

Clementinah Rooke, Patricia Tzortzopoulos, Lauri Koskela (2010)



Document detailing the wayfinding experiment to be conducted at Salford Royal Hospital,
A setting of the Salford Royal NHS Foundation Trust

by

Clementinah Rooke

Phd (2008-2011), MA, BSc (hons), DipHE, Cert Ed

University of Salford

Summary

This document is a summary of the proposal to conduct a wayfinding experiment in the Red area of Salford Royal NHS hospital. The experiment is part of the ongoing research on wayfinding which is split into two overlapping phases. The first phase studied the existing environment in order to establish how people visiting the hospital make sense of the environment in finding their way. Helpful and unhelpful aspects of the current wayfinding system were identified and reported. The second phase focuses on informing strategies for improving wayfinding across the hospital. In this document a brief description of the background and context of the research is offered prior to a detailed description and explanation of the problems encountered and how the experiment will be conducted (methodology). The potential benefits to both the researcher and Salford Royal hospital are described last.

Background and context

Salford Royal hospital is a complex environment whose wayfinding problems are recognised by management, staff and users alike. The site is made up of colour coded areas: Red, Green, Yellow, Orange Blue and Purple. Currently there are 9 entry points across the site and main entrance is located in the Red area. Through here, all other areas can be reached via a connecting corridor found on the first floor. The challenge faced by visitors using the main entrance (Fig 1) is to successfully navigate through the maze between the main reception and the connecting corridor. To get to the corridor the wayfinder can choose from 4 routes accessible either via the stairs or lifts. These have different starting points on the ground floor. However, missing from the key decision making point (DMP) (Fig 2) of this part of the hospital are instructions on how to get to the first floor and where to find the various entry points in the first place. Thankfully, the lifts which are situated between the Red and Blue area (Fig 4) are in clear view and happen to be what the wayfinder resorts to if immediate help is not offered at the information desk. The other three entry points can be found either through exploration or by following verbal instructions obtained at the information desk. The four routes including the main entrance and the key are explained with the aid of photographs below.

The four routes explained

The main entrance is easy to identify and is in clear view from both the road and the car park. From the moment the visitor enters the building, the information desk situated directly opposite the revolving glass door can be seen. It is less than 50 metres away and next to it is the key DMP (Fig 2) which can also be seen from the entrance. This sign is in clear view from the moment the wayfinder enters the hospital through the main entrance. Situated next to the information desk (left) and the entry to the Plaza Shopping Mall (right), it stretches all the way from the floor to the ceiling. Nineteen destinations most of which are indicated by way of an arrow followed by text can be seen

here. However, on this sign, there is no mention of the connecting corridor leading to the Purple, Orange and Green areas. The wayfinder is given the impression that these areas are on the first floor together with two other departments.

The entry to the first route (stairs) is situated near the information desk (Fig 3). The door seen to the left of the red bench is marked with the words **STAIRS**. To get to the staircase, the wayfinder must open one more door which is immediately visible on opening the first one. On the first floor, the wayfinder is presented with yet another door which opens to a corridor (Fig 4). Slightly to the right and on the wall opposite the door is a sign bearing directions for several destinations (Fig 5). On it the directions for the Orange, Purple and Green areas are indicated by way of an arrow pointing to the left. Following these directions takes the wayfinder to the third DMP (Fig 16) along this route.

Access to the second route (lifts) is to the left of both the information desk and the entry point to the first route. It is contained in the space between the Red and Blue area (Fig 6). In here two signs showing directions for the Red and Blue area can be seen. A map situated on the wall to the right of the lifts can also be seen. In the space between the lift is yet another sign telling the wayfinder that they are in the Red area. Once on the first floor, the wayfinder exits into an enclosed area (Fig 7) similar to the one on the ground floor. Here two signs hanging from the ceiling guide the wayfinder to the Plaza and the Outpatients Department. On either side of this enclosure, are two doors which are directly opposite each other. One opens up to the Blue area whilst the other leads the wayfinder to the same corridor described for route 1 above (Fig 4). Beyond the open door seen here is the same DMP seen in Fig 5. The exit point to the first route is a few meters to the right (Fig 8).

The third and fourth routes are located beyond the Plaza Shopping Mall: a commercial area equipped with almost everything that can be found on the High street (Fig 9, 10, 11). A sign announcing the presence of the stairs protrudes from the wall on the left as the wayfinder leaves the Plaza (Fig 12). A door leading to the staircase is situated less than a meter inside the break seen in the wall just before the sign. A few meters further down are directions for other departments within the Red area hanging from the ceiling. The corridor leading from the Plaza curves sharply to the left at the vending machine seen here. More signs, also hanging from the ceiling (Fig 13), can be seen as soon as the wayfinder turns left. One of them is an arrow pointing to the left followed by the words **LIFTS**. Two of them give information on how to get to the Yellow, Green, Orange and Purple areas (via the first floor), a message different to that communicated on the key DMP (Fig 2). Inside the lift area a directory containing various departments on each level/floor of the Red area (Fig 14) can be seen on the wall. Another sign hanging from the ceiling announces the directions for the Surgical Admissions Lounge with an arrow pointing left (into the lifts) followed by the words **Third Floor** in brackets.

On the first floor the 3rd route exits via a door directly opposite the same corridor seen in Figs 4 & 8 above (Fig 15). Beyond the sign for the stairs seen here, the corridor curves slightly to the left at the door seen in this photograph. The wayfinder exiting from this route is presented with the same DMP described as the last one for routes 1 & 2 (Fig 16). It can be seen on the wall to the right in this photograph. On the sign the instructions for the Green, Orange, Purple and yellow areas are indicated by an arrow pointing to the left followed by the words '**Access to...**'. The wayfinder using the 4th route (lifts) exits into the enclosed lift area seen in Fig 17. Two signs hanging from the ceiling immediately

lead the wayfinder back into the lifts with the directions for the Outpatients department (ground floor) and the Surgical Admissions Lounge (third floor). On the wall directly opposite the lift area is the same DMP used by wayfinders exiting from routes 1, 2 & 3 above.

The breakdowns

There are several breakdowns in the flow of wayfinding information along all the four routes. The first breakdown is that encountered by those using the first and third routes. It is found in the area where all the routes converge. Here, the DMP bearing wayfinding information for the Orange, Green, Purple and yellow areas is positioned in such a way that gives the impression that access to these areas is through the door seen here. This appears to be read in conjunction with the initial instruction on the key DMP stating that these areas are on the first floor. Those visiting the hospital for the first time can be observed walking up to the door only to find that the door is private to staff. A digital key pad positioned near the door handle plus a sign with the words **staff only** clearly communicates that one cannot proceed beyond the door. However, some, depending on the state of their mind at the time, go as far as attempting to open the door. In this part of the hospital spontaneous help is offered by fellow wayfinders or staff with prior knowledge of the setting. If help is not readily available, the wayfinder can be observed looking for further clues by walking all the way to the door which marks the exit to the Red area and entrance to the connecting corridor (Fig 19).

The wayfinder who uses the second route encounters their first breakdown in the enclosed lift area on the first floor. Within the lift area nothing guides the wayfinder on how to get to the other areas of the hospital. Here the only information available is that leading the wayfinders back into the lifts or to the Blue area which is clearly signposted. The DMP (Fig 5) with the directions for the other areas is visible only if the door leading out of the lift area is left open. However, as it is not standard practice to leave the door open all the time, this vital DMP is rendered useless during the times when the door remains closed. The second breakdown along this route is the same one describe above.

Those using the fourth route encounter similar breakdowns to those described for the second route. The wayfinder emerging from the lifts is presented with a similar layout: a door leading to the Blue area on one side and one exiting the lift area directly opposite, signs hanging from above guiding the wayfinder back into the lifts and a directory for the various departments in the Red area. Here people can be seen displaying 'a looking lost behaviour' in search for further clues. However, the open door at the end of the glass wall seen in fig 17 seems to encourage an intuitive movement towards the sign which has been strategically positioned on the wall directly opposite the lift area. However, this intuitive movement only appears to be possible when the door is left open. Once out of the of the lift area, the next breakdown to contend with is the same one that for routes 1, 2 & 3: the instruction giving the impression that the Orange, Purple, Yellow and Green areas can be accessed through the door in the area where all the routes converge.

In this section the four routes available for the visitor who wishes to get to either the Orange, Purple, Yellow or Green areas of the hospital via the Red area have been described with the aid of photographs. According to the information on the key DMP these areas are on the first floor. However, on reaching the first floor, it is clear that this is not the case. One must use a connecting corridor (Fig 20 & 21) which starts beyond the area where all the four routes converge (Figs 18). This

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point is located where the building housing the Red area ends. For the purposes of this experiment, three significant DMPs for the four routes are identified. There is the key DMP on the ground floor, the one in the corridor on the first floor and the one where all the routes converge. Two major breakdowns in the flow of wayfinding information along these routes are focussed on. The first occurs inside the lift areas for routes 2 & 4 and the second can be found where all the routes converge. The use of colour coded arrows is suggested as the appropriate repair for both breakdowns. In the experiment the researcher seeks to test whether the suggested repair will improve wayfinding in this setting. The researcher is confident that this intervention will reduce or completely eliminate the confusion occurring in these areas. The experiment is described below.

Experimenting with colour-coded arrows

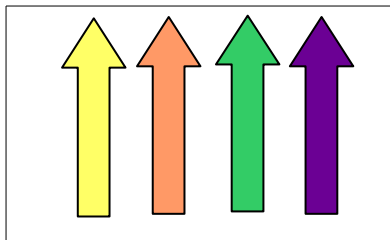
The proposed solution which focuses on how knowledge is communicated or managed with particular reference wayfinding is underpinned by the tri-partite conception of knowledge flow and lean knowledge management. It is believed that having the **right information**, in the **right form** and in the **right place** should add value to the wayfinder by reducing or eliminate the confusion that occurs in this setting.

The tri-partite conception redefines the informational and practical aspects of knowledge, combining them with a conception of physical objects and environments as information carrying entities which are constituted, recognised and used in the course of social practice. Thus, the formulation includes: [1] information; [2] social practice; [3] the physical properties of objects in which knowledge can be embedded. In complex environments such as large hospitals, wayfinders tend to rely on the three knowledge flows in order to find their way around. The first channel for example can be represented by graphical information on direction giving signs for both external and internal purposes. The second is represented by the practice of giving verbal instructions by staff, volunteers or other visitors to the setting. The last can be seen in how it is possible to identify the main entrance to the hospital without the need for written or spoken word (e.g. protruding structure with wide glass doors from top to bottom). Clearly, it is necessary to integrate all three modes in order to cater for all kinds of users including those who may be unable to read. Incorporating the three aspects of the tri-partite conception of knowledge flow when designing wayfinding systems is likely to ensure a lean system which should not only help meet the needs for all but add value to the the customer.

At Salford Royal, it is clear that the wayfinding system heavily relies on information (signs) and the practice of giving verbal directions. The impact of the physical properties of hospital on wayfinding is generally overlooked. This can be seen in the way some signs are positioned in such a way that creates confusion and ambiguity. In the brief explanation of the proposed solution below the value of paying attention to the physical properties of the environment is highlighted.

Proposed use of colour-coded arrows

Any wayfinding information must have a destination and direction. The signs analysed so far indicate that at Salford Royal this is mostly in the form of an arrow followed by text naming the destination. The use of colour-coded arrows suggested here eliminates the need for text. Thus both the destination and direction are contained in a single artefact. This should also effectively eliminate the distress that is likely to be suffered by those who cannot read for one reason or another. The arrows will be positioned at a height that will be accessible to all kinds of users including those in wheelchairs. Equally important is the positioning of the arrows in relation to the complex physical layout of this part of the hospital. This should help ensure that the **right information** in the **right form** is in the **right place**, thus delivering it to **the right people** at the **right time**.



On the ground floor

It is suggested that in both lift areas on the ground floor the colour-coded arrows be placed pointing upwards (see attached document) in the space between the lifts. This should help support the instructions given at the information desk or that on the key DMP that the Yellow, Orange, Green and Purple are on the first floor.

On the first floor

Here, it is suggested that the arrows should be placed in the same space suggested above but with the arrows facing the direction in which the next DPM is to be found. Thus right pointing arrows should be placed in the space between the two service lifts and left pointing arrows in the space between the two ordinary lifts. This repair applies for both routes 2 & 4. Following the direction of the arrows should take the wayfinder to the DMP seen in fig 5 in the case of route two and that seen in fig 16 in the case of route four .

The area where all routes converge

The space on the protruding wall in this part of the hospital is ideal for placing the colour-coded arrows. Placing the arrows on the part facing the corridor onto which routes 1, 2 & 3 emerge should help eliminate the confusion that that the door a few meters to the right of the DMP seen here is the desired entrance (see attached doc). However, as this part of the wall is not visible to those emerging from route four, a second set of arrows is suggested for the part that faces the lift area for this route (see attached doc). Doing this should allow the smooth flow of the instructions given by arrows

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placed in the space between the lifts. In turn, it should eliminated the need to go to the confusing DMP on the wall.

Methodology

Through action research, several breakdowns in this setting continue to be analysed and solutions are being developed and tested by observing the behaviour of the wayfinders in context, in discussions with the hospital's redevelopment team and through the use of Information Technology means such as Second Life. For this experiment, once the colour-coded arrows are in position, their impact on wayfinding behaviour will be measured using participant observation (ethnography) and direct observation in the Virtual Environment of Second Life. Both methods are briefly described below.

Participant Observation

Using this method will require the researchers to observe how people make sense of the colour-coded arrows designed to eliminate the confusion created by ill positioned signs wayfinding. These direct observations will be supplemented by conversations with other visitors to the hospital and with members of staff and hospital voluntary workers. Based on the experience gained during the first phase of this research, it is expected that spontaneous discussions will arise with staff, volunteers and other visitors to the setting.

The researchers will observe the behaviour of wayfinders on every day of the week over an intensive period of 7 days. Half of the week will be spent on observations starting as early as 0700hr ending at 1400hr. The other half will be spent on observations starting at 1400hr lasting until 1900hrs. This pattern should allow for the inclusion of the hours when it is almost impossible to turn to anyone for directions. In the weeks that follow the findings from the experiment will be compiled into a report which will be presented to Salford Royal Hospital's Redevelopment team no later that 5 weeks from the start of the experiment.

Direct observation in Second Life

This method will be used as means of comparing the behaviour of wayfinders in the real setting of Salford Royal hospital with that of wayfinders in the virtual model of the same hospital. Here the researchers will invite participants to walk the four routes described above first without the colour-coded arrows and later with colour-coded arrows in position. This activity will require the researchers and participants to be logged into the virtual world at the same time. In addition to the researchers observations, the participants will be asked to report on their experiences by responding to a set of open ended questions either in writing or in a one to one interview with one of the researchers. As this is a technological intervention, it is not expected that it will be as labour intensive as the first experiment. Thus it is envisaged that the findings of this experiment will be reported at around the same time as those of the earlier experiment. In the event that this fails, it should be possible to

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present a separate report detailing the findings from this experiment at a time convenient to the team of researchers working on Second Life project.

Potential benefits

The potential benefits of conducting this experiment are briefly summarised under industry and academic impact below. It is believed that both Salford Royal hospital and the researcher will benefit from a successful completion of this exercise.

Industry impact

Based on evidence collected in phase one of this research, it can be said that the problems of this setting are a result of three things: information overload throughout the entire hospital, the absence of vital wayfinding information where visitors appear to look for it and the ambiguity caused by poorly positioned signs including the ill articulation of colour as a wayfinding tool. The result has been a heavy reliance on staff and volunteers. This is reflected in the chaos that occurs during the days and times when volunteers and personnel are off duty. The layout of the setting is far too complex to explain verbally and the large volume of sign designed to solve the problems created by the complex layout appear to cause more confusion.

In both the short and long term Salford Royal hospital should benefit from the use of colour-coded arrows in the following ways:

- a reduction in the need for staff to stop to offer help to anyone lost or appearing to be lost. This means that staff will not have to divide their working day between direction giving and their normal duties, the result being improved service delivery and customer satisfaction.
- improved physical health for the wayfinder due to reduced levels of anxiety. The later may impact negatively on diagnosis (elevated blood pressure etc.)
- improved fiscal health for the organisation due to:
 1. cutting down or eliminating the hidden costs associated with direction-giving by people other than information staff or those that may arise from missed appointments etc.
 2. reducing the need to continue purchasing signs that are unlikely to solve the problems of a complex layout.
- increased awareness, on the part of key decision makers, of the need to design a wayfinding system that ensures that the right information in the right form is in the right place, thus communicating with the right people at the right time.

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Academic impact

Completing this experiment successfully will help extend the current body of literature on knowledge management. A successful operationalisation of the tri-partite conception of knowledge flow in the built environment would mean bringing together two disciplines: design and knowledge management. Thus the conception can be used to sensitise designers to the varied needs and knowledge levels of wayfinders when designing buildings and wayfinding systems in the first instance. It should also be possible to derive generic guidelines for designing wayfinding systems for complex hospital environments.