

# MANUAL FOR THE APPLICATION OF THE UNIVERSAL DESIGN PRINCIPLES IN THE ORGANIZATION OF THE MAIN ACTIVITIES TYPICAL OF URBAN CENTERS

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## INTRODUCTION

This manual is presented as a self-training module, aimed at providing information useful to those who are responsible for the design and completion of structures and services intended for the public, in light of the CONVENTION ON THE RIGHTS OF PERSONS WITH DISABILITIES, approved by the United Nations General Assembly in December 2006. Article 4 of the Convention, in fact, commits the member states to “encourage *universal design* in the formulation of standard practice and guidelines”.

“Universal Design” is a step forward in respect to the now widespread regulations related to “accessibility”; it does not contradict these rules but rather acknowledges them as something that is taken for granted.

The European and national regulations currently in force take into consideration cases of legally recognized disability and, as a rule, focus on the rights of those people considered “disabled” to have adequate personal assistance as well as emphasize the concept of “accessible” spaces. For example, a legal requirement guarantees people with motor difficulties access to public buildings but there are no similar requirements to provide seating so as to lessen the discomfort of possible waits, or to reduce as much as possible the distance that must be covered. In addition, the problem of discrimination is not taken into consideration in many cases. It is commonly believed that a place is in conformity with accessibility requirements even when people with disabilities are obliged to use different and penalizing routes, or to use complex equipment at times with a segregating effect.

If these solutions are sometimes inevitable as regards pre-existing buildings or spaces whose historical value or whose structures prevent significant remodelling work to be done, similar problems unfortunately are still found in new designs, even in buildings of notable importance for their use of resources and size.

Often the designers interpret the problems related to accessibility and the relevant regulations as restraints of their free expression on the formal level and so limit themselves to passively respecting regulatory requirements rather than considering “non-discriminatory” design as a new frontier in design.

The manual intends to indicate procedures for planning services and building spaces and structures, with the objective of making them easily, efficiently and agreeably usable by everyone, giving the possibility of an objective evaluation of the result achieved in respect to this objective. For this, it refers to some inalienable principles.

- the validity of the 8 Principles of designing for all,
- reference to the ICF classification,
- the need to involve representatives of people with disabilities in the process of design formulation or the evaluation of existing elements.

In order to avoid useless duplication, the manual, whenever possible, will refer to information and training materials already publicly available, the consultation of which may be either essential or only recommended.

## GLOSSARY

**Accessible/accessibility** – accessibility is a general term used to describe the degree to which a product (an object, service or environment) is accessible to the maximum number of people possible. It can be seen as the ability to access a function and the possible benefit that a service or product can offer. Accessibility is often used in reference to disabled people and to their right to have access to products and services through the use of a support technology.

**Design / Plan** – means the planning of a process that takes into account the various factors that can positively or negatively influence the attainment of a predetermined goal.

**"Discrimination on the basis of disability"** means any distinction, exclusion or restriction on the basis of disability which has the purpose or effect of impairing or nullifying the recognition, enjoyment or exercise, on an equal basis with others, of all human rights and fundamental freedoms in the political, economic, social, cultural, civil or any other field. It includes all forms of discrimination, including denial of reasonable accommodation. *(taken from art. 2 of the Convention on the Rights of Persons with Disabilities)*

**Evaluation/evaluate** – “Evaluation” means verifying that those necessary and acceptable standards have been effectively achieved; evaluation may concern a new design or a pre-existing situation.

**Process** – means the set of actions that must be put into action to reach a particular goal (getting an identity document, making purchases, going to the cinema or theatre, and so forth)

**«Reasonable accommodation»** means necessary and appropriate modification and adjustments not imposing a disproportionate or undue burden, where needed in a particular case, to ensure to persons with disabilities the enjoyment or exercise on an equal basis with others of all human rights and fundamental freedoms. *(taken from art. 2 of the Convention on the Rights of Persons with Disabilities)*

**Universal Design** – indicates the design (and creation) of products, environments, programs and services usable by all people in the broadest sense possible, without the need for adaptation or for specialized designs. “Universal Design” does not exclude the use of auxiliary mechanisms, where necessary, for groups of people with specific disabilities, as defined in art. 2 of the *Convention On The Rights Of Persons With Disabilities*

## 1. REFERENCES

### 1.1. UNIVERSAL DESIGN

The attention to problems related to personal disabilities can be traced back to the end of the 1940's in Europe, Japan and the United States when veterans, often with various types of disabilities, returned home from the Second World War.

In the 1950's, a new sensibility developed regarding the elimination of architectural barriers, a corollary to the hope of overcoming the segregation of people with disabilities in specialized institutes that had received them up till that time. The overcoming of architectural barriers ('Barrier-Free Design') however, still concerned primarily people with motor difficulties.

In the USA, the Veterans Administration and other organizations had the American Standards Association in 1961 publish the first rule on "accessibility" entitled "A 117.1 - Making Buildings Accessible to and Usable by the Physically Handicapped". Although not obligatory, some states and local agencies decided to adopt the standard.

In the 1970's, in the wake of the civil rights movements, originally created to support racial minorities, the idea began to evolve of overcoming barriers with individual solutions in the sense of "non-discrimination" and equal opportunity. At this point, the design and creation of non-discriminatory environments and products became a tool for achieving civil rights for everyone.

In the United States, the concept of "accessible design" was introduced for the first time with the Rehabilitation Act of 1973 that made responsible the organizations that received federal financing in the field of assistance.

An important additional step forward was later brought about by the Americans with Disabilities Act (ADA) of 1990, which extended the application of minimum accessibility standards to all public buildings.

The term "Universal Design" (UD) was coined in 1985 by the architect Ronald Mace who, having had poliomyelitis since his childhood, had to use a wheel-chair and respirator. Mace described Universal Design as "*the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.*"

Mace also wrote that Universal Design "*isn't a new science, a new style and it isn't unique. It requires only knowledge of the needs and the marketplace and a common sense approach so that we all design and produce goods used by the greatest possible number of people.*"

Mace himself later recognized that the term "universal" was not ideal because it may create an expectation of solutions that are impossible to achieve.

In effect, Universal Design defines a user broadly and does not concentrate on people with disabilities only. It suggests making all elements and spaces accessible and usable by the greatest number of people possible. UD does not imply that everything should be completely usable by everyone: the term refers more to an aspiration than to an obligatory objective; it does however propose offering solutions adapted to the needs of disabled people as well as of the rest of the population, containing costs related to specialized aid or service technologies.

In 1997 this methodological approach acquired a definite structure with the definition of the seven design principles developed at the Center for Universal Design of North Carolina State University, a group formed of architects, designers, technical assistants and researchers in the field of environmental design that included: Bettye Rose Connell, Mike Jones, Ron Mace, Jim Mueller, Abir Mullick, Elaine Ostroff, Jon Sanford, Ed Steinfeld, Molly Story, and Gregg Vanderheiden. Other researchers in various disciplines collaborated on the project financed by the U.S. Department of Education's National Institute on Disability and Rehabilitation Research

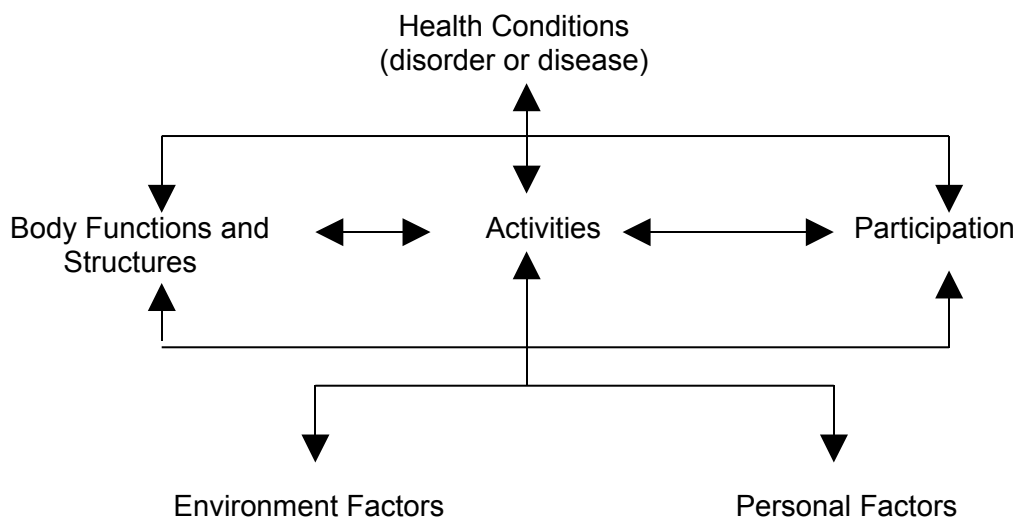
## 1.2 ICF – International Classification of Functioning, Disability and Health

The spread of “Universal Design” undoubtedly has been one of the consequences of the adoption by the World Health Organization (WHO) in 2001 of the ICF (International Classification of Functioning, Disability and Health), which radically changed the previous system, the ICIDH (International Classification of Impairments, Disabilities and Handicaps). “Negative” references to such terms as *impediments*, *disability* and *handicap* have been replaced by “positive” ones that relate to the entire human population, like *body function*, *body structures*, *activities* and *participation* and *environmental factors*.

We thus have moved beyond the earlier distinction between “normal” and “disabled” to acknowledge the wide range of diversities that more realistically define our society, considering those people affected by a range of pathologies of varying severity and the growing number of elderly or other people characterized by specific conditions and whose activities are also limited because of unforeseen external factors, conditions we could certainly not define as “disability”.

As an extreme example, think of how many people are left- instead of right-handed, or even how many immigrants to a foreign country have simply not mastered the language.

The following diagram illustrates the interactions in this new approach:



Disease is a fundamental impairment of body functions and structures which, in turn, consequently determine limitations in daily activities and social life. Personal and environmental factors can modify the disabling impact of the pathology. The causative lines however are reciprocal at all levels and thus environmental or personal factors are also able to maintain, aggravate or, in some cases, explain limitations in the completion of an activity or in having a social life. This picture is not only plausible but also supported by scientific evidence.

The disabling process is seen as a complex interaction between health conditions and contextual factors (i.e., personal and environmental factors) with a dynamic interaction between these factors that can have a reciprocal influence on each other.

The purpose of an approach based on ICF is to give a global picture of the person and not of the disease, focusing on the development of personal abilities and on an environmental context that support this development.

The approach is no longer oriented towards providing assistance of help/support but towards arriving at the greatest possible autonomy.

The ICF classification structure has four levels; among which frequent references are made to the chapter on “Environmental Factors” in this Manual.

- **HUMAN FUNCTIONING**
- **BODY FUNCTIONS**
- **ACTIVITIES AND PARTICIPATION**
- **ENVIRONMENTAL FACTORS**

The ICF classification’s very structure has shifted attention from a purely “physical” evaluation to one that we could schematically defined as linked to people’s “autonomy”.

This implies the need to define some criteria for the application of UD principles as concerns not only the design of single tools or spaces but also the entire process that leads to the completion of what could be called a “plan”.

This is one way to rise above such outdated concepts as that of “accessibility”, to which current regulations normally refer, and to examine instead the sequence of actions necessary to accomplish a predetermined objective.

This manual propose to advise planners and designers, heads of public and private services, as well as business people in conducting an overall evaluation along these principles, keeping in mind that each step is a normal part of a decision-making process by various people.

The Manual also put forward an objective evaluation tool that may be applied to existing situations in order to identify those areas where remedial actions are most needed.

## 2. DESIGNING FOR EVERYONE

### 2.1 “Universal” Design

“Universal Design”, with its Eight Principles, seeks to take into account the entire range of possible differences, with the aim of allowing equal, or at least similar, access and/or use of areas and objects to all people.

This manual, a follow-up to the “Guidelines for the Design of Products Following the Principles of Universal Design”, published in 2006<sup>1</sup>, endeavour to apply these principles not simply to an environment or a consumer good but above all to such complex processes as those that lead to the definition (and “use”) of those services – administrative, cultural, commercial, recreational, and so forth – typically found in historical urban centres.

From this point of view, it is important to state that the authors of this manual ascribe absolute importance to the role, both in the past and nowadays, of urban centres as psychological and cultural catalysts of direct interpersonal exchanges, a role that can never be completely replaced by the use of telecommunication tools that have the side effect on an individual of progressive isolation and insecurity, which may include an increase in pathologies related to a prolonged exposure to alternative and virtual realities.

It therefore is important to facilitate the maximum number of people in the maintenance of those direct relationships that find their natural realization in the typical services offered by cities, without however abandoning those essential aids that permit an otherwise inaccessible quality of life for some categories of people.

It has always been up to human beings to choose if, when and how to use the tools placed at our disposition by science and technology. The principles of Universal Design should be used to stimulate a search for non-discriminatory organizational models in those cases in which the use of ICT (Information and Communication Technologies) permits also apparently equivalent solutions for the direct contacts that specifically characterize urban centre life.

### 2.2 The reference to Universal Design

The seven Principles of UD mentioned in Paragraph 2.1 – the inspirational source of our manual – were codified in 1997 by a work group at North Carolina State University<sup>2</sup> – are listed below: The eighth principle referred to in this text was introduced with the Guidelines for the Design of Products Following the Principles of Universal Design<sup>3</sup>.

The eight principles originally made reference to “design” intended as the planning of a product; their application to complex procedures for service has come about by analogy.

#### *THE UNIVERSAL PRINCIPLES OF USE*

##### *Principle 1: Non-discriminatory use*

The design is usable and marketable to people with different abilities.

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<sup>1</sup> “Guidelines for the Design of Products Following the Principles of Universal Design”, Project ‘PROFUSE’, Pistoia, September 2006

<sup>2</sup> The Center for Universal Design (1997). The Principles of Universal Design, Version 2.0. Raleigh, NC: North Carolina State University - Copyright © 1997 NC State University, The Center for Universal Design

<sup>3</sup> “Guidelines for the Design of Products Following the Principles of Universal Design”, Project ‘PROFUSE’, Pistoia, September 2006

*Principle 2: Flexible use*

The design accommodates a wide range of individual preferences and abilities.

*Principle 3: Simple and intuitive use*

The use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

*Principle 4: Perceptible information*

The design efficiently communicates necessary information to the user, regardless of ambient conditions or the user's sensory abilities.

*Principle 5: Tolerance for errors*

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

*Principle 6: Low physical effort*

The design can be used efficiently and comfortably and with a minimum of fatigue.

*Principle 7: Size and Space for Approach and Use*

Appropriate size and space is provided for the approach, reach, manipulation, and use regardless of the user's body size, posture, or mobility.

*Principle 8: Form neutrality*

The product's aspect, that is the study of its form, must not be identifiable as a product meant specifically or specially for use by people with a disability.

The Eight Principles were subsequently expanded further to become "guidelines", thus facilitating their comprehension and application:

**Principle 1: Non-discriminatory use**

Guidelines:

- *Provide the same means of use for all users: identical whenever possible; equivalent when not.*
- *Avoid segregating or stigmatizing individual users.*
- *Provisions for privacy, security, and safety should be equally available to all users.*
- *Make the design appealing to all users.*

**Principle 2: Flexible use**

Guidelines:

- *Provide choice in methods of use.*
- *Accommodate right- or left-handed access and use.*
- *Facilitate the user's accuracy and precision.*
- *Provide adaptability to the user's pace.*

**Principle 3: Simple and intuitive use**

Guidelines:

- *Eliminate unnecessary complexity.*
- *Be consistent with user expectations and intuition.*
- *Accommodate a wide range of literacy and language skills.*
- *Arrange information consistent with its importance.*
- *Provide effective prompting and feedback during and after task completion.*

**Principle 4: Perceptible information**

Guidelines:

- *Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.*

- *Provide adequate contrast between essential information and its surroundings.*
- *Maximize legibility of essential information.*
- *Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).*
- *Provide compatibility with a variety of techniques or devices used by people with sensory limitations.*

### **Principle 5: Tolerance for errors**

Guidelines:

- *Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.*
- *Provide warnings of hazards and errors.*
- *Provide fail-safe features.*
- *Discourage unconscious action in tasks that require vigilance.*

### **Principle 6: Low physical effort**

Guidelines:

- *Allow user to maintain a neutral body position.*
- *Use reasonable operating force.*
- *Minimize repetitive actions.*
- *Minimize sustained physical effort.*

### **Principle 7: Size and Space for Approach and Use**

Guidelines:

- *Provide a clear line of sight to important elements for any seated or standing user.*
- *Make reach to all components comfortable for any seated or standing user.*
- *Accommodate variations in hand and grip size.*
- *Provide adequate space for the use of assistive devices or personal assistance.*

### **Principle 8: Form Neutrality**

The product's aspect, that is the study of its form, must not be identifiable as a product meant specifically or specially for use by people with a disability.

## **2.3 The ICF functioning model**

These Guidelines, to be used for the evaluation of the differing abilities of product users, refer to the **International Classification of Functioning, Disability and Health (ICF)**, approved by the WHO on 22 May, 2002.

Instructions are provided in the ICF on the new international standard for measuring and classifying health and disability.

It belongs to the family of international classifications developed by the WHO and is a revision of the International Classification of Impairments, Disabilities and Handicaps (ICIDH) published in 1980.

The objective of the ICF is to provide a common language for describing and measuring an individual's disability – in other words, to describe and measure human function and its differences. The ICF classifies health and correlated states; it is a tool for creating a profile of an individual's general state of health as well as the characteristics associated to his life experience.

It may be considered a complete vocabulary that permits describing human functioning as regards various disabilities.

The ICF has adopted and promotes a "bio-psycho-social" interpretation of disability with the objective of providing a consistent perspective of various health dimensions at the following levels:

- biological
- individual
- social

The bio-psycho-social model is based on the integration of two great conceptual models that, over time, have held contrasting views on disability:

- the medical model
- the social model

The medical model was – and in many ways still is – the predominant one; the social model was created to counter the medical one and has been linked historically to the promotion of the rights of people with disabilities.

The medical model of disability considers physiological and psychological abnormalities (caused by illness, psychological disturbance or injury) as problems to be treated through medical interventions.

The social model views disability as stemming primarily from the disadvantages imposed by the physical and social environment that surrounds us.

The ICF has proposed integrating the two models by recognizing their complementary nature insofar as it affirms that:

- both the medical and the social models provide appropriate elements of interpretation and intervention;
- Neither the medical nor the social model is sufficient alone to provide solutions.

**Disability is considered the complex interaction between an individual's characteristics and those of the world.**

Therefore, the ICF – besides its political and social messages regarding disadvantages caused by the lack of resources, opportunities and environmental adjustments for people with disabilities – provides a launching pad for the scientific validation of these concepts.

In particular, they systematically and specifically demonstrate:

- WHEN and with WHAT IMPORTANCE the environment restricts a person's full participation;
- WHAT KIND OF ENVIRONMENTAL MODIFICATIONS can increase participation (i.e., removing obstacles/providing opportunities)?

From this basis, it is evident how environmental factors may, in relation to their qualitative and quantitative characteristics, facilitate or obstruct the functioning of each of us.

## **2.4. The Functional Characteristics of People**

What knowledge about the variety of human bodies in different people serves to guide the designer's choices in a search for solutions that favour the non-discriminatory usability of a product on which he is working?

What kind of person must be taken into consideration?

What kind of "functional framework" and what conditions?

In order to begin answering these questions, it is necessary to refer to a descriptive framework – concise but not exhaustive – of people with diversity due to impairment and/or to particular contextual situations.

- **People with motor difficulties**
  - People with upper limb motor difficulties
  - People with lower limb motor difficulties
  - People with other limb motor difficulties
  
- **People with sensory difficulties**
  - People with visual difficulties
  - People with hearing difficulties
  - People with other sensory difficulties
  
- **People with language difficulties**
  
- **People with cognitive, comprehension or orientation difficulties**

### **2.4.1. People with motor difficulties**

The type of motor difficulty may derive from a temporary or permanent impairment as the result of trauma or one of a wide variety of pathologies: arthritis, a lack or deformity of one or more limbs, multiple sclerosis, medullar injuries, etc.

These impairments can limit or hinder the activities necessary to use a product or to carry out an activity.

#### **2.4.1.1 People with upper limb motor difficulties**

This group can include people with a temporary or permanent impairment caused by stroke, tendonitis, arthritis, amputation, medullar injuries, tetraplegia, Parkinson's disease, multiple sclerosis, muscular dystrophy, poliomyelitis, cerebral paralysis, a congenital defect or lack of an upper limb.

Also included in this same group are: children with small hands and little strength, the elderly with their natural decrease in functionality of movement and strength, chronically fatigued individuals, those who have the use of a single hand or arm, people who must wear personal protective clothing or equipment such as gloves, people who temporarily cannot use their dominant hand or arm, and people who work in extreme and adverse environmental conditions.

In all of these cases, problems of movement, coordination and/or strength in the use of upper limbs can be verified.

The designer must therefore develop solutions that facilitate the execution of the following actions:

- Reaching down, up, forward, back
- Pushing/pulling
- Lifting
- Transporting
- Holding

- Revolving/turning
- Manipulating

#### **2.4.1.2. People with lower limb motor difficulties**

This group can include people with temporary or permanent impairments caused by trauma, stroke tendonitis, arthritis, amputation, medullar injuries – tetraplegia, Parkinson’s disease, multiple sclerosis, muscular dystrophy, the result of poliomyelitis, cerebral paralysis, or a lack or congenital defect of the lower limbs, people with respiratory and/or circulatory difficulties.

We can also include in this same group: children, the elderly with a natural decrease in functionality of movement, strength and balance, people in chronically fatigued states, people who wear personal protective clothing or equipment (e.g., work boots), and pregnant women.

People with lower limb motor difficulties may or may not use mobility aids, such as canes, crutches, Canadian crutches, walkers, manual and/or electronic wheelchairs, mobility scooters, and so forth. In these cases, there is an obvious overlapping with the needs of those with upper limb motor difficulties, (i.e., a person using a cane to walk has only one free hand), and the size of the aids must be taken into account, (e.g., enough frontal space for a person in a wheelchair to approach, a suitable height for use).

In all of these cases, problems of movement, coordination and/or strength in the use of lower limbs can be demonstrated.

The designer must therefore develop design solutions that facilitate the execution of the following actions:

- Standing/Sitting
- Walking
- Maintaining one’s equilibrium on one or both feet
- Manoeuvring with the feet, e.g., operating a pedal

#### **2.4.1.3. People with other motor difficulties**

This group can include people with temporary or permanent impairment caused by stroke, tendonitis, arthritis, amputation, medullar injuries - tetraplegia, Parkinson’s disease, multiple sclerosis, muscular dystrophy, a result of poliomyelitis, cerebral paralysis, people with respiratory difficulties.

In the same group are also included children, the elderly with a natural decrease in functionality of movement, strength and balance, people in chronically fatigued states, people who wear personal protective clothing that limits movement or equipment, and pregnant women.

In all of these cases, problems of movement, coordination and/or strength in the overall functionality of the body itself can be verified.

The designer must therefore develop design solutions that facilitate the execution of such actions as:

- Changing a fundamental body position, (e.g., sitting, reclining, crouching, kneeling, standing up, or bending, etc.)
- Maintaining a body position, (e.g., remaining seated, reclined, crouched, kneeled, or in an upright position, etc. for a certain period of time)
- Maintaining balance
- Moving the body’s barycenter

#### **2.4.2 People with sensory difficulties**

The type of sensory difficulty can derive from temporary or permanent impairments due to a wide variety of pathologies. These impairments can limit or impede various important activities in the use of a product.

#### **2.4.2.1 People with visual difficulties**

This group can include people with temporary or permanent impairments lead to blindness, hypovision, caused by trauma glaucoma, retinitis, cataracts, or damage to the eye's structure or functions.

In the same group we can also include the elderly with their natural decrease in visual capacity due to the aging process, people who wear personal protective devices, such as protective glasses, people who operate in extreme and adverse environmental conditions (places with high glare, coloured or low lighting), people who work in very visually polluted environments, and those fatigued by visual effort.

In all these cases in which a reduction or absence of visual capacity is verified, the designer must develop appropriate design solutions to permit the greatest number of people possible to:

- Perceive details and parts in the case of near vision or of distance vision.
- Perceive details and parts with alternative means to the visual ones
- Distinguish objects from the background
- Perceive contrasts
- Perceive distances and sizes

#### **2.4.2.2 People with hearing difficulties**

This group can include people with temporary or permanent impairments that lead to partial or total deafness caused by trauma, inner ear damage, cerebral trauma, damage from prolonged exposure to noise, or hearing decrease due to aging.

In the same group, we can also include people distracted by multiple sources of noise, those who work in highly noise-polluted environments, and those who use headphones and earphones, also as a means of personal protection.

In all these cases, the designer must develop appropriate design solutions that facilitate people with reduced or no hearing faculty in the execution of the following actions:

- Perceiving high and low tones
- Perceiving relevant information from background noise
- Identifying the source of sound signals
- Perceiving information through means other than auditory ones.

#### **2.4.2.3 People with other sensory difficulties**

This group can include people with temporary or permanent impairments that cause a loss of tactile functions and of sensory functions related to temperature and other stimuli.

In the same group, we may include people who use personal protective clothing and/or systems, who work in particularly hostile environments, e.g., a cold environment that can cause a noticeable loss of sensory functions.

In all these cases, the designer must develop design solutions that assist people with impaired sensory functions:

- The perception of surface characteristics, (e.g., structure and other characteristics)
- The perception of temperature and the subsequent risk of burns
- The perception of vibrations
- The perception of tremors
- The perception of superficial and/or strong pressures

#### **2.4.3 People with language difficulties**

This group can include people with temporary or permanent impairments due to various causes. In some cases, language difficulties can be related to hearing and/or cognitive difficulties.

In the same group are included foreigners or those who use a different language, people from different cultures, children, and the elderly with their natural loss of functional capacity, people who work in particularly hostile environments or who use personal protective clothing or systems.

In all these cases, the designer must develop design solutions that assist people who may have problems intelligibly expressing actions when required, as in all cases in which the product /goods/service presupposes the use of voice commands, a voice response to questions or the expression of requests.

#### **2.4.4. People with cognitive, comprehension and orientation difficulties**

This group can include people with temporary or permanent impairments caused by mental retardation, Down's syndrome, Alzheimer's disease, stroke, cranial trauma.

In the same group we may include fatigued or distracted people, foreigners or those who use a different language, people from different cultures, and people with a limited vocabulary, children, and the elderly with a natural loss of mnemonic capacity.

In all these cases, the designer must develop design solutions that assist people with cognitive, comprehension and orientation diversities:

- Understanding of visual, auditory and tactile information
- Timely reaction to stimuli
- Maintenance of concentration
- Initiation of a sequence of actions
- Memorization

### **3. GUIDELINES AND EVALUATION**

#### **3.1. Designing the “processes”**

A design and its evaluation must begin with by defining the need to be satisfied and must be based on a reference framework made up of limitations and prior experiences.

In our case, the purpose of an evaluation process or of a new design is the complex set of actions that permit the attainment of a final objective; this series of actions can be summarized as:

- information acquisition
- the decision-making process
- transfer
- carrying out the activity in a strict sense
- return to the starting point

Naturally, the “burden” and complexity of each step predictably will vary according to the type of activity and may be broken down into further simple stages.

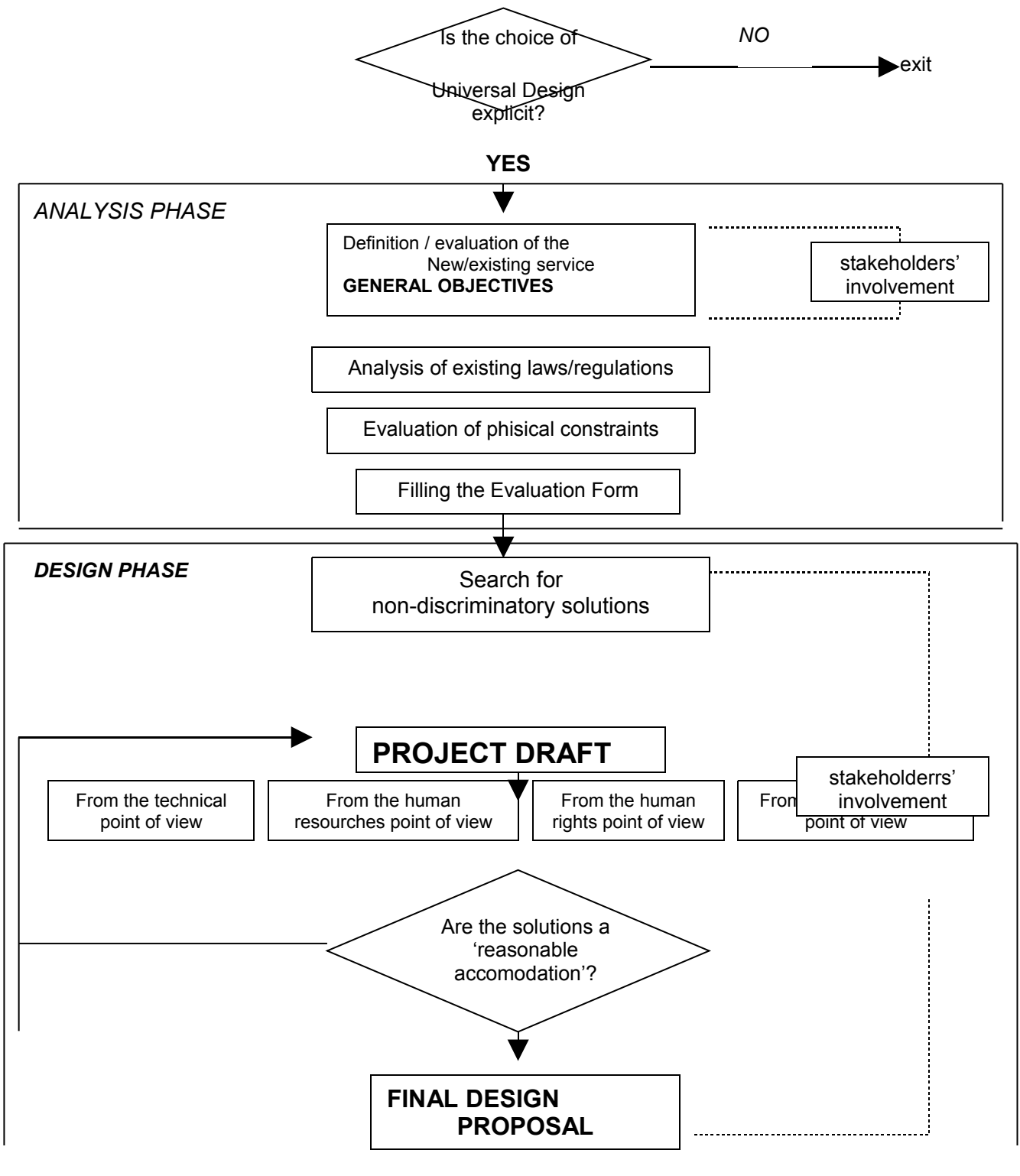
In order for the entire process to meet the objective of eliminating, or at least reducing as much as possible, the potential elements of “discrimination” that derive from individual differences among people, the principles of “Universal Design” ought to be verified at each sub-phase. “Non-discrimination” means the possibility of carrying out a certain operation autonomously with or without the support of products and in a similar or equivalent way in respect to those people who do not have functional problems.

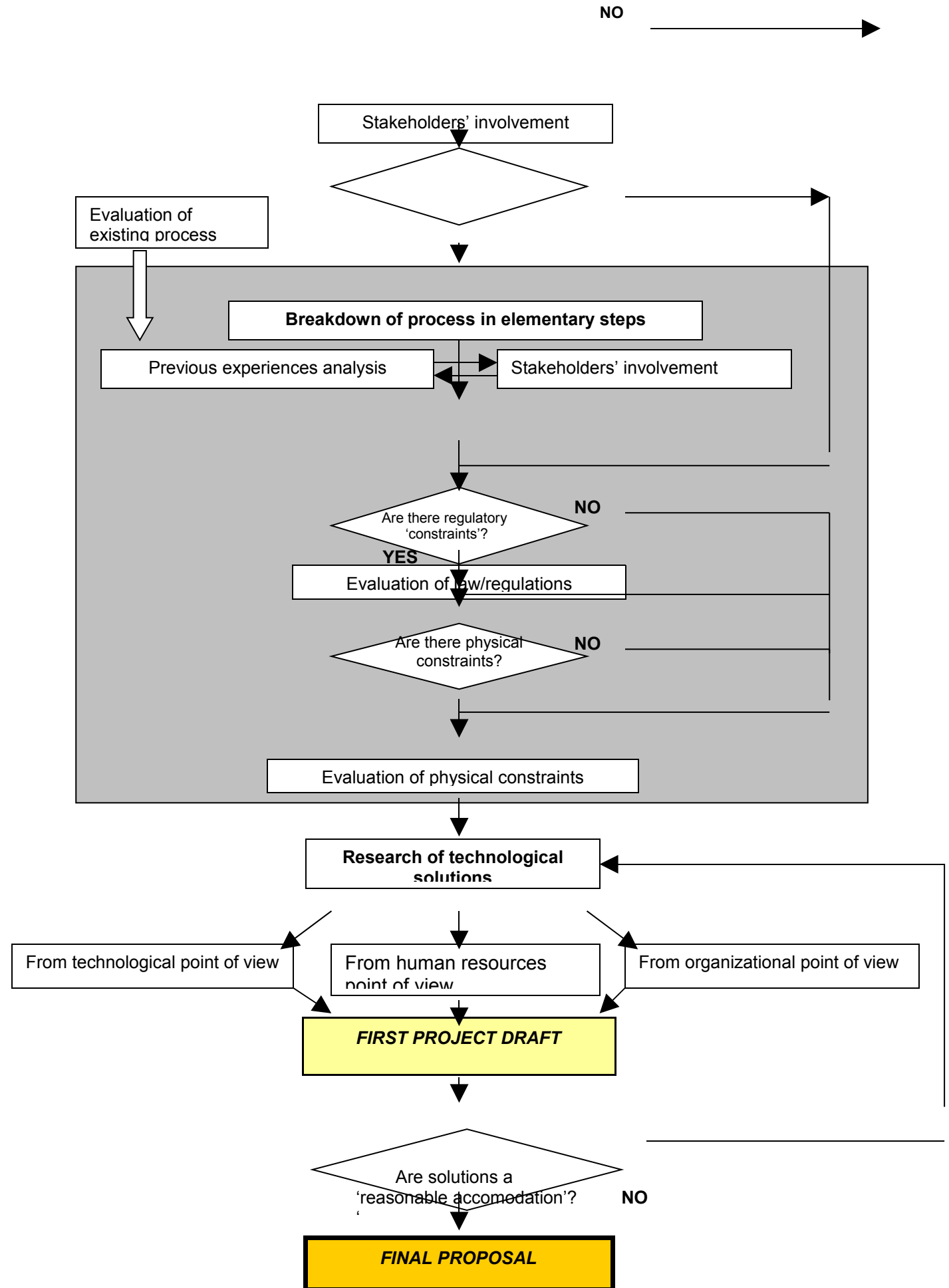
Considering the impossibility of completely eliminating all the consequences of diversity among human beings, the final aim of the evaluation or design must be the “reasonable accommodation” cited in the text from the Convention on the Rights of Persons with Disabilities that was approved in December 2006 by the United Nations General Assembly.

Indeed in order to evaluate the “reasonableness” of the solutions identified, the involvement of representatives of people with the disabilities under consideration is indispensable.

In the following paragraphs are Guidelines that illustrate a design process that include the relevant evaluation steps for an analysis of a pre-existing situation, which can be used to evaluate the presence of discriminatory elements in the decision-making process related to the opportunity/need for an overall re-design of these services.

## PROJECT PROCESS FLOW-CHART





1. The flow chart refers to a planning approach that takes into account the necessary steps required to carry out a complex activity; the entire process starts from the moment that the user decides to undertake an activity, continues up to the moment the objective is reached and finishes when the user returns to the starting point. The entire set of elements taken into consideration nevertheless is based on the designer's precise, immediate ability to intervene: anyone who decides to open a business in a specific area can - respecting all laws and regulations - autonomously plan the building but not the surrounding road network. He can, however, remove any discriminatory obstacles by demanding coherent decisions and going beyond the prescriptive regulations

<sup>2</sup> It is also important to make explicit the choice to apply the principles of "planning for everyone" in order to ensure transparency in the relationships between possible customers and the designer.

<sup>3</sup> The term "previous experiences" is meant to describe already existing alternatives that meet users' similar needs.

<sup>4</sup> The term "regulatory constraints" is meant to describe all laws and/or regulations that are put in place by the public authorities and which normally establish minimum levels for the removal of discriminatory barriers (See Legal Data Base).

<sup>5</sup> The term "Physical constraints" is meant to describe limitations that may derive from the environmental situation: physical condition of the locations, characteristics of pre-existing buildings that cannot be modified (i.e., because they are historical), climatic conditions, etc.

<sup>6</sup> The expression 'reasonable accommodation' refers expressly to the text of the "International Convention on the Rights of People with Disabilities" approved in December 2006 by the United Nations General Assembly: "Reasonable accommodation" indicates the modifications and adaptations that are necessary and appropriate and that do not impose a disproportionate or excessive burden where, in specific cases, there is the need to ensure that people with disabilities can enjoy and use all human rights and fundamental freedoms on equal basis with all others."

<sup>7</sup> The term 'final proposal' is meant to describe the result of a planning process as regards both the carrying out of a totally new service as well as modifications to an existing service.

## 3.2. Design phases

### 3.2.1. – The choice of Universal Design.

The choice to follow the Universal Design objectives has been explicit since the beginning of the design process as, unsurprisingly, many of the subsequent choices will be conditioned by them. They are therefore to be considered an integral part of the specification references that describe the design's purposes and which the designer must follow.

The formalization can be contained in the text of the project assigned by the eventual client, or in other non-binding forms. It is however essential that it be taken into account in each phase of the design, considering it not a constraint but rather an opportunity to look for innovative solutions.

### 3.2.2. Stakeholders' involvement

Both in the case of evaluating a current situation and designing a project yet to be carried out, the greatest difficulty is undoubtedly linked to subjective factors: the infinite variety of the personal conditions, by definition, does not permit using evaluation/design criteria that are suitable for all individuals, nor often in the case of people with disabilities of adopt criteria that, although valid or reasonable by the designer/evaluator, are in reality mainly or completely inapplicable to real situations; in the evaluation process, it is therefore indispensable to involve people with disabilities or in any case people able to evaluate through direct experience the effectiveness of the measures devised/adopted and possibly provide alternative directions.

The importance of involving the various "interest groups" in the realization of projects in a specific area is also obviously supported by organizations of people with disabilities, which often have demanded in official documents to be involved from the beginning in the design of structures and services, all the more if these initiatives are directed at them.

Some documents that refer to this subject<sup>4</sup> are listed below:

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#### 1993 - **Standard Rules on the Equalization of Opportunities for Persons with Disabilities, adopted by the United Nations' General Assembly.**

*Rule 5 refers specifically to the responsibility of States to guarantee full accessibility to buildings and outdoor spaces, involving people with disabilities in the definition of standards and laws on accessibility.*

*Rule 18 assigns to organizations of people with disabilities the role of identifying the needs and priorities, of participating in the planning, the realization and evaluation of services and of the measures that concern their own lives as well as a contributing role in public awareness and in a commitment for change.*

#### 2002 - **Madrid Declaration**

*Nothing about disabled people without disabled people.*

*All actions will be undertaken with the will to communicate and cooperate with the most representative organizations of disabled people. Participation must not be limited to an exchange of information or acceptance of decisions already made. Instead, at all levels of the process, governments must establish specific mechanisms for consultation and discussion that will permit disabled people through their organization to contribute to the planning, use, supervision and evaluation of all activities.*

#### 2003 - **Norcia Declaration**

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<sup>4</sup> Source: [www.communityplanning.net](http://www.communityplanning.net) site

*The organizations of people with disabilities, through their consultants and otherwise, must participate in the planning of services and accessibility and availability measures along the lines of: “nothing about disabled people without disabled people”.*

**2006 - Convention on the Rights of Persons with Disabilities**

*Art.4 paragraph 3. In the development and implementation of legislation and policies to implement the present Convention, and in other decision-making processes concerning issues relating to persons with disabilities, Member States shall closely consult with and actively involve persons with disabilities, including children with disabilities, through their representative organizations.*

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To guarantee the efficiency of the participatory process, it is a good idea to involve the user from the very first phase. For this reason, specific techniques have been worked out for some time, which permit the management of a “shared plan” right from the beginning.

A number of experiments have been carried out in the field of urban planning and the design of public spaces (squares, public gardens, schoolyards...), but similar techniques can be applied to the evaluation and design of other types of structures and services.

In this text, we naturally take for granted the resolve to remove all possible causes of discrimination based on disability from the set of actions necessary to enjoy the structures and services under consideration.

Therefore, the initial decision processes are not taken into consideration, in the course of which it is deemed appropriate to consult people and organizations so they may express their opinions and provide indications with regard to the priority of projects to be carried out.

From this point of view, it seems productive to consult representatives of various categories of stakeholders in discussions related to a new project or the evaluation of an existing one, besides people representing the world of the disabled, the following may be contacted regarding the features of the planned design or its evaluation: public administrators, engineers, business people and company directors in order to assess their knowledge and sensitivity to the problems of non-discrimination and make them aware of the value and benefits of this type of economic investment and possible improvements using UD. These early contacts can also be useful for anticipating possible objections to the choices that will subsequently be made.

We present the following outline as a potential model for the interviews to be conducted, keeping in mind that the subject areas and their wording may vary based on the type of service to be designed or evaluated.

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## **PROJECT INPUT – OUTLINE FOR STAKEHOLDER INTERVIEWS**

The interviews will have more than one aim:

- verification of the degree of sensitivity relative to the problems of non-discrimination,
- verification of the degree of information on the importance of observable facts, existing regulations and possible actions,
- bring these themes to the attention of the contact person
- collect possible (preliminary) suggestions, objections, comments, indications of critical needs, etc.
- interpret the social dynamics to focus on spheres of possible interest for UD research

The interviews should be carried out with four different categories of subjects:

1. People with disabilities
2. Heads of associations of people with disabilities
3. Public administration managers (in local governments with either political or technical responsibilities)
4. Administrators of private establishments (e.g., shopping centres, shops, performance halls, etc.)

The interviews may also be carried out without using a specific questionnaire but the interviewer shall however include the answers to the questions on the following example form in order to make the answers comparable from a statistical point of view.

It will be particularly important to analyse the answers also with reference to the category of stakeholder who responded to the questions, verifying the presence of possible perceptual differences of problems among the various categories.

Subjects to be covered in the interview:

1. The first questions will verify the interviewee's degree of information as well as to directing him towards an outlook consistent with the project: UD principles go beyond the concept of "non-disabled", envisioning the design of goods and spaces that may be used and "experienced" equally by everyone; it would be interesting to know how much the contact person knows regarding this area.
2. Degree of acquaintance with the Convention on the Rights of Persons with Disabilities that makes specific reference to UD as design standard.
3. Acquaintance and acknowledgment of the ICF classification model for measuring a subject's physical characteristics looks at the "ability to function" within a specific context; even in this case, the division between "normal" and "handicapped" is moving towards a view of individual autonomy and well-being that is conditioned also by external factors.
4. In view of the preceding points even "normal" conditions for an individual become an object of attention; thus, the statistical incidence of the elderly, pregnant women or those with very small children, left-handed people, etc. becomes important
5. From Question 5 on, the persons interviewed are requested instead to consider their own actual observations, asking them to think about what they see and experience daily and asking them for their ideas and suggestions.

An example of the form that summarizes the interview is shown below:

**INTERVIEW FORM**

*INvolving People for a Universal Town*



Programme 'Leonardo da Vinci' Conv. N. LLP-LDV/TOI/2007/IT/194  
 Co-ordination: CII PISTOIA s.cons. a r.l. – via Tripoli 19 -51100 Pistoia (Italy) - P.IVA 01000060473  
 Tel +39 0573 964482 – fax +39 0573 964486 – e-mail: [input@ciipistoia.it](mailto:input@ciipistoia.it) –  
<http://www.inputproject.eu>

Organisation interviewed	
Role / Responsibilities of the person interviewed	
Other useful information	

1	Level of Universal Design knowledge	none	<input type="checkbox"/>
		poor	<input type="checkbox"/>
		good	<input type="checkbox"/>
		applied	<input type="checkbox"/>

2	Knowledge of UN Convention on the Rights of People with Disabilities	YES	<input type="checkbox"/>
		NO	<input type="checkbox"/>

3	Acceptance of the ICF model for the evaluation of 'human functioning' instead of the identification of 'different' minorities	YES	<input type="checkbox"/>
		NO	<input type="checkbox"/>
		Do not know	<input type="checkbox"/>

4	Correct (quantitative) statistical perception of observable facts <i>(e.g., proportional incidence of the elderly and people with disabling illnesses)</i>	YES	<input type="checkbox"/>
		NO	<input type="checkbox"/>
		Partial	<input type="checkbox"/>

5	In which of the following situations or places do you believe that the most serious discrimination exists? <i>(rank in order from 1-most important to 10-least important)</i>	School	<input type="checkbox"/>
		Public offices	<input type="checkbox"/>
		Private offices	<input type="checkbox"/>
		Shops	<input type="checkbox"/>
		Sport facilities	<input type="checkbox"/>
		Public areas and road network	<input type="checkbox"/>
		Public transport vehicles	<input type="checkbox"/>
		Airports, stations, etc.	<input type="checkbox"/>
		Theatres, cinemas...	<input type="checkbox"/>
		Bars, restaurants ....	<input type="checkbox"/>
Other	<input type="checkbox"/>		

6	Ability to cite some concrete examples	YES	<input type="checkbox"/>
		NO	<input type="checkbox"/>

7	Indicate a case of which he/she was witness	
---	---	--

--	--

8	Who should take action to remove the problems? <i>(in order of responsibility)</i>	European Commission	
		National policies	
		Local policies	
		Public Administration	
		Technical Managers	
		Private entrepreneurs	
		Associations	
		Unions others	

9	Known positive practical examples	

10	Referring to your experiences, how difficult is to remove the actual discriminating factors?		
		Not possible	
		Possible, but technically difficult	
		Possible, but very expensive	
		Possible	
		easy	

11	Ideas, suggestions, possible innovations	

As regards the planning and evaluation of services that are the specific objective of the design, the themes of the participatory process should be to:

- acquire direct information on the behaviour and demands of people who are expected to use the service to be designed or evaluated.
- know the expectations of the end-users in order to make the project more functional and adapted to their actual needs.
- Collect possible suggestions and proposals.

The techniques to achieve these objectives are many, and vary according to the type of design that is being tackled and the number of people involved but they can be defined in brief as:

a. Identifying the individuals to be involved

- the disabled people likely to be interested in using the service or structure and the persons in charge of the organizations or the service provider.
- the people in charge of services or structures with similar elements even if set in a different area.
- The stakeholders (manufacturers, schools, local associations, artisans, merchants, volunteers, etc.), to be considered, not only as people with needs but also as people with interests and economic and human resources.

b. Defining the methods of involvement

- decide the contact method: telephone or direct interviews, open- or closed-answer questionnaires, mailings, and so forth.
- define the sample size
- plan and test possible questionnaire, train the interviewers,
- define the statistical analysis criteria

c. Collection and statistically processing of information, taking into particular account all suggestions and remarks brought forward.

The results obtained from this participatory process must be pulled together into a specific reference document for the planning or evaluation process. They may also be the object of a public presentation directed at the involvement of operators outside the project but whose actions may condition the result.

Once the project has been defined or the evaluation of the existing service completed, possibly giving rise to a series of suggestions for corrective actions, it is opportune to schedule public presentations and organize talks at the local level.

At this phase, it is appropriate to ensure that the information provided has been effective in terms of clarity and unambiguous interpretation, making explicit the resolve to “listen to” the subjects involved and to use concretely the opinions collected in the final decision-making process. It is also important to communicate and, if possible, agree on which parameters will be used to evaluate the effectiveness of the project.

### **3.2.3. Process breakdown**

Any human activity that aims at meeting an objective can be broken down in a series of simpler consecutive actions.

The breakdown of a process into increasingly more basic individual steps allows a single action to be more effectively analyzed with the aim of identifying the critical areas and factors of the micro-process under the most favourable conditions, without the risk that the activities being analyzed are so broad that they impede the critical elements at the basis of the problems from being seen.

To give an extremely simple example, any process that anticipates the movement from one’s own home to a point outside can be broken down into

- reaching the road,
- use of a public or private vehicle,
- carrying out the journey,

- possible parking.

Each action has an objective whose accomplishment is indispensable for the following action. It seems obvious that the first point may present problems linked to the location of one's home on an upper floor, the presence of steps and inadequate passages, the distance from the road, while the second point is influenced by vehicle characteristics, the organization of public services, personnel attitudes and training, etc.

It is thus necessary to consider the various aspects and phases as distinct.

Listed below are some (very simple) examples of the breakdown of rather widespread processes:

*Example 1*

<i>In order to purchase essential goods, one needs to:</i>	
1	<i>Obtain information (directly or from one's home using electronic means (web), telephone or post) regarding opening hours, types of products for sale, etc</i>
2	<i>a) exit one's home</i>
	<i>b) pedestrian route</i>
	<i>c) use of public collective transport</i>
	<i>d) use of private collective transport</i>
	<i>e) use of private vehicle</i>
3	<i>Enter and move around the point of sale</i>
	<i>Have contact/communicate with public/private operators</i>
	<i>Perceive, recognize, choose and collect the merchandise</i>
4	<i>Cover the distance back to one's home with the purchased goods</i>

*Example 2*

<i>In order to go to the cinema one needs to:</i>	
1	<i>Obtain information (directly or from one's home using electronic means (web), telephone or post) regarding opening hours, programming, tickets prices, availability of spaces or other services specific to the support of the disabled, etc ....</i>
2	<i>a) exit one's home</i>
	<i>b) pedestrian route</i>
	<i>c) use of public collective transport</i>
	<i>d) use of private collective transport</i>
	<i>e) use of private vehicle</i>
3	<i>Enter, find one's bearing and move inside the cinema</i>
4	<i>Purchase the ticket and in general enter in contact/communication with the staff</i>
5	<i>Attend the show (use of the service)</i>
6	<i>Cover the distance back to one's home</i>

*Example 3:*

<i>In order to obtain an identification document at a public office one needs to:</i>		
1	<i>Obtain information (directly or from one's home using electronic means (web), telephone or post) regarding opening hours, programming, tickets prices, availability of spaces or other services specific to the support of the disabled, etc ....</i>	
2	<i>Cover the distance to the various places (offices, etc.)</i>	<i>a) exit one's home</i>
		<i>b) pedestrian route</i>
		<i>c) use of public collective transport</i>
		<i>d) use of private collective transport</i>
		<i>e) use of private vehicle</i>
3	<i>Obtain and present all documentation necessary to request the I.D. (Have photos taken, request and obtain papers, pay revenue stamps, fees etc.), request the document and collect it.</i>	<i>Enter and move around the offices, etc (including entering a photo studio or using an automatic booth to have one's photo taken)</i>
		<i>Have contact/communicate with public/private operators</i>
		<i>Sign, authenticate documents (generally documents requiring formal legal recognition)</i>
4	<i>Cover the distance back to one's home</i>	

### 3.2.4. Environmental factors in the ICF

In order to identify the factors that can be the cause of critical issues when analyzing an existing service or planning a new one, it may be useful to refer to the ICF (International Classification of Functions) classification, described in a previous chapter, selecting the paragraphs considered relevant contained in the chapter "Environmental Factors", marked with the code "e".

e1 products and technology	e115 Products and technology for personal use in daily living
	e120 Products and technology for personal indoor and outdoor mobility and transportation
	e120 Products and technology for personal indoor and outdoor mobility and transportation
	e125 Products and technology for communication
	e140 Products and technology for culture, recreation and sport
	e150 Design, construction and building products and technology of buildings for public use
	e155 Design, construction and building products and technology of buildings for private use
	e160 Products and technology of land development
e3 support and relationships	e340 personal care providers and personal assistants
e4 attitudes	e430 Individual attitudes of people in positions of authority
	e440 Individual attitudes of personal care providers and personal assistants
	e455 Individual attitudes of health-related professionals
e5 services, systems and policies	e510 Services, systems and policies for the production of consumer goods
	e515 Architecture and construction services, systems and policies
	e520 Open space planning services, systems and policies
	e535 Communication services, systems and policies
	e540 Transportation services, systems and policies
	e585 Education and training services, systems and policies

It is necessary at this point to refer to the descriptive content of each paragraph, which may be consulted on-line at the site, [www.who.int/classifications/icf](http://www.who.int/classifications/icf). Some examples of the descriptions are listed below:

<b>e115 Products and technology for personal use in daily living</b>
--

Equipment, products and technologies used by people in daily activities, including those adapted or specially designed, located in, on or near the person using them.

Inclusions: general and assistive products and technology for personal use

**e120 Products and technology for personal indoor and outdoor mobility and transportation**

Equipment, products and technologies used by people in activities of moving inside and outside buildings, including those adapted or specially designed, located in, on or near the person using them.

Inclusions: general and assistive products and technology for personal indoor and outdoor mobility and transportation

**e1200 General products and technology for personal indoor and outdoor mobility and transportation**

Equipment, products and technologies used by people in activities of moving inside and outside buildings, such as motorized and non-motorized vehicles used for the transportation of people over ground, water and air (e.g. buses, cars, vans, other motor-powered vehicles and animal-powered transporters), not adapted or specially designed.

### **3.2.5. Form for specifying the critical issues**

***The combination of elementary steps in which the process and “environmental” factors of the ICF classification are broken down allows an “evaluation form” to now be set out, an example of which follows:***







### **3.3. The evaluation of existing structures and services**

The choice of Universal Design cannot overlook a careful and objective evaluation of what already exists, namely an examination of the problems individuals encounter when carrying out in its current form the process being analyzed, and that can have consequences of varying types: from that of simply prolonging the times required for the action to the impossibility of achieving the predetermined objective.

It is also essential to evaluate two categories of conditioning elements that may escape the notice of both the designer and the user: regulations in force and their resulting objective limitations, i.e., the morphological, climatic environmental situation, etc.

The clarification of their analysis can however lead to a comparison with third parties (normally public administrations) that could dismiss all or part of the limitations analyzed.

#### **3.3.1. Consulting the intended users**

To complete the evaluation forms, it is fundamental that attention be paid to the representatives of the categories that can be most affected by the discriminatory effects of the critical issues and that they are consulted.

To this end, it is appropriate that a questionnaire-form be prepared to carry out interviews aimed at people with various disabilities who can provide useful information for comparison also with other individuals with less serious limitations.

An example of a questionnaire-form related to the carrying out the “purchase of essential goods” is shown below; it specifies that the questions asked will derive from the service to be designed or evaluated, the environmental and socio-economic conditions, and so on. In short, it is essential that questionnaires occasionally are prepared that take the specific situation into account.

In order to perform an important statistical analysis of the data collected via the questionnaires, it seems useful to prepare a form related to the task of who will be given the questionnaire, with obvious attention, where applicable, to the problems related to privacy and the treatment of sensitive data.

This does not exclude the possibility of also gathering personal information (sex, age, educational level, etc.) and/or data related to the type and degree of disability or impediment that may be useful in correctly interpreting the data.

An example of a possible user form follows

**The form that follows, like the others presented elsewhere in the Guidelines, as stated above, must however be considered merely as an example:**

---

***Example of a questionnaire related to the task:***

**“CARRYING OUT PURCHASES OF ESSENTIAL GOODS”**

---

1. *Do you usually go shopping for necessities (food or clothing)?*
  - Yes, I usually go shopping for food and clothing.
  - Yes, but only for food,
  - Yes, but only for clothing.
  - No, I don't usually buy food or clothing.
  
2. *If you usually go shopping for food, how often do you go?*
  - Every day
  - Several times a week
  - Once a week
  - Every other week
  - Once a month or less
  
3. *Where do you generally go shopping for food?*
  - Shopping centres
  - Supermarkets/hypermarkets/discount stores
  - Neighbourhood shops
  
4. *Where do you generally go shopping for clothing?*
  - Shopping centre
  - Outlets
  - Neighbourhood shops
  
5. *What are the most important factors in your choice of where to go shopping for essential goods (food or clothing)?*  
*(additional responses are allowed)*
  - Proximity to home
  - Ease of parking
  - Absence of architectural barriers
  - Availability of elevators, stair lifts, patient lifts and so on.
  - Spaciousness
  - Trusted relationships with the sales personnel
  - Availability of help/assistance at the point of sale
  - Wide range of products on sale
  - Hours open
  - Other (specify) .....
  
6. *What is the primary means you use when you go shopping:*
  - Private automobile (driven on one's own)
  - Private automobile with or without aids (driven by others)
  - Regular public transit
  - Public transit for people with disabilities
  - Private transit for people with disabilities (driven on one's own )
  - I generally walk
  - Other (specify) .....
  
7. *Do you generally go shopping:*
  - Alone
  - With a personal assistant
  - With a companion (e.g., a family member or friend)

8. *When you go to a shop, which activities require the help of a personal assistant and/or a companion (e.g., a family member or friend)?*  
*(additional responses are allowed)*
- Overcoming architectural barriers (e.g., entrance steps, stairways, gradients)
  - Identifying and choosing the products
  - reaching the products
  - Paying for the goods
  - Bagging the purchases
  - Carrying the bags
  - Other (specify).....
9. *Generally, which obstacles do you encounter in the places where you go shopping?*  
*(additional responses are allowed)*
- Architectural barriers (e.g., entrance steps, staircases, gradients)
  - Absence of reserved parking spaces
  - Background noise
  - Inability to move about the shop because of narrow aisles, etc.
  - Absence of orientation facilities (e.g., tactile maps and routs for the blind)
  - Goods placed too high on displays
  - Lack of availability of sales personnel
  - Other (specify).....
10. *Whose help do you ask to overcome the obstacles present in the activity when you go shopping?*
- The person accompanying me (personal assistant, relative, friend)
  - Shop personnel
  - Other customers
11. *What kind of help/facilities do you normally encounter in the store when you go shopping?*  
*(additional responses are allowed)*
- Reception services
  - Home delivery of merchandise
  - Shopping carts for people in wheel-chairs
  - Grabbers to reach merchandise
  - Bar code reader of product information
  - Help in bagging the merchandise
  - Other (specify).....
12. *Do you generally try on articles of clothing before buying them?*
- Yes
  - No, it's difficult to try them on during a commercial activity
  - No, generally there's no need to
  - No, (reason).....
13. *Do you use the internet to make purchases?*
- Yes, often
  - Yes, occasionally
  - No,
14. *If yes, what difficulties have you encountered?*  
*(additional responses are allowed)*
- Lack of accessibility of internet site (navigation within the site)
  - Complexity of the procedures to make a purchase
  - Transaction security poor



### 3.3.2. – Analysis of the regulations

It is perhaps useless to recall that any design must take into account existing regulations; in our case, however, the reference is perhaps necessary because the objective of the planning process is complex and involves various professionals according to the characteristics of the buildings but also of public road networks, means of communication, and the equipment necessary to carry out certain tasks.

Today, the existence on the internet of numerous specialized databases, generally managed by disabled people’s organizations, permits a designer to rapidly enhance his own knowledge. Further information can be acquired directly from the organizations themselves.

In any case, it is appropriate to keep a record of the relevant regulations and to catalogue them on a suitable form in order to facilitate their consultation.

### 3.3.3. Conditioning Elements

In undertaking the evaluation or design of complex processes, it is essential to analyze the conditioning elements that may derive from pre-existing environmental or cultural factors. Particularly in an urban environment, there can be a great many conditions; let us list some of the most important ones:

- the land conformation can be a constraint for pedestrian or other routes in the case of appreciable differences in level,;
- the road system in historical centres, particularly those with a medieval layout and especially narrow streets, can be an impediment to the creation, for example, of rest areas or even sufficiently wide pedestrian routes;
- in the case of very heavy traffic, complex routes may be required for rail crossings (tramway or city-train lines) or the crossing of lanes dedicated to special traffic;
- the presence of buildings of historical or cultural importance whose formal characteristics cannot be modified easily, or there are restrictions concerning landscape modification, which can limit the introduction of aids and the creation of alternative routes;
- in the case of new construction, the ground surface available and possible regulatory limitations to external height can also create unavoidable conditions.

From the Universal Design point of view, it is also necessary to take into consideration other “intangible” aspects, such as particularly noisy areas, probable periods of congestion, specific climatic conditions and the local tendency to maintain traditional structural characteristics in the construction of new buildings and the same local uses, whose maintenance could become important.

Data related to possible “conditioning elements” are shown in an example of a master form:

<b>CONDITIONING EVALUATION FORM</b>	
	<i>If YES indicate:</i>
Does the project include new buildings?	<i>size, volume or other constraints,</i>
Does the project include modifications regarding the use of pre-existing buildings?	<i>Possible architectural or other constraints</i>
	<i>Possible structural constraints</i>
Can the normal climatic conditions be a conditioning element?	<i>Possible difficulties in external pedestrian routes, in accessibility, and so forth.</i>
Identification of the target area anticipated for the service to be designed.	<i>Evaluation of distances, transport system, sociological factors (prevalent personal</i>

	<i>characteristics)</i>
Evaluation of pre-existing public transport systems (bus, tram, underground, taxi)	<i>Distance to stops, schedule, accessibility</i>
Evaluation of existing pedestrian routes	<i>Size, security, paving, crossings, lighting, risk elements</i>
Schedule compatibility: are there particularly heavy periods of activity during the course of the day?	<i>Excessive transit times during specific periods, presence of risk factors</i>
Relief characteristics of the area: differences in levels, exposure to the sun, etc. ....	<i>Excessive grade (over 5%), presence of risk factors, presence of icy surfaces, or slippery surfaces because of rain, etc.</i>
Other conditioning elements	

**The above-mentioned Evaluation Form may now be completed, highlighting the critical issues identified in the various step towards completing the process under examination.**



		environmental factors																					
Process elementary steps		e1 products and technology							e3 support and relationships	e4 attitudes			e5 services, systems and policies										
Going shopping		e115 Products and technology for personal use in daily living	e120 Products and technology for personal indoor and outdoor mobility and transportation	e1200 General products and technology for personal indoor and outdoor mobility and transportation	e125 Products and technology for communication	e140 Products and technology for culture, recreation and sport	e150 Design, construction and building products and technology of buildings for public use	e155 Design, construction and building products and technology of buildings for private use	e1602 Products and technology of urban land development	e340 Personal care providers and personal assistants	e430 Individual attitudes of people in positions of authority	assistantse440 Individual attitudes of personal care providers and personal	e455 Individual attitudes of health-related professionals	e510 Services, systems and policies for the production of consumer goods	e515 Architecture and construction services, systems and policies	e520 Open space planning services, systems and policies	e535 Communication services, systems and policies	e540 Transportation services, systems and policies	e550 legal services, systems and policies	e555 organizations and associations services, systems and policies	e575 services, systems and policies for the general social support	e585 Education and training services, systems and policies	
Obtain information (directly or from one's home using electronic means (web), telephone or post) regarding opening hours, types of products for sale, etc					X												X						
Cover the distance to the sale point	a) exit one's home							X				X			X								X
	b) pedestrian route								X			X				X							
	c) use of public collective transport			X								X				X							
	d) use of private collective transport																						
	e) use of private vehicle		X																				
Carry out the necessary tasks at the point of sale	Enter and move around the point of sale							X							X							X	X
	Have contact/communicate with public/private operators				X																X		

	<i>Perceive, recognize, choose and collect the merchandise</i>	<b>X</b>										<b>X</b>											
<i>Cover the distance back to one's home with the purchased goods</i>	a) <i>exit the point of sale</i>							<b>X</b>				<b>X</b>			<b>X</b>								<b>X</b>
	b) <i>pedestrian route</i>								<b>X</b>							<b>X</b>							
	c) <i>use of public collective transport</i>			<b>X</b>								<b>X</b>				<b>X</b>							
	d) <i>use of private collective transport</i>																						
	e) <i>use of private vehicle</i>		<b>X</b>																				

### 3.4. General considerations

Generally, in order to achieve a satisfactory “non-discriminatory” outcome – the reason for this manual – as well identifying the accessibility requirements for the areas in which the services take place or that must in any case be crossed; the following recommendations should be kept in mind:

- Regarding preliminary information on the service:
  - the information must be in a format that is easily available and accessible to everyone from the homes of interested parties in order to reduce the need for useless movements;
  - the information must be clear, concise, correct and easily understood;
  - particular attention must be paid to ensuring that communications clearly inform users of potential risks to their safety, special access procedures, the need for auxiliaries, documentation, etc.;
- Information regarding signage, labelling, packaging:

Refer to the January 2002 document “*CEN/CENELEC Guide 6, Guidelines for standards developers to address the needs of older persons and persons with disabilities*”. The document analyzes the following points:

- alternative formats: a search for alternative means for presenting information enables the information to be interpreted correctly by people with various sensory abilities;
  - placement and organization of information
  - adequate levels of lighting, colouring, contrasting colours
  - size and intelligibility of fonts
  - user-friendly language
  - symbols and pictures
  - surface finishes, temperature
  - use of non-allergenic or non-toxic materials
  - an easily understandable process
  - and so forth.
- regarding the method of service provision:
    - it is essential that the staff undergo a series of information, awareness and training courses on the themes of disability that should be based on a non-medical, social approach to disability.
    - training must be oriented towards the needs of the consumers/end-users who may encounter difficulties in the use of a specific service;
    - the staff’s ability to use the tools or technologies available for problem resolution must be guaranteed;

### 3.5 Process of synthesis: the project

The analysis phase of the planning process is made up by the phases that precede the design process, in which the critical needs are identified and the design objectives defined. This takes place by involving the stakeholders, evaluating what currently exists, breaking down the process, and analysing regulations and possible conditioning elements.

**The search for solutions represents the design synthesis phase and is directed at defining the formal and functional aspects as well as interaction with the object being designed, whether a space, an activity or a service.**

Often the elements that emerge during the analysis phase are interdependent, linked by complex relations that are not always quantifiable and that sometimes clash among themselves (e.g., the cost of a technology and services, the size/weight of a device's batteries and its functional autonomy, etc.). It is equally possible that implementation details that have an impact on the final characteristics (services, efficacy, etc.) of the object being designed cannot be quantified in the design phase but only be roughly estimated or sometimes evaluated only afterward.

Thus, it follows that the design process often is a cycle that includes:

- i) design planning,
- ii) verification of the degree of correspondence between the resulting design and the desired specifications,
- iii) modification of the design, and possibly of the specifications/constraints and a partial redesign, and which is repeated until a satisfactory final version has been attained that, at times, does not respect any of the specifications initially defined, as it is sometimes necessary to find compromises and/or modify the design in order to achieve a feasible result.

Therefore, each non-elementary product or service design process can expect a repetitive cycle with subsequent refinements to the design itself.

From the Universal Design point of view, it is obviously important to take particular care of those aspects related to addressing the critical issues identified in the earlier phases and which may have been indicated in the critical issues process evaluation form (paragrafo 3.2.5).

In fact, these critical issues more or less provide a definition of the design's constraints and essentially are fundamental.

From the point of view of achieving 'reasonable accommodation', it is possible that not all the elements of the critical issues defined can be tackled, due to conditioning elements (e.g., existing building structures, a road system that cannot be modified, available budgets, etc.) because of the intrinsic competition of design aspects linked to resolving the critical issues, etc.

Therefore, it makes sense, following the analysis phase – or, in other words, after identifying the critical issues – to define the fundamental constraints, according to the specific context, without being subject to reconsideration, except if evidence should turn up regarding the impossibility of achieving a feasible result.

In this phase, the possibility of technological implementation is a particularly suitable opportunity. It is important to underscore that the approach utilized must be based on the user's needs and considerations. It must therefore be a **human-centred** approach, not a push for a technological solution. **The objective of technology must not be to create an aid for the disabled but rather to be a tool for going beyond the concept of accessibility and for embracing universal design.** The final objective is a design process in accordance with the principles of Universal Design and to create environments and services that may be used in an equivalent, non-discriminatory manner by the greatest number of people possible, without stigmatizing aids, through a simple and intuitive operation in which limited physical force is needed and the diversity of physical characteristics of all individuals becomes an opportunity and not an obstacle.



#### 4. SELF-EVALUATION OF THE DESIGN OR THE SERVICE

It is assumed that the course of action indicated in these Guidelines will comply with the principles of Universal Design, (described previously in paragraph 2.2).

Let us then summarize the elements under which to work:

- The first and eighth principles and the related “guidelines entail, as far as possible, a search for “unique” solutions to avoid differentiating between procedures, services and courses of action for people defined as “non-disabled” and those who for some, even temporary, reason suffer from physical, sensory or intellectual limitations; it goes beyond a requirement for simple “accessibility” that can be resolved by the creation of “separate” – that is, segregated – alternatives. In particular, it seems relevant that, in turn, a model related to “formal”, pleasing factors relevant not be penalized.
- The second principle stresses the need for an array of alternative procedures in the various steps of the activity that permit it to be accomplished by people with different individual characteristics.
- The third and fourth principles focus on the simplification of informative methods and procedures; attention is centred on the use of alternative communication tools (auditory, visual, tactile, etc.), easily understood symbols, a range of colours used also to prioritize the information by highlighting what is essential.
- The fifth principle emphasizes the current regulations related to risk analysis and accident prevention. In our case, it is appropriate to interpret as a “risk” or a “danger” not only possible physical harm but also the unsuccessful completion of a predetermined objective, namely what has been more correctly defined an “error”; the connection with the previous point seems evident.
- The sixth and seventh principles, which could be defined as “ergonomic”, require that the procedures and spaces be studied in such a way as to reduce the effort and inconvenience that especially penalize people affected by some form of disability and which take into account the presence of auxiliary aids or personal assistants.

In order to define as “non-discriminatory” the means for carrying out the process that we are designing or simply evaluating, it is necessary to verify that each of the phases previously broken down corresponds to the principles, or at least to the maximum number of principles possible

To this end, we have provided a sample of a form that may be used:

Evaluation process form <i>Obtaining an identity document</i>		1: equitable use	2: flexible use	3. simple and intuitive use	4. perceptible information	5. tolerance for error	6. low physical effort	7. size and shape for approach and use	8. Form neutrality
1	<i>Obtain information either directly or from home using electronic media (web), telephone or hard-copy resources, concerning documentation necessary to request the I.D., opening timetables and availability of specific services for persons with disabilities</i>								
2	Cover the	<i>a) exit one's home</i>							
		<i>b) pedestrian route</i>							
		<i>c) use of public collective transport</i>							
		<i>d) use of private collective transport</i>							
		<i>e) use of private vehicle</i>							
3	<i>Obtain and present all documentation necessary to request the I.D. (Have photos taken, request and obtain papers, pay revenue stamps, fees etc.), request the document and collect it.</i>	<i>Enter and move around the offices, etc (including entering a photo studio or using an automatic booth to have one's photo taken</i>							
		<i>Have contact/communicate with public/private operators</i>							
		<i>Sign, authenticate documents (generally documents requiring formal legal recognition)</i>							
4	<i>Come back to home</i>								



Non applicable

In order to check that the procedure indicated in the previous chapters has been correctly applied, in view also of a possible certification, the use of a check-list similar to the following may be considered.

Is it demonstrable that the choice to use the principles of “Universal Design” is explicit and shared by those in charge of the initiative?		
Has the collection of information, needs and opinions of the stakeholders been documented?		
Are the applicable regulatory prescriptions available and were they analysed?		
Is the documentation related to an analysis of possible “physical” influences available?		
Is a process breakdown of the basic phases available?		
Is documentation available from the point of view of functional differences that relates to the verification of any possible problems connected to each individual basic phase?		
Is documentation available that relates to the interventions `recommended to resolve the problems of discrimination discovered in previous analyses?		
Do the proposed interventions take into account the eight principles of “Universal Design”?		
Are the proposed interventions “reasonable solutions” for facing possible problems discovered on a physical level, in human relations and the use of technology?		
Have the stakeholders reviewed the proposed solutions?		

The completion of the procedures suggested in these Guidelines naturally cannot demonstrate the complete elimination of all obstacles that human beings in their diversity may encounter in the realisation of their objectives.

They are only indicative of a method to be used to focus on the progressive elimination of, sometimes truly discriminatory, difficulties that, even temporarily, are found each day by people with a specific vulnerability

The International Convention on the Rights of Persons with Disabilities, often quoted in these pages, has proclaimed “the equal and inalienable rights of all members of the human family as the foundation of freedom, justice and peace in the world” and further on it recognises that “disability is an evolving concept and... results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others”.

It is therefore vital that the greatest attention is placed on guaranteeing this effective equality in the evaluation and design processes for the structures in our cities.



## BIBLIOGRAPHY AND REFERENCES

### **For further information on the work method for the participatory processes:**

Lorenzo R., *La città sostenibile. Partecipazione, luogo, comunità*, Milano, Eleuthera, 1998

Elcome, D & Baines, J. *Steps to Success – Working with Residents & Neighbours to Develop and Implement Plans for Protected Areas*. IUCN, Commission on Education and Communication; European Committee for EE, Switzerland, 1999 (available through ARP)

Ilaria Garofolo, editor, *Per una progettazione consapevole*, Edicom Edizioni, Monfalcone - Gorizia 2004

AA.VV. "Linee guida per lo sviluppo sostenibile e le Agende 21 in Toscana" downloadable from the site [www.rete.toscana.it/sett/pta/svilcost/documentazione.htm](http://www.rete.toscana.it/sett/pta/svilcost/documentazione.htm) al cap.5 *Progettazione partecipata: criteri e metodi*.

#### **www.communityplanning.net**

It is a genuine portal on a community planning model, and it is very easy to find information thanks to the structure itself of the portal. In fact, concise definitions are listed on the general principles of the approach that is necessary to adopt in various situation that require these methodological tools. Another two interesting sections concern the techniques and scenario. The techniques described also report information related to logistical organization, costs, and means of participation.

#### **www.avventuraurbana.it/strumenti/planning.shtm**

The site of this group of experts from various disciplines – from architect to communicator, from political expert to social worker and facilitator – describes in a rather detailed way the work tools used according to the context and the points of reference, to manage and achieve spaces for effective interaction.

#### **www.contrattidiquartiere.net**

It contains guidelines that summarize popularly a process-type of participation directed at drafting of a neighbourhood contract.

**CEN/CENELEC Guide 6** - Guidelines for standards developers to address the needs of older persons and persons with disabilities, EDITION 1- January 2002

### UNIVERSAL DESIGN WEB SITES

#### **Center for Universal Design**

[www.design.ncsu.edu/cud](http://www.design.ncsu.edu/cud)

Center founded by RonMace, FAIA, father' of Universal Design. Hold copyright to principles of Universal Design.

#### **Academy of Neuroscience for Architecture**

<http://www.anfarch.org>

The mission of the Academy of Neuroscience for Architecture is to be the international center for interdisciplinary activities that build intellectual bridges between research on the brain and those who design places for human use.

#### **Adaptive Environments Center**

[www.AdaptiveEnvironments.org](http://www.AdaptiveEnvironments.org)

Adaptive Environments is a 27 year old educational non-profit organization committed to advancing the role of design in expanding opportunity and enhancing experience for people of all ages and abilities. Source of news, events, opportunities, projects and publications.

**Age Concern**

[www.ace.org.uk](http://www.ace.org.uk)

Concern is the UK's largest organization working with and for older people.

**AGE - European Older People's Platform**

[www.age-platform.be](http://www.age-platform.be)

Aims to voice and promote the interest of older people in the European Union and to raise awareness of the issues that concern them most

**Age Lab**

<http://web.mit.edu/agelab>

Established in '99 to develop new technologies promoting healthy, independent living through the human lifespan. Research involved engineering, computer science, human factors, health and medical sciences, management, marketing, and the social and behavioral sciences.

**American Association of Retired Persons (AARP)**

[www.aarp.org](http://www.aarp.org)

Organization for mature adults 50 and above in the United States.

Information on health, long-term care, economic security, independent living and residential design for the home.

**American Society of Interior Designers (ASID)**

[www.asid.org/asid2/resource/icon.asp](http://www.asid.org/asid2/resource/icon.asp)

Nonprofit professional society representing the interests of interior designers and the interior design community. ASID promotes professionalism in interior design services and products for the workplace and home.

**Asociación Pro Desarrollo de la Persona con Discapacidad (APRODDIS)**

[www.aproddis.org](http://www.aproddis.org)

APRODDIS is a non-profit organization based in Peru committed to improving the quality of life among people with disabilities.

**Bobby**

[www.bobby.watchfire.com](http://www.bobby.watchfire.com)

Bobby is a comprehensive web accessibility software tool designed to help expose and repair barriers to accessibility and encourage compliance with existing accessibility guideline.

**Canadian Mortgage & Housing Corporation (CMHC)**

[www.cmhc.ca](http://www.cmhc.ca)

Committed to housing quality, affordability and choice for Canadians.

**Center for Accessible Environments (CAE)**

[www.cae.org.uk](http://www.cae.org.uk)

CAE is an information provider and a forum for collaborative dialogue between providers and users on how the built environment can best be made or modified to achieve inclusion by design.

**Center for Applied Special Technology (CAST)**

[www.cast.org](http://www.cast.org)

CAST is a nonprofit organization that works to expand learning opportunities for all individuals, especially those with disabilities, through the research and development of innovative, technology-based education resources and strategies.

**Cornell University – College of Human Ecology**

[www.humec.cornell.edu/units/dea](http://www.humec.cornell.edu/units/dea)

Department of Design and Environmental Analysis Hub of Academic cross-disciplinary inquiry.

**Danish Center for Accessibility**

[www.dcft.de](http://www.dcft.de)

The center offers information and advice about accessibility and inclusive @ design.

**Design Center for Global Needs**

[www.sfsu.edu](http://www.sfsu.edu)

San Francisco State University. Ricardo Gomes, Professor of Industrial Design created the Center for multi-disciplinary exploration of universal design, cultural identity, design for social responsibility and community design.

**Design for All Foundation**

[www.designforall.org](http://www.designforall.org)

Working to achieve that everyone can enjoy open spaces, products and services with equal opportunities

**European Institute for Design and Disability (EIDD) / Design for All European Network**

[www.design-for-all.org](http://www.design-for-all.org)

EU-wide non-governmental organization dedicated to inclusive design

**The EQUAL Research Network**

[www.fp.rdg.ac.uk/equal/](http://www.fp.rdg.ac.uk/equal/)

AUK-wide EPSRC funded Network for Extending Quality Life of Older People and Disabled People.

**The Helen Hamlyn Research Centre**

[www.hhrc.rca.ac.uk](http://www.hhrc.rca.ac.uk)

The Helen Hamlyn Research Centre works to advance a socially inclusive approach to design through practical research and projects with industry.

**Industrial Design Society of America (IDSA) Universal Design Committee**

[www.idsa.org/whatsnew/sections/udidsal/noframes.htm](http://www.idsa.org/whatsnew/sections/udidsal/noframes.htm)

Network with about 600 members.

**Inclusive Design and Environmental Access (IDEA)**

[www.ap.buffalo.edu/~idea/](http://www.ap.buffalo.edu/~idea/)

School of Architecture, State University of New York at Buffalo

**International Association of Universal Design (AIUD)**

[www.aiud.net](http://www.aiud.net)

Promotes practical researches on and the realization of universal design with the members from various fields, the advisors, and others.

**National Center for Accessible Media [NCAM]**

[www.wgbh.org/wgbh/index.html](http://www.wgbh.org/wgbh/index.html)

NCAM is a research and development facility dedicated to expand access to present and future media for people with disabilities, to explore how existing access technologies may benefit other populations, and to provide access to educational and media technologies for special needs students.

**Lighthouse International**

[www.lighthouse.org](http://www.lighthouse.org)

U.S. hub of research and advocacy, including design, related to vision impairments

**Royal National Institute for the Blind**

[www.rnib.org.uk](http://www.rnib.org.uk)

Important resource for research and product information relative to vision limitations including excellent telecommunications information.

**Sensory Trust**

<http://www.sensorytrust.org.uk>

Raises awareness of good practice in urban and extra-urban green space design and management.

**Trace Center**

[www.trace.wisc.edu](http://www.trace.wisc.edu)

University of Wisconsin, Madison. Unparalleled US hub of information technology and telecommunications research, policy development, education.

***Travel guides for Tourists with Disabilities***

<http://europa.eu.int/>

Provide information on the existing tourism facilities for tourists with disabilities.

***Universal Design Magazine (Japan)***

[www.universal-design.co.jp](http://www.universal-design.co.jp)

English and Japanese, occasional publication.

**Attached:**