Original Research Article

ENHANCING EDUCATIONAL &VOTING PROCESSES BY USING COMMUNITY PARTICIPATION

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Abstract: Participation is directly linked to the concept of governance. E-governance is considered a challenge in systems of systems. The main objective of this paper is designeing a website that allow easy navigation between education and voting subsystems, by integrating the subsystems based on bi-lingual code-and-redirect strategy. This strategy allows us to integrate other subsystems later easily and efficiently. The voting subsystem focuses on encouraging citizens for participating by providing resources and full digitized maps for all the country. The educational subsystem focuses on measuring the level of participation by building an e-questionnaire which allows accessing it on a wide range. An efficient representation of collected data is proposed that is robust to large amount of data. By Benefiting encouragement and measurement provided by the proposed system, the decision-maker can set efficient and effective policies, and track the process of carrying out those policies.

Keywords: Governance, participation, Voting, E-learning and Education**.**

Introduction: Governance [1] is a procedure where people and foundations, whether public or private, deal with their basic affairs. It is the cooperation between people in general sector and common society for aggregate decision making. At first the idea of administration or governance developed and was connected in the urban setting to adapt all the more proficiently to their problem solving and decision making. In consequent decades, the administration or governance model was slowly connected at the central or focal government level. It was likewise reached out to transnational issues, as worldwide administration and governance. People and all citizens feel concerned and inspired by the execution of their local and nearby governments, since it has an obviously noticeable effect on their ordinary lives. In the advancement context, universal associations and organizations have credited to governance highlights which concern effectiveness,

efficiency and democracy.To achieve a better governance there are 8 characteristics must be supported. these characteristics includes participatory, agreement arranged, responsible, straightforward, responsive, successful and productive, fair and comprehensive and takes after the tenet of law. Participation [2] [3] in which men and ladies is a key foundation of good administration and governance. Cooperation or participation may be either immediate or through honest to goodness middle of the road institutions or agents. It is vital to bring up that delegate vote (democracy) based system does not as a matter of course imply that the worries of the most powerless in the public eye would be thought about in choice making. Participation should be educated and sorted out. This implies opportunity of affiliation and expression from one perspective and a sorted out common society then again. The development of the new data and correspondence technologies and innovations (ICTs) includes all qualities and attributes of giving increased the value of the procedures that portray great administration and governance. This 'e-administration' or 'e-governance' is people in general segment's utilization of the most inventive data and correspondence advances from communication technologies, similar to the Internet, to convey to all citizens enhanced services, solid data and more noteworthy learning keeping in mind the end goal to encourage access to the representing handle and support more profound resident investment. It is an unequivocal responsibility by leaders or decision makers to fortifying the association between the citizen privacy and the general publicity.

Education [4][5]is one of the most important factors in achieving the development goals of the country. It is the key to the national development. In Egypt Education has seen massive growth in recent years. Governments around the world are increasingly considering the replacement of traditional paper-based voting schemes with electronic voting systems.

A particular form of such e-voting systems are those which allow voters to cast their ballots over the internet, so-called remote e-voting (or i-voting) systems. Democracy is one of the most important issues in our world. Democracy can be achieved through multiple method. One of the most important methods for democracy is participation. In this paper, a descriptive study for managing participation is proposed. Such framework has tested through two case studies. These studies are built using statistics concepts to evaluate the participation factors efficiency.

Related Work: E-government activities are frequently unsuccessful in developing countries because of the non-implementation of technical system; removal of technology after implementation, major goals relating to cost, implementation timeframes, and capability are not achieved and undesired results [6]. While some studies focus on the success and failure rates of e-government [7].several recent studies on citizen participation and local governance have been reviewed. In [39] A descriptive study focussing on the legal frameworks and forms through which citizen participation has been institutionalised from the official perspective in Latin American countries. In [8] A descriptive study reviewing the legal bases and forms of participation in local governments in six Latin American countries (Brazil, Colombia, Venezuela, Chile, Ecuador and Peru). In [9] A research project describing volunteer contributions and examples of social integration at the local level with socially marginalised and excluded people living in slums and squatters' settlements of 16 cities in Africa, Asia and Latin America. In [10] An assessment of Democratic Local Governance based on studies conducted in two Asian countries (Philippines and the Indian State of Kerala); two in Latin America (Bolivia and Honduras); one in Europe (Ukraine) and one in Africa (Mali). In [11] Field studies on democracy and decentralisation in Ghana, Cote d'Ivoire, Bangladesh and Karankata State in India. In [12] A review of the practice of decentralisation in Africa

focusing in the experiences of three African countries: Tanzania, Zimbabwe and Nigeria. In [13] A comprehensive study on decentralisation and democratisation in five African countries (Kenya, Nigeria, Zimbawbe, Tanzania and Uganda).

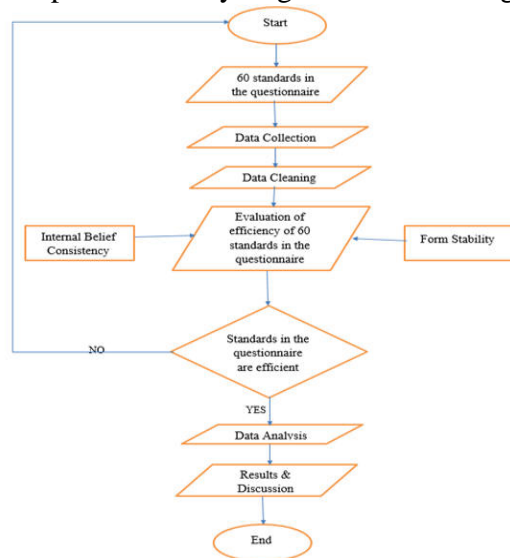Model Discussion: The proposed system composed of many stages as shown in figure 1.

Fig 1 .The proposed system stages.

Questionnaire standard input data: Education and how to achieve governance in it using participation are presented. The problems and solutions that face this approach in Egypt suggested 60 standards in the questionnaire of Education and made it available over a questionnaire in a proposed website. These 60 standards have been selected carefully using previous studies and experts.

Data Collection: We have collected data from the people who filled the questionnaire available on the Education website. We have collected 148 data inputs. In our whole proposed system, we developed a method for collecting data in our two case studies; Education and Voting making questionnaire for them available in the Arabic and English languages. Fig. 2 shows that where A denotes Arabic language and E denoted English language. Also in the whole proposed system we take care of the security in the collection of our data. The proposed system

is built using PHP programming language, so we developed a hidden PHP page called Q that provide the security of our system and guarantees that the same person doesn't fill the questionnaire more than once. Figure 3 shows a logical description of that page; where 216 is the identifier of the Education Questionnaire in the PHP and 218 is the identifier of the Voting Questionnaire in the code, and A denotes Arabic language and E denotes English language
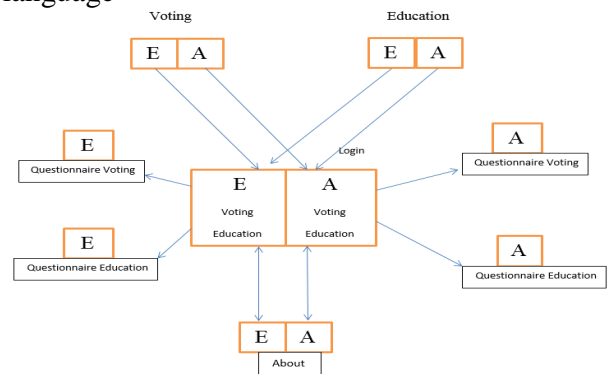

Fig 2. Data collection in the whole system
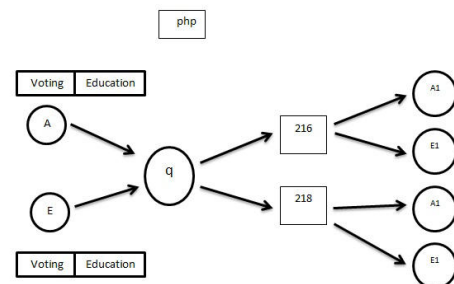
Fig 3. Q page

There are many methods to collect data but we want to code the collection of data in a way that provide us with a guarantee that we can collect large amount of data without failure even in limited resources version. Table 1 shows the variant methods for coding the collection of data in the questionnaire alongside with their features. We used the third method in our proposed system as it's robust to large amount of data and cost effective

Table 1: Varian representations of result file in data collection

First	Second	Third
1=a 2=b 3=a . . . 15=c . . . 60=b	Q1=a Q2=b Q3=a . . . Q15=c . . . Q60=b	$q1=3 $q2=2 $q3=3 . $q15=1 . . . $q60=$
Store n line even if user doesn't choose any item	Save storage (store only n line if user is selected)	The third representation of result file doesn't store data, it rather solves. Save storage (store only n line if user is selected)
Easy to read	Hard to read	Easy to read

Data cleaning: A manual way for data cleaning done by removing data inputs that's have one of the following features:

1. The data filled have missing values
2. The data is inconsistent or bad. E.g. when all values of all questions are the same.

After applying data cleaning, 120 data inputs resulted.

Evaluation of the Standards: To evaluate the standards, we need to make to important statistical studies on it; Internal Belief Consistency and Form Stability.

Internal Belief Consistency: In order to know the internal belief consistency; we need to find the correlation (r) that's given by equation (1) for every standard in the education questionnaire.

$$r = \frac{\sum XY - \frac{(\sum X)(\sum Y)}{n}}{\sqrt{\left(\sum x^2 - \frac{(\sum X)^2}{n}\right)\left(\sum Y^2 - \frac{(\sum Y)^2}{n}\right)}} \quad (1)$$

Where X is the total degree of the standard in the sample data input, Y is the total degree of the standard in the whole data inputs and n is the number of data inputs of the sample.

Our sample has 20 data inputs and so we calculate the correlation.

The value of tabular correlation (r) at a level of evidence 0.05= 0.54.

And we find that all correlation values are between 0.55 and 0.93 that's higher than 0.54. So there's internal Belief consistency.

Form Stability

In order to ensure of the form stability, we need to calculate the reliability factor using the method of Spilt-Half Reliability where we would split our standards to even standards and odd standards due to their numbering. Equation 2 shows the Reliability. The use of Spilt-Half Reliability would lead us to calculate the mean (3) and standard deviation (4) for each half.

$$Reliability = \frac{2(r)}{1+r} \quad (2)$$

Where r is the correlation.

$$\bar{x} = \frac{\sum_i x_i}{n} \quad (3)$$

Where $\bar{x}$ is the mean and n is the number of data inputs of the sample and x is the degree of each data input.

$$s = \sqrt{\frac{\sum(x - \bar{x})^2}{n-1}} \quad (4)$$

Where s is the standard deviation and $\bar{x}$ is the mean and n is the number of data inputs of the sample and x is the degree of each data input.

Table 2: Split-Half Reliability

Reliability	Even Standards		Odd Standards		Axis
	$\bar{x}$	S	$\bar{x}$	s	
0.97*	84.85	17.18	70.55	14.13	Participation in Education

The value of tabular correlation (r) at a level of evidence 0.05= 0.54. From the Table 4.3; we find reliability is higher than 0.54. So there's close between the two halves of the form. So the form is stable. So the 60 standards in the education questionnaire are efficient and we can now go along the following step.

Data Analysis: Our questionnaire has 60 standards. In order to have a stable result of our questionnaire we used a Likert Scale which is psychometric response scale primarily used in questionnaires to obtain participant's

preferences or degree of agreement with a statement or set of statements. Likert Scale has many variations; we used the scale that has three options and the options are Much, A little, Do not affect which measure the agreement of the participant. The data of that variation can be efficiently analyzed using Chi-square test.

After we unload the data; we made a statistical analysis on it where we calculated the ratio of each answer at each standard then we calculated Chi-Square for each standard shown in (5) which represents the percentage of participation in education would be achieved if we made that standard. the Chi-Square alongside with the ranking of standards based on the Chi-Square is calculated.

$$x^2 = \sum \frac{(o-e)^2}{e} \qquad (5)$$

Where x^2 is the Chi-Square and o denotes the observed value and e denotes the expected value. Table 3 shows the Chi-Square alongside with the ranking of standards based on the Chi-Square.

Table 3: Chi-Square of Participation in Education

Axis standards	Much		A little		Do not affect		x^2	Rank
	R	%	R	%	R	%		
1.	30	25	66	55	24	20	25.80	15
2.	72	60	30	25	18	15	40.20	9
3.	78	65	24	20	18	15	54.60	4
4.	84	70	30	25	6	5	79.80	1
5.	66	55	42	35	12	10	36.60	11
6.	72	60	36	30	12	10	45.60	6
7.	54	45	66	55	0	0	36.65	10
8.	48	40	48	40	24	20	9.60	20
9.	78	56	30	25	12	10	58.20	3
10.	54	45	54	45	12	10	29.40	14
11.	42	35	54	45	24	20	11.40	19
12.	54	45	54	45	12	10	29.40	14
13.	66	55	36	30	18	15	29.40	14
14.	42	35	60	50	18	15	22.20	16
15.	42	35	72	60	6	5	54.60	4
16.	36	30	66	55	18	15	29.40	14
17.	48	40	54	45	18	15	18.60	17
18.	48	40	66	55	6	5	47.40	5
19.	54	45	60	50	6	5	43.80	7
20.	66	55	36	30	18	15	29.40	14
21.	42	35	54	45	24	20	11.40	19
22.	66	55	42	35	12	10	36.60	11
23.	78	65	30	25	12	10	58.20	3
24.	54	45	42	35	24	20	11.40	19
25.	48	40	42	35	30	25	4.20	23
26.	48	40	48	40	24	20	9.60	20
27.	54	45	60	50	6	5	43.80	7
28.	54	45	48	40	18	15	18.60	17
29.	54	45	48	40	18	15	18.60	17
30.	54	45	42	35	24	20	11.40	19
31.	60	50	36	30	24	20	16.80	18
32.	60	50	42	35	18	15	22.20	16
33.	84	70	30	25	6	5	79.80	1
34.	48	40	60	50	12	10	31.20	12
35.	36	30	54	45	30	25	7.80	21
36.	54	45	54	45	12	10	29.20	14
37.	48	40	48	40	24	20	9.60	20
38.	55	45.83	53	44.17	12	10	29.45	13
39.	48	40	42	35	30	25	4.20	23
40.	78	65	24	20	18	15	54.60	4
41.	48	40	60	50	12	10	31.20	12
42.	36	30	54	45	30	25	7.80	21
43.	36	30	66	55	18	15	29.40	14
44.	72	60	36	30	12	10	45.60	6
45.	30	25	54	45	36	30	7.80	24
46.	60	50	36	30	24	20	16.80	18
47.	60	50	42	35	18	15	22.20	16
48.	72	60	48	40	0	0	4.80	22
49.	30	25	54	45	36	30	7.80	21
50.	60	50	42	35	18	15	22.20	16
51.	48	40	48	40	24	20	9.60	20
52.	78	65	30	25	12	10	58.20	3
53.	54	45	54	45	12	10	29.40	14
54.	78	65	30	25	12	10	58.20	3
55.	78	65	24	20	18	15	54.60	4
56.	48	40	60	50	12	10	31.20	12
57.	36	30	54	45	30	25	7.80	21
58.	36	30	66	55	18	15	29.40	14
59.	96	80	54	45	0	0	43.20	2
60.	66	55	36	30	12	20	74.40	8

We found the expected value by the ordinary mean equation by dividing the number of data inputs on the number of available answers. We can also find the observed value by the ordinary summation of the observed value of the three available answers in each standard.

Results Discussion: We have filtered the percentage of participation in Education and we get out the highest 10 values for participation. Figure 4, 5 show diagram for it alongside with the values.
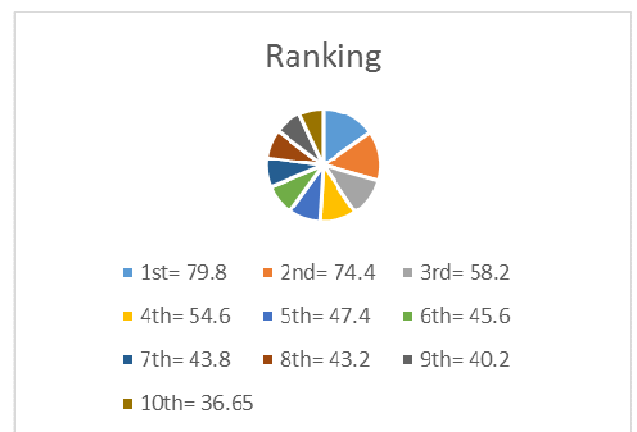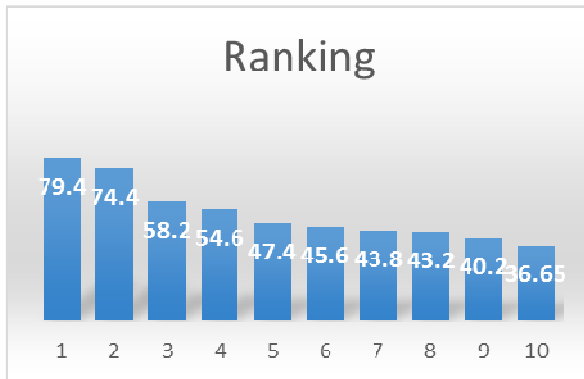

Fig. 4 Highest ten values

Fig 5. Ranking of highest ten values

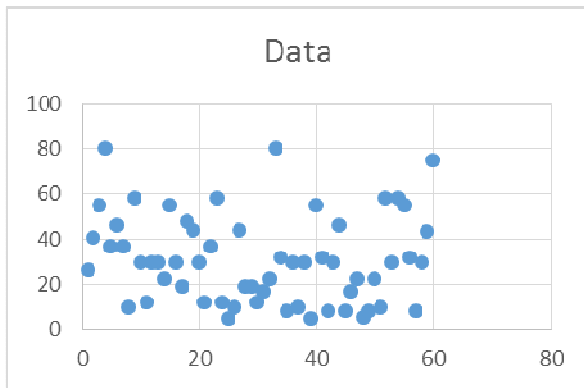All the values of participation are shown in Figure 6.

Fig. 6 All values of Participation

Figure 7 shows the maximum, average, median, standard deviation and minimum values of our data.
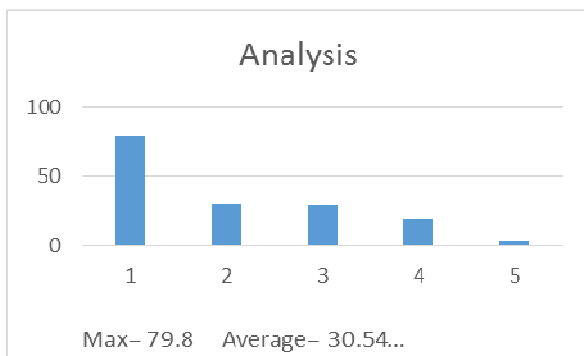

Fig. 7 Max, Average, Median, Standard Deviation and Min of the values of participation

Conclusion and Future Work: Egypt is one of the leading countries in Africa in the area of e-government and e-governance. Education is one of the most important areas that need for community participation. The vote in the elections, one of the key indicators to measure the degree of political participation narrated the way people choose their leaders and rulers. A proposed system to help achieving participation in education and voting using e-governance has been proposed. A questionnaire of 60 standards that the participant should fill is presented declaring the degree of agreement with that standard. Statistical analysis to make sure of proposed model in the Education field is declared. Effectiveness of the standards questionnaire has achieved by calculating the Internal Belief Consistency and the Form Stability. The highest percentage of participation achieved was 79.8%. The average of participation achieved is 30.54%.

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