

“EWS Matrix” and “EWG Matrix”: “De-sign for All” tools referred to the development of a enabling communication system for public spaces

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Abstract. The widespread sense of spatial disorientation that can be experienced in many public places (buildings and open spaces), generally depends on a design approach that doesn't take into account both the "communication skills" of the different parts of the spatial organization, both the variability of people and their ways of interacting with environments, orienteering themselves. Nevertheless, "not find the way" often has some obvious practical costs (loss of time, failure to achieve a target) and some more intangible, but no less important, emotional costs. That's why the design of signage systems must take into account both the specificities of places and the extreme variability of its users. The paper presents the results of a study on this specific issue. In particular, the study focuses on the description of some tools useful for the analysis and design of a signage system that is truly "for All".

Keywords: wayfinding, design for all, signage systems.

1. Introduction

The orientation capabilities within a place depends largely on three different aspects: on the communicativeness of the place itself, through its local, urban and architectural elements, and the communication artifacts included in it; on the reception and interpretation models of environmental information that individuals "usually" adopt to orient themselves; on the different "abilities" of individuals, which vary with respect to physical, cognitive, social and cultural factors. In fact, places, routes, targets and directions, strongly characterize the spaces of our lives, from urban scale to the architectural one, from domestic to public and socializing spaces, so being able to use them in a simple and natural way can contribute significantly to the wellbeing, not only psychological, of the individual.

The signage designer must know, control and manage the above-mentioned three variables in an objective

and awareness way. This in order to allow "everyone" to identify locations and directions to specific destinations without the risk of being lost, with all the consequent inconveniences deriving from an experience of spatial disorientation, that can be both practical (loss of time, failure to reach a place) or emotional (anxiety, stress). Actually, a well-designed environment must allow those who live in it to "orient" themselves: they need both to understand where they are (to build a mental map of the place) and which path to take to get to a specific point without physical or psychological impediments (a draw Action Plan).

Three factors more, indeed, generally make the orienteering activity inside public environments and particularly complex buildings:

- a) They usually are places which, from time to time, can be subject to modifications through additions or changes respect to the original project;

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- b) Users of a public space belong to categories with different instances and which in turn contain "diversities" related to individual skills and abilities of persons. In particular, users of public spaces and environments often move within them often in conditions of high emotional stress (such as in hospitals), in a hurry (as in stations and airports), with lapses of concentration (because while talking to someone or doing something else) and consequently with a low attention level to the elements of the context (that's why, according to a Design for All approach, they are also considered as "limit users");
- c) The overall organization and typological models of public spaces and environments always changes from place to place, with the names of units or functions often difficult to understand and to retain.

The widespread sense of spatial disorientation that exists in many public places (buildings and open spaces), therefore, generally depends on a bad design, that is a design approach that doesn't take into account both the "communication skills" of the different parts of the spatial organization, both the variability of people and their ways of interacting with environments, orienteering themselves.

The issues of spatial cognition and of architectural and interior design wayfinding-oriented have already dealt within a wide literature describing theories and operative principles. The complexity of contemporary society expressed by human "variability" and the potential social wealth deriving from it, however, asks new questions that now are mostly addressed to "Design for All". It is a "design approach for social inclusion, diversity and equality", which in recent years has spread mainly in Europe. Recently, we are looking for methodologies and tools useful for the designer who must deal with the wide quantitative and qualitative variability of user features deriving by this approach.

This paper reports the results of a research on "Public Signage Systems for All". The research has carried out a system of "analysis tools" developed at the School of Architecture, University "G. D'Annunzio" of Chieti-Pescara (Italy), as part of a Master Degree Laboratory in "Design for All". A special attention has been given to the construction of the "Enabling Wayfinding Strategies Matrix" (also EWS Matrix) and the "Enabling Wayshowing Guidelines Matrix", (also EWG Matrix): they represent the most innovative aspect of the research, as they have revealed to be effective tools for the development of communication systems so-called "enabling".

2. Objectives

This research has developed a system of design tools useful to designer for analyze, in the most objective and complete way, both the communicability of the place, the orienteering difficulties/abilities of multi-users, and the different multi-users' strategies to receive and interpret information and to orient themselves. These tools facilitate the definition of a requirements list, that is sufficiently complete, comprehensive and useful. The development of these tools can be referred to the more general theme of "Design for All Approach".

This theme has a specific theoretical base in two different fields of research: the first one about the research topic related to spatial orientation and the second one attributable to the most recent developments of "Design for All".

In particular, the theme of spatial orientation has been studied and analyzed in the first part of sixties by Kevin Lynch [2], who introduced the concept of "wayfinding" to indicate the ability of people to "find the way" to reach a desired place by interacting with their environment through its "signs", that is through their "representability", «namely the quality that provides that a physical object is highly likely to evoke a vigorous image in any observer». Weissman [5] has proposed four classes of spatial variables related specifically to the built spaces, and later Arthur and Pardini [1] have introduced the concept of "communicative environment". It indicates that the built environment and its parts should work as "communication devices". Finally, Mollerup [3] has developed the concept of "wayshowing", that refers to the ability of any place to prepare and assist the user to orient himself: in particular, Mollerup [3] has identified nine strategies that individuals use for orientation, which depend by the provision of person, from his previous knowledge and by the information that he can find in the place where he is moving.

The Design for All, on the other hand, is based on the principle that, in the increasing complexity of contemporary society, the diversity among individuals is a social "resource" and then an opportunity for the project. The objective of "social inclusion", that is the active, comfortable and enjoyable participation by all to all daily activities (occupational, social and leisure), may be pursued through the respect and appreciation of differences.

Based on these assumptions, the meta-project objectives of the research were:

- Identify the main issues of the environmental communication and signage of a public space (the application case has been referred to a specific public building, the interiors of the hospital clinic of Chieti, Italy).
- Define an outline of specific and "inclusive" design requirements, useful to develop a "communicative artifacts system" allowing to enable "All" potential users to find their way through their different capacities, without the fear of getting lost.

3. Method

The development of analysis tools took place in stages.

The first one refers to the analysis of the actual state of the environmental communication of places, (direct observation of the specific studied places, identification of several "macro-requirements" that are generally related to the communicative sign systems, identification of the main disabilities/difficulties related to the spatial orientation activities of multi-users). This analytical research has been carried out by means of special "analysis forms" referred to "signals" and "paths".

Later, two matrices were developed, in order to know the multi-users difficulties respect to their different orienteering ways (the "EWS Matrix") and to allow the designer to detect the best design strategies for the development of enabling communication systems of artifacts (the "EWG Matrix").

Overall, it is a "tools kit" that allows both to highlight common problems and resources of environment, and to aware the potential difficulties of the "multi-users" with respect to the various implemented "orienteering strategies". The basic idea of the research is that, through the EWS and EWG Matrices, it is possible to define specific design requirements related primarily to the needs of "limit users" and then they will be extended to the generality of people. This in full harmony with the so-called "Design for All Approach", that is based on the enhancement of the concepts of diversity, inclusion and equality.

3.1. The EWS Matrix

The EWS Matrix ("Enabling Wayfinding Strategies Matrix") derives from the need to understand how the 9 wayfinding strategies (Mollerup 2005) can become "for all". Namely, how can they enable all

potential users with specific difficulties, allowing them to be able to orient themselves using their own "spare capacities". In particular, the matrix relates in several ways 46 major disabilities related to "orienteering" and identified through the literature; 17 main capabilities/problems related to "orienteering" activity; 9 Wayfinding strategies; 8 macro-requirements referred to the environmental communication and signage. It is a tool of both "knowledge", that is useful to analyze the specific features of the context, and "project", as it also provides useful and objective information to identify the most effective wayfinding strategies in reference to the same context.

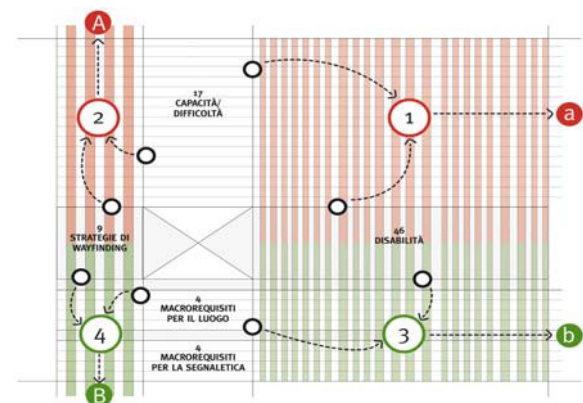


Figure 1. The EWS Matrix Scheme

In particular, the EWS Matrix (Figure 1) consists of two parts:

- The upper part, in which red is the predominant color (to indicate the condition of "disabling" of the wayfinding signage not "for All"), initially relates the 17 activities/difficulties found during the wayfinding activities with the 46 most common kinds of "disabilities" (submatrix "1"). In the last column on the right ("a"), to each line corresponds a "score" that indicates the "disabling" degree of each of the 17 activities, that are also the skills required for each activity. In the upper left (submatrix "2") these skills are related with the 9 wayfinding strategies. In particular, the top line ("A") shows the score, obtained by summation, which indicates how a strategy is more or less disabling. In fact, the higher the score, the strategy could give rise to greater difficulties in those 46 types of users previously identified who may have the need and desire to carry it out.

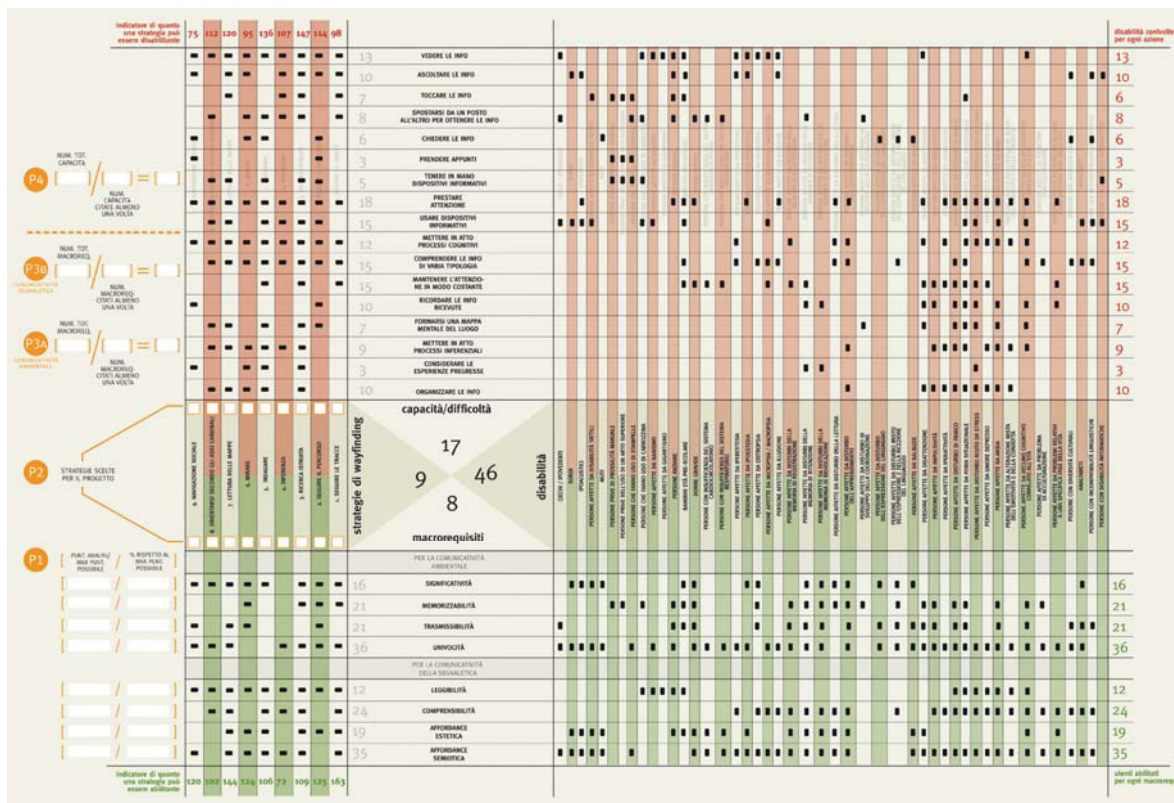


Figure 2. The EWS Matrix (Enabling Wayfinding Strategies Matrix)

For example, among the nine wayfinding strategies, the most disabling ones are the "trained searching" (147), "investigating" (136), and "reading maps" (120), mainly because they need many skills to be put into act.

- The lower part is characterized by a green tone (to indicate the "enabling" condition of a wayshowing "for All"), in the left area (submatrix 3). It relates the 46 disability with 8 macro-requirements, that are 4 for the environmental communicativeness (significance, storability in memory, transferability, uniqueness) and 4 for signage communicativeness (readability, understandability, aesthetic affordances, semiotic affordances). As well as before, for each macro-requirement there is a "score" ("b") that indicates the number of abled-users. In the lower left (submatrix 4) the 8 macro-requirements are related with the 9 wayfinding strategies. Here, following the same logic, a score (shown in the bottom row "B") shows how a strategy is potentially "for All" being tied to the more enabling macro-requirements. In this case, for example, strategies that may reveal more enabling are "fol-

low the tracks" (163), "reading the maps" (144) and "taking aim" (124).

At this point the EWS Matrix (Figure 2) can be used as a real tool for pre-project analysis, simply filling the left column with data obtained from the critical interpretation on the site of the environmental and signage communicativeness. These data can be synthesized using some analysis forms, specially designed, which, through the filter of the 8 macro-requirements, plot the observed data in the form of scores, ie assigning scores ranging from 1 to 6 to places, passages, signs and signals.

Briefly, reporting such scores in the lower left corner of the EWS Matrix (at the point P1) designer can be guided in choosing the most promising wayfinding strategies (at point P2). Through them, the Matrix brings back two scores (P3 scores, b, and P4), useful to start to use the second matrix, the EWG Matrix "Enabling Wayshowing Guidelines").

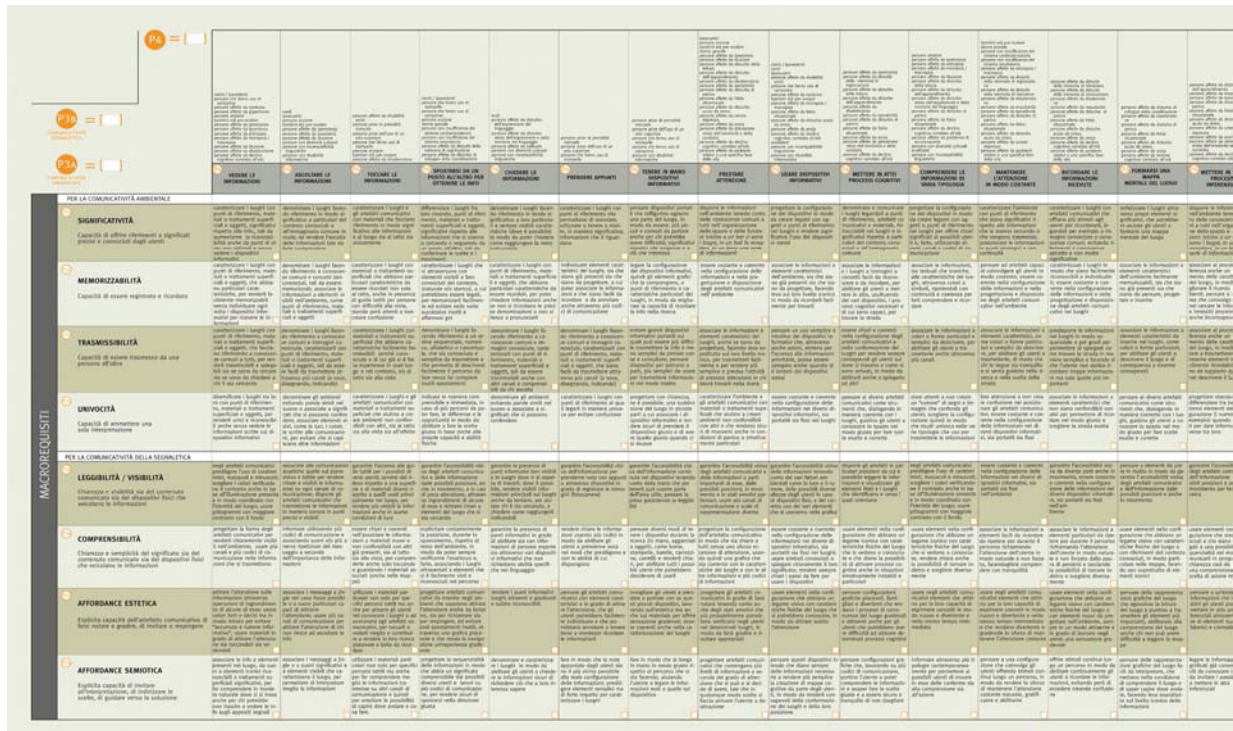


Figure 3. The EWG Matrix (Enabling Wayfinding Guidelines Matrix)

3.2. The EWG Matrix

The EWG Matrix ("Enabling Wayshowing Guidelines Matrix"), or matrix of the "Guidelines for All" (Figure 3) is designed to provide the designer with a system of guidelines changing to the changes of the framework conditions (namely, in reference to the place and the multi-users). It can be used starting from the results obtained with the previous matrix, and it eases the selection of strategies for the design of the communication systems of artifacts. The designer, therefore, is able to understand the best wayshowing inclusive strategies for any specific users and environmental characteristics. In particular, the EWG Matrix relates the 8 macro-requirements of environmental and signage communicativeness with the actions that the user must do to be able to carry out the different strategies, considering also the prevailing disabilities associated with them. The result is a Matrix in which each cell reports a single, possible design guideline. These are intended to guide the designers in the interpretation of the features of places and in seeking the more "enabling" solutions of

communication systems for individuals-users of public spaces and environments in which they move and orient themselves.

4. Results

The methodological apparatus developed by the research has been applied then to a concept design that is presented in the final section of this paper. It consists of a design concept about an enabling communication system of artifacts for the interiors of a "key Unit" of the hospital clinic of Chieti (Italy) [4].

4.1. Analysis

The hospital clinic of Chieti (Italy) works since 1999. In particular, the hospital extends on a hilly land, and is divided into several buildings that are organized into four groups on different levels connected by "nodes" and linear paths. The research focused on the problems arising from the moves of the multi-user: generally the movements start from the

main entrance, located on the 7th level, towards the main destinations within the hospital.

The analysis of the environmental communication, that has been developed using specific observation forms and questionnaires, has highlighted the main problems related to the environmental communication and to the orienteering skills of its usual kind of users, with particular reference to the occasional ones.

The use of the EWS Matrix and of the EWG Matrix provided an indication on which are the most appropriate wayfinding strategies in reference to the specific studied context. This has allowed the definition of a requirements outline, which was extremely extensive and objective.

4.2. Concept design

The environmental communication and signage issues have showed the crucial role of "nodes" in the hospital clinic of Chieti, in order to ensure a safe and proper orientation of users. In particular, six are the "nodes" that allow access to the various functional areas of the building.



Figure 4. Different solutions of "Portals" for the Hospital Clinic of Chieti

Through some typological schemes, it was possible to define the concept of the project, which refers to the idea of an entry and exit "portal" (Figure 4). So, three different kinds of "information portals" were

developed: through different sensory channels, they inform users about the place where they are and which direction to take to reach the desired locations. The design concept went so far, as to choose also the most suitable materials for the production of the information supports. In particular, the choice of materials was carried out according to the flexibility application of the signage, to the requirements of cleanability, resistance to impact, and especially to the availability of color variations of the information supports, this considering that the project makes extensive reference to the use of colors.

5. Credits

The research described here was conducted under the coordination of Prof. Giuseppe Di Bucchianico within the "Interior and exterior design of sustainable living" Degree Laboratory, during the academic year 2009/2010 in the School of Architecture, University "G. d'Annunzio" of Chieti-Pescara. In particular, the research was conducted with candidates Stefano Picciani and Valeria Vallese. The design results reported in the Paper, on the other hand, refer to the degree Thesis of Stefano Picciani, entitled "The hospital signage for All. Enabling communicative system of artifacts for the interiors of the Hospital Clinic of Chieti" (supervisor Prof. G. Di Bucchianico, Co-supervisor Prof. S. Camplone). The figures inserted in this paper are taken from the above-mentioned dissertation thesis. The present paper was written from Giuseppe Di Bucchianico (Paragraphs 1, 2, 3) and from Stefania Camplone (Paragraph 4).

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