

The ICT Assistive Devices Register: an instrument to support appropriate provision of Assistive Technology

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Abstract. This paper describes the preliminary results of a project, carried out on behalf of the Italian Ministry of Health, with the objective of creating a Register of ICT Assistive Devices for supporting appropriate provision of Assistive Technology. Forms for technical specification have been created for all the typology of devices included in the Italian National List of AT products eligible for provision. A Vocabulary for specifications was created in order to standardize the terminology used and avoid the use of synonyms in different forms. An online tool was developed, consisting of a web based database, to create forms, manage the vocabulary, and insert data of specific products into the forms.

Keywords. AT provision, AT information systems, AT classification

Introduction

The advancements of Information and Communication Technologies in the last years, and the rapid increase in the spread of such technologies, has brought about great opportunities for increasing independence and quality of life of people with disabilities. An accurate information about the opportunities and limitation of AT is recognized as a key issue for AT service delivery [1]. Keeping the pace with AT requires continuous education and information to get knowledge of the latest technological solution available on the market [2]. Some instruments exist for end users, professionals, and the public in general, that provide information and guidance on assistive technologies available on the Italian and European market, such as the SIVA [3] and EASTIN web Portals [4]. Those websites include Databases that describe the AT products with technical information, a text description and a picture. Starting from this background, the aim of this project was to create a Register of ICT Assistive Devices that could be used as an instrument to support AT professionals in the process of providing appropriate assistive solutions.

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The scope of the Register are assistive devices eligible for medical prescription according to the Italian legislation, belonging to classes 22 - Assistive products for communication and information - and 24 - Assistive products for handling objects and devices - of the ISO 9999:2007 Classification [5]. The project was carried out by the GLIC association (the acronym stands in Italian for “Interregional Working Group on ICT Assistive Technologies”) which is a network of centres for Assessment and Advice on ICT assistive devices [6].

1. Method

The starting point of this project was the Italian National List of AT products eligible for provision (the so called *Nomenclature*). This list, based on a fourth-level classification, identifies the typology of products eligible for provision by the National Health Service. For each item of the *Nomenclature* List, belonging to ISO classes 22 and 24, a basic Dataset of technical and functional specification was created through an iterative process of consensus building. Most of the work of creating the forms for datasets was done individually by the members of the working group; everyone was assigned a number of typologies from the *Nomenclature* List to work on. After the forms had been completed a cross review process took place. Every form was reviewed by two other members of the working group and the suggestions that came out were either accepted or further discussed in group sessions. A further review of all the forms by manufactures and suppliers ICT assistive devices is planned for the next months.

A Vocabulary for specifications was created in order to standardize the terminology used and avoid the use of synonyms (e.g. screen, monitor, display,...) in different forms.

2. Results

A form was created for all the seventy five items of the *Nomenclature List*. This include a large part of the ICT Assistive Devices available on the Italian market such as image-enlarging video systems, communication devices, special keyboards, joysticks, remote controllers, etc. Every form is composed of a list of specifications that could be one of the following type: *Numeric* (i.e. a number and a unit of measurement if needed), *Boolean* (i.e. a yes/no characteristic), *Text* (a free text), *Choice list* (i.e. the data can be selected from a fixed list), *Interval* (i.e. a numeric interval and a unit of measurement if needed). The use of the Text type have been reduced as much as possible as this does not allow automatic verification of data, is more error prone, and makes search and comparison procedures more difficult. The specifications are characterized by a *Name* (which is kept as short as possible) a *Description* (which clarifies the meaning of the specification), an *Example* (to clarify how the data must be entered, especially for Text characteristics), a *Type* (as described above), and a *Unit of measurement* (if needed). Another field for the *Minimum/Maximum* or *Compulsory* value can be used to impose quality thresholds, in terms of minimal technical and functional characteristics, in order to decide which of the products available on the market can be provided by the National Health Service. Table 1 shows an example of form for simplified keyboards.

The Specification Vocabulary include almost 600 entry for technical and functional data. Rules for adding new terms in the vocabulary were defined, such as

keeping the name as wide and general as possible, keeping the name short, choosing self explanatory names, etc. Before adding a new term in the vocabulary one is also required to check if an entry that can be use for the purpose already exists. Within the vocabulary, entries that characterize a part of device or a function (such as the keypad or the scanning function) were grouped together into a cluster. This feature have been proved useful when creating new forms as it avoids to forget relevant features of a specific function or part of device. Ten clusters were created that group features of specific function or part of device; this include for example Scanning Function, Keypad, Keyguard, Power supply, Speech synthesis, Display, etc.

Table 1. An example of a form for technical data for simplified keyboards

Spec name	Description	Type	u.m.	Choices
brand		T		
model		T		
manufacturer		T		
weight	including batteries (if needed)	N	g	
length		N	cm	
width		N	cm	
height		N	cm	
type of keys		C		mechanical; membrane; touch screen
keys dimension	indicate the diameter /side of the alphanumeric keys	N	mm	
key activation force	indicate the force needed to activate the keys	N	g	
color-coded keys		B		
colors of keys	in case of color coded keys, indicate the colors for the different groups of keys	T		
color of characters	indicate the color of characters (letters, numbers an symbols) printed on the keys	T		
character dimension on the keys	indicate if the characters are printed on the whole key or on a part of it	C		on the whole key; part of the key
layout	indicate the order of keys on the keyboard	C		abcd; qwerty; other
letter case	indicate if the letters are printed on the keyboard in upper or lower case	C		upper case; lower case
italian keyset	indicate which keys of the Italian keyset (accented vowels, punctuation, € symbol, ...) are on the keyboard	T		
function keys (F1-F12)	indicate if the keyboard has the function keys	B		
keyguard		C		available; included; not available
depth of the hole		C		< 5mm; > 5 mm; adjustable
hole shape		C		circular; square/rectangular; other
keyguard removability		C		fixed and not removable, fixed removable; not fixed
material		T		
transparent		B		
run on function	indicate if the keyboard can adjust the function that repeats the character when the key is held down	C		not active; can be disabled; adjustable

splash-proof	the keyboard resist if a small amount of liquid is spilled on it	B	
anti-slip feet		B	
wrist-rest		B	
inclination	indicate possible inclination (in degrees) of the keyboard	T	
wireless		B	
batteries type		C	disposable; rechargable
battery level indicator		B	
battery life	indicate the battery life under the condition specified in "energy consumption criteria"	N	h
energy consumption criteria	indicate the criteria for calculating the battery life	T	
cable length	in case of NOT wireless keyboard indicate the cable length	N	cm
operative systems	indicate the supported operative systems	T	
connection	type of connection with the PC (e.g. USB, PS2)	T	

To help the cooperative work of creating and reviewing the forms, an online tool was developed (see Figure 1), which consists of a web based database where forms can be added for every Nomenclature List item. This online tool also allows to manage the specification vocabulary and to insert data of specific products into the forms.

Through the online tool, the specifications in the forms can be linked to a 4th level (the Nomenclature Typology) or to upper ISO 9999 levels if they are relevant to all sublevels. It is also possible to manage a “father-son” relationship between specifications, in case more detail are required for a specification. For the simplified keyboard, for example, the *sons* specifications regarding batteries are only activated if the answer to the *father* specification “Wireless” is yes

The screenshot shows a web browser window displaying the GLIC (Gruppo di Lavoro Interregionale Centri Ausili Elettronici ed Informatici per Disabili) online tool. The interface is in Italian and shows a form for a specific keyboard model. The left sidebar lists various keyboard types under the category '22.36.03 Tastiere'. The main form area is titled 'Elenco modelli In consultazione...' and displays a table with columns: ID, Marchio, Modello, and Stato. Below this, there is a detailed form for the selected model, 'TASH W214001', with fields for 'Voca', 'Valore', 'UM', 'Nota', 'Esempio', and 'Informazioni'. The 'Informazioni' section includes fields for 'Distributore', 'Compilatore', 'Marchio', 'Modello', and 'Produttore', each with a corresponding value or empty field for input. The 'Informazioni' section also includes a text area for 'Responsabile della distribuzione in Italia' and a text area for 'Responsabile dell'immissione in commercio in condizioni di conformità CE'.

Figure 1. A screenshot of the online tool

3. Discussion

Nowadays great relevance is placed by policy makers and financing agencies in the provision of assistive solutions that are effective within the rehabilitation programme, useful for the client, and efficient in using resources, in one word assistive solution that are appropriate [7]. The ICT Assistive Device Register can contribute to this objective in two ways: by providing an instrument that can help AT professionals in taking informed decision on the most appropriate solution for the end user, and by helping the National Health System in establishing a process for quality control of the devices provided to the users. The register could also help local health authorities in tenders or prices negotiation by allowing a more “quantitative” comparison between different products.

Furthermore the Register could help a process of harmonization between different AT information systems at European and worldwide level. Efforts in this direction have already been done within the Nord-4 [8] project and in the EASTIN network [4], that brings together the information of several European AT information system. Sharing the forms created in this project with the main AT information providers in Europe and worldwide could help the harmonization process and eventually result in a better information for AT professional, end users and the public in general.

Acknowledgment

This project was partially funded by the Italian Ministry of Health

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