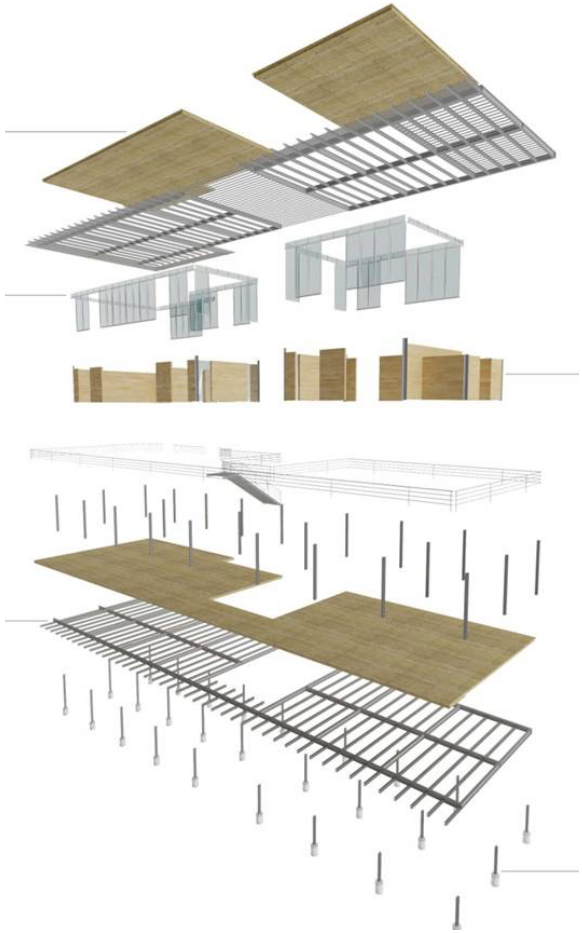
Materials for Architecture and Technological Innovation (6 CFU)

Materials Technologies for the Environment (6 CFU)

Prof. Alberto De Capua



MpA 1 TERMINOLOGY AND DISCIPLINARY APPROACH

- Technology of architecture
- Quality and Quality
- Building Process
- Standard

TERMINOLOGY

TRADITIONAL "The study of applied sciences in relation to the transformation of raw materials into products for use and consumption".
Devoto Oli, *Dictionary of the Italian language*, Le Monier, Florence, 1971

ATTUAL " The study and critical reflection on the many techniques related to the entire process of knowledge, decision, production of architecture, with particular reference to their practical implementation.

- The scope of action
- Technological Innovation
- Quality
- Construction process
- Standard

Terminology

The scope of action

Exercise and integrate in the design the sciences necessary to ensure specific performance, for each of which specific links with other disciplinary fields are highlighted. The services needed to guarantee:

Safety - also in relation to the study of structures;

Comfort - in relation to technical physics, ergonomics, hygiene, ...;

Usability - in relation to distribution characteristics, post-employment evaluations, interior equipment, ...;

Management - in relation to economics, estimation, legal matters, ...;

The disciplinary commitment is that of guaranteeing certain conditions, qualitatively definable and verifiable, to our "living in the world".

Technological Innovation

Quality

Construction process

Standard

TERMINOLOGY

The scope of action

Technological Innovation

Innovation means creating from scratch or modifying objects, methods and behaviours with respect to customary practice. An innovation can derive from chance or necessity; from a fortuitous situation or, more often, from the desire to give a solution to a need or a problem that cannot be solved in conventional ways.
The objective must be to put the inhabitant, the citizen, back at the centre, to avoid that any proposal for innovation is read as a simple solution to a specific problem, and not as a contribution to increasing the complexity of managing a space, a workplace, a city, etc.
N. Sinopoli, V. Tatano, 2002, On the Trails of Innovation, Franco Angeli, Milan.

Quality

Construction process

Standard

1. It concerns the study of sciences related to performance, production and organisational conditions that form an integral part of the design and implementation of architectural actions.

2. It stresses the need to reconsider the role of the construction industry in the country and calls for the opportunity to entrust it with the possibility of offering complex and particular process and product services at international level.

3. It considers the quality of internal and external relations to be essential for the quality of architecture in the cyclical process of construction, which proceeds from the moment of conception through the phases of planning, pre-design brief, design in its development to the executive, execution, control, maintenance, management, programming that restarts the cycle.

4. It highlights in the body of knowledge concerning the material and immaterial actions of transformation / preservation of our settlement systems the ethical conditions and responsibilities of correct forecasting and use, in a general horizon of sustainability of the systems themselves.

5. Recalls the need to introduce into the culture of the project the attention to the experimental verification of the results achieved in the works carried out, the specific methods and techniques developed at the international level and to use these verifications to improve the decision-making processes

6. It is proposed to direct its studies to the sustainable innovation of organizational and productive knowledge processes.

A product is born because there is a demand that requires it and that expresses certain **needs.** These needs are expressed through an explicit program that promotes the functional aspects of the intervention, and by an implicit and general program that is expressed through **demands**

Starting from these needs and requirements, we identify the **requirements** that the products must possess. On the supply side, in response to demand, products are created that are able to provide specific **performances**

By comparing the **requirements** - **demands** - and **performance** - offers - it can be established which objectives are achieved and which are not. The different levels of satisfaction of the requirements correspond to the same levels of quality.

Quality

Construction process

Standard

Quality

Achieving compatibility between needs and possibilities, integration between possible ideas and achievable things, more simply consistency between form and content

pre-project

Design of the project, field of checks, compatibility research, adjustments and manipulations calibrated according to needs and possibilities.

NORMATIVE CONTROL

- objectives of the programme
- means available
- context conditions

Construction process

Standard

Construction Process

UNI 7867 standard.Organized sequence of operational phases that lead from the detection of needs to their satisfaction in terms of building production

The C.P. is defined by a procedural subsystem that rationalizes the building activity in the public sector

TRADITIONAL

IDENTIFY PROBLEMS	**planning**	**committer**
HOW TO SOLVE THEM	**design**	**designer**
CARRY OUT THE NECESSARY INTERVENTIONS	**building**	**company**
USE	**management**	**users**

ACTUAL

TO PROMOTE RECOVERABILITY BUILDING ELEMENTS	**disposal**	**Company / designer**
REUSE MATERIALS	**reuse**	**NORMATORY BODIES PROJECT PLANNER COMPANY PRODUCERS**

Building Process and Performance Standards

PLANNING: Evaluate the "demand" for intervention, translate it into a "building program" and verify its satisfaction through a "feasibility study". For the planning of the interventions: "three-year programme" and annual updates that are a prerequisite for the "feasibility studies" (quantification of the needs that the public entities prepare). New technical-administrative figures: "Single Coordinator" of the training and implementation phases of the programme and "Single Process Manager" (RUP).

DESIGN: The standard distinguishes between three levels:

- Preliminary design (expresses the will of the administration. It defines the qualitative and functional characteristics of the works)

-Definitive project (it takes into account the needs to be satisfied and translates them into environmental, technological, procedural, economic, maintenance and management choices as provided for in the preliminary draft)

- Executive project (expresses the phase of instructions to performers, with the definition of construction details, calculations and estimates) .

The Procedural Regulations link the level of elaboration of the project also to the modalities of entrustment of the works. Different modalities (public auction, private bidding, tendering, etc.)

CONSTRUCTION: The processes of "construction" include the phase of choice of performers, the organization and equipment of the site, the execution of works and the supply of materials, components and systems, controls during the work, the delivery of works to users and the final technical and administrative control.

MANAGEMENT: The processes of "management" include the phase of use, management and maintenance of the building, the phases of operation, adaptation, requalification and demolition.

These processes are managed by many players, with very different objectives, cultures and languages.

Standard

Normativa esigenziale - prestazionale

It controls the quality of the building by establishing a relationship between the performance of a building and the needs of the users for whom it is intended.

Needs - What, by necessity, is required for the normal performance of an activity (UNI 8290)

Wellness
Safety and security
Usability
Management
Integrability
Appearance
Safeguarding the environment

Requirement

Transposition of a need into a set of characters that characterize it. This is the request addressed to a specific building element to have operating characteristics such as to satisfy certain needs. These characteristics are "functional" so they must be realized independently from the material with which that building element is realized.

Performance

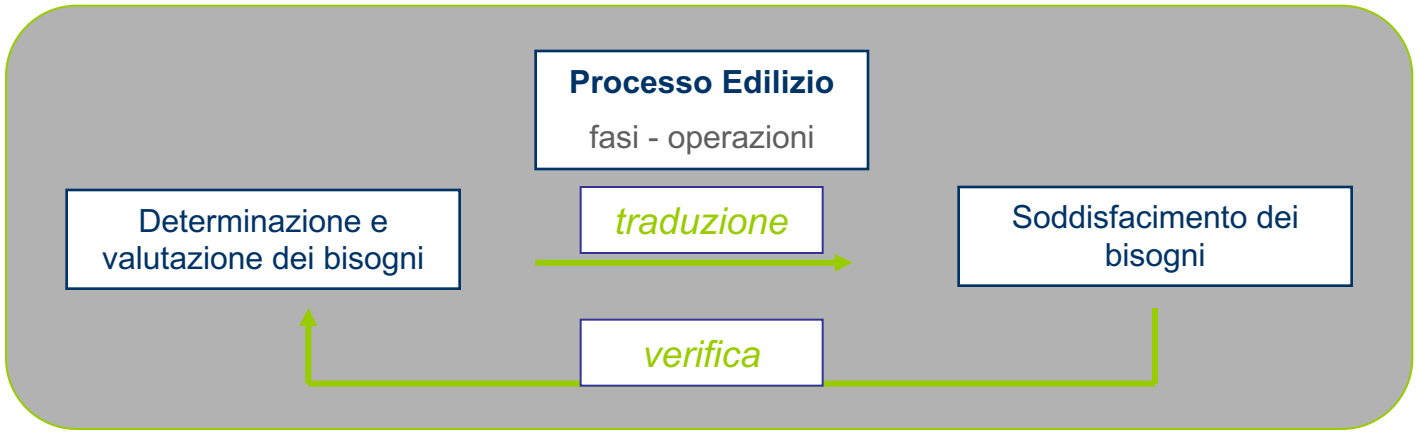
Behaviour in the use of a building element, referred to the characters that characterize a requirement. They describe the behaviour of a particular component and building element when used.

Qualità

Processo Edilizio

Norma

Rapporto norma - processo



Obiettivi della normativa

Azioni della normativa

Objectives of the legislation

This is a general need for rationalization, i.e., organization, planning, guidance and control of interventions. An orderly way of guiding transformations and aimed at balancing the different production sectors.

The standard, understood as a code of conduct, is defined as a "natural standard"; natural standards are "consensual" standards. However, the ones that interest us here are the so-called "systemic" ones. to which corresponds a will or a criterion of pre-arrangement or predisposition with respect to objective data.

The purpose of the standard is to unify, i.e. to make different solutions to the same problem similar. To unify the different characteristics of the products, or to standardize its functions, means to establish minimum levels of acceptability of that product or minimum levels of quality that are indispensable.

Azioni della normativa

Standard

Rapporto norma - processo

Obiettivi della normativa

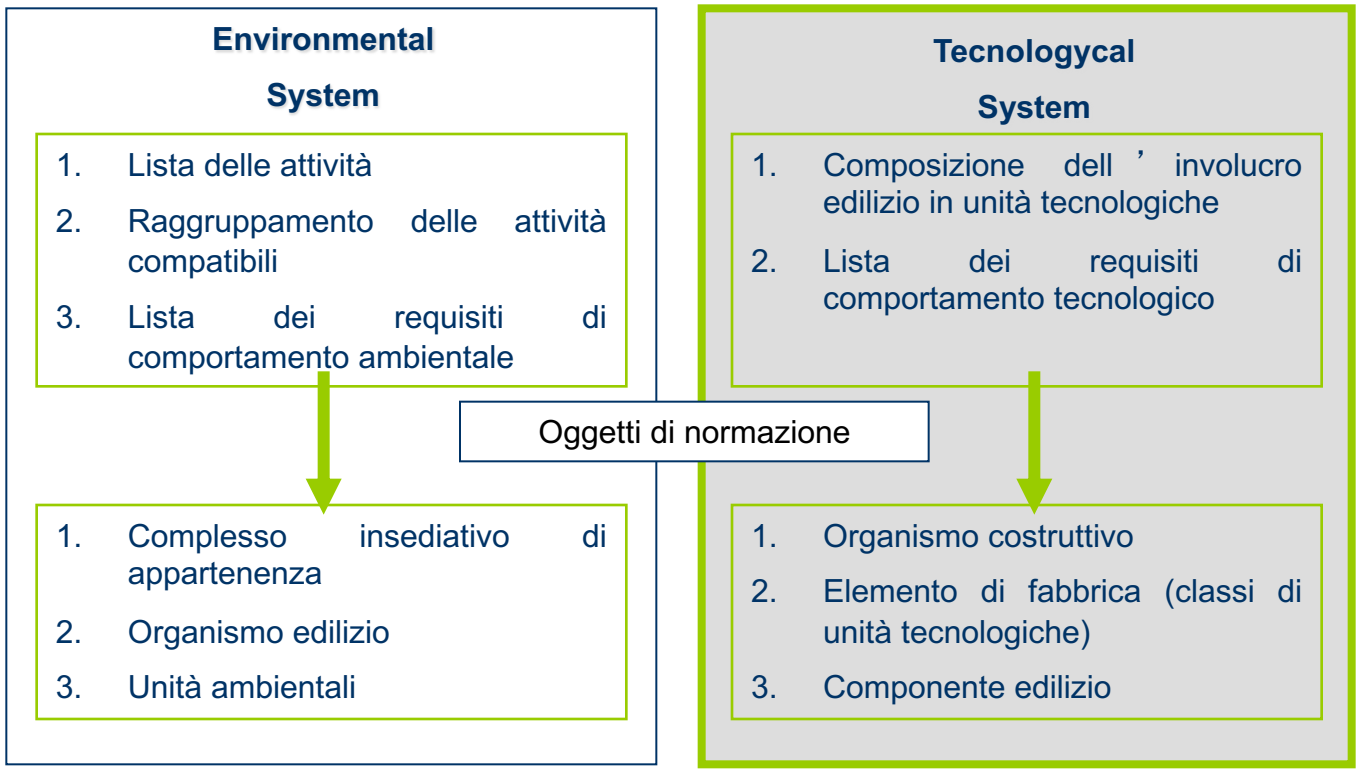
Actions

- To detect and organize the needs expressed by the demand;
- Educate the question if it is not able to express the minimum demand levels;
- Explain the methodologies to be followed and then a series of "rules of the game" (requirements, requests for performance, specifications of performance, ...);
- Verify the levels of performance offered and the correspondence with the required quality levels.

Standard

The quality standard is a guide for the sequences of design decisions and for the quality control carried out. It is based on the contents of requirement, requirement and performance. It is also called performance or demanding-performance, because through it you try to define what you want from the building object in terms of performance.

The regulatory action can take place in a sequence of the type:



Standard

Regulatory Sector

Environmental Regulatory Sector

It brings together all the tools, at a low level, relevant to design in relation to environmental quality, i.e. the environmental well-being to be guaranteed in living organisms. Although referring to procedures and standards existing in the national field, this legislation is affected by local conditions related to the context of application, at least as regards the definition of performance levels to be required;

Regulatory Sector Functional-Space (or Type)

It includes all the tools, of various levels, related to the conception, design and use of spaces relating to settlement complexes, building organizations and individual environmental units. In this field, it is very important to define standards or models or criteria that are specifically related to the physical, geographical and anthropic contexts of the territory in which we operate. The knowledge of significant factors in this regard derives from the knowledge of the different regional realities, supported if necessary by appropriate surveys;

Standard

Regulatory Procedural Sector

It includes all the regulatory instruments of various levels relating to the organisational aspects of planning, design and construction activities, their control and the control of results.

Settore Normativo Procedurale

It includes all the regulatory instruments of various levels relating to the organisational aspects of planning, design and construction activities, their control and the control of results.

UNI 10838:1999 Terminology referring to users, performance, building process and building quality

Materiale bibliografico di riferimento

BUTERA F. M., 2004, *Dalla caverna alla casa ecologica,* Edizione Ambiente

CAMPIOLI A., LAVAGNA M., 2013, *Tecniche e architettura*, Città studi Edizioni, Milano

GREGOTTI V., 2003, *Sulla orma di Palladio. Ragioni e pratica dell'architettura,* Laterza, Bari

NARDI G., 2001, *Tecnologie dell'architettura. Teorie e storie,* Clup, Milano.

PIANO R., 2007, *La responsabilità dell'architetto. Conversazione con Renzo Cassigoli,* Passigli.

QUARONI L., 2001, *Progettare un edificio. Otto lezioni di architettura,* edizioni KAPPA, Roma.