NAFATH

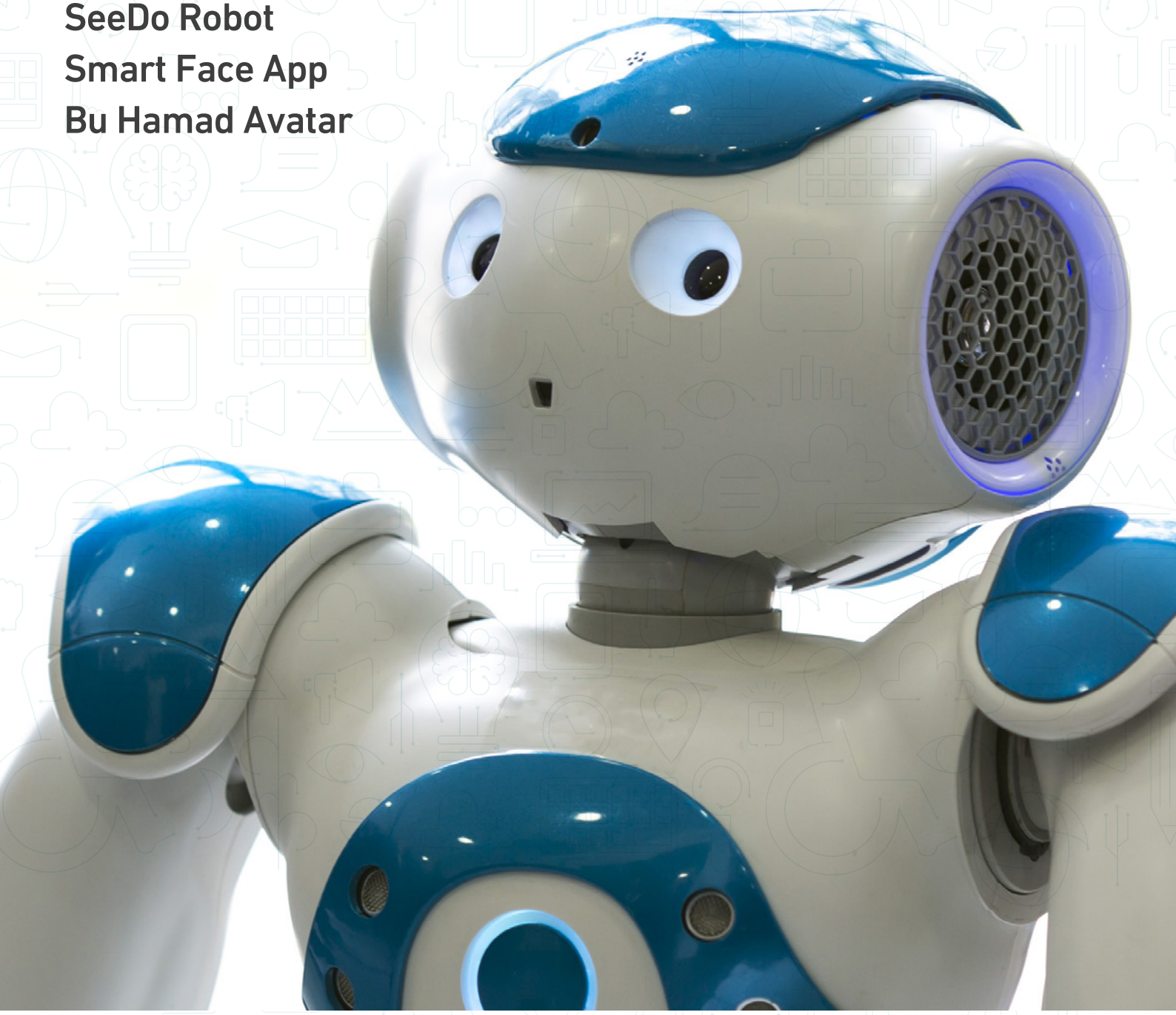
Issue 5 | 2018

Mada Innovation Program

SeeDo Robot

Smart Face App

Bu Hamad Avatar



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Assistive Technology Center “Mada”

Towards enhanced eAccessibility and Innovation in Assistive Technology

Mada Assistive Technology Center is a non-profit organization committed to connecting persons with disabilities to the world of Information and Communication Technology. Founded in 2010, to accommodate the UN convention on PWD, in recognition that technology is pervasive across a breadth of private and public sector activities and inherent in the Ministry of Transport and Communications strategy, Mada works to improve digital inclusion for persons with disabilities in the State of Qatar.

Our Vision
All Persons with a Disabilities in Qatar reaching their full potential through Information and Communication Technology.

Our Mission
Unlock the potential of all Persons with a Disabilities in Qatar by enabling both individuals and their environment through Information and Communication Technology.

The organization strives to do more than just empower individuals; it endeavors to enrich the lives of PWDs to the fullest, by addressing issues in the ecosystem to ensure that they have all the required technology to succeed. To deliver on its ambitions, Mada engages in strategic and operational partnerships with critical players in the PWDs ecosystem.

Mada prioritizes three key areas; education, employment and community. The center also provides advisory services and policy recommendations to various stakeholders and organizations.

We are committed to promote innovation and the development of new solutions for persons with disabilities, particularly by creating relevant Arabic Language Assistive Technologies, to better serve local and regional needs. We work closely with important AT manufacturers and relevant worldwide private sector entities to develop innovative Assistive Technology solutions and services. Our organization also conducts relevant research studies to keep Qatar and the Arab region updated on the latest breakthroughs and international best practices.

“Nafath” is a quarterly publication issued by Mada Center to be a major source of information on the latest trends and innovations in the field of assistive technology. Our quarterly publication is an information platform and also a discovery tool: we want to bring together the huge domestic and regional appetite for Arabic Assistive Technology products and services with the latest technologies and trends in the whole world.

Like everything we do, we highly appreciate and encourage your contributions and feedback, as readers’ opinion is most valuable to us. This periodical is available in print and digital forms, as well as other accessible formats upon request. ■

mada Team

contents

NAFATH

mada assistive technology center

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Aging and Technology

A Success Story

Aging is an inevitable transition in human life that could lead to facing challenges in performing day-to-day activities. The elderly often face different progressive challenges that can be overcome with the help of Information and Communication Technology (ICT) and Assistive Technology (AT) that enable them to live independently and interact with society without barriers.

AT in this context is any technology that helps older people successfully perform difficult or impossible activities at this age. Research and studies have shown that the positive impact of ICT and AT on the lives of the elderly contributes towards improving the quality of their lives. It also plays a role in stimulating the mind and body, providing access to services, and supporting independent living.

A need for programs and initiatives to bridge the gap between the elderly and ICTs was identified. In response to this need, Assistive Technology Center "Mada", launched the "@ Wasal" program for training the members of the elderly community on the use of ICT. "@Wasal" program is a course based on the guide to "Aging and Technology" released by Mada. This initiative was carried out in partnership with the General Retirement and Social Insurance Authority and Ehsan Center for Empowerment and Elderly Care.

Technology has opened up new horizons for the elderly, promoting the possibility of independent living in a way that preserves their dignity and enables them to communicate with friends, family and others. One of the most important benefits of this program was enabling the elderly to use electronic services and smartphone applications to communicate and access various government e-services without having to physically go to the concerned locations, making their lives easier.

Mada released the "Aging and Technology" guide to raise awareness and serve as a reference material for institutions, organizations and various agencies involved in the provision of care and services for the elderly. The guide addresses the most important ways through which the elderly can utilize assistive technology effectively, and identifies the best solutions and technological options available and classifies AT solutions according to the different needs of the elderly.

The guide discusses four areas related to age and technology, the first of which is telecommunications, including e-mail, games and smart phone applications. The second area deals with home security and safety through sensors, Internet-connected cameras and digital communications systems to assist in case of domestic accidents. The third area focuses on health, including tele-health care and drug management tools and applications. The fourth area addresses vital aspects of the lives of older people, such as participating in online learning and volunteer activities, developing capabilities and contributing to the community by keeping them in contact with family and friends, and so on.

In conclusion, the elderly are often reluctant to deal with technologies, but different experiments have shown that in order to change this situation, it is vital to educate this community about the benefits of the use of ICT and AT in their daily life. This will lead to making the elderly more interested in technology as they discover the positive change it will potentially make to their lives. The impact of ICT and AT reaches beyond improving the ability of the elderly to perform daily tasks efficiently, while protecting and preserving their dignity and independence. ■

@wasal Program for the Elderly

Case Study

Sarah is one of the older women who joined the @Wasal program 2018. The program was organized by the Assistive Technology Center - Mada in cooperation with the General Retirement and Social Insurance Authority and Ehsan Center for Empowerment and Elderly Care.

She summarized her experience by saying that she suffered from social isolation because of her inability to communicate effectively with family members and relatives who were preoccupied with their everyday life responsibilities. The isolation and loneliness made her very sad, and had negative effect on her self-confidence as she needed others' help to communicate with those she wanted to contact.

Her lifestyle completely transformed after joining @Wasal program, as she said that this program has changed her life for the better. She can now communicate with family members, friends and relatives through various communication applications such as Whatsapp, Instagram and Snapchat. These applications play an important role in her life today, where they make textual, audio and visual communication possible and easy for her.

Because of her poor eyesight, Sarah couldn't use her mobile to send text messages. @Wasal training included the use of Voice Recording feature which allowed her to easily send voice messages. She also learned how to zoom in and out which allowed her also to read all of her messages and see the photos sent to her clearly. Sarah is thrilled because now she is able to independently video call her son who is studying abroad.

I no longer need to go to government departments or offices to get official documents issued or apply for specific services. For example, I recently renewed my ID card using my mobile phone through "Metrash 2" application, which made a real difference to me. In general, after joining @ Wasal program, my life has become much easier said Sarah. ■

Accessible Events and Assistive Technology

A Part of Mada Open Training Program

The barriers caused by disability are significantly reduced in an accessible environment, thereby placing crucial responsibility on planners and developers to create environments that are accessible to all and suitable for people with different abilities and needs. These environments can be digital or physical, such as websites or buildings respectively, including various events from conferences to sports competitions. Designing accessible events depends on the accessibility of both buildings and content in its digital and printed forms. One of the best ways to ensure the accessibility of any event is to look at it from the perspective of the visitor: where does his/her journey begin, what does it need, where does it end, and how?

Many believe that accessibility only benefits persons with disabilities. This belief contributes to the misconception that investing on accessibility is a burden on any organization and that the number of people benefiting from it is very limited, but this is often untrue. Accessibility must be viewed from the principle of universal access, and that any changes made by an event organizer to increase accessibility are beneficial to all and not only to persons with disabilities.

It is also important to look at the role that assistive technologies can play in improving accessibility within events. Technological developments in recent years have provided event organizers with a lot of inexpensive and effective options to enable all visitors, including persons with disabilities, to enjoy various aspects of events. In order to raise awareness of these technologies amongst event organizers, Mada Center holds training workshops on organizing accessible events as part of the annual Mada Open Training Program.

Prior to the Event

The journey of a visitor to any event begins well in advance of the event itself. There are many ways in which the audience interacts with an event before the opening day, such as advertising, announcing the event in all its forms, whether it is visual, audio, or interactive. This also includes all content in the lead up to the event published on social networking platforms. It is important that all this content is accessible to people with disabilities. In order to achieve this level of accessibility, there are two

concepts that need to be understood. The first of which is e-Accessibility, or ensuring that content is designed according to international web standards (WCAG 2.0) that focuses on correct organization and labeling of digital data. Accessible digital data enables users of assistive technology such as screen readers and Braille converters to access the content effectively using their AT. These guidelines, and several related best practices, are available on the Mada website.

The second and equally important accessibility concept that must be understood at this stage is the importance of the explicit dissemination of any and all information regarding the accessibility of any event. Event planners must communicate clearly whether the event venue is accessible to persons with disabilities by providing information about aspects like the entrance, parking, toilets and emergency exits. The event planner must also communicate whether there will be specialized facilities like sign language or audio interpretation of visual materials. All details related to the accessibility of events must be published prior to the event so that people with disabilities are encouraged to participate. Often, events are accessible, but the public has not been informed of this, which discourages the participation of a large number of people with disabilities. Additionally, assistive technology can facilitate greater access to the registration process. Devices such as the Ubiduo can be placed on site, ahead of the event, to enable Deaf visitors to communicate with others through text.

During the event

Upon arriving to an event, it is preferred to have a central point of information that visitors with disabilities can visit to learn about the accessibility features of the event. The organizer can provide this information through an application or website designed according to the Web Accessibility standards, which will make it easier for all visitors to learn all the details of the event, such as the schedule, or explore the venue through a virtual map or communicate directly with the organizers.

Providing content in alternative formats is one of the fundamental accessibility components of any event. Video material must be accompanied by closed captioning for the deaf and audio descriptions for the blind. All slide-shows that will be presented by speakers should be submitted in accessible digital format prior to the talk for those who request. Accessibility requirements and the nature of accommodations vary depending on the nature of each activity.

There are many innovative ways to use technology as a means for increasing accessibility, for instance, implementing the use of wayfinding beacons to guide blind visitors and enable them to navigate the environment independently. When this system is in place, any blind person can use the wayfinding application to find out where the meetings rooms, toilets, exits, etc. are located.

After the event

Any media coverage generated by or about the event, through traditional means or social media, must also be accessible to all as per the principles discussed above. Follow up emails must include description of any images. At times, emails are entirely composed of an image which contains text, without any description of what the text is, which makes it impossible for users of screen readers and other assistive technology to understand the message. Post-event questionnaires should also be conducted to allow participants to rate the accessibility of the event.

In conclusion, we reiterate that designing and organizing events in ways that provide physical and digital access is in the interest of everyone. Websites designed according to international standards for e-accessibility benefit assistive technology users and everyone else because they are easier to use, simpler to understand and better organized. This principle applies to all types of accessibility, whether it is to buildings, printed materials, presentations and others. Designing events in an accessible manner is a societal, legal and ethical responsibility that cannot be neglected under the principle of equality and human rights. It is a basic requirement that must be met by all event organizers. ■

Qatar eAccessibility Policy

10 WAYS

TO MAKE YOUR MOBILE APP ACCESSIBLE

Mada eAccessibility provides services in Accessibility Consulting, Reporting and Training in ICT. eAccessibility team works under the Mada Policy and Advisory Department.

Mada's Website Accreditation Program is a unique and valued way to demonstrate your organization's forwardthinking approach to barrier-free web design and your commitment to putting people first.After undergoing Mada website accessibility consultancy, training and satisfactory compliance to recommendations, organizations will be awarded Mada's Website Accessibility Accreditation Badge to place on Their website.

As a result of Mada services and in recognition of accessible websites in Qatar, Mada would create a list of linkable websites reviewed and awarded the Accreditation. Optionally, Mada would organize a joint press release for organizations that qualify for Website Accessibility Accreditation.

Web Accreditation is awarded based on the following criteria;

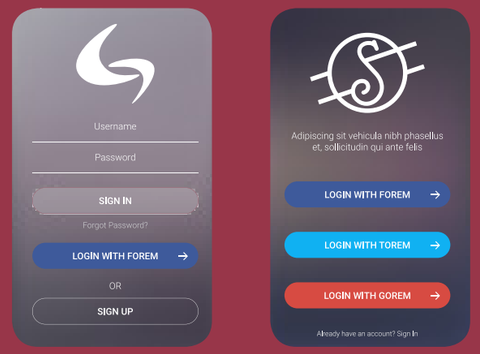
85% score or better in online accessibility analyzer tool

Pass Mada website usability assessment audit report

01 The mobile app user interface must be operable with gesture and keyboard

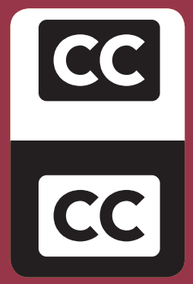
- App menus and sub menus
- Form fields and media player controls
- Static and Dynamic content
- Never use actions that are dependent on sight; example drag/drop or sliders
- Focus on all content must be visible, never disrupted and operate in a predictable way

02 All content and user interfaces must operate in a consistent logical sequence



- Consistent logical tab/reading orders (Example: Form fields and menus)

03 All non-text element and content must have a text equivalent



- Meaningful and functional graphics must have associations to meaningful text descriptions
- Audio content must have caption or link to text transcript
- Videos require caption and audio/text description

04 App layout, navigation, content and function must be consistent

- App menus visual layout and presentation must be consistent
- Form field layout and placement must be consistent

05 App document structure is used appropriately

- Each screen has a proper title
- Heading elements are used appropriately
- List elements are used for actual lists
- Paragraph element is used appropriately
- Table structure is used only for tabular data; table header and captions

06 Keep the design and layout Simple

- Minimize content to display in small screen width 120 to 300 pixels
- Minimize use of images, text and styling loads much quicker
- Left align all content and fully utilize space

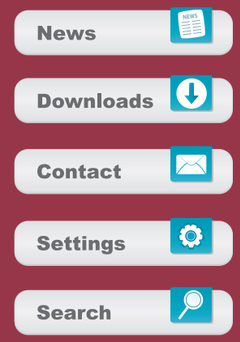
07 Use scalable sizing and positioning of text and visual layout

- Text size should scale using percentages
- Tables use percentages for proper scaling

08 Color should be used appropriately with good visual contrast and not used alone to convey a meaning, prompt an action or response

- Minimum colour contrast between foreground and background content should be 4.5:1
- Avoid using red colour alone to convey a form validation error message

09 Form controls must be labeled properly with usable layout



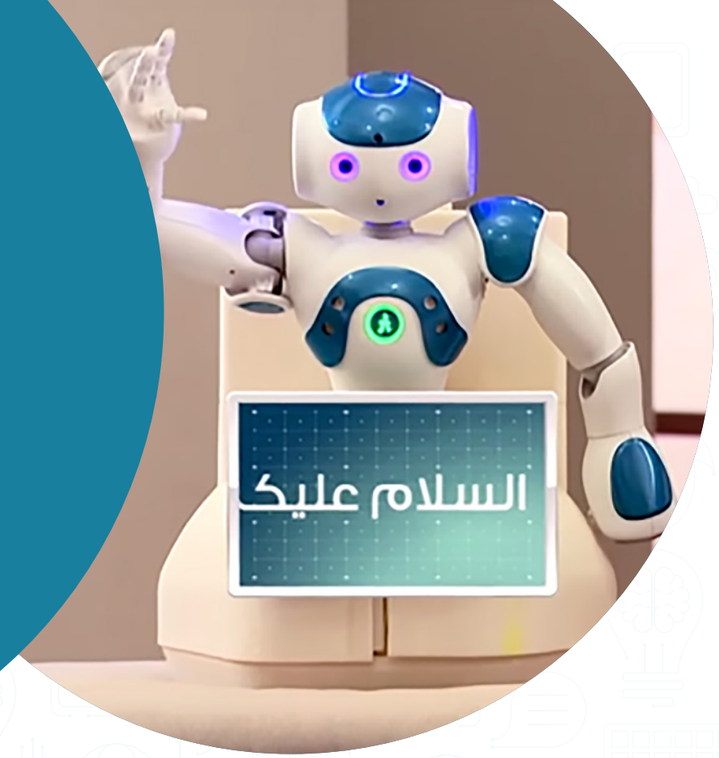
- Visual layout of labels and form controls must be tight
- Use label elements to associate text labels with form controls

10 Mobile App content and functions must be understandable to everyone

- Use simple language in the app for people with language barriers and cognitive disabilities
- Use descriptive link phrases that describe link destination; avoiding using link phrases like: “Click Here”, “More” and “Learn More”
- Programmatically identify different languages or change of languages in the app

SeeDo

Qatari Innovation for Deaf Children



Mohammed Al-Jefairi, SeeDo Robot Innovator

What is SeeDo?

SeeDo is an interactive robot that has been engineered by Qatari innovator, Mohammed Al-Jefairi. SeeDo is designed as an invention for helping children with deafness to learn sign language. Assistive Technology Center "Mada" partnered with the famous Qatari TV show "Stars of Science" to support the development of innovative assistive technology (AT) solutions, and the sustainable growth of AT solutions & entrepreneurship in Qatar and the region. As part of this collaboration Mada had provided mentorship support to Mohammed during his participation in "Stars of Science" to develop this international award winning robot.

SeeDo is the first of its kind technology to provide access to training tools in an interactive and engaging format that allows deaf children to adapt sign language proficiency in an appealing way.

Why is SeeDo Robot so important?

Studies show that the early years of a child's life is the most crucial learning period to develop language and communication skills. By the age of six, the average child will have picked up an average of 1,000 words in their vocabulary. However, in comparison it is believed that a hearing impaired child will only pick up 50 words in the same period.

Mohammed Al-Jefairi has recognized that children with Hearing impairments are disadvantaged in the society by getting left behind as they struggle to communicate clearly and fully interact with the world around them.

As per Mohammed, the current learning tools and resources designed for young deaf children are yet to utilize the full potential and benefits of technology to serve their needs. Mohammed is commitment towards improving the situation and helping to shape a more inclusive world with smarter long-term solutions led to his invention of the SeeDo Robot.

How does SeeDo Robot Work?

SeeDo uses its robotic hand to communicate in all forms of sign language. It can also display all kinds of useful visual content on its built-in TV screen. In addition to that, SeeDo is engineered with electronic processors, a motion sensor and specialized depth cameras which can capture and interpret hand movements, so that SeeDo can accurately respond to a child's sign language. SeeDo uses advanced electronic processors, motion sensors and specialized cameras to capture and recognize the movements of the hand, so that the robot can accurately respond to the sign language.

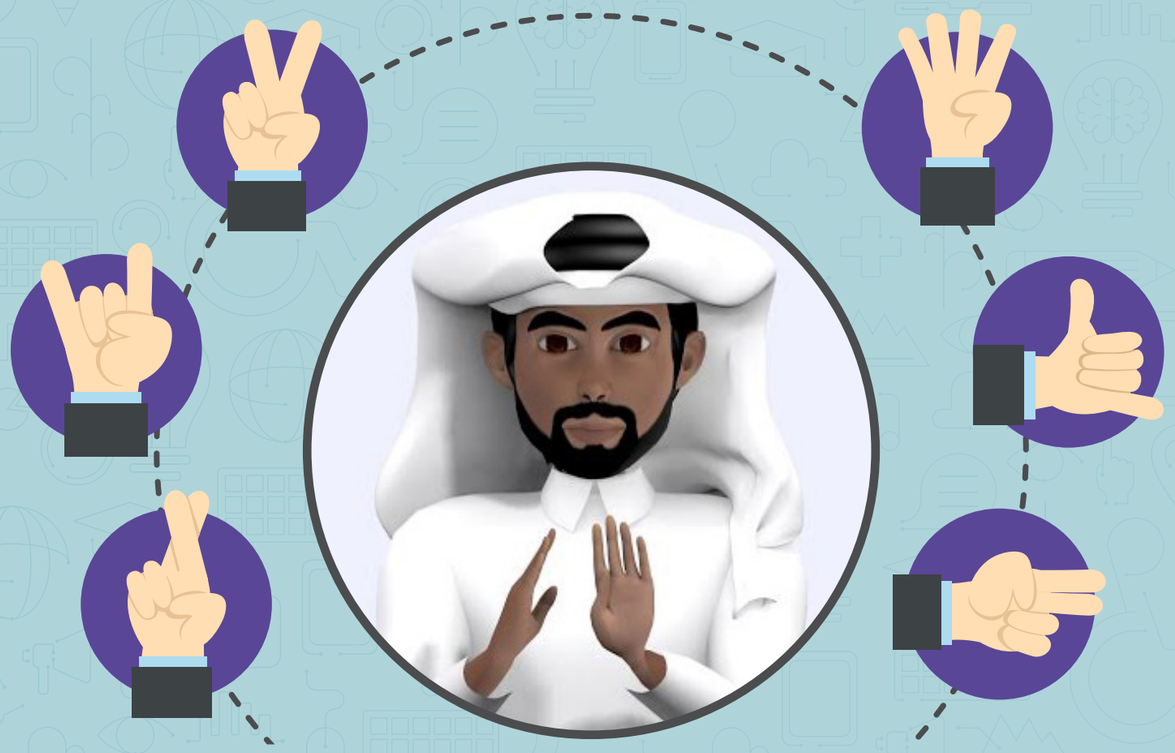
Of course, SeeDo has the scope and the technology to do much more. For instance, it can use its screen to tell exciting visual stories which are designed to improve the child's vocabulary, and it can pose all kinds of puzzles and games in sign language for rapid learning. It can essentially talk to the child in real-time using a mixture of visual content and physical sign language, and it can instantly correct any mistakes that the child is making in conversation. If the child makes a mistake, SeeDo will shake its head and perform the correct sign language gesture for the child to learn.

Why is SeeDo unique?

One of the biggest daily challenges faced by deaf children is to pick up the nuances of language and identifying non-visual words. It might be quite straightforward to teach a deaf child the signs for a tree or a window by simply pointing to a tree or a window.

For deaf children, the challenge lies more in teaching signs for abstract words like 'weekend', 'honesty', or an 'opinion'. Usually children will instinctively pick up these words through natural verbal communication with other people, but this challenge is much greater for deaf children. SeeDo Robot is engineered to be the unique solution to this unique problem. ■

Bu Hamad: A Qatari Real-time Sign Language Interpreter Avatar



Assistive Technology Center “Mada” supports leading Arab technology initiatives to develop solutions that serve people with hearing impairments. Individuals with hearing impairments demand for technological solutions that support Arabic sign language. One of these solutions is a 3D technology sign language interpreter (Avatar) by Mindrockets Inc. As result of the collaboration between Mada Innovation Program and Mindrockets Inc., this technology was used to develop the virtual character called Bu Hamad.

Why the need for avatar interpretation of Sign Language?

It is understandable that people may ask the need to translate closed captions into Sign Language using Avatar Technology. Especially when it comes to written texts, deaf individuals can read, so why this technology?

A deaf person’s first language is not their native language, but their native sign language, and native sign languages differ from one country to another. For deaf individuals, who primarily learn their sign languages, learning a written language is harder. For instance, for an average Arabic deaf person, learning Arabic is harder than learning the Arabic Sign Language (Or localized Sign Language such Qatari Sign Language). This is the reason why many deaf individuals face reading and writing issues.

Thus, many websites use videos where someone automatically signs the written text in order to make written materials accessible for hard of hearing and deaf individuals. However, this is a time consuming process as such videos need to be edited contributing towards major costs. This is where avatar technology for real time signing comes in as an efficient solution. The visually captured motions of sign language are fed to the avatar first before being presented as sign language with motion blending and animation.

Bu Hamad, the Qatari Avatar

For the Arabic Sign Language, many initiatives were launched aiming to develop and design avatar solution to translate Arabic Sign Language. Most of them were not updated or aborted due to the high cost of building dictionary containing all Arabic words that can be used by deaf individuals. Thus, Bu Hamad was developed with an objective to deliver a complete front-end digital solution that interprets Arabic Text to localized sign language.

Mada played an important role in the development of Bu Hamad by holding consultative sessions for sign language interpreters, persons with hearing disabilities and hearing impairments experts in order to exchange opinions, experiences and observations to improve Bu Hamad’s performance and correct his Qatari Sign language dictionary.

Bu Hamad is being actively used on the official Mada website and Mada AT portal providing deaf users with a new experience and allowing them to understand the content of webpages. Thanks to the dictionary containing thousands of words, the avatar can translate in real time any text to Qatari Sign Language and to American Sign Language for the English text. Mada AT Center continues to promote for Bu Hamad and introduce it to the public in various events and exhibitions.

As we know, avatar interpretation is still ongoing in the right way. There are many challenges to deal with in the future, including facial animation which is important to the deaf community to understand signs done by hands. ■

Smart Face App

Allowing People with Physical Disabilities to Operate Communication Devices

As part of its innovation program efforts in the field of Arabic AT, Assistive Technology Center “Mada” collaborated with Arab League Educational Cultural and Scientific Organization to launch the Mada-ALECSO App Award for the best Arabic applications aimed at improving the living conditions of persons with disabilities. The competition was very popular in its first year, with 116 participants from 17 Arab countries. Two winners were selected for Mada-ALECSO App Award 2017. Smart Face, one of the winners of the Mada-Alecso Apps Award in 2017, is an innovative android application supported in the Arabic language that allows people with a physical impairment with restricted dexterity to operate the Android device through facial or head movements.

The application tracks the head movements of the user and moves the cursor accordingly on the screen. The application is fully customizable in terms of offering options to configure the behavior of the cursor (e.g. movement speed, sensitivity, etc.). When the user wants to click an element on the screen, he/she has to hover the cursor over it for a brief moment.

Karim Khoui, the developer of Smart Face, had embedded all features of the application in the accessibility section of the Android device, where one can customize options depending on the needs of the user. Once installed, mouse cursor will appear on the screen allowing the use of various applications such as the camera, social media and calls making.

Technologies are leaning towards utilizing built hardware in mobile devices to cater towards the needs of individuals with disabilities. The mainstreaming of accessibility features within mobile devices will contribute towards serving the accessibility needs of a wider population at a more affordable cost. Mada›s innovation program is dedicated to supporting the development of Arabic applications that empower people with disabilities and facilitate their access to various services. ■

Mada Assistive Technology School Kits to Support Students with Disabilities in Qatar

In fulfillment of its commitment to support students with disabilities accessing the curriculum without any difficulties, Assistive Technology Center “Mada” took the initiative to provide Assistive Technology School Kits to Qatari students in public schools. The Assistive Technology (AT) kit project promotes the benefits of using AT within schools by emphasizing the need for building capacities to provide AT services independently.

The main goals of the “Assistive Technology School Kits” project are to provide access to technology through training and information resources, which includes all recommended AT based on the needs of students› assessment, and to help Additional Educational Support Needs (AESN) Teachers develop their capacity to work collaboratively to implement assistive technology services at schools. An AT School Kit comprising of a set of devices was provided to each school followed by a necessary AT training for the relevant school staff.

Throughout 2017, 26 AT School Kits have been provided and 190 teachers (AESN, specialist and shadow teacher) have been trained successfully to be able to assess their student’s needs successfully. The project has provided customized assistive technology kits for autistic students in public schools. The kits include AT solutions to improve social interaction skills, daily routines, sensory games, GPS tracking devices, robots and applications for academic skills development.

As schools are increasingly challenged to serve a diverse student population, the main challenge is providing effective inclusive education by understanding how to implement inclusive education through AT in ways that are feasible in ensuring schooling success for all children. AT School Kits project works towards addressing this challenge by providing AT and building the capacities of AESN teachers, therapists and AT specialists to meet the educational goals of the students with disabilities. ■

Building Assistive Technology Capacities within the Education Sector in Qatar

Building Assistive Technology Capacity within the Education sector is a primary mandate of Mada. This goal is achieved by designing programs to build teaching excellence through Assistive Technology (AT) in order to make schools more inclusive and improve outcomes for students with a disability. The programs were committed to ensuring that educators were equipped with the skills and knowledge to support all students with disabilities and understand their unique learning needs.

As part of the program, 40 Educators were trained to be AT Super Users to offer AT expertise within an education context. All the successful Super Users who completed the program were accredited by Mada and Qatar University.

Abdul Aziz wants to learn ...

This case study will look into the impact of using special communication applications installed on the iPad on the development of the skills of verbal communication, attention and concentration of a child with Autism.

Abdul Aziz (nine years old) is non-verbal and he has poor visual communication, social skills and poor interaction with peers (almost non-existent where he likes isolation). He has sensory problems such as loud voices; he can react violently to very loud voices to the extent that he could attack any person who makes them. He lacks attention and information need to be repeated when talking to him. He also suffers from weakness in his fine muscles and fingers; therefore, he can't hold the pen and find it difficult to use scissors.

How did the Super User help Abdul Aziz?

The case of Abdul Aziz was overseen by one of the Mada education super-user graduates, who worked with Abdul Aziz to collect the required data from classroom, teachers, and the occupational therapist and support teachers.

For communication, Abdul Aziz relies on pulling the person toward what he wants. He loves numbers/letters and related songs. Moreover, he has an excellent photographic memory as he refers to words when reading them from a book. He knows the numbers, letters, shapes, colours, however he does not understand the concept of time, days and seasons of the year. He sometimes gets angry and persistently crying due to the lack or difficulty communicating with others.

Considering student's situation and the difficulties in surrounding educational/home environment, a decision was made to use a variety of low-tech and high-tech aids in communication. Various applications were used to control the size of images, number of columns and the possibility using images of the student performing specific tasks.

How did Abdul Aziz improve?

Significant development and improvement in communication have been noticed on Abdul Aziz as well as increase in processing language and vocabulary. Abdul Aziz demonstrated significant progress by being able to form sentences of two-three words; expressing his needs for example, I want candy. In addition, he can now count up to 100 and he also mastered English and Arabic alphabets.

The case study of Abdul Aziz is a reflection of the positive impact of building AT expertise capacity within schools and relevant educational institutions where staff members can work with the students directly to maximize their full potential in education. ■