
MOBILE ELECTION

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Abstract: *Mobile phones have the potential of fostering political mobilisation. There is a significant political power in mobile technology. Like the Internet, mobile phones facilitate communication and rapid access to information. Compared to the Internet, however, mobile phone diffusion has reached a larger proportion of the population in most countries, and thus the impact of this new medium is conceivably greater. There are now more mobile phones in the UK than there are people (averaging at 121 mobile phones for every 100 people). In this paper, the attempt to use modern mobile technology to handle the General Election, is discussed. The pre-election advertising, election day issues, including the election news and results as they come in, and answering questions via text message regarding the results of current and/or previous general elections are considered.*

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Introduction

In our previous papers [1,2] the Question-Answering Mobile Engine (QAMEN) has been represented. QAMEN is based on industry-standard SMS messaging technology and thus works with any mobile in any GSM network. In this paper QAMEN will be restricted by General Elections issues. For clarity we will distinguish two versions of QAMEN for election: PC version – QAMEN-E_{PC} and Mobile version QAMEN-E_{MBL} and only the **Election** Application Domain (AD) will be considered.

While it is too early to determine the political effects of mobile phone diffusion, the political events in different countries suggest that mobile technology may come to play an important role in political participation and democracy. Text messaging has already played an important role in the 2008 United States campaign of Barack Obama. Obama's text message announcing his vice-presidential candidate selection of Joe Biden reached approximately 2.9 million Mobile Subscribers (MS), many of whom signed-up with the promise of receiving vital information via text messaging on their mobile phone.

We are definitely against blind copying the digital techniques used in the 2008 US presidential election. One disincentive is the short campaigning time of UK general elections. US presidential campaigns are two years long and so the candidates were able to test different digital media. But with UK general election campaigns only three and a half weeks long, UK parties will have to get it right, first time. Planners argue that use of digital media will come down to the demographics of swing voters. It depends on whether the parties believe that the next election will be won by retaining the loyalty of the over-50s or at the margin of first-time and under-25 voters, most of whom are mobile-literate.

Despite the differences, the growth of the importance of technology in politics cannot be ignored. UK politicians are still learning the new tone, style and dynamics needed for mobile campaigning. Politicians need to see it as an opportunity to express themselves, rather than a threat; i.e. politicians need to overcome their fear of the unfamiliar and embrace the opportunities it provides.

The Electoral Commission has warned that the UK electoral system continues to operate under 19th century structures and requires urgent reform before the next general election,. "The planning and running of elections need to be more robust and coordinated," said Sam Younger, chairman of the Electoral Commission. "We are still trying to run 21st century elections with 19th century structures, and the system is under severe strain." [3].

In the UK, legislation currently prevents electronic voting in general elections, but the technology has been well tested in 17 pilot projects during local and European elections. These trials were funded by the Office of the Deputy Prime Minister, which is also investing £12m into Core (co-ordinated online register of electors), a project that aims to modernise electoral rolls - a crucial step in enabling national e-voting systems.

The biggest e-voting trial conducted so far in the UK was in Sheffield, where 174,000 citizens were given the opportunity to vote using the internet, kiosks and mobile phones. Voters in the city were given the choice of voting using a traditional ballot paper, a mobile phone text message, a touch-tone telephone, a website or a touch-screen internet kiosk at a polling station.

The Electoral Commission wants e-voting technology to be proven before it will give the green light to an electronic general election, but proving the technology is difficult without a large-scale trial. The Office of the Deputy Prime Minister says there will be no large-scale e-voting projects until "issues of secrecy, security and technological penetration have been addressed". This makes it into a **vicious circle**. In this paper the way of breaking such a circle will be discussed. QAMEN-E_{MBL} will be represented as an election monitoring system. The purpose of this paper is to describe the main stages of mobile election and discuss the ways of mobile election monitoring.

Reading this paper will tell you the following:

- Mobile election overview.
- Pre-election advertising.
- The Election Day.
- Mobile Election Results.
- QAMEN-E_{MBL} Versus QAMEN-E_{PC}.
- Mobile Request Processing.

Mobile Election Overview

- The first local and mayoral electoral vote in the UK by text message took place on 23rd May 2002 [4].
- Korean campaigners sent text messages to encourage voting in 2002, while the Italian government in 2004 sent a reminder message about upcoming European elections to all mobile phone subscribers [5].
- Mr. Tony Blair became the first UK Prime Minister to use text message technology to talk directly to the people on 25th November 2004 [4], answering questions submitted in advance by text message from members of the public as well as in real-time in a mobile phone chat-room, transmitted live from No.10 Downing Street.
- The Spanish general election of 2004 occurred in the wake of an unprecedented terrorist attack, but its outcome reflects the potential that mobile phones have to provide the user with independent information and bring about voter mobilisation. Mobile technology contributed to the quality of democratic practices in the sense that SMS messages helped provide citizens with more information about the rapidly unfolding events related to the terrorist attacks, including the reaction by the government and the opposition party as well as the investigation and the protests during the "day of reflection" [6].
- The information about the first mobile phone election in the UK had been announced in April 2005 [7]. In the UK, the General Election always sparked a frenzied dash for information as voters tried to keep up to date with hot election issues. As with all major news stories, people want to be able to follow events as they unfold and the mobile phone is proving to be the ideal tool for this.
- On May 21, 2006 the Montenegro, a small country in the former Yugoslavia, saw the first instance of volunteer monitors using SMS, as their main election reporting tool. A Montenegrin NGO (Non-Governmental Organization) was the first organization in the world to use text messaging to meet all election day reporting requirements.

- Since then, mobile phones have been deployed in six elections in countries around the world, with volunteers systematically using text messaging in election monitoring. SMS monitoring is becoming a highly sophisticated rapid-report tool, used not just in a referendum election like in Montenegro, but in parliamentary elections with a plethora of candidates and parties and complex data reported via SMS. This was the case in Bahrain, a small country in the Middle East, where monitors reported individual election tallies in a series of five to forty concurrent SMS messages, using a sophisticated coding system, with near accuracy.
- In the two years since the first large-scale SMS monitoring in Montenegro, there have been rapid improvements in mobile services as competition in the wireless industry has increased worldwide, and there is growing interest and understanding on the part of NGOs that systematic election monitoring is not as difficult as it first may seem. As election monitoring via SMS becomes standardized and NGOs gain experience, there is no reason for mobile phones and SMS not to play a greater role in other areas of civic participation.
- Election in Sierra Leone [8] is lead by the National Election Watch (NEW), a coalition of over 200 NGOs in the country. NEW has monitors at 500 of the 6171 polling stations. Monitors report on whether there are any irregularities via SMS back to headquarters.
- The Estonian Government has passed a new bill that will allow its citizens to vote using their mobile phones in the next election [9]. The measure will come into effect for the 2011 election, and makes Estonia the first country in the world to approve such a method. In order to vote using their mobile phone, Estonians will be required to purchase a special chip for their handsets which will verify the voter's identity and authorise their vote on the system.

The future is bright for innovative ways in which mobile phones are used by citizens to participate and engage in their countries as the mobile revolution unfolds. In fact, the 2008 US presidential election saw the widest possible mix of offline and online media used to help candidates connect with some 200 million voters scattered across America's vast expanse. Experts are predicting that in future elections, the use of mobile technology will become the standard and play an even larger role than in recent US election where Barack Obama's use of text messaging is already being held as a successful way to reach out to the constituents.

Mobile campaigning needs a new political vocabulary, style and humour - far removed from the stultifying prose of traditional party literature. Mobile is all about personalized content; offering politicians a way of communicating with voters that is simply not possible with television or newspapers.

Pre-election Advertising

Election advertising is defined as any content that can reasonably be regarded as attempting to gain electoral success for any candidate or political party which seeks to increase their status or position. Election advertising is anything that can reasonably be regarded as influencing a voter in a particular direction, and it's a media-neutral definition. Election advertising requires advertiser identification, and spending limits apply. A message supporting someone else needs the beneficiary's written permission. The Election Advertising Campaign (EAC) will provide a unique perspective for both candidate or political party, and MS. EACs goal is to get more votes, more attention and more exposure for the General Election 2010 in the UK.

What can the General Election campaign, political parties, candidates and Registered Mobile Subscribers (RMS) expect from EAC?

- Increased voter turnout due to text message reminders.
- Votes by text could increase turnout, especially a potential record number of young voters. 95% of 16-24 year olds use text messaging regularly, each sending an average of 400 texts per month. Young Britons would be far more willing to vote in the General Elections if the government were to introduce voting by mobile phone. ICM Research found a huge 73% of 18 to 24-year-olds would have voted if they had the option of doing so by mobile phone. The opportunity of being able to cast a vote via text message would make people more likely to participate in an election.

- Political parties, for instance, might invite party members and ordinary citizens to participate in the pre-election candidate nomination process by mobile phone voting.
- Candidates will be able to use text messages to collect campaign contributions. Mobile search is the ideal opportunity for candidates to position themselves about key issues like jobs, schools, knife crime, etc.
- RMS will be able to receive text messages from their candidate or party of choice. This is another sign of how political outreach could try to keep up with the changing nature of personal communication.
- Every evening at 8pm a text summary of the key political events of the day and the latest election news will be sent to the RMS.
- Receiving a reminder for scheduled and special elections events could become the norm.
- Be the first to know with breaking news alerts.
- EAC keeps RMS abreast of the fast changing political scene in the final days before the General Election.
- RMS might be asked from time to time for whom they are likely to vote, to define the current situation of candidates popularity as a projection of the election results.

Registration as RMS is very simple:

- Type in your name, post code and password.
- Send this message to 5-digit short code. It should be memorable short code like ELECT (35328), or 2ergo (23746). It is important to note that these short codes should only be considered as examples.
- Confirmation about registration will be sent as a text message to the RMS mobile phone along with a Pin number (required for election day only) and notes about what kind of information will be regularly sent to the RMS mobile phone. All information, of course, needs to be suitable for the limited text messaging format of 160 characters.
- Simply send a text message CANCEL to 35328, or 23746 and you will be unsubscribed from all services.

For non-registered MS it would be enough to text NEWS to 35328, or 23746 for breaking news alerts, or text EVENTS to the same short codes for the nearest election events, or text RESULT for actual election results.

In order for EAC to succeed, a number of conditions have to be in place:

- The power of the message lies beyond 160 characters: One of the best tactics of wise political campaign managers has been the use of embedded links in each message that direct to a candidate's homepage.
- Political campaigns have utilized demographic information to target voters in particular cities, regions or with specific issues in mind. With location-based services becoming more commonplace on phones, the ability to deliver targeted messages will be one of the biggest enhancements to mobile messaging in the near future.
- QAMEN-E_{MBL} should be able to handle thousands of messages per minute to one mobile short code.
- The mobile provider (e.g. 2ergo for QAMEN-E_{MBL}) would give the highest priority to the election mobile short code.
- Note that each SMS message sent to QAMEN-E_{MBL} for this service will cost 10-15p (network charges vary).

An important consideration is the cost of a wide-scale program. An analysis of the last years Presidential Election in the United States,[10] allows the surmise that not only has text messaging surpassed actual calls as the most popular form of mobile communication but its cost-effectiveness in elections was astounding. For a political campaign, the acquisition cost of an "opt in" text user (a RMS in our case) is about 13 cents. By comparison, the acquisition cost of door-to-door canvassing is about \$2.50 and for phone calling, it's about \$1.00. The difference in actual cost-per-vote results is even more obvious: \$1.62 per vote for opt-in text lists compared to \$20-\$35 per vote from phone calls, leaflets and door-to-door visits.

However, the Sheffield trial did reveal some potential problems with e-voting. The biggest problem was cost. Offering voters access to secure and robust electronic voting channels more than doubled the cost of running the election, to £55 per voter, according to the Institute of Public Policy Research.

Mobile phone technology allows users to be directly accessible at all times and locations and that is why it would be more effective for political parties to use the power of mobile messaging, namely QAMEN-E_{MBL}, not only during the short campaigning time of UK general elections but the whole year.

The Election Day

RMS from around the country used the power of text messaging to cast their vote. Attendees cast their ballots by texting only the name of the candidate to the short code 2VOTE (28683), or ELECT, or 2ergo to take part in the election.

A note about security. RMS voting requires the entry of a password and pin. In a traditional voting system no formal identification document is required when voters present themselves at a polling station; and yet the same person may be required to present three forms of ID just to register at their local Blockbuster video store. Therefore QAMEN is a vast step forward in RMS security.

Arriving messages are passed to QAMEN-E_{MBL} and then the data is compiled in a database (DB) ready for analysis. It is amazing to see the numbers change on the screen as the SMS messages pour into the DB (see Figure 1). The RMS will be kept updated on the latest election news, latest announcements and sent reports on quantitative data such as real-time voter turnout and even on the actual election results. For non-registered MS it would be enough to text RESULT to 35328, or 23746 to get the latest election results anytime and anywhere.

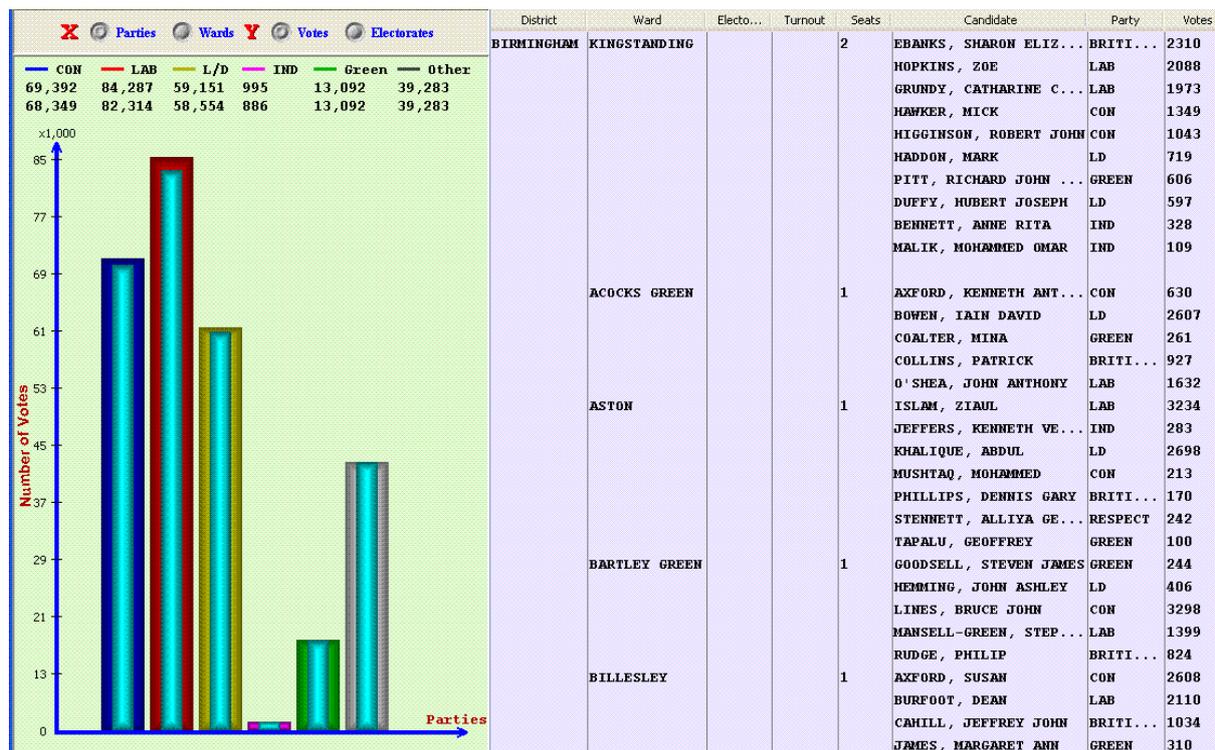


Figure 1. Current result of local election in Birmingham

Mobile Election Results

QAMEN-E_{MBL} is supposed to make nationwide election results available not only to RMS but to all mobile devices. MS can send any request regarding election results to 35328, or 23746 and QAMEN-E_{MBL} will reply via text message.

The visualization of election results can make it more intuitive and productive. People have always relied on visual tools such as maps, charts, and diagrams to better understand problems and solve them quicker. The mobility context and technical limitations such as a small screen size make it impossible to simply port visualization applications from desktop computers to mobile devices, but researchers are starting to address these challenges. Considerable effort is needed to understand how to design effective visualizations for mobile devices. Although many researchers have proposed specific techniques, no reports on the topic have yet provided a broad discussion of mobile visualization that could be useful to mobile application developers. In this paper only textual presentation of election results will be considered.

Mobile phones (and consequently QAMEN-E_{MBL}) have some limitations when compared to PCs (QAMEN-E_{PC}). These limitations are the problems that need to be taken into account when developing an acceptable mobile question-answering procedure.

QAMEN-E_{MBL} Versus QAMEN-E_{PC}

Compared to QAMEN-E_{PC}, QAMEN-E_{MBL} has many restrictions that have to be considered and overcome:

- Displays are very limited due to smaller screen size, the 160 characters SMS restriction and lower resolution.
- Input peripherals such as tiny keypads, micro joysticks, and rollers are often inadequate for complex tasks.
- Connectivity is slower, affecting interactivity when a significant quantity of data is stored on remote databases.
- QAMEN-E_{PC} might provide the powerful command prompt (see Figure 2).
- It is easy to use such a prompt to represent requests in clear, grammatical and correctly-spelt language. Often Mobile Request (MR) for QAMEN-EMBL will be ungrammatical. As a rule MSs:
 - Do not want to use upper case to type request like *“george bush, washington dc”* [11]. Or use dots to separate *“d”* and *“c”*.
 - Dropping *“?”* at the end of MR.
 - Not using any punctuation at all.
 - Deletion of articles.
- The fact is that MR simply will not be spelt, punctuated, and capitalised correctly but the main requirement for QAMEN-EMBL is - to handle non-standard or poorly formed/structured (but, nevertheless, meaningful) user's MR.
- QAMEN-E_{PC} has no problems displaying the response in a convenient format for the user (see Figure 3) but for QAMEN-EMBL the small screen and 160 characters restrictions may cause some problems when it comes to displaying the response.

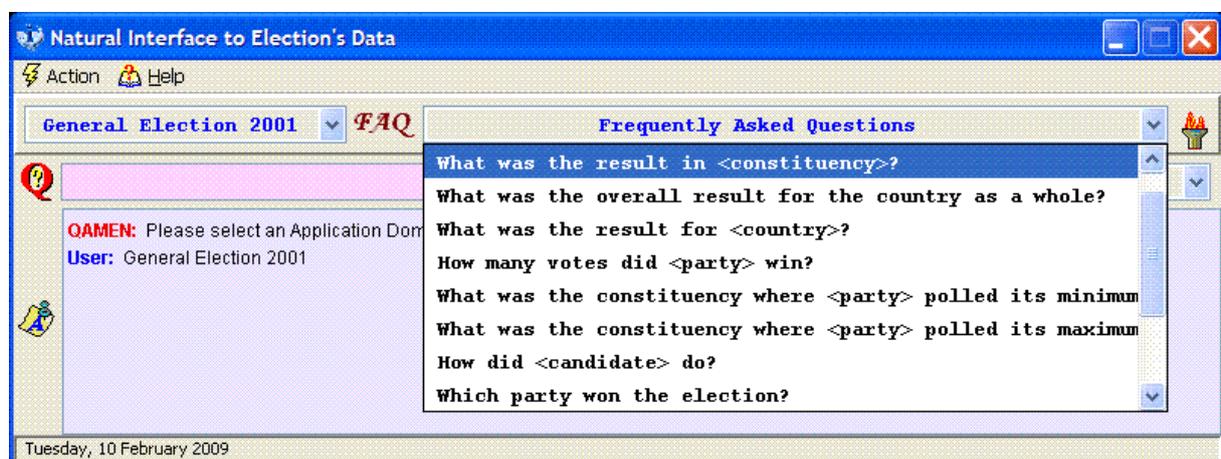


Figure 2. QAMEN-E_{PC}: Command prompt interface

The main conclusion from such comparison is QAMEN- E_{MBL} should be **more intelligent** than QAMEN- E_{PC} . More evidence for such conclusion comes from the fact that it is simply impossible to require the users to remember, for example, the exact name of the constituency in order to correctly ask what seems a very simple question: "Who won the election in Suffolk Central & Ipswich North in 2001?". It would be expected that the user instead of using the symbol '&' types in "**and**". In which case QAMEN- E_{PC} will not find the constituency in DB and will have to generate the clarification dialog:

QAMEN: Do you mean Suffolk Coastal, Suffolk South, or Suffolk West constituency?

User: No, I mean Suffolk Central.

QAMEN: Suffolk Central constituency does not exist but there is Suffolk Central & Ipswich North constituency.

User: It's exactly what I meant.

QAMEN: Thank you.

Theoretically QAMEN- E_{MBL} can do the same, but such dialog would not be acceptable due to time and money. But QAMEN- E_{MBL} is an intelligent system and in the result of similarity measurement [12] between MR *Suffolk Central and Ipswich North* and similar DB values namely: *Suffolk Central & Ipswich North*, *Suffolk Coastal*, *Suffolk South*, *Suffolk West* and *Ipswich* constituencies, QAMEN- E_{MBL} selects *Suffolk Central & Ipswich North* with great confidence.

In the case when user simply made a mistake and instead of typing in the desirable constituency *Hereford* in the MR: "Who won the election in Hereford" he/she entered *Hertford* (it's **wrong** but at the same time it's **right** from the QAMEN- E_{MBL} point of view because it has the right part of an existing constituency), QAMEN- E_{MBL} found an answer for the constituency *Hertford & Stortford*. When MS sees the response, he/she realises that MR was wrong and corrects it.

General Election 2001 **FAQ** **Frequently Asked Questions**

What was the result in <constituency>? **New** **Constituencies**

QAMEN: Please select an Application Domain.
User: General Election 2001
User: What was the result in Plymouth devonport?

General Election 2001

Constituency:	Plymouth devonport		
Parties	Candidates	Votes	
Lab	Jamieson, David	24,322	
Con	Glen, John	11,289	
LD	Baldry, Keith	4,513	
UK Ind	Parker, Michael	958	
Soc All	Staunton, Tony	334	
Soc Lab	Hawkins, Rob	303	

QAMEN: Any more questions?

Tuesday, 10 February 2009

Plymouth

- Pendle
- Penrith & the border
- Perth
- Peterborough
- Plymouth devonport**
- Plymouth sutton
- Pontefract & castleford
- Pontypridd
- Poole
- Poplar & canning town
- Portsmouth north
- Portsmouth south

Figure 3. QAMEN- E_{PC} : Question-Answering interface

Mobile Request Processing

The main purpose of MR processing is to understand *what was meant* rather than *what was said* and in the result of such, understanding and returning to MS only elections-relevant information. The mechanism of query phrasing is very simple: "eliminating the unnecessary until only the necessary remains" and has been discussed elsewhere [13]. Here we just remind ourselves of the main steps involved in MR processing.

- QAMEN-E_{MBL} takes the MR as a character sequence and converts the original MR to a *skeleton* by noisy (non-searchable) words elimination. In the result of such conversion MR will contain only **meaningful** words. Let's call word meaningful if it represents DB field descriptor or DB field value.
- AD election is represented by DB. DB **meaningful** fields (i.e. they don't represent primary or foreign keys) contain election data. Each meaningful fields has a list of descriptors. Between descriptors and meaningful fields exists an one-to-one attitude.
- The purpose of MR processing is to match MR meaningful words against the DB fields descriptors.
- To highlight the complexity of such matching, it is enough to consider quite a simple MR: "Who won an election in <constituency>?". Without knowing "who is who" and meaning of "won election" QAMEN-E_{MBL} cannot answer this question. To explain it to QAMEN-E_{MBL} the Production Rules (PR) need to be involved.

The subset of PR in format:

$$\langle \text{Precondition} \rangle \mapsto \langle \text{Antecedent} \rangle \Rightarrow \langle \text{Consequent} \rangle$$

is shown below.

1. AD:Election \mapsto who \Rightarrow candidate
2. AD:Election \mapsto [candidate]:<win \oplus won> \Rightarrow [SQL]:<MAX(votes)>
3. AD:Athletics \mapsto [runner]:<win \oplus won> \Rightarrow [SQL]:<MIN(time)>
4. AD:Athletics \mapsto [shooter]:<win \oplus won> \Rightarrow [SQL]:<MAX(distance)>
5. AD:Election \mapsto votes \Rightarrow [Field]:<CANDIDATE.VOTE>
6. AD:Election \mapsto candidate \Rightarrow [Field]:<CANDIDATE.[CANDIDATE NAME]>
7. AD:Election \mapsto party \Rightarrow [Field]:<CANDIDATE.PARTY>
8. AD:Election \mapsto [party]:<win \oplus won> \Rightarrow [SQL]:<TOP1, SUM(votes), DESC>

where \oplus - denotes "exclusive OR".

Precondition consist of **class₁:value₁ {& class_i:value_i}**.

Antecedent might be represented by: (i) **single word** (e.g. *who, won, August, seven, etc.*), (ii) **sequence of words** (e.g. *as soon as, create KB, How are you doing, etc.*), or (iii) **pair - [context]:<value>**.

Context allows one to avoid word ambiguity and thereby distinguish difference between "Candidate won an election" and "Party won an election".

Presentation of **Consequent** is similar to Antecedent structure except (iii). For *Consequent pair* represents **[descriptor]:<value>**.

For AD *Election* subset (1, 2, 5..8) of PR is used. PR 3 and 4 in fact show another meaning of the same word *won* but for a different AD.

- The final step of a phrased MR to SQL query conversion is quite complicated because it is necessary to access data from many different tables within an AD and join those tables together in SQL query. Result of conversion of MR "Which party won the election" to SQL-query using selected PR and executing of produced SQL query is shown in Figure 4.

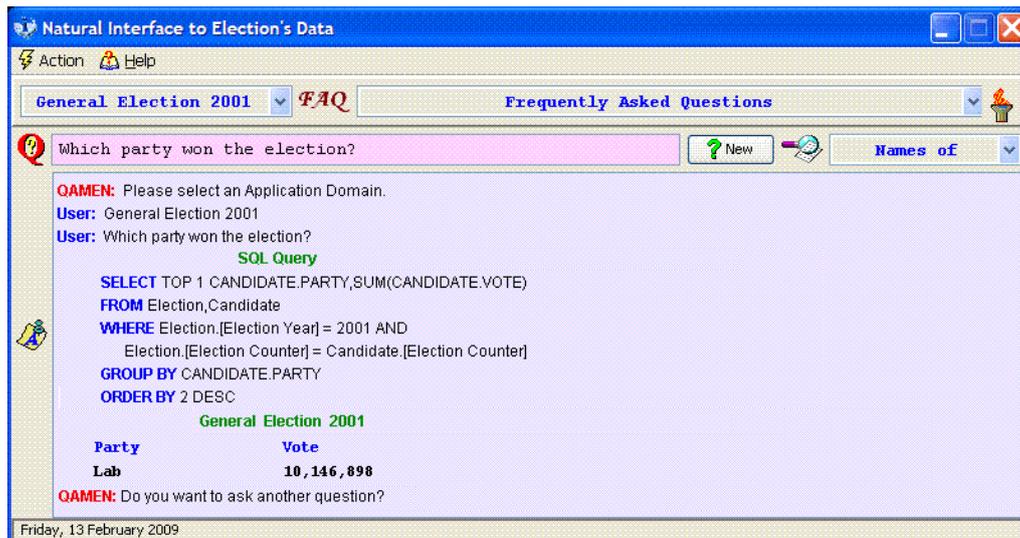


Figure 4. QAMEN-PC: Request Parsing: SQL query creation

Using QAMEN-EMBL for testing is quite expensive and that is why QAMEN-EWEB, which is oriented toward AD Election, was used. Because AD is predetermined, for QAMEN-EMBL (QAMEN-EWEB) it would be easy to understand what the MS meant by the entered MR. Instead of type in the MR "What was the result in Plymouth Devonport constituency in 2001 General Election?" it would be enough for MS to text in just "Plymouth Devonport 2001". By the way, exactly these three words represent the result of initial MR processing. After conversion to SQL query and running it result will be displayed in the mobile format (see Figure 5) i.e. QAMEN-EMBL (QAMEN-EWEB) is trying to minimize the space for response (compare with Figure 3).

Conclusion

Like any technology, mobile telecommunication can have a wide variety of effects on political behaviour and practices, and the fact that it has been around for such a short period of time makes it impossible to reach a general conclusion about its ultimate impact. Nevertheless, we hope that in future elections, the use of mobile technology will become the standard and play an even larger role, helping to make nationwide election campaigns available to all mobile users.

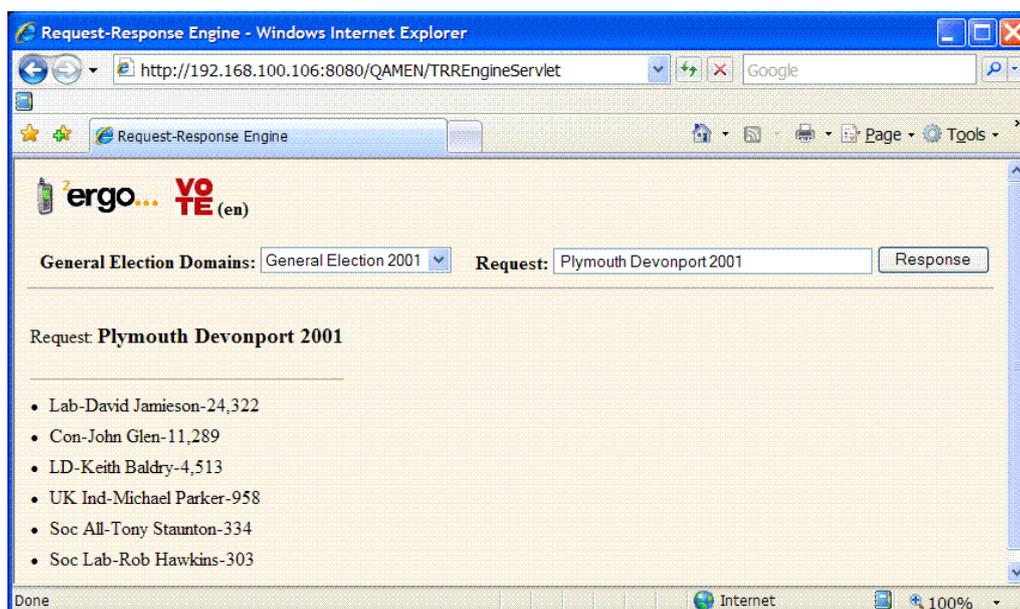


Figure 5. QAMEN-EWEB: Question-Answering interface

Without a doubt mobile phones have the potential to change certain aspects of political behaviour, including people's desire to participate in the political process. We believe that political parties should have their mobile campaign constantly, every year and not only during the three-and-a-half weeks of the election campaign every four or five years. Moreover, it would be very useful to have access to the results of any general election instantly via mobile phone. In our paper we tried to demonstrate that QAMEN-E_{MBL} can provide such services to mobile users.

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