Advanced Databases Project

The Project is to develop a small integrated Voting System. Suppose that we want to a voting record is one of the main pillars of the modernization of the new Party President. Its implementation will mean the definitive overcoming a paper-based, significant savings in resources and simplifying management, which will result in greater speed in making decisions and consequently in a reduction of the best candidates.

In this way, the Party can select those candidates with better opportunities to win the election.

Mainly paradigm shifts: the file is no longer a set of papers that moves and becomes a set of information in electronic format, accessible to all processes involved and where processing takes a leading role.

This system consists of two subsystems:

1. A OLTP subsystem
2. A OLAP subsystem

General requirements

- Define the database corresponding to the OLTP relational database application. The database must include integrity constraints that you consider.
- Assume that the database for this Voting System is distributed in at least two sites. It can be used a cloud database.
- Develop the OLTP application using VSTO for the two selected Surveys (p.e. City, State, National) and for capturing the desired position of the candidates. These position can be Major, Local Deputy, Federal Deputy, Senator, Governor, President.
- Allow write Surveys using forms embedded in Word documents (or Web if you want). The notes are composed by text fields, check boxes, radio buttons, and list boxes.
- Save the different data captured in the Survey notes in the database. The same note as XML document should also be stored in the database.
- Generate dimensional model corresponding to the business intelligence application.
- Extract, transform and load the data to the application base multidimensional business intelligence.

The project will take place in teams of no more than four students and no less than two.

It will be agreed on Saturday to assess all projects.

OLTP Subsystem

This subsystem will allow:

1. Insert / delete / update candidate data. Data to be considered: social security number (affiliation), first name, last name, mother's maiden name, date of birth, sex, address, education, ethnicity, religion, actual position.
2. Contextualizing a candidate. You must select a candidate before saving electronic Voting records. These records may be consulted.
3. Save Voting notes invoking Word like interface. Saving of a note will be held as any Word document. Additionally, the data captured in the Survey note will be stored in a relational database. The note will be stored a field of type XML. It must implement at least two Survey notes. You must consider to a candidate for many possible desired position (e.g. Major, Local Deputy, Federal Deputy, Senator, Governor, President). The notes can be favorable or not to a candidate.

   Allow consultation of the electronic Voting record of the candidate. This file corresponds to the integration of Voting notes attached to the candidate.

   The electronic Voting record of the candidate contextualized be presented in a protected Word document (that is, this document cannot be changed) organized by the Voting notes and dates in order from the most recent to the oldest. Advantage of the facilities of the navigation pane of Word will be taken:

   Present the different Voting notes recorded for a candidate.

   When we consult the electronic Voting records for a candidate, these should be displayed as shown in the following figure. It should be displayed Voting note associated with the selected date and for a possible position.

Major	**Display of the selected note**
02-feb-16	
26-ene-16	
Local Deputy	
02-feb-16	
26-ene-16	
Federal Deputy	
07-feb-17	
02-feb-16	
26-ene-16	
...	

OLAP Subsystem

The application associated with this system will correspond to a business intelligence application. In such an application, it shall submit:

- In a tabular format:
  - The number of notes by candidate, month and year
  - The number of notes by type (e.g. City, State, National) by month and by year.
  - The number of notes by position (e.g. Major, Local Deputy, Federal Deputy, Senator, Governor, President).
- In a line graph
  - One graph for the first ten candidates with the best evaluation
  - One graph for the first five candidates for a desired position
- In a map chart
  - The Geographic distribution of the best candidates for a given position

Technologies and Tools

- Visual Studio Tools for Office (VSTO)
- MS Word
- DBMS, e.g. MS SQL Server, MS SQL Azure

- Business Intelligence Tools, p.e. QlikView, PowerBI, Tableau, Cognos, MS Analysis Services, Data Tools

Bibliography

- Visual Studio Tools for Office (VSTO)
  - What is VSTO. http://whatis.techtarget.com/definition/VSTO-Visual-Studio-Tools-for-Office-or-Microsoft-Visual-Studio-Tools
  - Craig Bailey. http://www.craigbailey.net/visual-studio-tools-for-office-vsto/
  - http://en.wikipedia.org/wiki/Visual_Studio_Tools_for_Office
  - https://msdn.microsoft.com/es-es/office/hh133430.aspx
  - MSDN Blogs. http://blogs.msdn.com/b/vsto/
  - Visual Studio Tools for Office (VSTO) Excel Programming Tutorials. https://www.youtube.com/watch?v=K2csNXOjego