PUPILS, POP-UPS AND PROTOTYPING

Or, how we applied innovative human-centred design methods to create the right library environments at Cambridge University

12th International Conference on Performance Measurement in Libraries - Wednesday, 2 August 2017
Imagine what’s next…

We’re a boutique design practice and innovation consultancy that specialises in imagining disruptive new products, services and experiences then making them a reality.

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Protolib
Physical environment design for Cambridge University Library

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Carnaby
Experience design for a European department store
Designing for dementia
Physical environment design for a dementia facility
Methodology
Protolib I + Protolib II
METHODOLOGY:
Step 1: Explore space needs

01_ Meta-analysis of existing research
02_ Codesign workshops
03_ Serious Play workshop
METHODOLOGY:

Step 1: Explore space needs

04_ Iterative Prototyping
05_ Ethnographic observation
06_ Exit interviews
07_ Surveys
08_ Feedback mechanism
09_ Expert interviews
10_ Conceptual design
**METHODOLOGY:**

**Step 3:** Understand how and when students use libraries

01. Diary studies
02. Geolocation
03. Exit interviews
### METHODOLOGY:

**Diary study in numbers**

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
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<tbody>
<tr>
<td><strong>PARTICIPANTS</strong></td>
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<td>MPhil</td>
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<tr>
<td>PhD</td>
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<td><strong>Disciplines</strong></td>
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<tr>
<td><strong>LENGTH OF STUDY</strong></td>
<td>21 days</td>
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<tr>
<td><strong>INDIVIDUAL DATA POINTS</strong></td>
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</table>
METHODOLOGY:

Step 4: Understand peoples’ wayfinding behaviour once inside the library

04_ Eyetracking
05_ Shadowing
06_ Observations

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TOBII EYETRACKER
Eyetracking headset
<table>
<thead>
<tr>
<th>Library类型</th>
<th>名称</th>
<th>注册借阅者总数</th>
<th>月借阅书籍总数</th>
<th>关键用途</th>
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<tbody>
<tr>
<td>科学图书馆，偶尔使用</td>
<td>科学图书馆，偶尔使用，有中等程度的收藏使用</td>
<td>1,000</td>
<td>100</td>
<td>为期一堂课的工作区，更长的学期工作区和作为阅读材料的来源</td>
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<tr>
<td></td>
<td>686 REGISTERED BORROWERS</td>
<td></td>
<td></td>
<td>KEY USE Between-lecture workspace, longer term workspace and source of reading materials</td>
</tr>
<tr>
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<td>大学图书馆</td>
<td>45,000</td>
<td>13,250</td>
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<td></td>
<td>KEY USE Between-lecture workspace, longer term workspace and as a source of resources</td>
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</table>
**METHODOLOGY:**

**Step 5:** Design and test a series of design interventions to improve the usability of physical library spaces

07_ Design and prototype
08_ Test interventions (eyetracking + shadowing)
09_ Iterate, refine and retest
METHODOLOGY:

Step 6: Create a design concept for libraries services within each of the 3 University hubs

10_ Ideation
11_ Concepting
12_ Concept Validation
Key Findings
Design Research
FACTS
Information that defines very specifically what has happened.

FINDINGS
Information that defines patterns & trends in what has happened & can identify influencing factors.

INSIGHTS
Explains why something is or isn’t happening and inspires and directs new opportunities.

REPORT
Assess success of changes over time

ACTION
Implement incremental or major changes to what’s offered to customers and how.

STRATEGY
Reinvent what is offered to customers and how.

WHAT

WHY

OBSERVE & LISTEN

MONITOR

REACT

TRANSFORM

RESPOND

REPORT

ACTION

INSIGHTS

FACTS

FINDINGS

MONITOR

REACT

TRANSFORM

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The mindset of a student influences their motivations and their aspirations

- **The Networker**
  
  “It’s a means to an end”

- **The Balancer**
  
  “It’s important to find a balance”

- **The Grafter**
  
  “I need to work really hard”
There are five factors which dictate people’s studying behaviour.
Intrahub or Extrahub: The location of college and department influences a student’s needs
Putting it all together...

Why Daisy works in her room
People have an individual hierarchy of working activities

- Tertiary activities
- Secondary activities
- Primary activities
- Reflection or break

<table>
<thead>
<tr>
<th>LOWER INTENSITY ENVIRONMENT</th>
<th>HIGHER INTENSITY ENVIRONMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflection or break</td>
<td>Primary activities</td>
</tr>
<tr>
<td>Tertiary activities</td>
<td>Secondary activities</td>
</tr>
</tbody>
</table>
People choose their working environment based on 3 factors:
Varying their environment helps people to maintain concentration and productivity

“I had been in the UL all morning and needed a change of scene, somewhere comfy to do data analysis.”

– PhD student, Department of Psychology, University of Cambridge. Interviewed outside the South Reading Room low intensity prototype environment at the University Library.
The working week:
Writing essays
Weekends

3 DAYS
READING

2 DAYS
WRITING

1 DAY
PROOFING
Social Groups: Students belong to two types of social groups and their involvement within them changes over time.
More chairs does not mean a higher level of occupancy

North Reading room (original layout)
Original layout featuring a mixture of café-style circular tables and rectangular tables.

<table>
<thead>
<tr>
<th>CHAIRS</th>
<th>HIGHEST</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>11</td>
<td>7</td>
</tr>
</tbody>
</table>

North Reading Room (Prototype 1.0)
A more regular layout of large rectangular tables. 4 chairs to a table.

<table>
<thead>
<tr>
<th>CHAIRS</th>
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<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>15</td>
<td>11</td>
</tr>
</tbody>
</table>

North Reading Room (Prototype 1.1)
Same as prototype 1.0 but with the addition of lamps and plug points.

<table>
<thead>
<tr>
<th>CHAIRS</th>
<th>HIGHEST</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>13</td>
<td>12</td>
</tr>
</tbody>
</table>
North Reading Room: fewer chairs, higher occupancy when sightlines blocked by plants

North Reading room (Prototype 1.2)
Same as prototype 1.1 but with the addition of plants blocking sightlines.

<table>
<thead>
<tr>
<th>CHAIRS</th>
<th>HIGHEST</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>18</td>
<td>14</td>
</tr>
</tbody>
</table>

North Reading Room (Prototype 2.0)
Similar to prototype 1.0 to 1.2 but with the tables reorientated and placed next to windows.

<table>
<thead>
<tr>
<th>CHAIRS</th>
<th>HIGHEST</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>20</td>
<td>15</td>
</tr>
</tbody>
</table>
South reading room: fewer chairs, less intense feel, similar occupancy

South Reading room (original layout)
The original layout featured a mixture of comfortable chairs and large shared tables.

South Reading Room (Prototype 1.0)
The large tables and chairs have been replaced with additional sofas and coffee tables, and the whole room has been made more cosy with the addition of cushions, blankets and rugs.

South Reading Room (Prototype 1.1)
Same as prototype 1.0 but with the addition of lamps and plug points.
South reading room: fewer chairs, less intense feel, similar occupancy

- **South Reading room (Prototype 1.2)**
  Same as prototype 1.1 but with the addition of floor standing lamps giving each seat a personal light source.

<table>
<thead>
<tr>
<th>CHAIRS</th>
<th>HIGHEST</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>12</td>
<td>11</td>
</tr>
</tbody>
</table>

- **South Reading Room (Prototype 2.0)**
  Sofas reoriented so that none of them face each other.

<table>
<thead>
<tr>
<th>CHAIRS</th>
<th>HIGHEST</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>15</td>
<td>9</td>
</tr>
</tbody>
</table>

- **South Reading Room (Prototype 3.0)**
  Alternative lay out so that fewer sofas face each other.

<table>
<thead>
<tr>
<th>CHAIRS</th>
<th>HIGHEST</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>13</td>
<td>10</td>
</tr>
</tbody>
</table>
South Reading room (Prototype 1.2)

Heatmap showing the occupation of seats within the low intensity prototype environment. Those sofas near the windows and plug are distinctly more popular than those away from these facilities.

Observation showed that these seats were in constant use and the first to be occupied in the prototype.

North Reading Room (Prototype 2.0)

Heatmap showing the occupation of seats within the medium intensity prototype environment. Those chairs nearest the windows and plug points were the most popular.

It is important to note that the presence of plants blocking sightlines reduced the feeling of being overlooked which would normally prevent people from choosing to sit in the middle of a room.
Designing at the site level: Hubs and Halos

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Food is an important part of a student’s working day

“A panini for lunch is about as good as it gets on the Sidgwick site.”

– Third year history undergraduate and president of their College JCR
Library Environments: A pattern language

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3-levels of design patterns: sites, layouts, spaces

**Site**
Patterns corresponding to groups of buildings. These patterns provide approximate relative sizes and spatial relationships. These patterns are based on user needs.

**Layout**
Patterns corresponding to groups of spaces. These patterns describe how spaces relate to one another and can be configured in usable arrangements.

**Space**
Patterns corresponding to individual spaces. These patterns describe the design of working spaces.
THE SIDGWICK SITE:
Target intensity ratios

EXISTING INTENSITY RATIO
Sidgwick hub

67% HIGH
29% MEDIUM
4% LOW

TARGET INTENSITY RATIO
Sidgwick hub

30% HIGH
50% MEDIUM
20% LOW
THE SIDGWICK SITE:
Space relationships

Notes
This diagram illustrates approximate relative sizes and spatial relationships. The diagram shows one potential future configuration, many others are possible. This future configuration is based on user needs, other factors should of course be considered.
CONFIGURATION

Relative sizes

ULTRA HIGH INTENSITY SPACE

HIGH INTENSITY SPACE

MEDIUM OR LOW INTENSITY SPACE
Transition zones should be used to allow people to circulate between distinct space types

The key role of transition zones is to preserve the individual qualities of distinct space types by acting as a buffer between them. They reduce the disruption caused by movement between spaces, and act as a distinct physical cue that prepares people for a change in behaviour appropriate to the new space. Examples of transition zones include spaces like vestibules, corridors and landing zones.

A single transition zone can serve multiple space types at once

A single transition zone can be shared between multiple space types. This will result in an increased amount of traffic in the transition zone. When this situation arises it may be more appropriate to create a landing zone. Landing zones are larger transition zones in which people can meet, gather or organise their belongings.

Ultra high intensity spaces should be accessed through layered transition zones

Due to the strict silence required in ultra high intensity spaces, they should be distanced from busier or noisier spaces by multiple transition zones. This will decrease the amount of disruption the high intensity spaces experience, and help to preserve a focused, disciplined atmosphere.
Expertise points should be located in areas with sufficient through-traffic, such as landing zones.

Expertise points should be located in landing zones or transition spaces. The increased amount of traffic in these spaces will provide more publicity for the space and help invite people to engage with experts in a more informal way. People will also feel more comfortable having discussions with experts in these areas, rather than in areas with noise restraints where talking is less acceptable.
MULTI-ENVIRONMENT CONFIGURATION

Spatial boundaries / Boundary delineation

Solid boundaries
Spaces with distinct characteristics, especially with regard to intensity or noise levels, should be separated by solid boundaries. This helps to preserve the specific characteristics of the spaces which are crucial to their role within the wider environment. Transition spaces should be introduced as a buffer between two solid boundaries, in cases where openings in a single solid boundary could disrupt the nature of a neighbouring space.

Permeable boundaries
Spaces with similar characteristics in terms of noise level or intensity can be separated by more permeable boundaries, such as changes in level, plants or even just their distance from each other. In many cases their awareness of each other can even be helpful, for example, in the case of a cafe generating helpful background noise for a between-lecture work environment.

No boundaries
Some spaces can be located in other spaces, without any real perceived boundaries, to the advantage of both. For example, in the case of an expertise point located in a landing zone, the absence of boundaries could help increase awareness of the expertise point and increase its approachability by enabling more informal interactions. This in turn could create a landing zone which creates a good first impression, as the increased number of scholarly interactions would make it a hive of academic exchange.
DESIGN PATTERN

Medium intensity environment

HUMANISING FEATURES
One of the key differences between a high and medium intensity space is the existence of humanising features such as plants or artwork, which make the space feel more personal and less oppressive. The presence of plants on tables contributes to the medium intensity environment by blocking sight lines between workstations, which in turn helps reduce the sense of exposure in the space.

INDIVIDUAL TASK LAMPS AND PLUG SOCKETS
Due to the amount of time people spend working in medium intensity environments, each desk space should be provided with its own individual task lamp and plug sockets. Individual task lamps enable people to work at desk spaces for longer, as they can adapt their workspace to different tasks, varying light conditions and personal preferences. People working for long periods of time may need to charge multiple devices throughout the day, and so provision should be made for at least 2 plug sockets per person.

DESKS AND CHAIRS WITH A GENEROUS AMOUNT OF SPACE PER PERSON
Medium intensity spaces should be furnished with desks and chairs. Each individual should be provided with a surface depth of at least 60cm and a surface width of at least 120cm, in order to support the use of multiple materials during work activities. This increased amount of individual desk space also reduces the density of occupancy of the room, which contributes to the creation of a medium intensity environment.
CONFIGURATION

Medium intensity environment
CONFIGURATION

Medium intensity environment

MAXIMUM 20-PERSON LAYOUTS
Each medium intensity space layout can contain furniture blocks of between 2 and 4 people, with up to 20 people visible to each other at any one time. Layouts consisting of more than 20 people should be divided by a visual buffer, which lowers the degree of exposure by reducing the number of people visible in each section of the space to a maximum of 20.

MAXIMISE ACCESS TO NATURAL LIGHT AND VIEWS
Workstations next to windows are the most popular due to the provision of natural light and views of the outside world, which contributes to the medium intensity nature of the space. Space layouts should therefore maximise the number of workstations with access to natural light and views.

GENEROUS SPACING BETWEEN DESKS
An increased feeling of space is important in the creation of medium intensity environments. Generous spacing should be allocated between furniture blocks, in order to create a space which is less densely populated than higher intensity spaces.
**DESIGN PATTERN**

**Low intensity environment**

**SOFAS AND ARMCHAIRS**

The use of living room-style furniture such as sofas and armchairs is essential in the creation of low intensity spaces. These soft furnishings provide people with the comfort they need when looking for a change of scenery from medium or high intensity spaces.

**A FLAT SURFACE FOR EACH SEAT**

People conduct a range of activities in low intensity spaces, some of which require a flat surface. Flat surfaces should therefore be provided for each seat. As a minimum, these flat surfaces could take the form of wide, flat arm rests on sofas, which can be used for working with books, notepads or laptops. As an optimum, they would take the form of high, moveable coffee tables which can be placed to the side of the sofa for setting books or a drink, or to the front of the sofa to allow for laptop use.

**ATMOSPHERIC LAMPS AND INDIVIDUAL READING LIGHTS**

Low intensity spaces are characterised by softer, living room-style environments, created in part through the use of atmospheric lighting. In addition to this, standing floor lamps with adjustable task lamps help to raise overall lighting levels in the space, whilst supporting users with their tasks. Provision of task lamps enable people to adapt their environment to changing lighting conditions or personal preferences.
DESIGN PATTERN

Low intensity environment

CUSHIONS AND BLANKETS
Cushions and blankets increase personal wellbeing by enabling people to adapt the space to their own comfort requirements. Cushions are used to change seating positions or rest books on, whilst blankets are used for warmth and comfort when people are feeling cold, tired, stressed or unwell.

HUMANISING FEATURES
Humanising features such as plants, fresh flowers and artwork contribute to the low intensity environment by making the space feel more personal and familiar.

PERSONAL SPACE
The increased amount of personal space in low intensity environments provides people with a change from more densely populated medium and high intensity spaces. People make use of this additional personal space to think, reflect and recharge. People will take up the space they need to feel physically and mentally comfortable, for example, by taking up both seats on a two-seater sofa. Personal space must be carefully considered when designing layouts and furniture configuration for low intensity environments.

ACCESS TO PLUG SOCKETS
Along with windows, plug sockets are a feature which increases the popularity of seats within low intensity environments. People will move seats in order to gain access to available plug sockets. Each seat in a low intensity environment should have access to one or more plug sockets to enable people to charge their devices.
CONFIGURATION

Low intensity environment
CONFIGURATION
Low intensity environment
Closed Analysis Space

**PLenty of Clear Wall and Surface Space**
Analysis spaces need to provide a large amount of wall and surface space, to facilitate the organisation and analysis of large piles of notes or data. Wall surfaces should be white to contribute to the airy, minimalist feel of the space, and smooth so that post-its will easily stick to them. The space will require at least one large table, or several smaller tables for organising piles of notes or data. Additional surfaces in the form of shelves or bookcases should be provided, for the storage and organisation of notes and analysis materials.

**Enclosed Room**
Due to the complex and lengthy nature of analysis activities, analysis spaces need to be enclosed, lockable spaces located near subject specialists. This enables people conducting analysis activities to store their work and belongings over longer periods of time and access the help they need as and when they need it. In situations where the provision of bookable or lockable spaces isn’t possible, provisions should be made for the storage of analysis work, for example in whiteboard lockers.

**Whiteboards**
Whiteboards and flip-charts should be provided in addition to blank walls, in order to maximise the amount of surfaces available for analysis, whilst also enabling people to visualise complex ideas or summarise findings.
DESIGN PATTERN

Closed Analysis Space

CLEAR ACCESS TO PERIMETER WALLS
The layout of an analysis space should ensure that people have clear access to all perimeter walls. This can be achieved by locating any furniture in the centre of the room and allowing clear circulation space around it.

MAXIMISE WALL SPACE WITHOUT SACRIFICING NATURAL LIGHT LEVELS
Analysis spaces should be designed to allow for an optimum amount of wall space, without sacrificing the amount of natural light entering the room. The size or number of window openings should be proportional to the size of the room and/or amount of free wall space available. One way of doing this would be to keep openings focused on one of the four walls, leaving the other three clear for analysis.

LARGE TABLE IN CENTRE OF ROOM FOR ORGANISING DATA
Analysis spaces should contain a large table in the centre of the room to provide people with enough surface space to arrange large piles of notes and other other forms of data.
High intensity environment

**TRADITIONAL TABLES AND CHAIRS WITH REDUCED AMOUNTS OF DESK SPACE PER PERSON**

High intensity spaces are furnished with traditional tables and chairs, in a layout which provides a reduced amount of desk space per person. This more densely populated layout results in people sitting closer together. This reinforces the disciplined nature of the space, as people have a feeling that others in neighbouring seats are monitoring their activity, and therefore stay more focused on their task.

Desks in high intensity spaces should be longer and positioned more closely together than those in medium intensity spaces. This helps to create a more densely occupied space, which increases the intensity of the environment.

**LARGE, OPEN-PLAN SPACE WITH A HIGH LEVEL OF EXPOSURE**

People experience more social pressure in larger, more densely occupied, open-plan spaces. The size and open-plan nature of the space is important, as the sense of peer pressure, low level of transience and self-policed level of silence in the space are directly linked to the number of people that can be seen working in the space.

High intensity spaces should have open sightlines which create a high degree of exposure. This enables people in the space to be aware of all other occupants of the space. This in turn increases the amount of social pressure experienced by people working in high intensity spaces.
DESIGN PATTERN

Ultra-high intensity environment

LONG ROWS OF DESKS

Long rows of densely populated desk spaces create an almost factory-like atmosphere in ultra high intensity space. The fact that people can see so many other people working under the same roof contributes to the industrious nature and heightened sense of productivity within the space.

Ultra high intensity space layouts should accommodate long rows of desks in a densely packed configuration. The close proximity to neighbouring desks and reduced amount of circulation creates a more intense layout with a lower level of transience than lower intensity spaces.

TRADITIONAL SPACE AND FURNITURE

Ultra high intensity spaces have a sense of grandeur and scholarly gravitas, created by traditional features such as paintings of historical figures, old wooden bookcases, traditional desks and chairs, archways and relief mouldings on ceilings. These features create an awe-inspiring environment, which motivates people to work by making them feel part of the academic tradition.

HIGH CEILINGS WHICH INCREASE SPATIAL VOLUME

High ceilings increase the volume and perceived size of the space in which people are working. This increased height and volume creates a sense of stillness which people are reluctant to disrupt, which helps maintain the disciplined and focused atmosphere in ultra high space intensity spaces.
DESIGN PATTERN

Break spaces

PROXIMITY TO WORKSPACES
The convenient location of break spaces is important, as it enables people to take short breaks near to where they are working. This ability to take short breaks increases people’s endurance and productivity, by enabling them to recharge at regular intervals without taking too much time away from their work. People are less likely to take breaks if the break spaces are located too far from their place of work, as this would result in them taking longer breaks than intended.

FURNITURE TO SUPPORT WORK AND BREAK ACTIVITIES
People use break spaces for different kinds of breaks. Some people take 10 minutes to sit on a sofa, have a drink and a chat with a friend, or read the newspaper. Others use break spaces as a productive break from the library, to read a chapter of a book or to send some emails. High tables are particularly popular for eating lunch, playing games and doing laptop work, so it is important that they are provided as well as more comfortable furnishings such as sofas.

ACCESS TO FOOD AND DRINK
Food and drink should be provided in break spaces either in the form of vending machines or a cafe. If break spaces do not provide food and drink, people will have to choose between venturing elsewhere for their break or avoiding taking a break entirely for fear of taking too much time away from their work. Convenient access to food and drink therefore increases the amount of time people can spend working.
DESIGN PATTERN

Between-lecture spaces

PROXIMITY TO TIMETABLED ACTIVITIES AND REFRESHMENTS

Between-lecture spaces should be located either directly next to or in very close proximity to lectures and supervisions, so that people can complete short bursts of work during gaps in their timetable. Access to refreshments is also important, as people like to fill gaps in their timetable productively whilst having a snack or a cup of coffee.

FURNITURE TO SUPPORT WORK AND BREAK ACTIVITIES

Furniture located in between-lecture spaces should consist of a mixture of soft furnishings and more formal workstations, in order to support a wide range of break and work activities. Desks and chairs are particularly valuable for enabling short bursts of work between lectures.

CHARGING STATIONS

Plug sockets are in high demand between lectures due to a shortage of plug sockets in lecture theatres. As a result, people gravitate towards available plug sockets in the periods of time between lectures. Between-lecture spaces should have a generous provision of plug sockets conveniently located next to desks and chairs, so that people can charge their devices and work at the same time.
**DESIGN PATTERN**

**Expertise points**

**LOCATED IN A BUFFER SPACE OR LANDING ZONE**

Expertise points should be located in landing zones or transition spaces. The increased amount of traffic in these areas will provide more publicity for the space and the informal nature of the space will encourage people to engage with experts. The higher accepted noise levels in these areas will also help people feel more comfortable to initiate discussions with staff.

**SIGNAGE**

Signage plays an important role in inviting people to engage with expertise points. Signage should clearly indicate that expertise points exist, be welcoming in tone, and give people an idea of the kind of expertise that is available to them.

**DESK AND CONSULTATION AREA**

The design of expertise points should make experts approachable by locating them in open, welcoming environments. Soft furnishings can be used to make consultation areas more approachable and invite informal discussions. Where desks are used, they should be open rather than enclosed.

Busier expertise points should provide an area where people can wait for consultation appointments, or for an expert to become available.

**GLAZED CONSULTATION ROOM**

Enclosed consultation rooms should be provided for longer consultations providing in-depth guidance. This additional level of privacy will make it more comfortable for people to talk openly about their research. These enclosed rooms should be glazed, as this will enable others to see that consultations are happening and increase awareness of their existence. It will also make the expert seem more approachable.
CONFIGURATION

Expertise points

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**DESIGN PATTERN**

**Entrance area**

**APPROACHABLE SERVICE DESK**
The service desk should be located to one side of the entrance space to avoid seeming confrontational. It should be approachable, easily accessible and constantly attended by a member of staff. Separate rooms or even glass walls enclosing service desks can create a perceived boundary that will prevent people approaching staff for help.

**SIGNAGE**
Where necessary, way finding aids in the form of signage or maps should be provided in the entrance space to help library users orientate themselves within the library, find their way to a particular destination.

**SELF-CHECKOUT & BOOK RETURNS**
These should be located next to the landing zone so people have space to set their books and bags whilst checking out or returning books.

**LANDING ZONE**
The landing zone provides clear, flat surfaces to help accommodate people who are checking out or returning books and a seating area for those who are waiting for friends or colleagues.
Entrance area

**ENTRANCE AREA (MINIMUM CONFIGURATION)**
Comprises a service desk, a self-checkout machine and landing zone with a flat surface and a chair. The service desk should be located to one side on entering the building to avoid seeming confrontational. It should be easily accessible and constantly attended by a member of staff. Separate rooms or even glass walls enclosing service desks prevent people approaching staff for help.

**ENTRANCE AREA SIGNAGE**
Signage should be provided at the entrance to the entrance area to inform users of any specific characteristics or rules of the library they are entering. Once inside the entrance area signage should be clearly located to help people orientate themselves in the space and find their way to their destination.
Landing zone

LANDING ZONE NEXT TO CATALOGUE TERMINAL OR SELF-CHECKOUT MACHINE
People need space to set down their bags or books whilst they search for a book on a catalogue terminal or scan books at the self-checkout machine. This could be a simple table or any kind of flat surface large enough to set a bag and some books. This provision of a single flat surface could be considered as the minimal viable landing zone.

LANDING ZONE IN A TRANSITION SPACE OR ENTRANCE AREA
Transition spaces and entrance areas provide distinct physical cues that prepare people for a change in behaviour appropriate to a new space. Some people may prepare for their transition to a new space by getting their materials out of their bags in advance of entering a high intensity workspace to avoid disturbing other people. Others may wait for friends.
Wayfinding within library spaces

Key findings
Finding a book
Eyetracking highlight video 11

PARTICIPANT
1st Year Undergraduate

LOCATION
MML

TASK 1
Find a book
The behaviour we witnessed in that video

- Scanning and moving aimlessly
- Scanning classmark labels
- Trying to decode the classmark system
- Memory vs system
- Lack of a strategy
- Giving up
- Need for reassurance
- Time taken
Common behaviours across participants

- Multiple classmark runs and separate collections cause confusion.
- Library-specific terminology and signage causes confusion.
- People blame themselves when they can’t find a book.
- People have trouble deciphering classmarks.
- People who are less familiar with libraries are fearful of elements that look library-specific.
- Science students are more likely to browse by topic than humanities students.
- People are more likely to use catalogue terminals and signage in larger, multi-storey libraries.
- Small, open plan, single-storey libraries give a false sense of confidence.
- Usability issues with iDiscover impact the wayfinding process.
SIGNAGE TESTING
What students said...

“I’m no good at libraries.”
– A 3rd year NatSci student.

“Sorry, I’m no good at finding things.”
– A 2nd year MML student.

“Either the book is out, it’s on someone’s desk or I’m a moron!”
– A 4th year NatSci student.

“I would have given up by now.”
– A 2nd year Education student.

“This code means jack all to me.”
– A 4th year NatSci student.

“I should be able to do this – my father is a librarian.”
– A PhD Chemistry student.
Library Environments: Wayfinding and navigation patterns
The wayfinding package: a hierarchy of spatial navigation tools and cues
To find your book, start by finding the correct **area and floor** (1) in the library. Check whether it’s a **periodical** (2), then find the shelves for the right **size** (3). Next, look for **subject** (4). Finally, locate the **date code & running number** (5).
Macro-level signage

- Macro-level signage helps users find the right floor, room, zone or general subject area in a library space.

- The addition of macro-level signage significantly improved the process of finding books by making it easier, quicker and less mentally demanding.

- Enables people to quickly identify the subject area or zone they were looking for using protruding signage on the end of each bookcase. Repetitive blocks of colour and text on this signage enabled people to identify distinct zones through high-level scanning of the library space.

- Signage is as important for eliminating sections of a library which are irrelevant to someone’s search as it is for locating the relevant sections.

- Good signage reduces the amount of mental bandwidth required to find their book, as they have less physical space to process.
DESIGN PATTERN

Macro-level signage: Colour-coded maps
DESIGN PATTERN

Macro-level signage: Stack-end signage (one subject area)

STRIP OF COLOUR
This strip of colour complements the other aspects of the wayfinding system by providing users with an additional visual cue with which to validate their navigation of the physical library space.

LARGE BOLD TOPIC LABEL
This is the largest and boldest element on the sign. It uses both the first letter of the classmark and the topic name. Users of the library for which this sign was designed search mostly using the first letter of the classmark and so the E element is larger than the “Spanish” topic label.
DESIGN PATTERN

Macro-level signage: Stack-end signage (two subject areas)

This strip of colour complements the other aspects of the wayfinding system by providing users with an additional visual cue with which to validate their navigation of the physical library space.

LARGE BOLD TOPIC LABEL
This is the largest and boldest element on the sign. It uses both the letters of the classmark and the topic name. Users in this library search mostly using the first letter of the classmark and so the CAT element is larger than the “Catalan” topic label.
**Micro-level signage**

- Micro-level signage helps users locate the specific stack, bay or shelf on which their book is located.
- Without micro-level signage users will resort to scanning individual book titles or classmark labels when navigating library collections. This can result in a significantly increased amount of time and effort on the part of the user.

3 COMPONENTS

- **Classmark range signage**
- **Shelf labels**
- **Split-bay labels**

http://modernhuman.co  @modhuman
DESIGN PATTERN

Micro-level signage: Classmark range for each bookcase

STRIP OF COLOUR
This strip of colour complements the other aspects of the wayfinding system by providing users with an additional visual cue with which to validate their navigation of the physical library space.

FIRST PART OF CLASSMARK IN BOLD FONT

CLASSMARK RANGE (LEFT)
This indicates the classmark range located on the left side of the bookcase a user is looking at.

CLASSMARK RANGE (RIGHT)
This indicates the classmark range located on the right side of the bookcase a user is looking at.

LARGE BOLD TOPIC LABEL
This is the largest and boldest element on the sign. Users in this library search mostly using the first letter of the classmark and so the E element is larger than the topic label.

DIVIDER LINE
Reinforces the separation of one set of classmarks from the other to reinforce the fact that the classmarks are located on different sides of the bookcase.
DESIGN PATTERN

**Micro-level signage: Classmark range for each bookcase**

- **MOST IMPORTANT PART OF THE CLASSMARK**
  This is the first element of the classmark that users should look at in order to identify the right group of stacks to look at. This element is therefore larger and bolder than the other elements of the classmark.

- **SECOND PART OF THE CLASSMARK**
  This is the second most important part of the classmark and so its font is smaller and less prominent, but still larger than the last part of the classmark.

- **THIRD PART OF THE CLASSMARK**
  This is the least important element of the classmark in the order of the search process and so it is smaller and less prominent than the other two elements.

- **RESOURCE TYPE LABEL**
  The resource type label is in large, bold font to help users distinguish periodicals from books.

- **STRIP OF COLOUR**
  This strip of color complements the other aspects of the wayfinding system by providing users with an additional visual cue with which to validate their navigation of the physical library space.

**Books**

723:29. C .95.197 to 724:5. C .95.373
DESIGN PATTERN

Micro-level signage: Protruding shelf labels

Inorganic Chemistry
QD 146 - 197

LARGE BOLD TOPIC LABEL
This is the largest and boldest element on the sign. Users in this library search mostly by topic, and so the topic element of the label is bolder than the classmark element.

STRIP OF COLOUR
This strip of colour complements the other aspects of the wayfinding system by providing users with an additional visual cue with which to validate their navigation of the physical library space.

CLASSMARK RANGE
Indicates the classmark range in which this topic can be found, which helps users narrow their search of the shelves. Users were more likely to browse by topic in this library so the classmark range font is less prominent than the topic label font.
Testing wayfinding prototypes

Eyetracking highlight video 15

PARTICIPANT
4th Year Undergraduate Spanish Student

LOCATION
MML

TASK 1
Find a book with design interventions
SIGNAGE TESTING

Time on task

Task 1
Find a book in the Catalan section

BEFORE: 0:08:15
AFTER: 0:03:10

Task 2
Find a book in the German section

BEFORE: 0:06:27
AFTER: 0:00:57

Benefits
Reduced time to find books by 60%
Made tricky items easier to find
SIGNAGE TESTING
What students said…

The signs with German, Catalan, Spanish on them really helped.
— A 2nd year MML student referring to the new protruding stack-end signage at the MML Library.

My method was to look at the signs and work out the order.
— A 2nd year MML student after having found a book in the MML Library.

I love the new signs. They make everything so much clearer and the colours really help.
— A 4th year MML student whilst looking for a book in the library.