5 and 6).

042-08

Figure 5:

Scattergrams showing the correlation between local and global accessibility for the Area Services building (left), Day care centre for adults with learning disabilities building (centre) and Day care centre for older people building (right)

X = -234.7797 + 193.39578 Y; **R^2 = 0.3042,** P value = 0.0019

X = -388.4862 + 139.88249 Y; **R^2 = 0.8320,** P value < 0.0001

X = -294.5647 + 109.71798 Y; **R^2 = 0.5338,** P value = 0.0009

X = -191.0775 + 127.55583 Y; **R^2 = 0.5038,** P value < 0.0001

X = -70.61875 + 25.682899 Y; **R^2 = 0.5613,** P value < 0.0001

X = -28.22445 + 8.6568143 Y; **R^2 = 0.4167,** P value = 0.0009

Figure 6:

Scattergrams showing the correlation between global accessibility and movement flows for the Area Services building (left), Day care centre for adults with learning disabilities building (centre) and Day care centre for older people building (right)

The day care centre for adults with learning disabilities shows by far the best correlation between global and local accessibility as well as spatial accessibility and movement flows. These correlations highlight the spatial qualities of the building. It is suggested that its layout could accommodate the requirements of an Area Services building as well as a day care centre for older people, whereas the other buildings could not accommodate its programme due to buildings layout constraints. More importantly, this demonstrates that the building exhibits the important spatial quality of being flexible and therefore able to adapt to changes in the delivery of social work services.

Design Recommendations

Although the buildings in the study accommodate distinct programmes which have given form to distinct spatial layouts, all share generic properties governing the interface between social service staff, service users and visitors. Findings from the preceding spatial analyses of the buildings, feedback from staff and service users and criteria set out by

the client on current best practice informed Space Syntax's proposals for the reorganisation and redesign of the buildings.

These design proposals sought to address criteria from the client concerning the buildings' stakeholders including:

- attention to privacy and dignity for both users and staff

- the creation of a safe environment for service users and service providers

- the promotion of an open and inclusive atmosphere

- encouragement of inter-team and interdepartmental knowledge sharing across the social services staff

- Overlying these criteria are Space Syntax's own tested principles concerning the effects of space on the buildings' users including:

- the creation of a layout which generates movement potentials within it

- an intelligible circulation system which facilitates intuitive way-finding - good sight lines taking in key spatial layout features such as reception desks, vertical circulation cores and public spaces

- design which engenders natural surveillance rather than enforced surveillance

- the achievement of appropriate levels of social awareness in the building – both in private and social spaces

- flexibility of building typology and use to accommodate changes in policy and service provision [xiv].

These design principles were considered in relation to each of the case studies for the purpose of proposing recommendations for a redesign with minimum physical intervention and maximum benefit to the buildings' occupants. The design recommendations for the existing buildings do not include the day care centre for older people. Due to its size (available area), it was felt that the only feasible solution was its re-location to a larger premises to adequately respond older people's needs.

Area Services Building

As a result of the findings from the spatial analysis, it was deemed that design proposals should provide a well organised horizontal circulation system, a vertical circulation easily accessible and visible from the entrance, a reception area that promoted a sense of safety and comfort, office and administrative areas in view of each other and communal areas adjacent to the most accessible spaces within the building.

Given that the spatial arrangement of the interface between staff and service users assumed critical importance in a building of this type, the first step in generating design proposals was to explore alternative configurations for the service user/staff partitioning within the building, based on the floor areas currently allocated to each.

A series of diagrammatic floor plans tested with visibility graph analysis were designed with a range of alternative staff/service user partitions, where user groups are isolated from each other, contiguous or clustered.

A preferred scheme was eventually selected which represents a more radical departure from the existing configuration than other options considered. Both "front of house" and "back of house" activities are clustered at one end of the building and stacked over two floors,

thereby creating greater convexity within the long, narrow building, greater opportunities for "ringy" circulation and greater potentials for interaction by grouping users and uses. One vertical core is used by service users and the other controlled by staff. This arrangement creates a shorter staff/service user controlled interface zone than exists in the current configuration, as this zone spans the building in the short direction. However, it does so over two floors, so that case worker teams on each floor are more accessible to the service user interface than in the existing situation in which upstairs staff is separated from service users by one storey.

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In this scenario, reception on the ground floor is moved to align with the interface so that staff and service users continue to share a common entrance. Each group then branches off toward their own wing. A separate entrance could still be created on the ground floor for the methadone clinic, although these two entrances would be in close proximity requiring additional spatial measures to separate groups.

Quantitative testing of the Space Syntax proposal showed that a more intelligible layout could be achieved in the building, despite its long and narrow rectangular shape. The core of integration, which had been limited to the central corridors with 'segregated' offices on either side, was replaced by a core of integration centred on clerical staff / operational managers / social workers working areas (figure 7), all in view to each other. In this way, the proposed layout promotes social interaction amongst different departments to the benefit of service users. The common areas – the canteen and library – which previously were isolated and hardly used by staff, are now in one of the most accessible spaces of the building, at the intersection of key local and global circulation routes. These aspects facilitate way-finding and a general understanding of the building's spatial layout which in turn eases communication amongst staff. The segregated areas are now occupied almost exclusively by interview rooms, counsellor rooms and clinics, facilitating privacy.

Figure 7:

Visibility Graph Analysis of Area Services building proposal – global accessibility

Day Care Centre for Adults with Learning Disabilities

To address the issue of the physical separation of the two administrative areas and the conflict in the reception and waiting areas [xv], a reorganisation was proposed for the day care centre for adults with learning disabilities, giving greater definition to "front" and "back of house" while still providing fluidity between.

Recommendations include a reorganisation of the "back of house", linking the two staff teams along the primary loop, enhancing communication between teams. Swapping the locations of the kitchen/dining facilities with the Day Services Team connects programmes previously separated. A new entrance into the Area Learning Disabilities wing along with a shifted main user entrance diverts visitors from using the service users' social space as a waiting area. Additionally, activating the central courtyard as a social space provides variation to the offer making it one of the key spaces of the building, in addition to increasing its overall integration (figure 8).

Visual graph analysis conducted on this proposal suggest that The opening of a new entrance into the main office space creates a secondary circulation ring controlled by staff, which improves the overall accessibility and way-finding in the building, as well as clarifying way-finding between user groups within the building. This circulation ring has a major impact on the spatial structure of the building as it also increases communication potentials amongst staff and enhances natural surveillance thereby improving care for service users.

042-11

Figure 8:

Visibility Graph Analysis of day care centre for adults with learning disabilities proposal – global accessibility
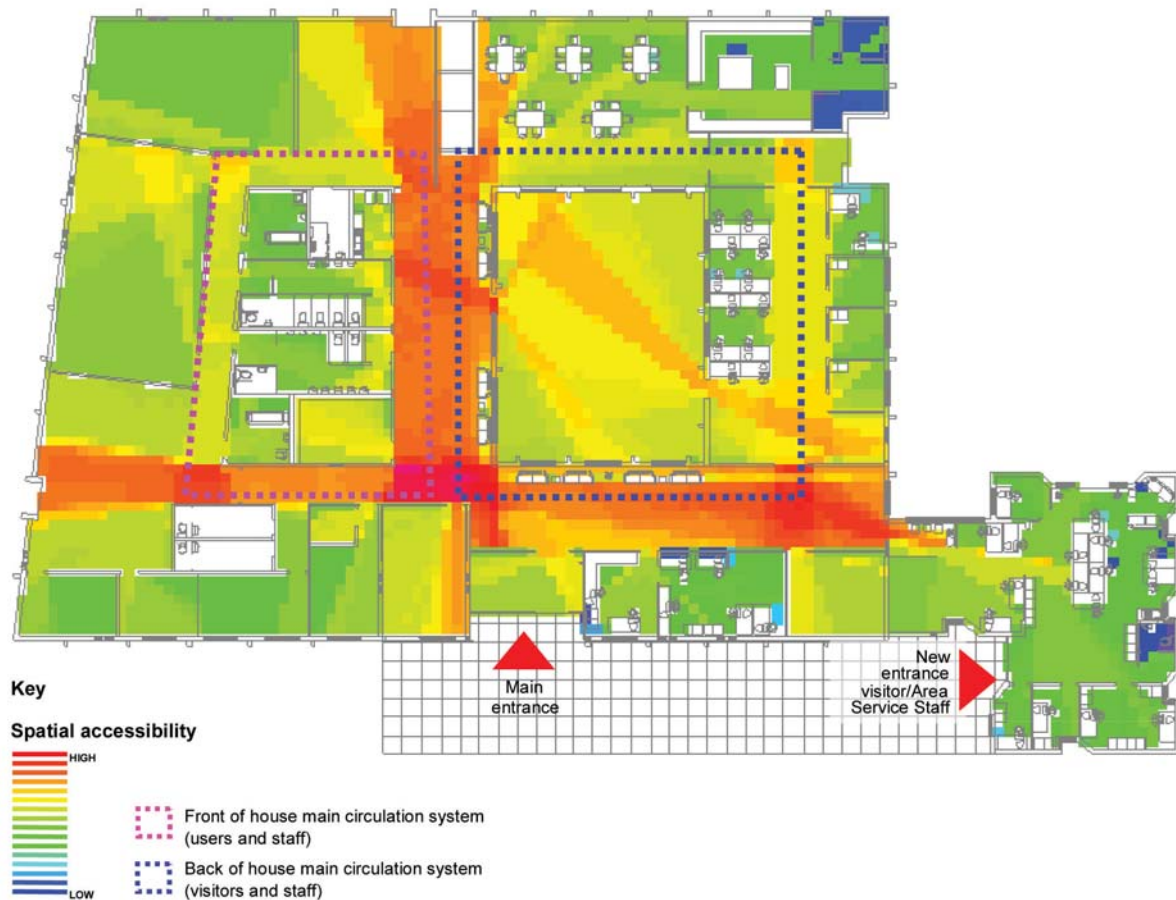
Conclusions

Using the space syntax methodology, the study found that the ability to provide social service care is significantly affected by the layout of each building. The study showed that a well-designed building, in this case typified by the day care centre for adults with learning disabilities, allows for a more efficient service delivery. It also shows that 'good' buildings are flexible and therefore able to accommodate changes in the delivery of social work services meeting the ever changing expectations of its service users.

Buildings with a clear and intelligible spatial layout, where service users and staff can understand the way the building is organised are easier to manage and provide a more comfortable environment for service users. Circulation, in particular, plays a key role in providing this. It influences the patterns of co-presence between staff and service users throughout the building, and as a consequence affects the level of staff and/or service user interaction, the institutional levels of communication and innovation, as well as the informal surveillance within them.

Lastly, through understanding the specific issues inhibiting satisfactory delivery of care and adequate staff interaction in each of the buildings, recommendations were made for interventions to the existing buildings and on general design guidelines for future social services facilities. It shows that, despite physical constraints within the existing buildings and budgetary limitations, good design can be achieved.

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i. In the particular case of this study, these references are related to the Scottish Health Service. These principles can nevertheless be generalised to apply to the Health Service for the United Kingdom.
ii. Such as finding accommodation for service users, sorting out benefits, etc.
iii. Information on staff views on the service organisation was also collected via structured interviews and Staff Communication Pattern Questionnaires, although these are not covered in this paper. For more information on those, refer to Space Syntax 2005 report.
iv. Such as friends or relatives.
v. The analysis of the day care centers does not address the outdoor spaces, with exception of a courtyard in the Day care centre for adults with learning disabilities building.
vi. The VGA map was constructed by dividing all accessible space in the selected buildings – on the basis of an accurately scaled map – into a rectilinear grid of points, in this case, 0.7m by 0.7m.
vii. Point depth from the entrance.
viii. Also referred to as wayfinding, the mathematical expression for "intelligibility" in this paper is defined as the degree of correlation between local (radius-3) and global (radius-n) accessibility levels.
ix. Ibid footnote 3.
x. It is not uncommon for a number of different departments to deal with one family such as Children and Family and Addictions.
xi. The number of visibility steps from the entrance in the Area Services building is 10.
xii. Area Service Team and an Area Learning Disabilities Team.
xiii. Ibid footnote 8
xiv. Although not included in this paper, the Space Syntax analysis also included a) a building location that is accessible to transport, retail and services and b) a building integrated into the surrounding community
xv. Refer to Section 4.2.

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