The Unified Arabic Braille Portal by Mada

Mada Center

Mada Assistive Technology Center pays special attention to research and publications in the field of ICTs accessibility, as the center strives to promote leading industry practices at the global, regional and local levels.

Mada aims to conduct various researches to analyze the reality of digital access and develop solutions for ICT accessibility in the Arab region in accordance with the latest trends and international best practices. In this context, the Center launched the Unified Arabic Braille Project and the first electronic portal specialized in the Unified Arabic Braille Language.

Braille is a method of reading and writing that relies on touching prominent dots that people with visual disabilities recognize once they pass their fingers over them. The method was invented in the mid-19th century and got its name from the name of its French founder Louis Braille. Braille helped blind children learn to read and write, and adults who lost their ability to read, due to blindness or vision impairment, continued to enjoy access to books, magazines, and other knowledge resources. Braille characters are written through bands called braille cells so that each cell mostly forms one character. Depending on the shape of these dots within the cell, each character is different. The maximum number of dots per cell is six dots, and the minimum number is one dot. Each cell is a small rectangle with two columns and six dots.

Braille is the only and unique method that enables blind or deaf-blind people who have difficulties accessing printed materials to read and write. In fact, the ability to write and read in braille opens the door to knowledge, intellectual freedom, equal opportunity and personal security. Nowadays, the cost of Braille electronic devices has begun to decrease significantly, which means that a larger segment of the blind – especially in developing countries – can access Braille electronic devices, but still there is not enough content to support the Arabic Braille. The ambition of every person who is a beginner at using braille is to have digital resources that he can use to identify the dots of letters and symbols shaped on these letters. Thus, providing Arabic Braille digital resources is an important addition for those wishing to learn braille including parents and academics, and those wishing to stay up-to-date with Arabic Braille.

The aim of the Unified Arabic Braille Portal by Mada, is to promote and develop the Arabic Braille. Mada started the project after conducting a survey about the use of Braille system in the Arab world. The survey results confirmed that the blind complain about three important things:

- Significant shortage of digital educational resources for the Arabic Braille system.
- The current Braille system has many issues and shortcomings.
- There are several problems with the software while writing and reading in Arabic Braille.

Mada developed a web-portal containing a set of resources and lessons about Arabic Braille. The purpose of the portal is to provide digital contents for blind and people who want to learn the Arabic Braille system. The portal also provides a platform to discuss issues and propose new features for the current system. It represents the first specialized Unified Arabic Braille website, which contains detailed references to simple Arabic Braille, abbreviations, mathematics and science, and 8-dot computer braille, in addition to simplified lessons to learn reading and writing in Arabic Braille.

The six-dots Braille systems allow encoding of a maximum of 63 characters, which is sufficient to encode letters, numbers, punctuation marks, and some signs of the ap-proved Braille system. However, these systems do not provide enough coding capacity for coding symbols used in science such as mathematics, physics, chemistry or even music. Hence the importance of the eight-dots coding system, which enables coding up to 255 symbols. This gives sufficient scope for the inclusion of all the important symbols. Using this system allows people with visual disabilities to read and write scientific, literary and artistic contents. Adopting a Unified Arabic Braille coding system has become important to allow Arabic blinds to create and read Arabic content. In this context, Mada developed the first 8-dot Arabic Braille computer table to support Braille abbreviations in the fields of mathematics and science. The 8-dots computer Braille table is a tremendous addition that will assist users of Braille displays and speaking computer programs in a smoother use of braille.

The Unified Arabic Braille Project provides the first Liblouis software library based on the Arabic Braille table to develop Braille writing and reading skills for blind and deaf-blind people. Liblouis software library is a free and open-source tool, that provides converting, reverse converting, and braille formats for many languages, and it consists of a group of packages designed for use in many applications and devices, whether

free or commercial. This package was written in C programming language so that it does not require a specific environment, and thus, can be easily used within applications written in high-level languages such as Java and Python. The Arabic Braille table was created from scratch and included in the Liblouis Software Library. It relies on writing Arabic language and displaying it in the system of abbreviations. All Arabic abbreviations that were approved in the Arab Braille Conference in Riyadh in 2002 were also included.