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## Developing A Modular Web Based System for Special Education: Advantages and Challenges

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### Abstract

The increasing complexity of regulations governing and tracking the special education process made it ever more difficult for all parties which may be special education centers (SECs), individuals, educators, parents, government and healthcare centers. Since there are many difficulties in the management of special education, SECs cannot easily process their essence aim. In this manner, information technologies help these parties to participate equally for managing special education. Modular web based systems are one of the information technology solutions to overcome these problems. In this paper, the goal is to show the fundamental advantages and also discuss the challenges in developing such a modular web based system for special education. If the advantages of the system can be understood and the challenges of the system can be properly addressed, the development of a modular web based system for special education, in our opinion, can be promoted significantly.

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### 1. Introduction

In order to be successful in education programs, equitable access to learning and opportunities should be offered to students. In the special education, corresponding programs and services support students to achieve this goal by offering equitable access to learning and opportunities, as well. In this sense, special education is one of the most important issues for the countries and managing and tracking the special education processes is difficult for all parties. In order to handle this difficulty, integration of all these parties is required that enables the communication and consistency between them.

The extensive usage of the Internet has encouraged the development of new web based tools and systems within the scope of education and training. These technologies are also quite common in special education and various software and information technologies have been developed to handle the problems in managing special education. Education authorities, educators and families have been using information technologies in special education domain

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for a long time. The studies of [1] and [2] are considered as some examples of the early researches in this field. Later, advantages of computer technologies in personal development for disabled individuals is proposed and discussed by [3].

A computerized child assessment system and an application of DataPerfect was developed by [4] not only just to save time, but also to monitor the development of children with development disability in a way which was not possible before. [5]; [6]; [7]; [8]; [9]; [10] have also conducted studies that deal with the use of information technologies, computer software and computer-assisted special education.

The studies of [11], [12], [13] and [14] are groups of work which are related with particular application areas and the application of audio-visual information technologies to special education. In addition, IEPPro, ClassIEP, netIEP and YagusaSE are other computer software products that have been developed successfully to increase the effectiveness of management in SECs.

A modular web based system that we have developed [15] to create a common platform helps the parties to participate equally for managing special education. Our modular web based system (ManSE [15]) presents many solutions for the problems of special education. However, there are also some challenges which must be considered in the implementation of such kind of a system. In this manner, this paper aims to provide an overview of challenges that must be considered in the development of a modular web based system for special education and also discuss the advantages of the same system.

## **2. Advantages**

### *2.1. Integrated Platform*

A modular web based system combines all the parties of special education such as SECs, governmental bodies, hospitals and parents. This integrated platform plays a key role in the modular system because of the importance of the special education and the number of stakeholders that are included in the domain of special education (there are many and different parties are involved and the cooperation between these parties is very important to make the special education successful). To achieve benefits in special education, all the related parties, as well as the information produced by these parties, should be kept in one platform.

### *2.2. Minimized Time and Effort for Management*

Preparing and evaluation of individual education program (IEPs) is one of the important issues in special education since IEPs provide information about the students' progress. In the existing situation, SECs prepare IEPs in hard paper formats, so this causes too many entry errors and challenge in finding old records. Assessment of IEPs is also difficult in the existing situation. In this sense, a web based system enables educators and other related staff to prepare and assess individual education program (IEPs). As a result, errors in data entry and data processing decrease. Since the web based system stores all records in one central database and has a modular structure, historical data is available to any related people and parties in the system.

SECs struggle with the amount of paperwork required by government. The modular web based system for special education reduces the burden of SECs for the processes of preparing and distributing paperwork and complying the rules and regulations. As the benefit of these steps, SECs can allocate more time for educating their students -which is the main goal of these centers- and save time by reducing the effort that is spent on administrative tasks.

### *2.3. Ease of Auditing*

Government finances huge amount of money to special education centers (SECs) to support special education and therefore, monitoring and auditing SECs is important to see if they comply with the regulations. Tracking and auditing these institutions is not an easy task. Due to the fact that the process requires too much time and effort in the existing situation, it is easier and more efficient with a modular web based solution. In this manner,

governmental agencies can track complete training history of any individual and have the information about the progress of any individual. As a result, a modular web based system enables the governmental bodies to track, assess and evaluate SECs easily.

#### *2.4. Information Sharing and Transferability*

There is no communication between the special education centers (SECs) in the existing special education system. Each SEC has its own system and there is no consistency between them. Existing systems cannot support information and opinion sharing between educators from different SECs. With the new web based system objectives and behaviors of the individuals can be retrieved directly from the central database and the educators can customize them according to the needs of the individuals. Thus, the educators can easily share their experiences on this system.

Moreover, the current system causes difficulties for students when they need to move from a SEC to another one because the training information in the previous SEC cannot be transferred to a new SEC of the student. In this manner, web based system provides communication between SECs and supports the exchange of information. Individual data and IEPs of any student can be easily transferred to another SEC. As a result, when a student moves from a particular SEC to another SEC, his/her electronic records can be automatically transferred to his/her new SEC.

### **3. Challenges**

#### *3.1. Sustainability*

The modular web based system for special education is based on a central system and therefore, a central database to enable the exchange of information between the parties. The central database stores the data that is used by the stakeholders of the system. The data may contain the demographic data of students, the learning history of students, course codes, behaviors, objectives, personal information of educators or information used by doctors / hospitals. Because all the parties rely on the operation of the system and the information kept in the central database, the sustainability of the system is vital (the system affects all the special education centers instead of a few ones because of the centralized system). Any loss in the data of the central database or a breakdown in the system may affect the stakeholders to different extents and cause irreversible problems.

#### *3.2. Vulnerability to Threats / Attacks*

Unlike individual software programs running on the computers of SECs, the modular web based system runs by using the network protocols (the Internet). Although the networking of computers is a prerequisite to exchange information between SECs, the networks are open to threats / attacks due to their structure. It is important that SECs, governmental bodies and other related parties can access to the system through the Internet without any problem, but it is also important that irrelevant / ill-intentioned parties are not able to access the system without any permission and to cause damage.

#### *3.3. Access Controls and Confidentiality*

ManSE is a platform that brings different parties (e.g. SECs, governmental organizations, parents, etc.) together to manage the special education process. Since the integration of different parties is done by using the modular structure of the system, the access controls should be adjusted properly. As mentioned in [15], each party uses its own module to access the system and therefore, the access levels of these parties vary from each other. For instance, SECs can access the modules where they can add their students and staff and monitor the progress of their own students. Governmental bodies can access the modules where they can audit SECs and add course codes, behaviors and objectives for data integrity. And finally, parents can access the modules where they can monitor the progress of their own children. The access controls are also important for the confidentiality of the information because it

assures that no one is overriding one's authority and accesses confidential information that should not have been accessed.

#### 4. Conclusion

Our project as a modular web based system for special education aims to unit all the special education parties in a common platform by improving the efficiency and quality of special education. In this paper, we have explained the advantages of the system and also addressed and presented some main challenges for the implementation of a modular web based system for special education. These challenges should be considered properly in order to develop an effective and efficient system. If the challenges are taken into account while developing the modular system, the proposed system can be used smoothly and deliver the potential advantages presented in this paper.

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