

Building rating system:

An instrument for building accessibility measurement for better indoor navigation by blind people

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Background

People with sight loss have encountered barriers when travel independently inside buildings for a long time, especially buildings full of unfamiliar features (1). Inside the buildings, many challenges are presented such as obstacles, noise and others, especially unpredictable objects like people to walk around, which directly affect their daily activities and navigation.

For these reasons, many people with sight loss are afraid of visiting the buildings alone due to the unfamiliarity of spaces, which can cause them end up in the hospital. This has resulted from a lack of inclusive design in the built environment. If the buildings are designed to meet the needs of people with sight loss, they would feel more confident to visit. Thus, knowing about a level of accessibility provided inside the building before making a visit to a building is essential and helpful.

Toward the inclusive built environment, many building regulations and legislations have been declared and used in most developed countries, highlighting barrier-free, accessible and adaptable buildings and dwellings for all people, regardless of disability, where the building designs standards are used, giving recommendations on how to create the built inclusive environments for all people. However, to check how a building performs in terms of access and ease of use, a site inspection is carried out throughout the building from checklists and recommendations to be followed. This is indeed a time-consuming inspection due to details and specifications given in the checklists and recommendations.

Spatial Representation Framework

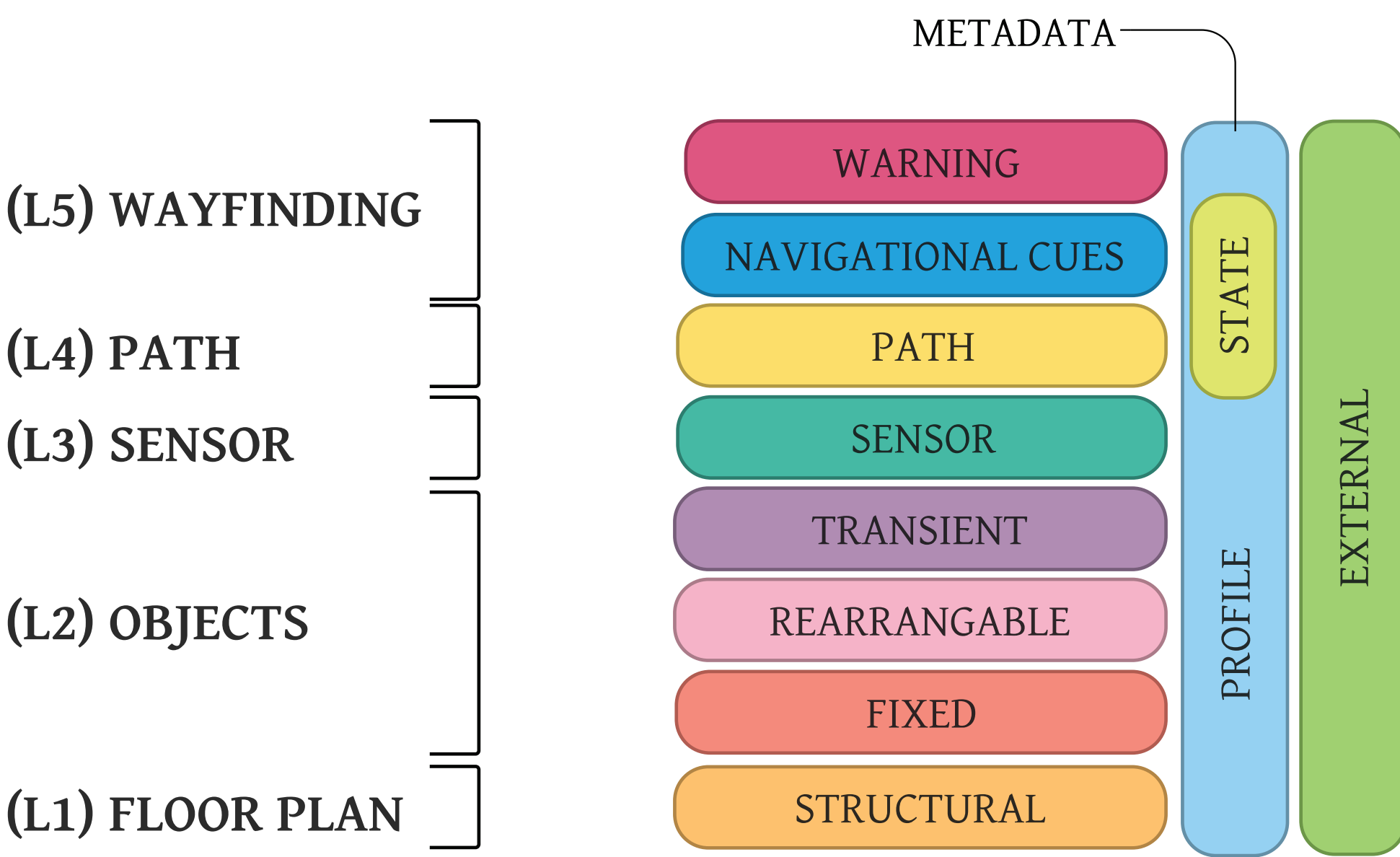


Figure 1: Spatial Representation Framework (SRF) for Indoor Navigation by People with Sight Loss

A SRF is a framework intended to help people with sight loss have freedom and confidence when walking inside buildings and public spaces on their own. It provides an outline of essential information needed to increase an indoor map for these people (2).

The SRF has eleven component (Fig. 1), where eight of which are grouped as a reference model, describing buildings and spaces, while two components are place beside a multiple-layered model and act as metadata, and the last component represents external information e.g. weather and noise from outside the buildings.

Building Rating System

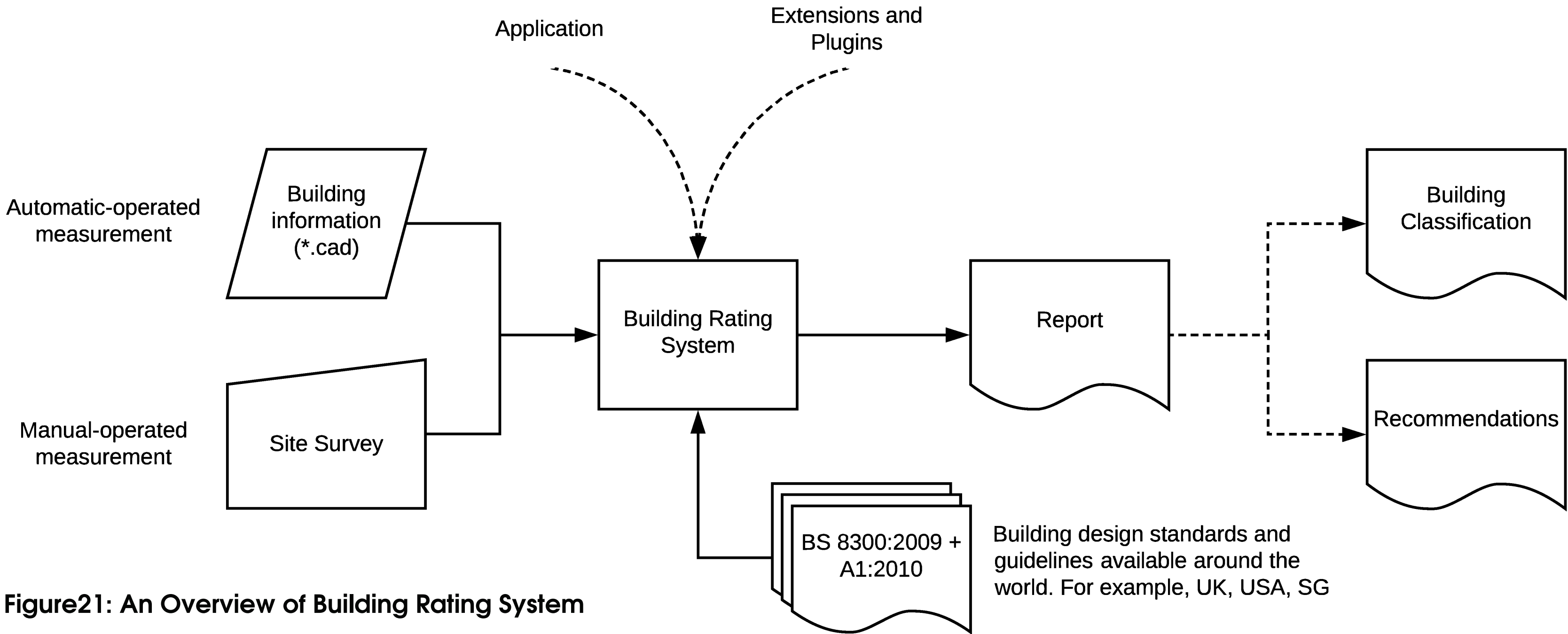


Figure 21: An Overview of Building Rating System

A BRS is an application extended from the use of SRF. It is an instrument for measuring a level of accessibility provided in the buildings for people with visual impairment. The BRS can be carried out in both manually and automatically operated measurements (Fig. 2).

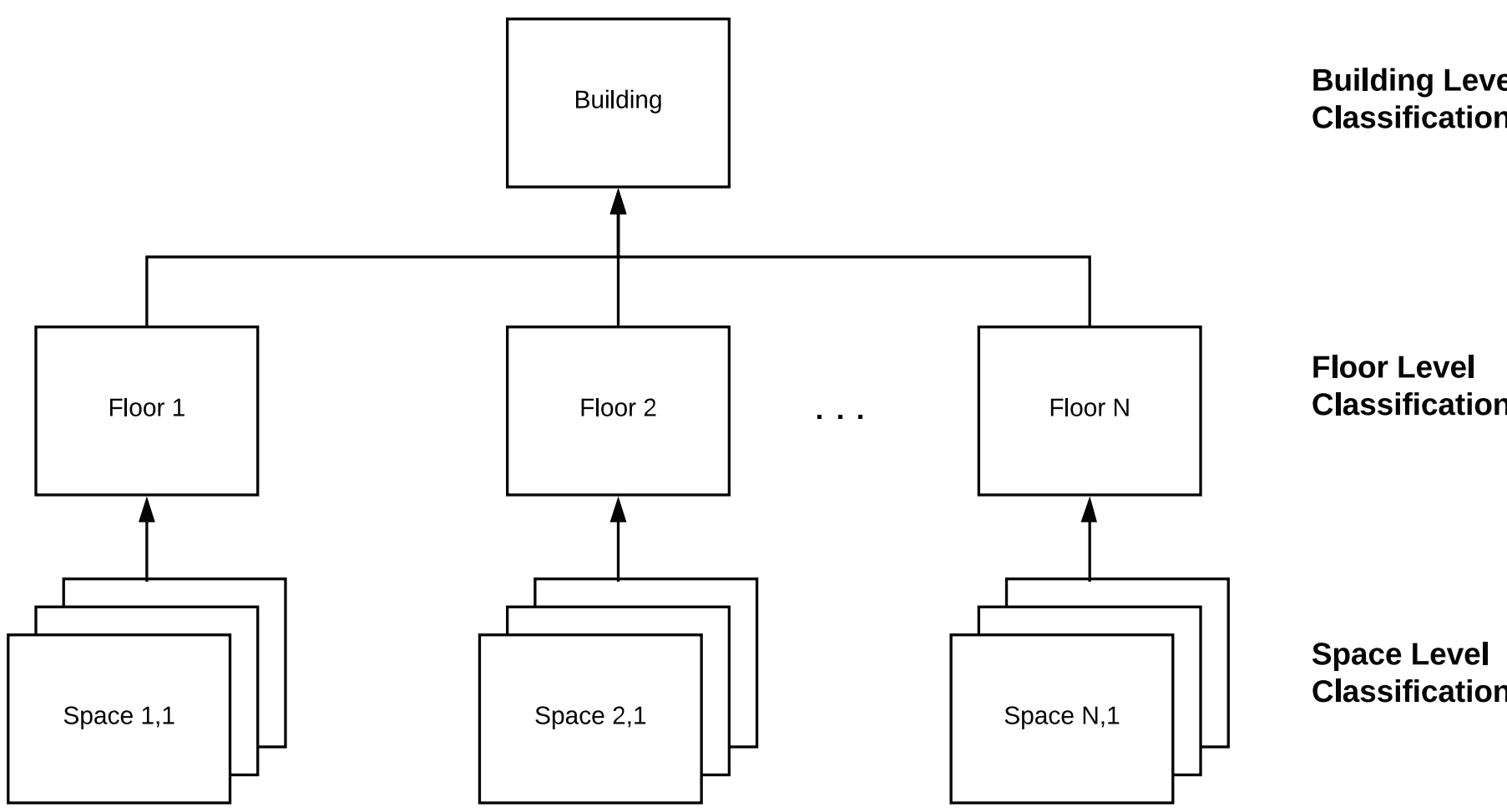


Figure 2: Bottom-up design of the building rating system

BRS classifies buildings into three levels, Fig. 3, that is building, floor, and space level classification. So, measuring levels of accessibility for each space is a starting point and can result in rating the level of accessibility of each floors and later the overall building using a majority scoring method

Once all spaces are measured, the results will be reported in forms of spider (radar) charts, representing the accessibility level at one particular floor achieved for each.

Result and Interpretation

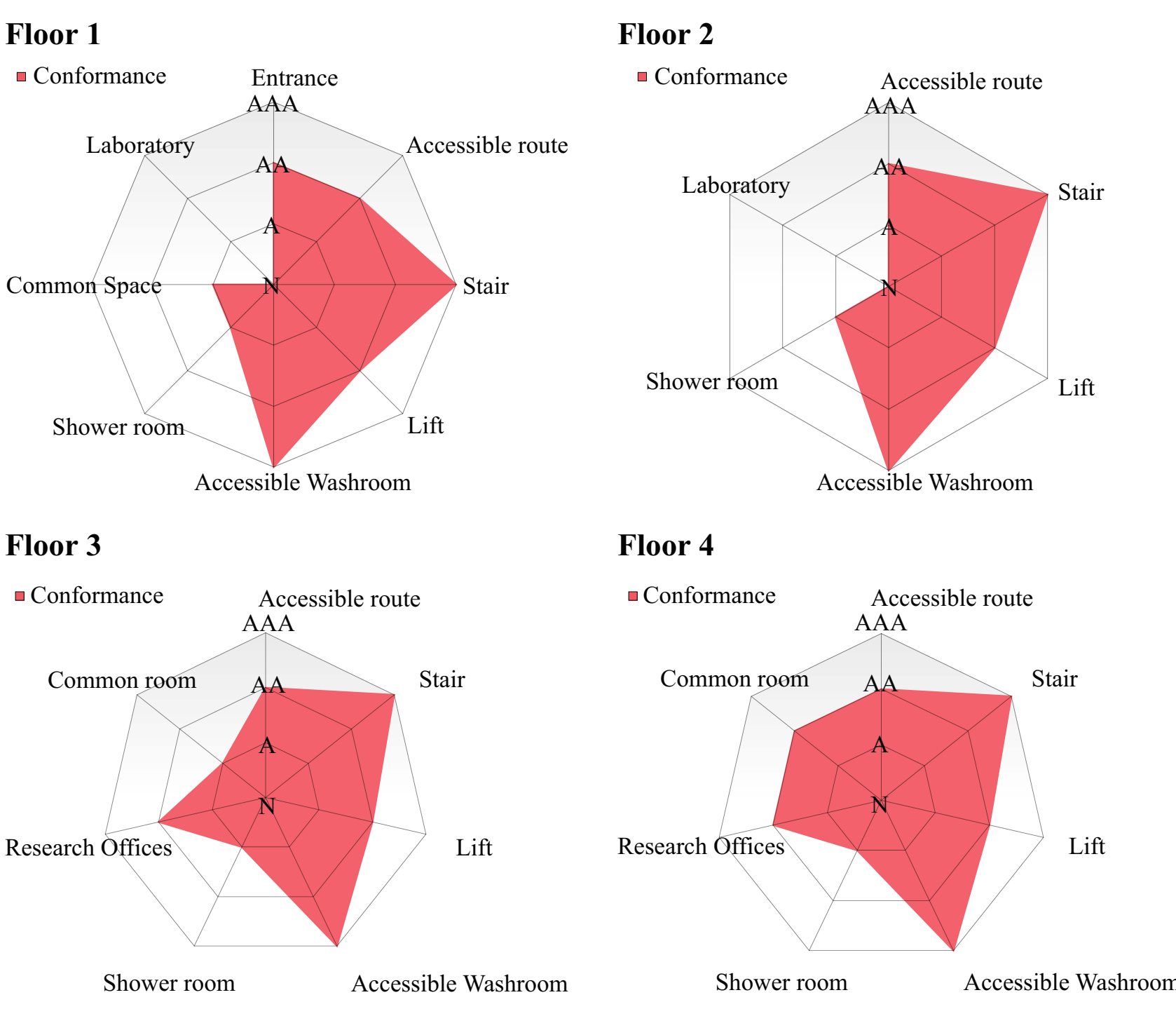


Figure 4: Example of the space classification in Building 53 (Mountbatten), University of Southampton

Table 1: Floor and buildings classifications – majority scoring approach

	N	A	AA	AAA	Classification
Floor 1	1	2	3	2	AA
Floor 2	1	1	2	2	AA
Floor 3	0	2	3	2	AA
Floor 4	0	1	4	2	AA
Building Classification					AA

Note: *Conformance AA is selected as the special rule applied in cases of "AA + AAA" is in a tile, as shown in Table II

From Fig. 4 and Table 3, a building is rated by the use of the space classification where a Conformance AA is given for all floors while a building classification is thus determined as Conformance AA, a general policy that all building must conform to, which people with sight loss may ask for helps when navigating around this building.

Conformance Level

No Conformance: no accessibility in the space due to the failure of meeting the minimum level requirement

Conformance A: a minimum level, providing an ability to navigate the space without any hazard to people with visual impairment

Conformance AA: a sufficient level of accessibility, providing features in addition to improving the independent navigation by people with visual impairment

Conformance AAA: an enhanced level, providing features in addition to enabling an ability to access all of the facilities provided in the space to people with visual impairment

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References

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