

Electronic voting

May 2007 electoral pilot schemes

At the May 2007 local government elections in England, five local authorities held pilot schemes trialling electronic voting, principally via the internet and using the telephone. This paper summarises the main findings of the Electoral Commission's evaluation of these pilot schemes.

Background

Under the Representation of the People Act 2000, local authorities in England and Wales can submit proposals to the Secretary of State for Justice (prior to 9 May 2007, the Secretary of State for Constitutional Affairs) to carry out electoral pilot schemes. Local authorities in Scotland can apply to the Scottish Executive to carry out pilot schemes. Electoral pilot schemes can involve changes to when, where and how voting at local government elections is to take place, how the votes cast at the elections are to be counted, or candidates sending election communications free of postage charges.

The Electoral Commission is required by law to evaluate every electoral pilot scheme in England and Wales, and may also be asked to evaluate pilot schemes in Scotland. We must consider whether the pilot scheme:

- helped to make voting or counting the votes easier
- helped to improve turnout
- helped to facilitate voting
- led to a reduction or increase in electoral fraud

- led to a reduction or increase in the cost of the elections

The Commission is required to publish evaluation reports on individual pilot schemes within three months of the elections taking place.

Electronic voting

The Government has been exploring options for remote electronic voting (e-voting) since 2002 and previous e-voting pilots have been held in 2002, 2003 and 2004. These pilots have been evaluated by the Commission, which had previously indicated its support for the piloting of e-voting in order to provide electors with more choice about how they cast their ballot. This has been qualified, however, with a number of important conditions:

- New voting methods should be rolled out only once their security and reliability have been fully tested and proven and they can command wide public confidence.
- The necessary costs for secure and reliable systems must be able to be reasonably met by the public purse.

In particular, the Commission has also highlighted the need:

- to ensure that the security and reliability of the remote e-voting process is sufficient
- to increase the transparency of the solutions adopted to ensure continued stakeholder acceptance of the technology
- for a centrally managed accreditation and certification process to provide independent assurance of e-voting solutions and to enable local authorities to make an informed choice regarding the use of appropriate technology
- to obtain better value for money by reducing the costs associated with e-voting

Announcing approval for a number of pilot schemes in January 2007, the Secretary of State for Constitutional Affairs noted that 'e-voting pilots on a small and controlled scale, testing a number of avenues including internet, telephone voting and the use of "centralised all-elections" facilities at polling stations for advance and polling day voting... will enable us to explore the impact of this important part of the modernisation agenda.'

[Pilot schemes at the May 2007 elections](#)

In total, seven applications were received in November 2006 to pilot e-voting. The Commission wrote to the Secretary of State on 1 December 2006 and stated that 'Many of these applications

contained much less detail than we would expect for schemes of this level of complexity and risk. In particular, several applications demonstrate insufficient understanding of the important security issues relating to electronic voting.' Only three of the applications provided evidence of effective project and risk management plans.

Following negotiations between the Department for Constitutional Affairs¹ and the local authorities, the applications were revised to address these concerns. The intended learning from these pilots focused on building on the evidence gained from the 2003 pilots and assessing the impact of requiring electors to provide personal identifiers in order to register for e-voting. On the basis of the information available, the Commission was satisfied that the revisions addressed the highlighted concerns in the pilots that went ahead.

A total of five pilots featured e-voting:

- Rushmoor Borough Council piloted remote internet voting from 26 April to the close of poll on 3 May 2007.
- Sheffield City Council piloted remote internet and remote telephone voting from 26 April to 30 April 2007.
- Shrewsbury & Atcham Borough Council piloted remote internet and remote telephone voting from 21 April to 1 May 2007.

- South Bucks District Council piloted remote internet and remote telephone voting from 21 April to the close of poll on 3 May 2007.
- Swindon Borough Council piloted remote internet and remote telephone voting from 26 April to the close of poll on 3 May 2007. It also piloted the use of supervised, networked electronic facilities at polling stations on polling day to allow electors to vote at any polling station within the borough.

There were no trials of e-voting machines (kiosk voting) at polling stations or elsewhere (i.e. supervised, non-networked voting facilities) at these elections, with the exception of a small-scale trial at advance voting stations in Shrewsbury & Atcham.

A total of three suppliers or combinations of suppliers provided the e-voting solutions for the pilots. A consortium led by Election Systems & Software (ES&S) worked with Rushmoor and South Bucks, Opt2Vote was partnered with Sheffield and Shrewsbury & Atcham, while a consortium led by Tata Consultancy Services provided the solution for Swindon.

All pilots involved the use of a paper-based pre-registration process in which electors had to provide personal identifiers in order to be issued with the credentials to vote electronically.

[Findings](#)

From an operational perspective, the individual 2007 e-voting pilots were delivered on

time, enabled electors to cast their votes and no significant security incidents or fraud have been reported.

However, there was an unnecessary high level of risk associated with all pilots and the testing, security and quality assurance adopted was insufficient. There was a general lack of transparency around the technology and its use.

Management

The overall pilot scheme programme was not well managed, above all because there was insufficient time for planning and implementation (see the Commission's separate summary paper 'Key issues and conclusions' for more detail on this). This was a major factor influencing the conduct of all the pilots in 2007. By the time suppliers had been chosen, just two to three months remained for implementation. Feedback from local authorities and suppliers suggests that a lead-in time of up to six months would have been more realistic. Furthermore, many local authorities assumed that the Ministry of Justice's (MoJ's) selection process for identifying suitable suppliers of e-voting solutions had entailed a higher level of testing and investigation than was the case.

Given the shortened timescales, all local authorities project managed their election activities in a professional manner. In general, there was a good relationship between the local authorities and their suppliers, although the less experienced local authority teams relied more

heavily on their suppliers to ensure that the pilot scheme was implemented. Supplier project managers also generally undertook their project management responsibilities professionally and were well integrated into their respective local authority teams.

The biggest contributor to project risk in all of the pilots was the timescale for implementation, which did not provide sufficient opportunity for design, development and testing, or for making changes if faults were identified. The timescales also meant that in many cases the relevant project management documentation was not produced.

The greatest areas of weakness in the project management of the e-voting pilot schemes related to the degree of quality management undertaken. While quality management is important in any information technology (IT) project, it is particularly important for e-voting pilots because of the concerns about security and the requirement to evaluate the confidence of the electorate in the new voting channels.

Quality management

While there were variations between the different pilots, in all cases the quality and testing arrangements were found to be inadequate. Significant quality management failings included the lack of evidence of effective configuration management, of comprehensive testing or strong technical development processes and of detailed design documentation.

There was little evidence provided by some of the suppliers of any comprehensive approach to testing. The only formal testing that took place for the majority of the pilots was user acceptance testing undertaken by the local authority with supplier support. This typically took place shortly before the start of polling and if any significant defects had been found there would not have been time to fix and then re-test the software.

One pilot supplier's development processes included a semi-independent code review for its e-voting software and the inclusion of measures to ensure that the version used at the elections was the same version that had been reviewed. This supplier has also expressed support for an open review of e-voting source code (the programming that instructs the voting software how to process the votes), although it is not known whether the source code for these elections was made available in this way. No detailed information was provided by other suppliers about their development and configuration management processes, despite the information being requested on more than one occasion.

The quality and timeliness of supplier documentation varied widely between suppliers. The best suppliers were able to provide good design information, whereas others provided documentation that was neither complete nor comprehensive. One supplier did not provide the bulk of its

documentation until after the elections had closed.

Quality assurance was undertaken through a security audit by the MoJ's contractors. While commendable, this took place late in the implementation process. The scope of the quality assurance did not include testing, configuration management or usability. While security testing (also known as penetration testing) did take place, this was carried out at a basic level only. Many of the suppliers did not have the required documentation for the audit, and assertions by the supplier staff had to be taken at face value. The amount of time spent on each pilot was insufficient and the testing was conducted too close to the elections, with not enough time to make any significant changes following the audit. In Swindon the e-voting system was changed in response to the quality assurance results on the night before the commencement of the e-voting period, causing the opening of the e-voting channels to be delayed by a few hours.

[Impact on voting](#)

The pilots provided increased convenience for many of the voters who used the e-voting channels. In some cases, however, the design of the user interface caused some usability issues for both internet and telephone voting. Some of these issues were affected by design decisions and the short timescales associated with the implementation of these pilots.

Pre-registration

For the 2007 pilots, electors had to apply in advance to use e-voting and as part of this process had to provide a signature, date of birth and some form of password or passcode. This information was to be provided on a form, to be returned by post to the local authority and entered (either manually or semi-automatically) into the system by local authority staff. Registered e-voters were subsequently sent a secure poll card containing a unique voter identification number (VIN), which they had to enter to access the e-voting website or telephone system, together with the personal information they had previously provided on the pre-registration form.

This approach was broadly consistent with the approach taken in the Electoral Administration Act 2006 in relation to the mandatory use of personal identifiers to improve the security of postal and proxy voting. Although a similar pre-registration process had been adopted in several pilots in 2003, in previous e-voting pilot schemes electors had generally been automatically sent credentials in one or more postings. Unlike in 2003, e-voting pilot schemes in 2007 made no provision for online registration for e-voting, again on security grounds.

While the use of pre-registration did in general operate successfully, there were a number of issues associated with the pre-registration and subsequent voting processes:

- Some electors believed that they were applying for a postal vote and did not understand that they were pre-registering for an e-vote when they returned their form.
- Different terminology was used for the password, including 'username', 'password' and 'passcode'. Sometimes the name used was confusing, such as referring to a password but requiring a numeric code. This caused a number of electors to fill in their registration form incorrectly.
- The manual processing of pre-registration forms by local authorities was time-consuming and inefficient.
- A large number of electors pre-registered but did not subsequently vote electronically, ranging from 66% of registrants in Sheffield to 42% in Swindon.
- Call centre logs and additional anecdotal evidence suggest that a significant number of electors subsequently forgot their password or passcode on attempting to vote.
- In some instances there were inconsistencies in the date format accepted by the voting interface.

Polling timetable

Voters in Shrewsbury & Atcham and Sheffield were only able to vote electronically in advance of polling day, whereas voters in Rushmoor, South Bucks and Swindon were able to vote both in advance and on polling day.

Analysis of the e-voting profile shows that the most popular day for e-voting was polling day, where this facility was available.

This is also reflected in the total take-up of the e-voting channels – where e-voting was not available on polling day between 3.4% and 8.5% of voters used the remote e-voting channels, compared with between 16.3% and 17.7% where e-voting was available on polling day.

Sheffield had the lowest uptake of e-voting, at 3.4%, despite having an extensive public awareness campaign that achieved one of the highest levels of awareness across the country.²

In Sheffield, a particularly low proportion – 33.9% of pre-registered e-voters – actually voted electronically, suggesting that a great many of them had not appreciated that the ability to vote electronically finished early (on the Monday before polling day). It is notable that previous e-voting in Sheffield, in 2003, allowed e-voting until the close of poll.

The provision made by pilot local authorities to allow electors who had pre-registered for electronic voting to vote at a polling station on polling day varied. In Shrewsbury & Atcham and Sheffield, where e-voting had finished before polling day, pre-registered e-voters who had not yet voted could do so simply by visiting the appropriate polling station. In Rushmoor, a pre-registered e-voter could vote at a polling station using a paper ballot provided that they could prove their identity and subject to telephone confirmation from the elections office that the elector had not already voted electronically. Swindon followed a similar

procedure, although online access to the electronic register from polling stations meant that there was no need to contact the elections office. Only South Bucks did not provide pre-registered e-voters with the capability of switching to a paper ballot at the polling station, although it allowed electors to visit the council offices to vote electronically if they were encountering technical problems.

The provision of this capability worked without problems in Shrewsbury & Atcham, Sheffield and Rushmoor. However, a significant number of polling stations in Swindon experienced technical problems at some time or another on polling day, resulting in 28 hours of total downtime (3% of voting hours). The Commission has also received reports of pre-registered e-voters in South Bucks attending polling stations on polling day seeking to vote in person.

[Impact on turnout](#)

It is difficult to make any firm statements concerning the impact of e-voting on turnout. In practice, the majority of those who voted electronically are likely to have voted anyway via another channel. Where it was possible to interview users of e-voting for the opinion research, in South Bucks, seven in 10 (71%) polled claimed that they would have voted in any case. Local surveys conducted by local authorities have resulted in similar figures, suggesting that up to 25–30% of those who voted electronically would not have voted if the e-voting channels had not been available.

[Security and confidence](#)

The level of security assurance of the pilots conducted in 2007 was below that associated with other government IT projects, and best practice in security governance was not followed. While this, in isolation, does not mean necessarily that there were security weaknesses, it does increase the risk significantly.

No significant security incidents were reported during the 2007 e-voting pilots. Given the short timescales, the limited technical documentation for the systems, and the lack of comprehensive acceptance testing, this was fortuitous: the level of risk of a security incident was much higher than it should have been.

All suppliers were requested to provide documentation outlining the threats to security and the countermeasures in place to combat them. The response to this varied. One supplier provided documentation that demonstrated a good understanding of the specific risks to e-voting systems and identified a range of appropriate mechanisms for controlling the risks. Another supplier provided draft and incomplete documentation that was in the correct format but did not demonstrate a good understanding of the specific risks related to e-voting. The security documentation provided by one supplier was totally inadequate. While it did identify some risks and the different ways that they could be countered, it did not say specifically how they were countered in their system. The MoJ's quality assurance audit did not provide clear guidance

to Returning Officers regarding the level of risk of the pilot.

It is unlikely that Returning Officers were explicitly told what security risks they were accepting when they decided whether or not it was safe to proceed with e-voting. This was new territory for many of them, however, and Returning Officers with more experience of e-voting projects may have asked more searching questions and not have assumed that the MoJ's quality assurance process was adequate. Following the elections, suppliers were required to delete the data from all servers and clients used at the elections. However, this process was not witnessed by Returning Officers or their staff and it was not clear how effectively it was performed. While some e-voting systems used encryption to protect the confidentiality of the voting data, it was not clear whether it had been implemented appropriately to prevent voting data from being recreated after the elections, potentially raising concerns about the preservation of the secrecy of the ballot.

Ensuring transparency of operations is a key issue with any voting channel and is an important factor in ensuring the acceptability of e-voting. The pilots did not provide any explicit measures to increase the transparency of the solutions provided. There were no verifiable checkpoints or audit trails, and the lack of certification of systems or their operations meant that the validity of the technology had to be taken on trust. The counting process was often performed by supplier staff and sometimes

required detailed knowledge of the software systems in order to undertake the count of e-votes. There were variations in the level of observation of e-voting that was possible across the pilots: while some local authorities facilitated observation by interested parties of the counting of e-votes, others, such as Sheffield, could have done more to improve the transparency of the process.

[Feedback](#)

The internet voting channel was particularly well accepted by those who used it, with 87% describing the internet voting process as easy. Approximately 73% of all those polled and 87% of those who used internet voting would like to see the provision continued at some or all elections in the future.

There was a greater number of usability problems with telephone voting. Although 67% described the telephone voting process as easy, around one-third (32%) said they found the experience difficult. Nonetheless, approximately 66% of all electors polled and 85% of those who used telephone voting would like to see the provision continued at some or all elections in the future.

Candidates and agents raised a number of concerns regarding e-voting. The main issue was that the internet voting systems were not open to scrutiny and relied almost entirely on trust. Concerns were also raised about the cost, the impact on voting behaviour and the inconvenience of the paper-based pre-registration process. Candidates and agents were fairly uninformed on the subject

of telephone voting, with anecdotal evidence suggesting that some were unaware it was even operating as a pilot scheme.

[Cost and value for money](#)

There were wide variations in the costs of the pilots, with the additional costs for e-voting varying from approximately £600,000 to £1,100,000. The cost per registered elector also varied widely, from approximately £1.80 in Sheffield to £27 in Shrewsbury & Atcham. The cost per e-voter was extremely high, varying from about £100 to £600.

There were also wide variations in the breakdown of the costs, partly due to the different ways that suppliers had provided this information.

[Learning and issues](#)

[Public take-up](#)

Four of the pilots also undertook remote e-voting pilots in 2003; of these, three experienced a significantly lower proportion of voters using e-voting channels in 2007 compared with 2003. The single largest influence on this is that in 2007 pre-registration was required for the use of the remote e-voting channels, whereas in 2003 e-voting credentials were sent out automatically to all electors. Rushmoor, which also pre-registered voters in 2003, experienced a slight increase in the take-up of e-voting, up from 15% to nearly 18% of voters.

These pilots also suggest that the level of public take-up, and therefore convenience, is greatly reduced if the e-voting channels finish before polling day. In

order to justify the high costs associated with piloting e-voting and to maximise convenience to the public, any future implementation of e-voting should ensure that the e-voting channels remain open until the close of poll provided that all the other concerns identified in these findings are addressed and overcome. The mechanisms piloted this year by Rushmoor to achieve this would appear to be a good model on which to base further refinements. However, this recommendation is contingent on the timescale for implementation being sufficient to allow enough time for testing and remedial action, to minimise the risk of any problems arising from the provision of e-voting on polling day.

There was a significantly lower take-up of the telephone channel compared with the internet channel. Across the four pilot areas where both channels were provided, the total number of remote e-voters who used the telephone channel was 22%. This compares with an equivalent figure in 2003 of 36%.³ This suggests that the telephone voting channel is becoming less popular over time, possibly due to the continued uptake of internet technology generally. Research in South Bucks has indicated that the telephone voter profile is older than average.

A significant minority (22%) of telephone voters stated that it would have been difficult for them to cast a vote had the pilot not taken place; it therefore appears to deliver a real benefit to those who use it. Given that the implementation of the

telephone channel can make use of many of the infrastructure components of internet voting, it is not possible to reach any definite conclusions as to the relative effectiveness of the telephone channel compared with the more popular internet channel. However, given comparatively low levels of usage, further consideration should be given to the long-term viability of the development of telephone voting.

Public acceptance

In general, there was broad but not universal public acceptance of the internet channel. The public acceptance of telephone voting was similar, but not as high as internet voting.

There is, however, a high risk that the confidence of the public could be significantly eroded as a result of the lack of quality assurance and transparency in the current systems. If the high level of implementation and security risk continues in future pilots, there is a risk of a significant service or security incident occurring.

Security and confidence

It is not feasible for local authorities themselves to perform the degree of scrutiny required to achieve sufficient security assurance, in terms of timescales, costs or the type and level of resources required. It is therefore essential that there is significant centrally provided evaluation and testing outside the context of an election. This would be best achieved through the provision of an accreditation and certification scheme, as the Commission has recommended previously. However, it could

also be undertaken in the short term for e-voting as part of a rigorous procurement exercise. This has not been undertaken for these pilots.

The certification of e-voting solutions, which would take place outside the context of an election, would need to be augmented with pre-election quality assurance activities to ensure that the solutions are being deployed in a manner that is consistent with the original certification process.

It will be important to ensure that any accreditation and certification scheme has appropriate characteristics. It should incorporate a set of requirements for e-voting systems to be used at all elections in the UK, including usability, availability, security and transparency requirements.

The certification process should involve an evaluation of technology, including a more detailed design or code review for critical components of the system. Further investigation is required to identify the optimum approach and level of detail to be undertaken in this area. Extensive testing is required, including the conduct of a mock election, suitability and accessibility testing, security penetration testing of the standard configuration as well as volume and stress testing.

Certification should also include the identification of a clearly defined configuration of the system under test, together with the envisaged processes with which it will be used. Quality assurance activities associated with individual elections should

be based on this certification configuration and any changes from this should be strictly controlled and assessed.

In order to gain stakeholder buy-in, it will be important that the accreditation and certification scheme is suitably transparent. This will include the publication of the e-voting requirements and of the certification process that will be undertaken as well as some form of report for each certified product outlining the results of the certification process.

Even with the implementation of commercial best practice security methods and assurance, there are residual risks associated with the use of remote e-voting channels compared with other remote voting channels. The principal risks include:

- the compromise of voting devices, such as home computers, by viruses or other malicious software
- attacks by people with privileged access to the system, either system developers or system administrators (this is also a significant risk for supervised e-voting channels)
- denial-of-service attacks (attacks that result in the e-voting facility being disabled or otherwise unavailable for voters to use), which can have a particularly high impact given the short timescales associated with elections

- the trading of votes, which is a particular concern for e-votes due to the relative ease with which voting credentials can be exchanged

A number of specific e-voting countermeasures have been proposed to address some or all of these risks, such as the use of pre-encryption, partially tested in 2003 and described in the Commission's strategic and technical reports of those elections (available at www.electoralcommission.org.uk), and the use of independent verification services, identified in the MoJ's statement of requirement for the framework. It is disappointing that none of these approaches was piloted in 2007, particularly as it is likely that many of them will not be taken up by vendors unless enforced by regulation.

[Transparency](#)

Ensuring transparency of operations is a key issue with any voting channel and is an important factor in ensuring the acceptability of e-voting. Indeed, concerns about the lack of sufficient transparency were highlighted during the 2007 pilots by interested observer groups.

In addition to a transparent accreditation and certification scheme, there is a need for clear guidance as to what should be observable during the e-voting process. Explicit measures are needed to increase transparency, including the production of verifiable checkpoints and audit trails. It should be possible for the conduct of the elections to be carried out by local authority staff without requiring the active intervention of supplier staff. At

all times, the Returning Officer and their staff should maintain control of the electoral process and manage any arising risks appropriately.

[Accessibility](#)

While the pilot local authorities all took steps to make the e-voting publicity and user interfaces accessible to disabled electors and other hard-to-reach groups, the limited implementation timescale meant that it was difficult to maximise accessibility or to engage fully with representative groups.

Consequently, a number of issues were reported by the Commission's accessibility contractors and other interested parties related to the pre-registration process and to the telephone and internet interfaces themselves. These issues are discussed in more detail in the individual statutory reports and the accessibility report provided by the Commission's contractors. Any future trials of e-voting should provide sufficient lead-in time to ensure that these issues are addressed.

[Implementation and risk](#)

It is important to realise that these remote e-voting pilots are complex IT projects and therefore require effective planning, testing and quality management. The lack of these elements in the 2007 pilots resulted in significantly higher implementation risks than necessary. The relative success of the delivery of the pilots, notwithstanding some issues at individual pilots, was due to the efforts of individual local

authorities and their suppliers, combined with good luck.

It is essential that sufficient time is allowed for testing and for any subsequent issue resolution and re-testing. There should be a significant period – approximately a month – between the planned end of acceptance testing and the start of polling. A number of problems occurred during voting that could and should have been identified and resolved had there been time to test the pilot systems properly.

However, the basic service provision of internet and/or telephone-based services is a well-understood area, and while there are clearly issues to be resolved related to security, transparency and usability, the long-term implementation risk associated with the use of mature technology within sufficient timescales by appropriately qualified organisations should be acceptable.

Swindon implemented electronic polling stations in order to support e-voting on polling day and to provide a 'vote anywhere' facility for electors to attend any polling station within the borough. This builds on the experiences of Sheffield and St Albans District Council which implemented electronic polling stations in 2003. All three pilots experienced difficulties in setting up the polling stations, a complex logistical exercise that involves putting networked technology into a variety of locations, some of which have limited telecommunications facilities and are only available for a very short period of time before the elections for set-up purposes.

While the pilots in 2003 achieved some benefit from allowing electors to choose to vote either on polling day at a polling station or remotely using an e-voting channel, Rushmoor realised the same benefit by allowing e-voters to switch to a paper vote on the production of suitable identification documentation. This was achieved in Rushmoor for a fraction of the cost and implementation risk. Although Rushmoor electors could only vote at their usual polling station, unlike Swindon, observation suggested that the 'vote anywhere' facility provided in Swindon had a very low take-up by voters and did not greatly increase the convenience to the electorate as a whole.

With the current technology and environment, the costs and risks of e-enabling networked polling stations on polling day significantly outweigh the benefits. In the medium to long term, it is possible that technological changes will simplify this process. However, unless this significantly reduces the level of cost and risk involved, the Commission recommends that this facility is not explored further.

[Cost and value for money](#)

There were wide variations in the costs of the pilots and in the breakdown of the costs. Although the MoJ requested a standard breakdown of costs, the suppliers have interpreted this differently, which makes it difficult to make comparisons. It is therefore difficult to determine whether good value for money has been achieved in the procurement of the pilots.

The MoJ should continue to pursue this issue.

Piloting e-voting is always an expensive activity because pilots are being conducted as one-off projects involving the set-up of complex IT systems which are implemented in very short timescales. The current level of e-voting usage does not allow economies of scale to be achieved.

In the longer term, it is clearly better to incur costs in piloting rather than to rush through ill-conceived legislation, and therefore the piloting process does have value in ensuring that the UK makes the best medium- to long-term decisions in modernising its electoral practices. However, given the high cost of piloting e-voting, it is essential that this process takes place in the context of an overall strategy. Piloting is not the only tool and there are a number of lessons that could be learned in other ways, such as laboratory-based testing, which could be considerably more efficient.

The systems were significantly oversized for the voting capacity provided in order to meet the availability and resilience requirements. It is important to recognise that the current costs of piloting e-voting may bear little resemblance to the potential longer-term costs, as local authorities could use appropriately certified commodity software and services from a competitive marketplace, which could be effectively shared to achieve economies of scale.

Therefore, despite the high costs of these pilots, it is not possible to conclude that e-voting is inherently or inevitably expensive. However, there are clearly many barriers to the establishment of a clear business case that only an effective strategy and planning process will be able to resolve. Unless this strategic framework is in place, pilots will not be successful in achieving the overall aims, and any expenditure on pilots will be extremely poor value for money.

Recommendations

While from an operational point of view the 2007 e-voting pilots generally worked, the level of risk placed on the availability and integrity of the electoral process was unacceptable. There are clearly wider issues associated with the underlying security and transparency of these e-voting solutions and their impact on the electoral process, together with the cost effectiveness of the technology, which need to be addressed.

The Commission has stated previously that an electoral modernisation strategy is required to ensure that the benefits of piloting are maximised. The absence of this strategy and other programme governance is now critical and has significantly reduced the value of these pilots.

The Commission recommends that no further e-voting pilots are undertaken until the following three elements are in place:

- There must be a comprehensive electoral modernisation framework covering the role of e-voting, including a clear vision, strategy and effective planning. The strategy must outline how the important issues of transparency and public trust will be addressed and should outline the process by which a more cost-effective deployment of the technology can be achieved.
- A central process must be implemented to ensure that tested and approved e-voting solutions can be selected by local authorities. This could be achieved either through an accreditation and certification process or through a more robust procurement framework than is currently in place. This process must be used to enforce the required levels of security and transparency.
- Sufficient time must be allocated for planning e-voting pilots. This should be approximately six months between the time the supplier contract is awarded and the elections.

None of these recommendations is new. The Commission made all three of these points in its strategic report *The shape of elections to come* following the last significant round of e-voting pilots in 2003.⁴ We cannot support any further e-voting pilots in the absence of a framework incorporating these recommendations.

The electoral modernisation framework should be accompanied by an e-voting blueprint which should describe the envisaged future situation,

covering legislative, process and technology aspects. The blueprint should define the current best practice that has been identified through piloting and other electoral modernisation projects. It is natural that many areas of the blueprint will be undefined and/or unclear at this stage. This will highlight those areas that need further refinement, either by piloting or other measures. The blueprint will be an evolving document that will be shaped by the electoral modernisation process and the technology marketplace. As the process and technology mature, the blueprint should evolve into standard legislation and best practice guidance that can be provided to local authorities and suppliers.

It is recommended that once the vision, strategy and initial blueprint have been developed, they should be published and open to public consultation. This will be an important step in ensuring that stakeholders are involved in the debate about the role of e-voting in the overall electoral modernisation process.

Further analysis of these issues is contained in the Commission's separate summary paper, 'Key issues and conclusions'.

¹ Hereafter referred to as the Ministry of Justice following the machinery of government changes on 9 May 2007.

² On prompting, 83% of those polled in Sheffield knew that new channels were being tested.

³ In 2003, there were two additional remote channels: digital television and text message; utilisation of these channels has not been taken into account in calculating this figure.

⁴ The Electoral Commission, *The shape of elections to come* (2003).

Further information

All evaluation reports for individual electoral pilot schemes are available from our website.

In preparing the evaluation of the 2007 electoral pilot schemes, the Commission has drawn on findings from work undertaken by a number of contractors, including technical and accessibility experts. Their reports are available from our website.

Further information on electoral pilot schemes is available from the Ministry of Justice website, www.justice.gov.uk.

Feedback

Please contact:

Mark Williams
The Electoral Commission
Trevelyan House
Great Peter Street
London SW1P 2HW

Tel: 020 7271 0566

Fax: 020 7271 0505

Email: mwilliams@electoralcommission.org.uk
www.electoralcommission.org.uk

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