International Research Journal of Innovations in Engineering and Technology (IRJIET)

ISSN (online): 2581-3048

Volume 2, Issue 4, pp 18-27, June-2018

"iCan" – A Web Application Framework for People with Special Needs

[1]Mai Ubeid, [2]Ihab Zaqout

[1]Department of Computer Systems Engineering, Faculty of Engineering and Information Technology, Al-Azhar University, Gaza, Gaza Strip, Palestine

[2]Department of Information Technology, Faculty of Engineering and Information Technology, Al-Azhar University, Gaza, Gaza Strip, Palestine

***Abstract* - In this study, a web application framework named "iCan" is proposed for people with special needs who can't move from place to another and they haven't the ability to get outside the home. It is a great step for their life to make the daily requirements easier. This type of web applications aims to serve those people but unfortunately is rarely or may not exist. The web application promotes miscellaneous services to choose for registered people in the system. The offered services are transportation offices, shopping centers such as markets, training centers, health care centers and other service providers. The proposed application will be implemented using PHP Laravel, JavaScript, jQuery, HTML5, CSS3 and Bootstrap Abstract should convey the importance of your research in a concise and logical manner.**

***Keywords*:** Special needs, Web accessibility, Actor, Use case diagram, Class diagram, Mobile Application.

I.INTRODUCTION

Web applications use web documents written in a standard format such as HTML and JavaScript, which are supported by a variety of web browsers. Web applications can be considered as a specific variant of client-server software where the client software is downloaded to the client machine when visiting the relevant web page, using standard procedures such as HTTP. Client web software updates may happen each time the web page is visited. During the session, the web browser interprets and displays the pages, and acts as the universal client for any web application.

Through Java, JavaScript, DHTML, Flash, Silver light and other technologies, application-specific methods such as drawing on the screen, playing audio, and access to the keyboard and mouse are all possible. Many services have worked to combine all of these into a more familiar interface that adopts the appearance of an operating system. General purpose techniques such as drag and drop are also supported by these technologies. Web developers often use client-side scripting to add functionality, especially to create an interactive experience that does not require page reloading. Recently, technologies have been developed to coordinate client-side scripting with server-side technologies such as ASP.NET, J2EE, Perl/Plack and PHP.

a) Problem Definition

- Difficulties for people with special needs to move from place to another.
- Parents do not have enough knowledge to deal with their disabled children.
- Many of those people don't have the motivation to challenge the circumstance.
- They need more health care from institutions.
- People with special needs want to have the essential tools for their daily life.
- They can't reach centers that provide courses about their interest.
- People with special needs require going to search about jobs.
- Difficulties to find someone who can improve their skills.

b) System Objectives

- Provide the necessary supplies of food, medicine and different tools for people with special needs.
- Announcements of training and education courses for these people in various fields.
- The physically handicapped communicate with transportation office.
- Provide health development programs.
- Connect with institutions to support talent and expertise.
- Easley reach to job advertisement.
- Provide blogs which contain different sections such as, educating parents about how to deal with them, the latest news of interest to those people and news about disabled people who achieve success.
- Easley communicate with each other.

ISSN (online): 2581-3048
Volume 2, Issue 4, pp 18-27, June-2018

c) *System Description*

Using web site for people with special needs who can't move from place to another, and they haven't the ability to get outside the home is a great step for their life to make the daily requirements easier. This type of web applications for those people is rarely exist overseas and does not exist in our country.

Because of the problems listed above in subsection A, we have decided currently to build a framework of the web application to serve people with special needs and to facilitate their life. The website will allow them to sign-in and view different sections such as: transportation offices, shopping centres like markets, training centres, blogs, discussions, working area and health care. The registered user will choose what type of service she/he needs.

Transportation section will connect the user with different transportation offices in different regions. Shopping centres section also connect them with their Facebook page or email to request what they need and specify the address to provide them the services.

Training centres section will send notifications for admin about new courses in their cross areas or fields and show what the most important courses are that improve their skills and interests. Blog section contains different subsections such as, educating parents about how to deal with them, the latest news of interest to those people and news about disabled people who achieve success.

Discussion section supports the ability for them to ask about many topics in the website. Advertisement section will help them find all the techniques to improve themselves.

Finally, health care section provide many programs, articles and videos that guide them to have good health. All these sections in the website are to help them to have the world in their homes.

The major advantage of choosing to build a web application is, it doesn't require any additional software and no installation, just connect to the internet to be reachable.

II. RELATED WORK

Basic concepts of e-accessibility, universal design and assistive technologies, with a special focus on accessible e-learning systems are described by [1]. They have presented, in particular, the accessible version ''Moodle Acc+'' of the well-known e-learning platform Moodle as well as new elaborated generic models and a range of tools for authoring and evaluating accessible educational content.

Both authors [2] highlighted the necessity to respect international accessibility and e-learning standards in creating Web sites or assistive software and provide solutions for access to learning objects, through web services using voice synthesis and speech recognition in Romanian.

Roles of e-teacher are considered which are useful in e-education of students with disabilities. Usefulness of assistive technology and e-learning technology are also considered. The examples of implementation of e-learning/e-teaching components in education of students with specific learning disabilities supported perspectives of inclusive e-education and importance of teachers' competence of e-teaching in inclusive education [3].

In [4], the authors proposed a framework, an Assistive Learning Environment (ALE) to enhance the learning experience of Learning Disabilities (LD) in their academic life, which is capable for recognizing what content has to delivered, variability associated with each LD learner and transformations associated with the content to deliver it the LD learner.

The research of [5] aimed to develop and design Geographical Information Systems (GIS) for facilitating disabled people by presenting some useful disabled information on the Google Map. The map could provide information about disabled types of people such as blind, deaf and physical movement. This research employed the Multiview 2 theory and method to plan and find out the problems in real world situation. This research used many designing data structure methods such as Data Flow Diagram, and ER-Diagram. The research focused into two parts: server site and client site which included the interface for Web-based application.

Researchers of [6] stated that educational institutions have thus utilized assistive technologies to assist disabled students in their learning, but some of these technologies are incompatible with some learning environments, hence excluding some disabled students and resulting in a disability divide. To solve this problem, amongst other solutions, e-learning personalization has been used and more recently, this is also achieved using Semantic Web technologies such as ontologies. Nevertheless, as ontologies are incorporated into learning environments little seems to be done to personalize learning for some disabled students. Their study, in order to bridge the gap, proposes a personalization approach based on a disability ontology containing information on various disabilities encountered in higher education, which can be used to present disabled students with learning resources relevant and suitable for their specific needs.

The construction of a tool for communication between listeners and speakers through the Brazilian Sign Language (LIBRAS) and the French Sign Language (LFS), making a simultaneous translation between the Brazilian written language and the French written language integrated through a web application, with the aid of the recognition of signals

ISSN (online): 2581-3048
Volume 2, Issue 4, pp 18-27, June-2018

by techniques of image recognition and use of web services. In addition, it raises a bibliography of the struggle of disabled people, the importance of non-verbal communication in human life, as well as an analysis of several translators available in the electronic mean, raising their strengths and weaknesses by comparing them in standard color, structure and navigation used [7].

Authors of [8] presented in their work a modeling framework that supports dynamic adaptation of the UI of web 2.0 applications. This work builds upon previous efforts of the authors [9] leveraged with the use of the semantic framework for Composite Capability/Preference Profiles (CC/PP), which allows the matching of device capabilities and user preferences arising because of functional restrictions. The combination of these models with those of the corresponding web applications enables an adaptive transformation process that facilitates access to users with special needs derived of their functional restrictions or because of context-related handicapping situations.

"Easy to Read on the Web" aimed at raising awareness and collecting / deriving concise and up-to-date recommendations, guidelines, standards and tools for enhancing the web experience for users with cognitive disabilities and other groups facing problems with "standard" information on the Web [10].

Authors of [11] presented a study that investigates how people with the mentioned intellectual disabilities interact with web pages, which difficulties they have while accessing the information and they proposed guidelines for the studied group. While conducting their study they have also analyzed how the guidelines (1.0and 2.0) suggested by W3C are applied to this particular group. While researchers of [12] observed how a group with intellectual disabilities, without experience using computers, performed universal tasks (selection, manipulation and navigation) when presented with different activities on the Web such as painting, playing games or searching. They aimed at evaluating usability and accessibility and for this they registered the following variables: successful conclusion of activities, type of difficulties found, errors, satisfaction, motivation and autonomy indicators.

The purpose of the research paper [13] was to describe special needs assistants' perceptions on their education, professional competence, the content and significance of their work within the school system of Finland, and the further development of their role and content of their work. 171 special needs assistants from the province of Lapland participated in the research. The results highlighted the diversity, challenges and development needs of special needs assistants' work.

The importance of research on social participation of students with special educational needs, enhance the available literature and encouraged researchers to fill actual gaps in research was highlighted by [14].

III. WEB APPLICATION ARCHITECTURE

A web-based application is any application which uses a web browser as a client. Term can also mean an application of software which is encoded in a programming language supported by the navigator (such as JavaScript, combined with a language of increase made by the navigator as to be HTML). The capacity to update and to support of applications of web without distributing and installing software on potentially thousands of client's computers is a key reason for their popularity, as the inherent support in favour of the compatibility of cross-platform is, the common applications of web include webmail, sales of online detail, online auctions, wikis and a lot of other functions [15].

Web application architecture defines the interactions between applications, middle are systems and databases as depicted in Figure (1) to ensure multiple applications can work together. When a user types in a URL and taps "Go," the browser will find the Internet-facing computer the website lives on and requests that particular page. The server then responds by sending files over to the browser. After that action, the browser executes those files to show the requested page to the user. Now, the user gets to interact with the website.

Web application architecture is critical since the majority of global network traffic, and every single app and device uses web-based communication. It deals with scale, efficiency, robustness, and security. As a result, web application architecture includes all sub-components and external applications interchanges for an entire software application.

The business advantages of web applications discussed by [16] as follows:

- *Cost effective development:* In web applications, the users access the system via a uniform environment — the web browser. While user's interaction with application needs to be completely assessed on different web browsers, application itself needs only to be developed for a simple operating system. There is no need to develop and test it on all possible operating system versions and configurations. It makes development and much easier diagnosis of breakdowns and for the web applications which use the Flash front end by assessing and to find solutions is even easier.
- *Accessible anywhere:* Unlike traditional Applications, the systems of web are accessible anytime, when and via any PC with an Internet connection. It puts the firmly responsible user where

International Research Journal of Innovations in Engineering and Technology (IRJIET)

ISSN (online): 2581-3048

Volume 2, Issue 4, pp 18-27, June-2018

from and when they access application. It also opens stimulating, modern possibilities such as the global teams, by working on home and collaboration real-time. The idea of sitting down in front of a simple computer and of working in a fixed place is a thing of past with the web applications.

- *Easily customizable:* User's interface of web applications is easier to customize that the case with the applications of desktop is. It makes easier to update look and sense of application or to customize the presentation of information to different groups of user. Therefore, there is no anymore need for everyone to settle for using exactly the same interface at all times. Instead of it, you can find the look improved for every situation and user.

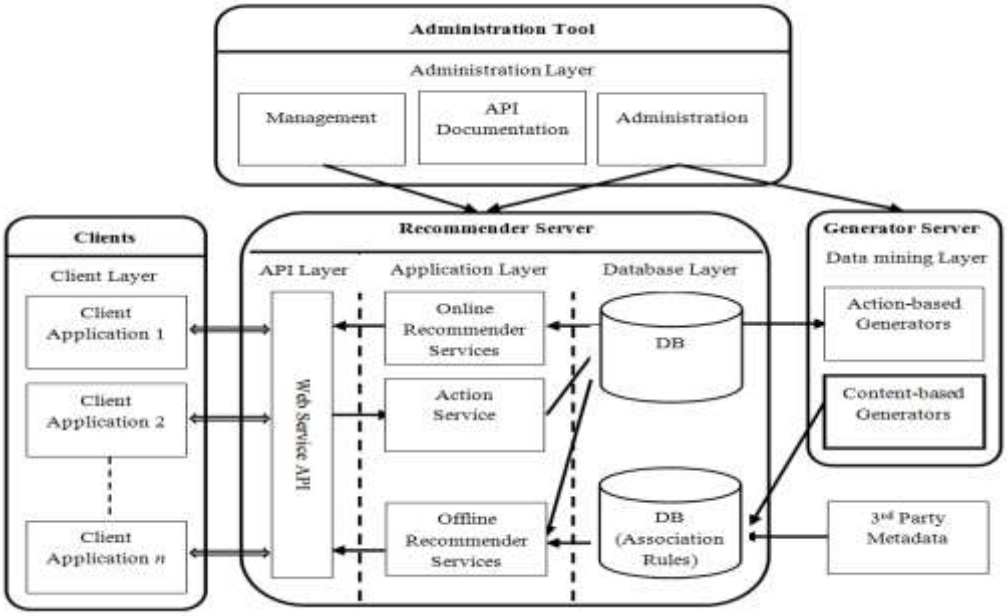

Figure -1: Web Application Architecture

- *Accessible for a range of devices*: Besides being a customizable for users groups, contents can also be customized for use on any device linked to Internet. It includes similar of PDAs, mobile phones and tablets. It spreads farther the capacity of the user to receive and to communicate with information in a way which goes to them. In that way, the up to date information is always at the fingertips of the people who need it.
- *Improved interoperability*: It is possible to fulfill a much bigger level of interoperability between web applications than it is with isolated desktop systems. For example, it is much easier to integrate a web-based shopping cart system with a web-based of accountancy than get two proprietary systems to contact mutually. Because of it, the architecture of the web makes possible to rapidly integrate enterprise systems, by improving the work-flow and other processes of business. By using Internet technologies you receive a model of flexible and adaptable business which can be changed according to the displacement of requests of the market.
- *Easier installation and maintenance*: With the installation of a web-based approach and maintenance becomes less complicated also. Once a new version or an upgrade one is installed on host's server, all users can access it right away and it does not need there to update the PC of every potential user. Offering new software can be more easily fulfilled, by demanding only that the users have recent browsers and plugins. As the upgrades are only carried out by an expert to a single server results are also more predictable and more reliable.
- *Adaptable to increased workload*: The increase of the capacity of processor also becomes a much simpler operation with web-based applications. If an application demands more power to carry tasks out, only the equipment of server needs to be updated. The capacity of web-based software can be incremented by "clustering" or by running software on several servers at the same time. When workload increases, new servers can be added to the system easily. For example, Google runs on thousands of inexpensive Linux servers. If a server fails, it can be replaced without affecting the overall performance of the application.
- *Increased Security*: Web-based applications are typically deployed and dedicated servers, which are controlled and supported by the experienced server administrators. It is much more efficient than the

International Research Journal of Innovations in Engineering and Technology (IRJIET)

ISSN (online): 2581-3048

Volume 2, Issue 4, pp 18-27, June-2018

surveillance of hundreds or even of thousands of client's computers as is case with the desktop applications. It means that security is tighter and any potential offences should be pointed out much more quickly.

- *Flexible core technologies*: Any one of the three basic technologies can be used to construct web-based applications, according to requirements of the application. The Java-based solutions (J2EE) from Sun Microsystems involve technologies such as JSP and Servlets. The newer Microsoft .NET platform uses Active Server Pages, SQL Server and .NET scripting languages. The third option is the Open Source platform (predominantly PHP and MySQL), which is best suited to smaller websites and lower budget applications.

Progressive Web Apps are user experiences that have the reach of the web [17], and are:

- *Reliable* - Load instantly and never shows the dinosaur, even in the uncertain conditions of network. When launched from the user's home screen, the service workers allow a progressive web application to load immediately, without taking into account the state of network. A service worker, written in JavaScript, resembles a client-side proxy and puts you in the control of the hiding place and how to answer requests of resource. By pre-cashing key resources you can eliminate dependency in network, by guaranteeing an immediate and reliable experience for your users.
- *Fast* - Quickly answer to user's interactions with silky smooth animations and no janky scrolling. 53 % of users will leave a site if it takes more time than 3 seconds to load! And once loaded, the users expect that they are quick — no junky scrolling or slow interfaces to be answered.
- *Engaging* - Feel being a regular application on the device, with an immersive user experience. The progressive web applications are an installable and live on the user's home screen, without the need for an app store. They promote an immersive full screen experience with help from a web app manifest file and can even re-engage users with web push notifications. The web app Manifest allows you to control how your application appears and how it is launched. You can specify home screen icons, the page to load when application is launched, the orientation of screen and even if indeed it is necessary to show the browser chrome.

IV. THE FRAMEWORK DESIGN

This section describes the overall system functionalities and the relationships among its components. The first section explains the use case diagram and the relationships between their actors. In second section, the class diagram of the framework of the web application is illustrated.

a) Use Case Diagram

The Use Case diagram as shown in Figure (2) depicts five different types of users named, visitor, user, admin, trainer, and notifier, and their relationship functionalities among each use case. The actor's list and their associated responsibilities are described as follows:

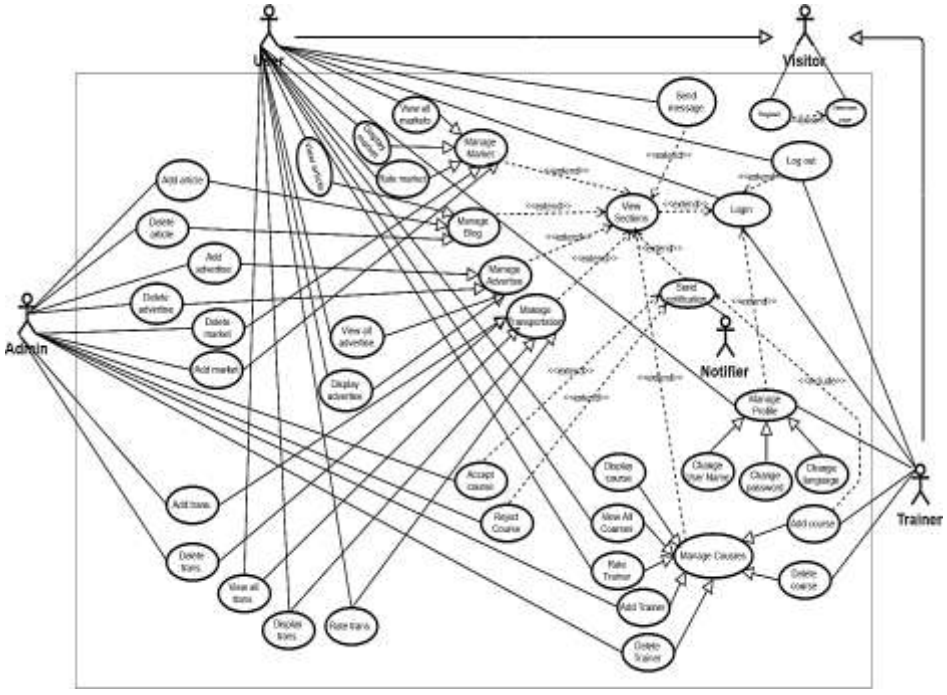

Figure -2: Use Case Diagram

International Research Journal of Innovations in Engineering and Technology (IRJIET)

ISSN (online): 2581-3048

Volume 2, Issue 4, pp 18-27, June-2018

- *Visitor*: Person who can view the main page and make registration.
- *User*: Person who will use the services in the website.
- *Admin*: Person who control and manage the functions in the network.
- *Trainer*: Person who can add or delete courses for user.
- *Notifier*: sub-system which send notifications for the admin to accept or reject courses.

The system Use Case list consists of 43 Use Cases described as follows:

- U_1(*register*)**:** Visitor sign up for new account to be a user.
- U_2 (*login*): User and trainer log in the website using user name and password.
- U_3 (*manage market*): Admin add or delete market and user can view them.
- U_4(*add market*): Admin add new market in the website.
- U_5(*delete market*): Admin delete one or more market from the website.
- U_6(*view all markets*): User view all the markets in the system and show them.
- U_7 (*display market*): User can select one market and view all details.
- U_8(*rate market*): User after viewing the market, give a rate for service.
- U_9(*manage transportation offices*): Admin add or delete transportation offices and user can view them.
- U_{10}(*add transportation offices*): Admin add new transportation office in the website.
- U_{11}(*delete transportation offices*): Admin delete one or more transportation offices from the website.
- U_{12}(*view all transportation offices*): User view all the transportation offices in the system and show them.
- U_{13}(*display transportation offices*): User can select one transportation office and view details.
- U_{14}(*rate transportation offices*): User after viewing the transportation office, give a rate for service.
- U_{15}(*manage advertisements*): Admin add or delete advertisements and user can view them.
- U_{16}(*add advertisement*): Admin add new advertise in the website.
- U_{17}(*delete advertisement*): Admin delete one or more advertises from the website.
- U_{18}(*view all advertisements*): User show the section of advertises in the system and view them.
- U_{19}(*display advertisement*): User view the details of specific advertise.
- U_{20}(*manage courses*): Trainer add or delete course, user select one of them, after admin add or delete trainer.
- U_{21}(*add course*): Trainer add new course for the users.
- U_{22}(*delete course*): Trainer delete one or more courses from the website.
- U_{23}(*view all courses*): User view all courses in the website.
- U_{24}(*display course*): User select one course and display its details.
- U_{25}(*view trainer*): User can select the trainer name to view his profile.
- U_{26}(*rate trainer*): User give rate for trainer after viewing profile.
- U_{27}(*send notification*): Notifier send notifications to admin when the trainer add new course.
- U_{28}(*accept course*): Admin accept adding the course on the website when the notification reach.
- U_{29}(*reject course*): Admin reject adding the course on the website when the notification reach.
- U_{30}(*manage blog*): User show the blog and manage adding or deleting articles.
- U_{31}(*add article or video*): Admin add new article or video in the website.
- U_{32}(*delete article or video*): Admin delete one or more articles from the website.
- U_{33}(*view article or video*): User select one article to view all details.
- U_{34}(*send message for website*): User send messages for admin if they faced any problem.
- U_{35}(*manage profile*): User or trainer manage the profile by many operations.
- U_{36}(*change user name*): User or trainer can change their user name.
- U_{37}(*change password*): User or trainer can change the old password to new password.
- U_{38}(*change language*): User or trainer have the ability to change language to use.
- U_{39}(*log out*): User and trainer log out from the website.
- U_{40}(*display sections*): Users select specific section of services they need.
- U_{41}(*view main page*): Visitor can see the services of different sections.
- U_{42}(*add trainer*): Admin have to add trainer in the website.
- U_{43} (*delete trainer*): admin delete one or more trainers from the website.

b) Class Diagram

The Class diagram in Figure (3) illustrates the system's class diagram and the relationships between their classes. There are 13 classes named, Account, Visitor, Admin, Profile, Trainer, User, Message, Notification, Market, Transportation office, Courses, Advertisement, and Blog.

International Research Journal of Innovations in Engineering and Technology (IRJIET)

ISSN (online): 2581-3048

Volume 2, Issue 4, pp 18-27, June-2018

V. PRELIMINARY SKETCHED INTERFACES

The proposed framework of "iCan" web application is designed to be compatible with personal computers and cell phones platforms. Some of the undergoing screen shots of personal computers interfaces and cell phones are depicted in the following two sections, respectively.

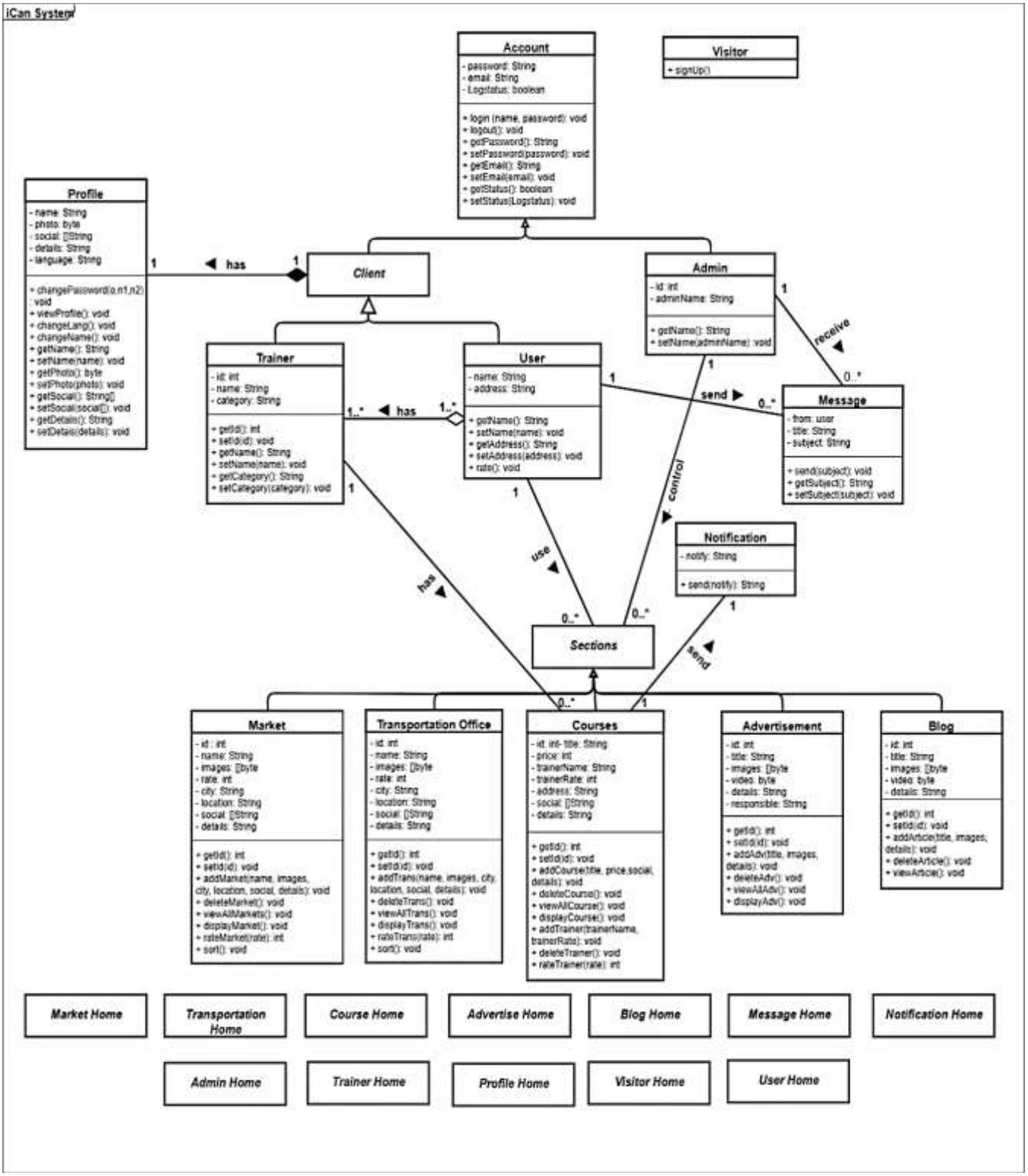

Figure -3: Class Diagram

International Research Journal of Innovations in Engineering and Technology (IRJIET)

ISSN (online): 2581-3048

Volume 2, Issue 4, pp 18-27, June-2018

a) Personal Computers

(a) *(b)*

(c) *(d)*

(e) *(f)*

(g) *(h)*

(i) *(j)*

(k) *(l)*

Figure -4: Screen shots of main pages using personal computers. (a) Visiting page. (b) Login Page. (c) Register Page. (d) Home Page. (e) Markets Page. (f). Transportation Offices Page. (g) Courses Page. (h) Trainer Page, (i) Blog Page. (j) Article Page. (k) Advertises Page. (l) User Profile Page

b) Cell phones

(a) *(b)*

(c) *(d)*

ISSN (online): 2581-3048
Volume 2, Issue 4, pp 18-27, June-2018

(e) *(f)*

Figure -5: Screen shots of main pages using mobiles. (a) Login page. (b) Home page. (c) Markets page. (d) Transportation page. (e): Training page. (f): Courses page.

VI. CONCLUSION AND FUTURE WORK

This framework study is meant to implement "iCan" website to facilitate people with special needs life and make the daily requirements easier. This type of web applications is rarely exist and applied overseas. The website will allow them to sign in and view different sections such as: Transportation offices, Markets, Training centers, Blog, advertisement and health care. The users will choose what type of service they need. All these sections in the website for help them to have the world in their homes.

In the future, this framework will be completely implemented and tested to be worked as third party between people with special needs and the society to provide them all services without make them tired.

REFERENCES

[1] M. Laabidi, M. Jemni, L. Ben Ayed, H. Ben Brahim, and A. Ben Jemaa, "Learning technologies for people with disabilities", *Journal of King Saud University – Computer and Information Sciences*, vol. 26, pp. 29–45, 2014.

[2] N. Isaila, I. Nicolau, "Promoting computer assisted learning for persons with disabilities", *Procedia Social and Behavioral Sciences*, vol. 2, no. 2, pp. 4497–4501, 2010.

[3] D. Bjeki, S. Obradovi, M. Vueti, and M. Bojovic,"E-teacher in inclusive e-education for students with specific learning disabilities", *Social and Behavioral Sciences*, vol. 128, pp. 128–133, 2014.

[4] Z. Pirani, M. Saiskumar, "Assistive E-Learning System for the Learning Disabled", Procedia Computer Science 45 -*International Conference on Advanced Computing Technologies and Applications*, vol. 45, pp. 718–727, 2015.

[5] S. Tongkaw, "GIS Application Management for Disabled People", *IOP Conf. Series: Materials Science and Engineering*, pp. 1-6, 2017.

[6] J. Nganji, M.Brayshaw, and B.Tompsett, "Ontology-Based E-Learning Personalization for Disabled Students in Higher Education", *Innovation in Teaching and Learning in Information and Computer Sciences (ITALICS)*, vol. 10, no. 1, pp. 1-11, 2011.

[7] C. De Aquino, M.Da Silva, A.Rodrigues, E. de Carvalho, J. Neto, J. Da Silva, C. De Morais, R. D'Emery, E. Silva, M. Teixeira, and M. Teixeira, "TRADUZ: Proposal of an interactive translator for people with hearing special needs", *12th Iberian Conference on Information Systems and Technologies (CISTI), Lisbon, Portugal, June 21 – 24, pp. 1-6*, 2017.

[8] P. Ackermann, A. Carlos, "Developing a Semantic User and Device Modelling Framework that supports UI Adaptability of Web 2.0 Applications for People with Special Needs", *Proceedings of the International Cross-Disciplinary Conference on Web Accessibility, Lyon, France*, April 16 – 17, vol. 12, pp. 1-4, 2012.

[9] C. Velasco, Y. Mohamad, A. Gilman, N. Viorres, E. Vlacho giannis, A. Arnellos, and J. Darzentas, "Universal access to information services — the need for user information and its relationship to device profiles", *Universal Access in the Information Society*, vol. 3, no. 1, pp. 88–95, 2004.

[10] K. Miesenberger, A. Petz, "Easy to Read on the Web - State of the Art and Research Directions", *5th International Conference on Software Development and Technologies for Enhancing Accessibility and Fighting Info-exclusion, Procedia Computer Science* 27, Vigo, Spain, November 13-15, pp. 318–326, 2013.

[11] T. Rocha, M. Golcalves, L. Magalhaes, F. Godinho, and M. Bessa, "Accessibility and Usability on the Internet for people with intellectual disabilities", *2nd International Conference on Software Development for Enhancing Accessibility and Fighting Info- Exclusion, Lisbon, Portugal*, June 3 – 5, pp. 1–7, 2009.

[12] T.Rocha, M. Bessa, L. Magalhaes, and L. Cabral, "Performing universal tasks on the Web: interaction with digital content by people with intellectual disabilities", *Proceedings of the XVI International Conference on Human Computer Interaction, Barcelona, Spain*, September 7 – 9, vol. 30, pp. 1–7, 2015.

ISSN (online): 2581-3048
Volume 2, Issue 4, pp 18-27, June-2018

[13] K-T. Maensivu, S. Uusiautti, and K. Maatta, "Special Needs Assistants – The Special Characteristic and Strength of the School System of Finland", *European Journal of Education research,* vol. 1, no. 1, pp. 23–36, 2012.

[14] S. Schwab, M. Nel, and F. Hellmich, "Social participation of students with special educational needs", *European Journal of Special Needs Education,* vol. 33, no. 2, pp. 163–165.

[15] "Web Application", *https://en.wikipedia.org/wiki/Web_applicati-on,* accessed on 6 November 2017.

[16] "The Benefits of Web-based Application", *https://www.magicwebsolutions.co.uk/blog/the-benefits-of-web-based-applications.htm,* accessed on 5 September 2017.

[17] "Progressive Web Applications", *https://developers.google.com/web/progressive-web-apps/,* accessed on 5 October 2017.

AUTHOR'SBIOGRAPHIES

Mai Ubeid is an undergraduate student since September 2013. Mai ranks first among her colleagues of specialization and college of the same batch.

Ihab Zaqout (b. 1965) holds a PhD degree from the university of Malaya, Malaysia since 2006 and currently is an associate professor in computer science. Research interests are digital image processing and data mining.

Citation of this article:

Mai Ubeid, Ihab Zaqout, "iCan" – A Web Application Framework for People with Special Needs", in *International Research Journal of Innovations in Engineering and Technology (IRJIET)*, Volume 2, Issue 4, pp 18-27, June 2018.

****

