

Procedures for measuring and representing environmental quality in buildings

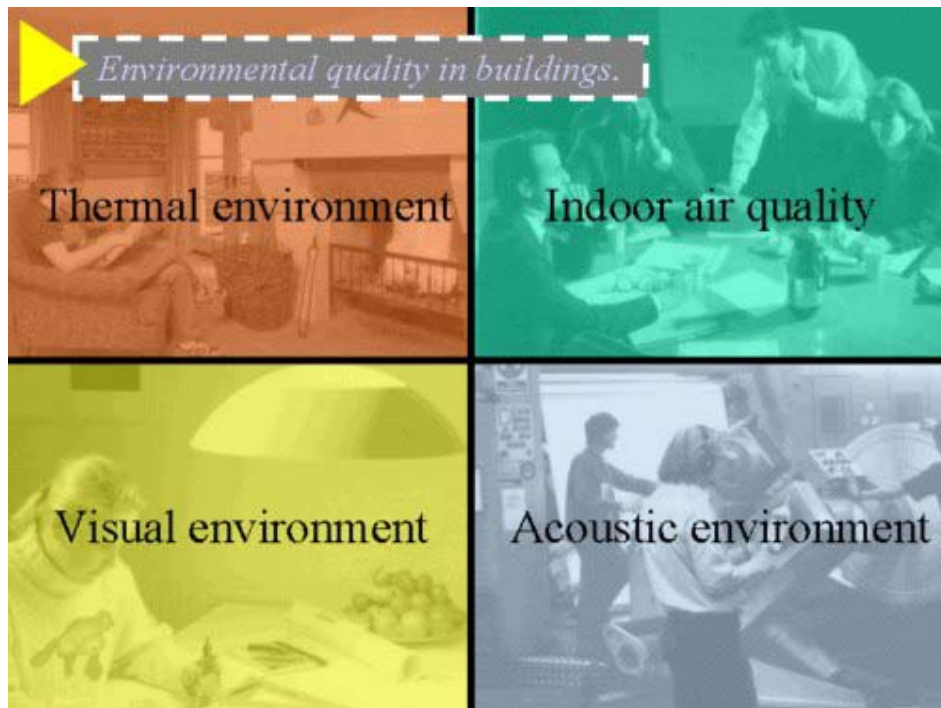
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Buildings affect the occupants' quality of life so that defining a method to evaluate the *environmental quality in buildings* is absolutely relevant.

Firstly I tried to find out which way the environmental quality in buildings influences both life and work for the occupants; then I looked for indexes to describe such quality and some *evaluation protocols* developed. These protocols have been tested on the field at last.

Evaluation can be divided into four main sections (see picture below).



Thermal, visual and acoustic environments, and indoor air quality (IAQ) are indeed different aspects of the environmental quality in buildings: each of them has been considered according to different approaches, theoretical and practical as well.

Besides, environmental quality evaluation in buildings has two different aims. Comfort should be checked in moderate environments, while hazardous environments - in which comfort can't be reached - should be checked for stress and health effects among the occupants. Analysis always focuses on the environmental system and on the people inside.

Items below show the assessment procedure.

1. Specify which *environmental feature* to evaluate;- e.g. acoustic properties of a room.
2. Identify *indexes* which characterize such a quality;- e.g. Reverberation time.
3. Measure *physical quantities* requested for calculating such indexes;- e.g. Sound level pressure.
4. Represent and verify the *results*;- e.g. plot reverberation time vs frequency and compare calculated with optimum values.

Each step focuses on indexes which can easily be measured on the field and on representations which are consequently made possible by using measured quantities. This way, some assessment protocols have been defined to be used in most cases when the environmental quality in buildings is concerned.

Three levels have been considered:

- A *standardized procedure* to evaluate a room completely after the relevant national and international standards. Specific instruments required.
 - A *simplified procedure* to evaluate the most relevant parameters in a room. Basic instruments required.
 - A *subjective procedure* to evaluate users' feeling about a room. No instruments required. To be used together with any of the preceding ones.
- Every procedure is made up of many assessment forms. See sample form below (taken from the evaluation procedure for visual environment).

The image displays two sample assessment forms for acoustic evaluation. The left form is a data entry sheet with fields for location, date, and a table for reverberation time. The right form shows contour plots of reverberation time and a table for comparison with standards.

Dimensione del locale (m ²)	Indice di riverberazione (s)	Indice di riverberazione (s)	Indice di riverberazione (s)	Indice di riverberazione (s)
1000	0.70	0.80	0.90	1.00

Indice di riverberazione (s)	Indice di riverberazione (s)	Indice di riverberazione (s)	Indice di riverberazione (s)	Indice di riverberazione (s)
1.10	1.00	0.90	0.80	0.70

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