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Application Voting System of Web based in Iraq

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Abstract

Currently voting process is paper based form, by using voting card or paper; thus the counting method is done manually, which exhausts a lot of time. Obsolete votes may be possibly occurring. This paper introduced a system in which voting and counting is done with the help of computer. The election process would be easier, it saves time, avoid errors while counting and obsolete votes are reduced. Electronic voting (E-voting) system is a voting system in which the election related data is stored and handled digitally, it would become the quickest, cheapest, and the most efficient way to administer election and count vote it is considered a means to further enhance and strengthen the democratic processes in modern information societies. The suggested a web based E-voting application using ASP.net with SQL server. This application implements a voting process within a voting station and gives the election results.

Keywords: E-voting, ASP.net, SQL, Database.

تطبيق نظام تصويت معتمد على الويب في العراق

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الخلاصة

نظام التصويت الالكتروني هو طريقه جديده للانتخاب في العالم ساعدت على تقليل الجهد المبذول في عمليات الانتخاب خاصه في الدول الكبرى وكذلك تقليل التكاليف الماديه المصروفه على مراكز الانتخاب،و عدد الاشخاص المراقبين لكل مركز انتخابي بالاضافة الى الاشخاص المسؤلين عن عمليات العد والفرز، هذا التطبيق يساعد الحكومات على تشكيل البيانات االتي يتم خزنها في برنامج التصويت الالكتروني مرجعا للدوله يمكن الاستفاده منه في مختلف مجالات الحياة. في هذا البحث وضحنا كيف يمكن ان تتم عمليه الانتخاب الالكتروني بشكل صحيح وكيف يمكن تطوير هذا النظام وجعله امن بشكل اكبر، وكذلك امكانية تطبيقه على جهاز يمكن للمفوضية العليا للانتخابات المستقله ان تعممه على مراكز الاقتراع لتسهيل عمليه الانتخاب على المفوضين وعلى الناخبين.

Introduction

Voting is an essential operation to any society built on consensus. It is a basic tool to detect a group's

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opinion on a matter that is under consideration. Parliamentary elections is the most important application of voting in societies look forward democracy, thus due to the election result affairs the governing of a country, and affects the lives of its citizens. As the number of voters and the need to cover and monitor larger constituencies increases, paper-based or traditional voting becomes a burden for large-scale voting. Other factors such as accuracy, efficiency, and convenience make the transition to electronic voting unavoidable [1]. The traditional elections, a voter should go to the voting stations. After direct person by person verification with some IDs and voter card, the voter is allowed to vote. The voter is then given a secret voting paper which allows a single vote only. Once the voting paper is used, it cannot be used again.

Traditional voting methods trust a lot of combination during the election.Based on this background, this paper introduces the overall goals for the implementation of e-voting. Assurance is put on building trust in this new technology. Various factors contributing to this trust-building process are visualized as a two main pillars of trust and describing the conditions in which e-voting projects are implemented. Both pillars are closely interrelated. Trust needs to be built on the top layer in parallel which commonly takes several electoral cycles to achieve. Failure in just one layer can be enough to weaken the other and may quickly lead to a loss of trust in the entire system.

E-Voting System

An e-voting system is a system consisting of mechanical and electrical parts. It contains software in order to control the devices, to include the voting papers, to cast and count the votes, and to calculate and display the results. The main tasks of E.vot. systems are [2]:

- Registration: registration of the voters in case of new voters should be added to our database;
- Rationing: identification, authentication, by using the voters voting ID number;
- Aggregate the votes: votes cast are collected by our proposed server;
- Handling the votes: votes are processed and an election result is calculated and presented.

E-voting system can be divided into three main categories: hardware, software, and human factors [3].

In this paper it's divided into two categories software and human.

- Hardware: electrical parts voting number card reader;
- Software: operating system, drivers, programs, databases, rules used in the program, procedures and sequences);
- Human factors: this category comprises usability, rules, strategies (e.g. information flow, security management), politics, and other diverse aspects such as transparency and trust.

All parts of the system have to be considered as equally important in terms of security risks.

E-voting is similar to paper based voting. In traditional paper based voting, voters entering the voting station have to be identified [4]. After identification process, they are able to vote. The whole scenario of classical voting can be seen in Figure -1.

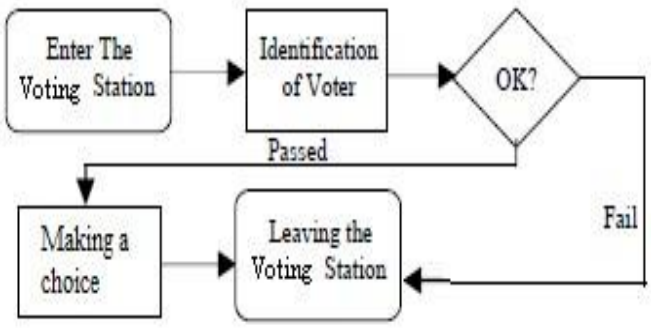

Figure 1- traditional voting process

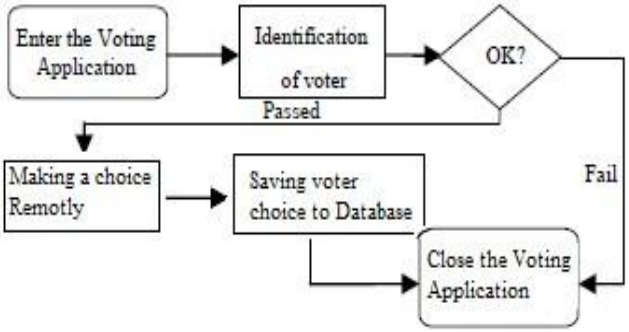

Figure 2- E-voting at voting station

There are two recognized types of E-vot. systems. The first one is based on visiting a voting station as illustrated in Figure- 2.

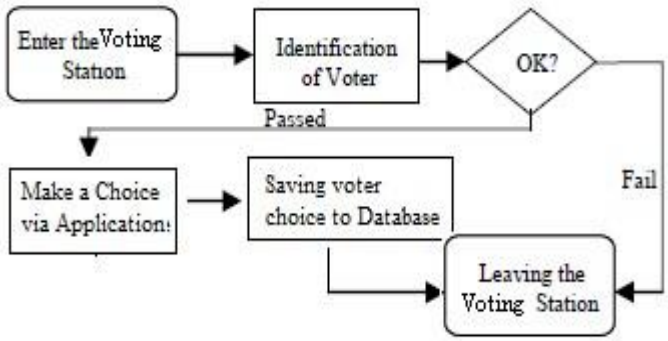

Figure 3- Internet based E-Voting

In this case voters are still identified by using voter card number. Voters make their decision by various electronic devices. The second type of E-voting system is based on remote technology. Usually voters have the chance to vote by using computers at remote locations or at voting stations. They use computer and internet for voting. Voters can vote out with the normal interval for voting (usually office hours). They can also vote even if they are abroad. This constitute is the most important advantage of the remote-based voting system. This is called I-Voting as shown in the figure below.

Related Work

More et al. [5] introduced a system that provides secure and efficient online vote casting and also paper ballot system if online voting fail. In their proposed system there is no need of internet for voting, it is required at the time of online registration only. All process will be done through SMS messaging without requirement of internet connection. Konnur et al. [4] produced and implemented a model called Electronic Voting machine (EVM) using a microcontroller chipset. Hence a result display unit is also required for the system by using a LCD display unit. Gerlach and Gasser [6] introduced a study that evaluated the risks of e-voting, noting that the concerns around integrity and associated with electronic voting have for the most part not materialized in the Swiss case. Questions such as the digital divide in access to networked technologies are also a real concern that should be addressed by the government as it expands the system.

Proposed Work

In this section, the proposed web based application that replaces the traditional paper based voting process, an E-vot. application. Table-1 shows proposed system requirements which are needed to implement the system.

Table 1- System Requirements

Microsoft.Net Framework	Version 4.0
Web Technology Languages	ASP.Net with C# language
Database	SQL Server 2012
Operating System	Windows 10
Tools	Microsoft Visual Studio 2013

As mentioned previously, E- vot. system implementation can be described with two scenarios. First one the system is put on one or more PCs at the voting station and the voting station president is responsible for login with secret username and password and set the system. Which would work within the allowed period of voting process in Iraq between 7:00 am to 6:00 pm. Figure -4 described the system flowchart.

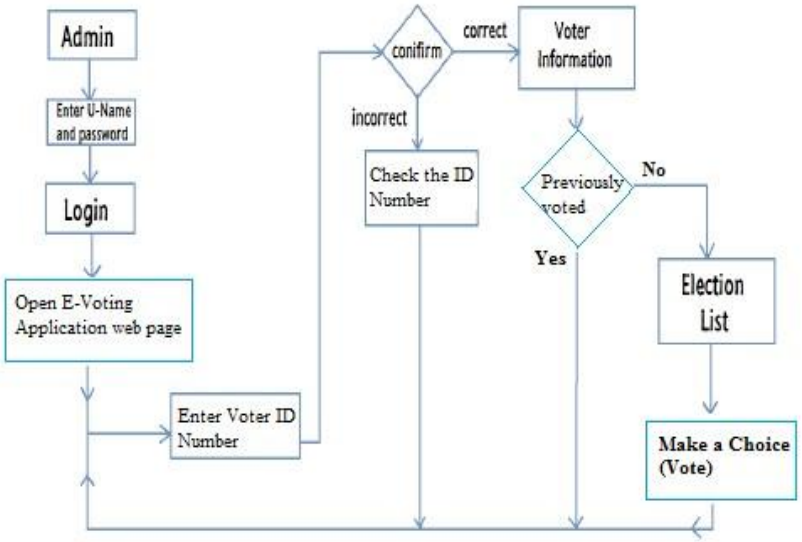

Figure 4- Proposed System Flowchart

There are two main database tables related with the system one for voter information in details and one for the electoral lists with their members. Figure -5 shows the entity-relation diagram, it consists of three entities admin, voter and election list with their attributes and relationship as shown below.

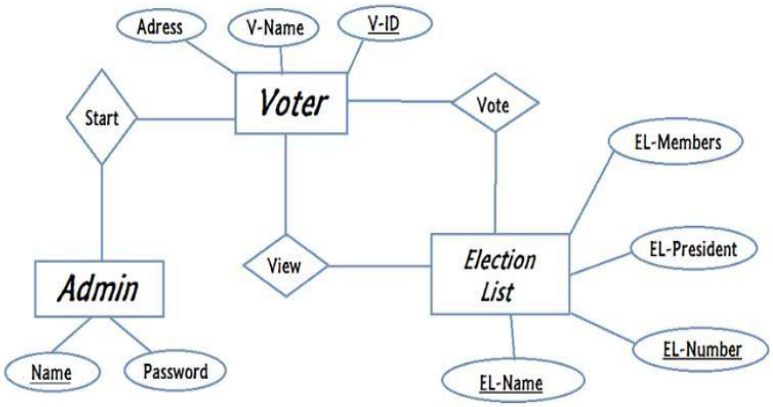

Figure 5- Entity-Relation Diagram

This proposed work of e-voting process can be summarized in steps with illustrated figures as follow:

1. In order to start e-voting process, an authorized username and password should be entered by the voting station president as shown in Figure -6.

Figure 6- Administrator Login

2. After login, the voter must enter a correct voter voting number as written at the voter card. If the voter is not registered and has no voting number, there is a possibility to add a voter information under the supervision of the administrator and let him/her vote. As illustrated in the following figures.

Figure 7- Voter Login

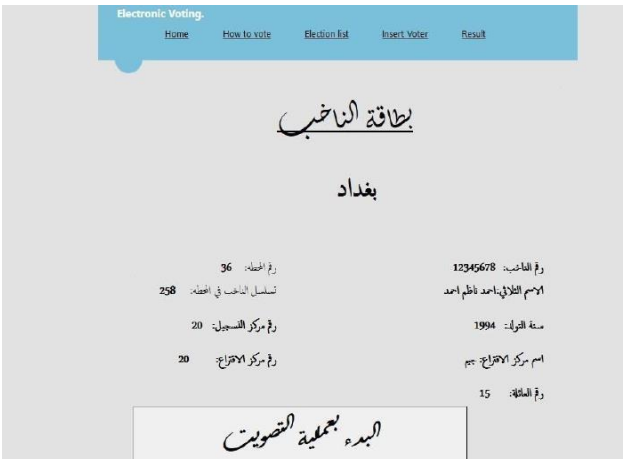

Figure 8- Voter details when the voter number is verified

Figure 9- Voter Registration in case he/she has no records

3. As voter ID or Number is verified, the system would check if he/she has previously elected, the system would allow a single vote only as shown in Figure -10. Else, the voter would be asked if he intended to vote or just repeal his/her voting voice in order to prevent electoral fraud, as indicated in Figures -11and 12.

Figure 10- previously elected voter

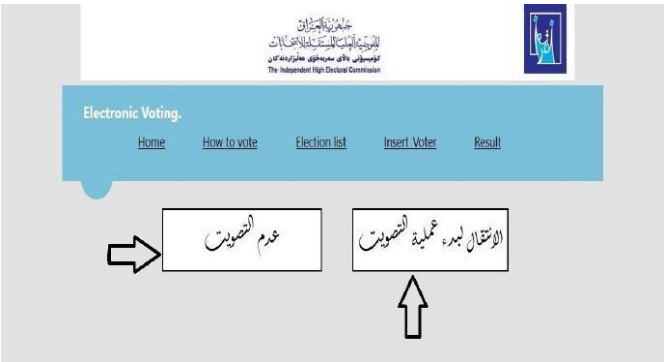

Figure 11- Two choices vote or no vote, the voter is asked

Figure 12- Make sure if the voter intend to repeal his/her voting voice

4. The supposed electoral lists with their supposed members are indicated in the following figures.

Figure 13- Supposed electoral lists

Figure 14- Supposed electoral lists with members

5. E-voting process is successful as shown in Figure -15, when the time is up the administrator would be able to show the results immediately as shown in Figure -16.

Figure 15- successfully voting process

الرقم	اسم القائمة	رئيس القائمه	عدد الاصوات
255	العراقيه	اياد علاوي	3
256	دولة القانون	نوري كامل	0
257	كتلة المواطن	عمار الحكيم	0
258	العراق المتحد	محمد ناظم	0
365	التحالف الازيدي	اياد مالك	0
589	كتلة المسيحيون	جورج نبيل	0

الرقم	اسم المرشح	تسلسل المرشح في القائمه	اسم القائمة	المحافظه	عدد الاصوات
255	علي محمد علي	1	العراقيه	بغداد	3
255	نوري كامل	2	العراقيه	بغداد	0

Figure 16- E-voting results

Conclusion and Future Work

E-voting system is new paradigm of voting in the world. As voting is given the opportunity for citizens to express their views. The suggested application can be applicable in Iraq, to reduce time, cost and efforts needed for counting and try to eliminate the fraud made by altering the voting voice of absent voters. First, there is a need to build a trusted data centers that store a detailed information about all Iraqi's people, who has the right to vote then there is a possible to put this application underway.

Till this moment no online E-voting system is available, due to security issues that should be taken in concern. I proposed as future work that turn this application to be online E-voting system by exploit modern encryption algorithms and upload it to a cloud. Besides that, the network lines security should be taken into consideration.

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