Chapter 7
Responsive and Robust Technical Infrastructures

The building blocks of a robust and responsive technical infrastructure create the foundation for e-parliament. This includes hardware, software, applications and services, and a well trained staff who understands the nature of a legislative body.

The basic technologies that are essential for e-parliament are similar to those needed by other large public and private institutions in the Information Society. This similarity enables parliaments to benefit from the many improvements that are continually being made as well as the ongoing reduction in costs due to technology developments. For example, not only are desktop and laptop computers becoming less expensive, but they are also becoming more powerful and available in a variety of forms that make them easier to use in more locations. Netbooks, smart phones and e-book readers are rapidly changing the ability of everyone to have access to some level of computing and communication capacity.

Similarly the availability of open source software that can address the needs of parliaments is beneficial. While there are issues of training and support for these programmes, they have significant potential for ICT in legislatures and they continue to grow. *Bungeni*[1] offers an example of complete applications built on open source software that support major parliamentary activities.

Local area networks are essential to the work undertaken daily in parliaments, which involves multiple actors – members and staff – and multiple bodies – the committees, the plenary and the various offices. A wired network requires a labor intensive effort to build and to maintain, yet it is one of the most important instruments for a public institution. Wireless capabilities provide additional advantages for mobility and access, but there is still a fundamental need for a wired system to ensure adequate bandwidth and security.

The Internet has become a critical resource for parliaments. Fortunately the world is experiencing a growing connectivity and many developing countries are gaining increased access to the global network. The challenge, however, is to provide sufficient bandwidth to support the many types of information that are becoming available. This is a challenge that even developed countries face, and a number of them are initiating policies and programmes to address this issue. As noted in previous chapters, mobile communication systems and devices are also growing and improving dramatically, and parliaments should take full advantage of them.

More opportunities for external communication – whether wired or wireless – expand the need for better security, safeguarding of member confidentiality, and adequate defenses against hacking and cybercrime. While some parliaments have long recognized the critical nature of this

1 See Chapter 5 on Systems and standards for parliamentary documents.

requirement, others have been slower to take appropriate measures.[2] This is a challenge that parliaments acting on their own can solve only in part. It calls for coordinated efforts with other public institutions within the country and with other organizations on a global basis. These efforts need to encompass both sound polices and best practices.

Parliaments must also develop the services that support the acquisition, maintenance and use of basic technical components such as computers and networks. These include a help desk, data network operations centers and application development teams. These services, in turn, support the most important legislative, oversight and representational work of parliaments by enabling them to create and manage documents, record and publish proceedings of plenary and committee meetings, and communicate with citizens.

A number of parliaments have begun to implement technological solutions on the floor, adding considerably to the efficiency of plenary sessions. These include workstations for every member, electronic voting, the availability of internal documents and agendas in digital format, large display screens, and access to e-mail and the Internet from the member's seat. Workstations often have a very small footprint, which is important for preserving the historic buildings in which many parliaments work. The introduction of these technologies on the floor has been possible due to the investments made by parliaments on basic infrastructure, including physical devices, communications networks and the staff to support them.

The single most important element of the technical infrastructure is the staff. PCs, networks, and applications must be acquired and supported by people who have expert knowledge and an understanding of legislative bodies. They can be internal employees or external contractors hired to fill gaps in capacity and knowledge. It is essential that those who allocate parliament's resources understand the critical importance of capable and well trained staff.

While ICT staff need the most current information and training, there is also a growing recognition of the need for educating members about technology, as well as staff of the parliamentary administration, who are often among the most frequent users of systems and generate their content. To be used effectively, technology can no longer be the province of a few; members and staff at all levels must have an understanding of its strengths and limitations.

Even though costs are decreasing, there is a minimum level of investment that must be borne by every parliament, even those in developing countries. Contributions from the international community or outside organizations may be helpful for startup, but ongoing support, upgrades, and maintenance remain the responsibility of the parliament itself. The findings presented in Chapter 4 suggest that ICT require somewhere between 3% and 4% of the total budget of the parliament.

As stated numerous times in this document and in the 2008 Report, technology is not an end in itself. A robust and responsive infrastructure is the means by which parliaments become more efficient and more importantly, more transparent, accessible and accountable to the public. It is one of the essential ingredients for achieving these goals in the modern political world.

2 World e-Parliament Conference 2009, Washington D.C., November 2009. Specialized Session on Security and reliability of technical infrastructures: challenges for parliaments,. [http://www.ictparliament.org/wepc2009/].

RESULTS AND FINDINGS FROM THE 2009 SURVEY

The 2009 survey focused on four key requirements for building a robust and responsive infrastructure for a legislature: 1) basic technologies and services, such as the acquisition and management of PCs, networks, and software; 2) systems that provide support for the most essential functions of a parliament, such as managing documents and conducting plenary sessions; 3) levels of service and staff support; and, 4) training for technical staff, members, and other users.

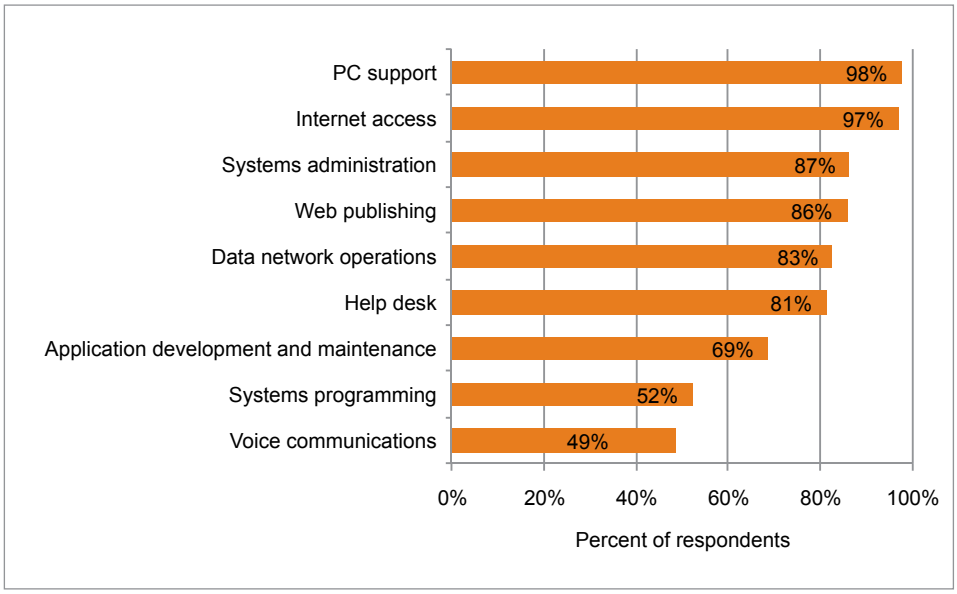
Basic technical services

Reliable electrical power is one of the basic prerequisites for any public institution using technology. It is a concern, therefore, that in response to the question "Does the parliament have reliable electrical power 24 hours per day?" 16% of chambers replied "No".[3] This represents an increase since 2007 in the number of parliaments that have to address this problem. In the 2009:2007 Compare Group, the percentage rose from 6% to 10% in the two years between the surveys. Whatever the causes may be – weakening economic conditions, technical limitations or poor management of critical resources – the fact is that this is an obstacle as serious as the digital divide.

As shown in Figure 7.1, most parliaments reported that they are able to provide basic ICT services such as PC support, systems administration, web publishing, and network operations. These results are similar to those from the 2007 survey, although there has been a decline of 18 percentage points in application development and maintenance services[4] (the extent of this drop is confirmed by an analysis of the 2009:2007 Compare Group which showed a decline of 16%).

In addition to the services shown in Figure 7.1, 96% of parliaments have a local area network (LAN) and the average number of physical connections reported per parliament is 2.171[5]. Also, 77% of parliaments have wireless access and 8% are planning or considering it. However, 15% reported that they do not have wireless access and are not planning or considering it.[6]

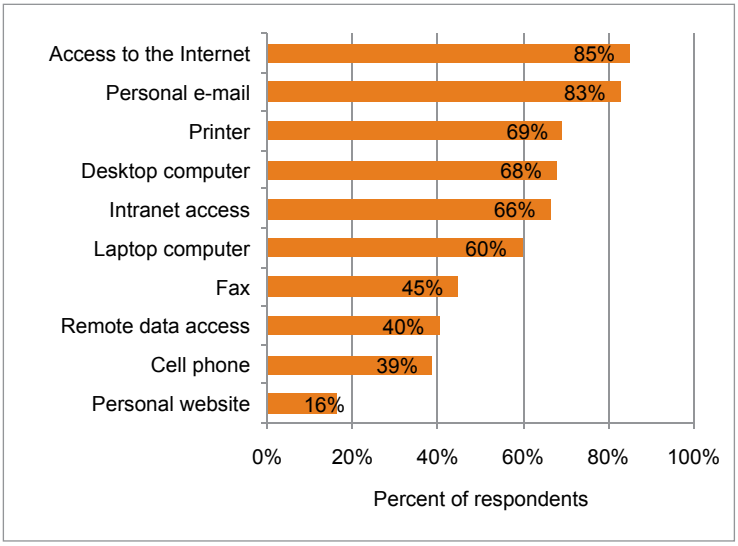
Figure 7.1: General ICT services available in the parliament



(Source: Survey 2009, Section 2, Question 1; 134 respondents)

3 Source. Survey 2009, Section 2, Question 13.
4 United Nations, Inter-Parliamentary Union, Global Centre for ICT in Parliament, *World e-Parliament Report 2008*, [New York]: United Nations, 2008, p.39, [http://www.ictparliament.org].
5 Source: Survey 2009, Section 2, Questions 4 and 5.
6 Source: Survey 2009, Section 2, Question 9.

Figure 7.2: ICT services provided by parliaments to members



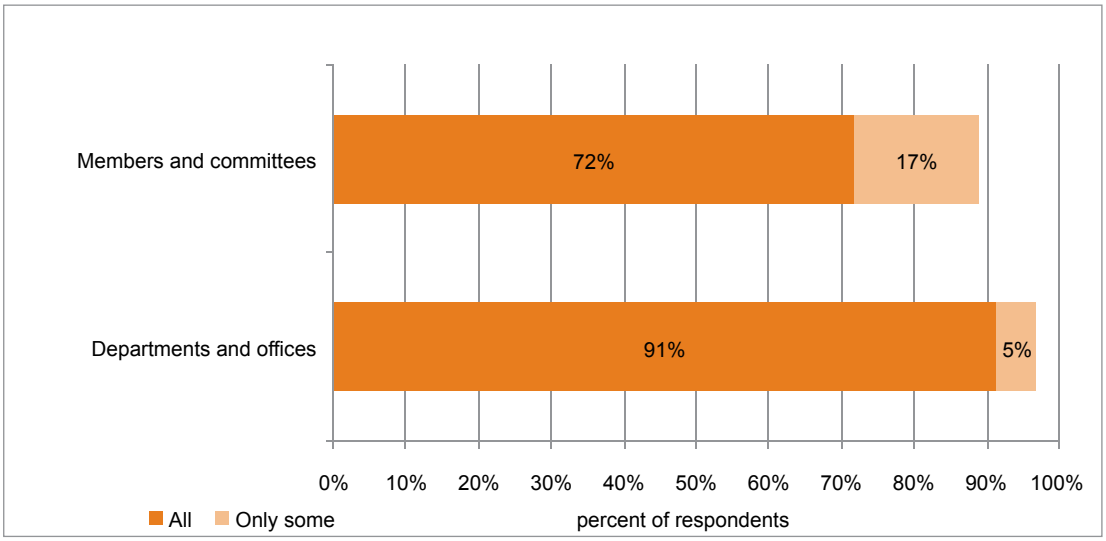
(Source: Survey 2009, Section 2, Question 2; 134 respondents)

Most parliaments are also able to provide basic equipment and important technical services for members, such as access to the Internet, personal e-mail, printers and a PC (see Figure 7.2). 80% of parliaments provide members with either a desktop PC or a laptop; 48% are able to supply both.[7]

Taken together these findings suggest that most parliaments are doing reasonably well in providing members with basic technology to support their work and communication with citizens, although 20% still do not provide legislators with a computer and 15% do not provide them with access to the Internet.

It is also important to note that while nearly all parliaments have a LAN and 92% report that all departments and offices are connected, only 72% state that all members and committees are connected (see Figure 7.3).

Figure 7.3: Members, committees and departments connected to the LAN



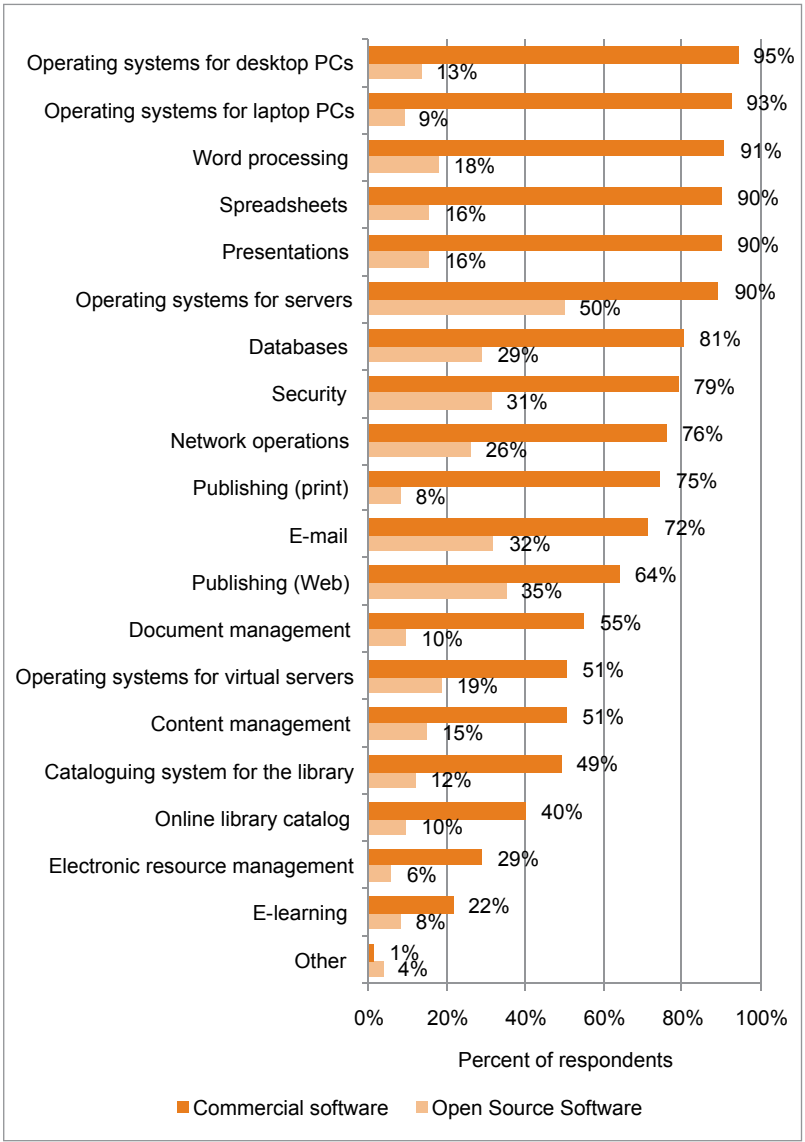
(Source: Survey 2009, Section 2, Question 6; 128 respondents – 96% responding "yes" to Question 4)

The full value of a LAN for a parliament can only be realized when all members and committees are connected. The lack of complete connectivity can create duplication of work, makes the parliament less efficient, and risks excluding some users from having timely access to important information and documents. A necessary criterion for an e-parliament is that all members and committees are connected by a local area network.

7 Source: Survey 2009, Section 2, Question 2. This finding is based on a separate analysis of the data not shown in Figure 7.2.

Open source software can be of particular interest to parliaments since it can help reduce costs. Figure 7.4 shows the comparative use of commercial software and open source software by parliaments for various operations, services, and applications.

Figure 7.4: Use of commercial and open source software



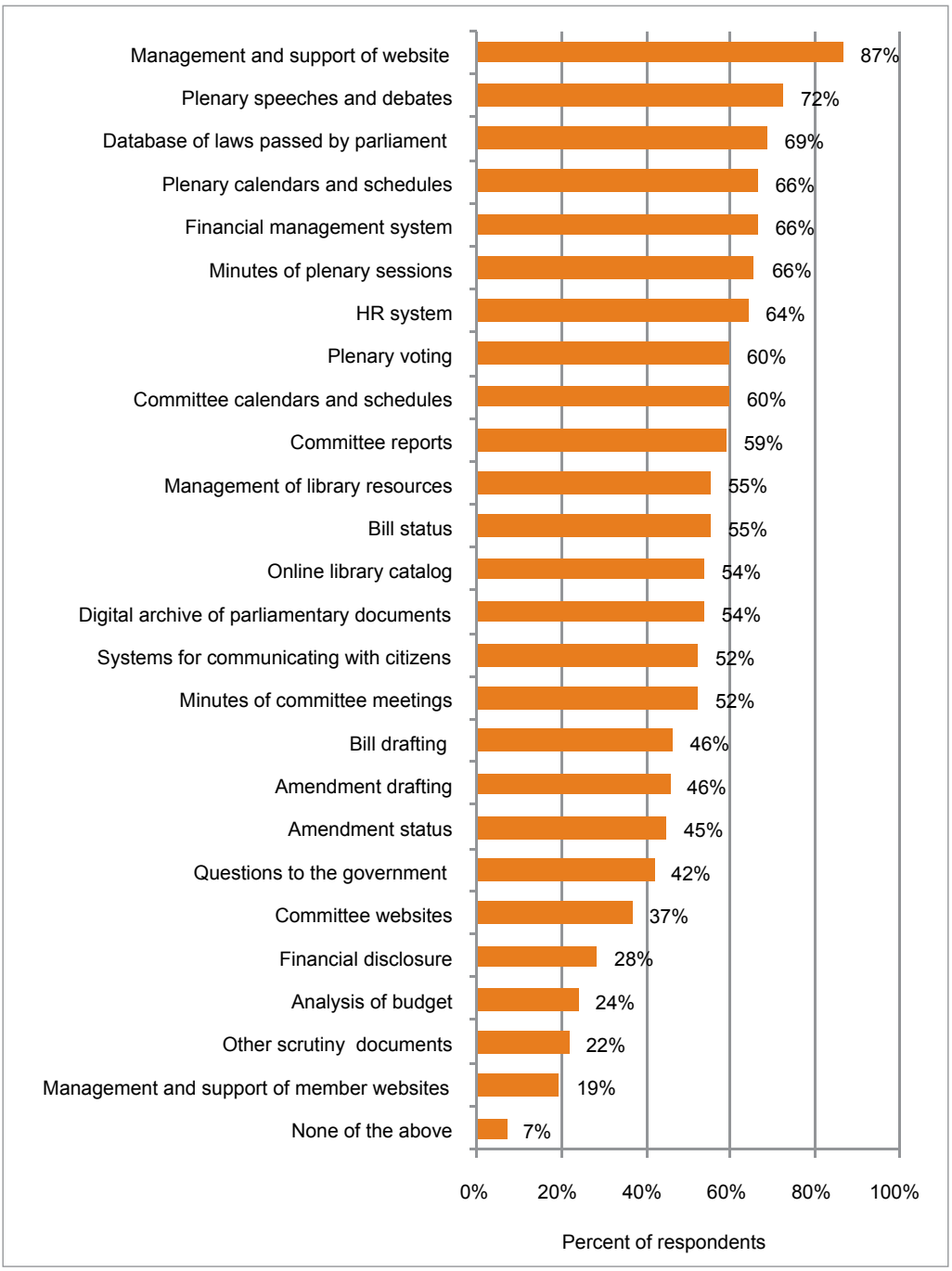
(Source: Survey 2009, Section 2, Question 14; 134 respondents)

Additional analyses of the responses to this question indicate that 74% of parliaments use open source software for at least one purpose; two parliaments reported that they use open source exclusively; and eight institutions use open source for more purposes than they use commercial software. Open source was used by the largest percentage of parliaments for operating systems for servers (50%) and web publishing (35%). The average percentage of parliaments using commercial software for any one application is 65%; the average using open source software is 18%. These findings document the relative dominance of commercial software among parliaments today.

Support for parliamentary functions

One of the primary values of the basic tools and services of technology is that they enable a parliament to create systems that serve its legislative, oversight, and representational work. Figure 7.5 shows the percentage of parliaments that have implemented a system to support the most important activities of a legislature.

Figure 7.5: Parliamentary functions supported by ICT



(Source: Survey 2009, Section 2, Question 15; 134 respondents)

Among the top 10 functions supported by ICT in most parliaments, four relate to plenary activities, two to the work of committees, two to administration, one to legislation, and one to communication. Figure 7.6 provides the details.[8]

Figure 7.6: Categories of top 10 functions supported by technology

Category	Function	% of parliaments
Communication	Management/support of the website	87%
Plenary	Plenary speeches and debates	72%
Legislation	Database of laws	69%
Plenary	Plenary calendars and schedules	66%
Administration	Financial management	66%
Plenary	Minutes of sessions	66%
Administration	Human resources	64%
Plenary	Voting	60%
Committees	Calendars and schedules	60%
Committees	Reports	59%

(Source: Survey 2009, Section 2, Question 15; 134 respondents)

Given the importance of websites for providing transparency and accessibility to the parliament, it is a positive finding that the function supported by the largest percentage of parliaments is the management of their website (87%). It is also notable that all of the functions supporting the work of the plenary included in the survey are ranked among the top 10. Because much of the work in many parliaments takes place in plenary, this finding is understandable. ICT can help plenary sessions be more efficiently conducted and reported. In addition, since nearly all parliaments must be able to manage their finances and provide services related to human resources, it is reasonable that many parliaments have applications to support this work.

It is somewhat of a concern that of the five functions that relate to legislation, only one – a database of laws passed by the parliament – ranks in the top 10, and only one other – the status of bills – has been implemented by at least 50% of all parliaments. The remaining three legislative applications – bill drafting, amendment drafting and amendment status – fall below 50%. And functions supporting oversight and budget review fall even below these three.

Finally, as seen in Figure 7.5, the only communication function supported by a large number of parliaments is the management of the website. Support for other communication methods has been implemented in just over half (52%), while support for committee websites, member websites, and financial disclosure, which is especially important for accountability, falls even lower.

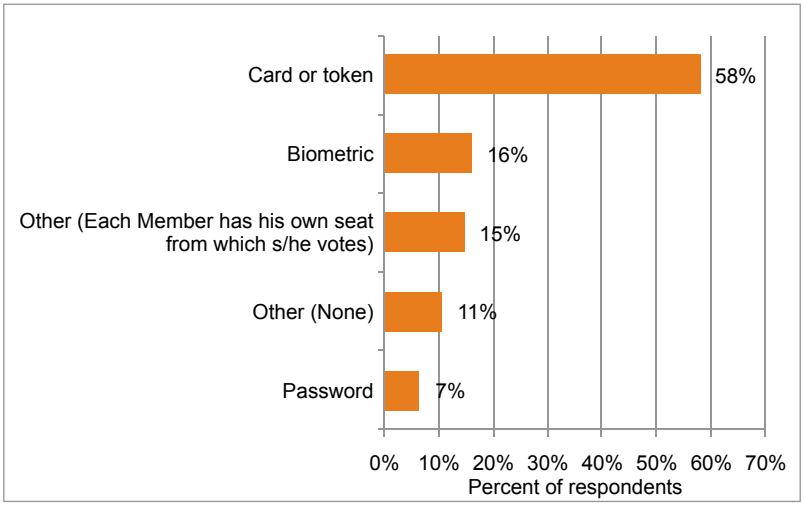
There are other findings from the survey that show considerable support for the work of the plenary. However, support for other functions directly related to legislation, budget, oversight, and communication is lagging behind.

8 Of the 25 functions included in this question, 5 relate directly to legislation, 5 to communication, 4 to the plenary, 3 to committees, 3 to oversight and the budget, 3 to information support, and 2 to administration.

Support for plenary activities

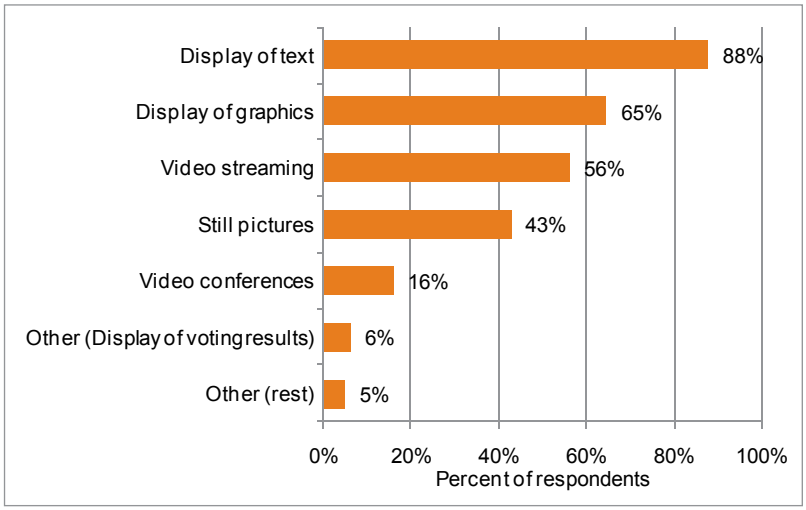
In addition to the applications noted above, many parliaments have introduced a number of technologies directly on the floor. For example, 81% of parliaments either have electronic voting systems in the plenary or are planning or considering it. The average number of times these systems are used in a year is reported to be close to 1.000.[9] The primary mode of authentication is a card or token (58%); other methods, currently used in far fewer parliaments include biometrics, seat location, and passwords. Four legislatures reported that they use two methods (see Figure 7.7).

Figure 7.7: Methods of identification and authentication for e-voting



(Source: Survey 2009, Section 2, Question 19; 74 respondents – 56% responding "yes" to Question 16)

Figure 7.8: Purposes for digital displays in plenary



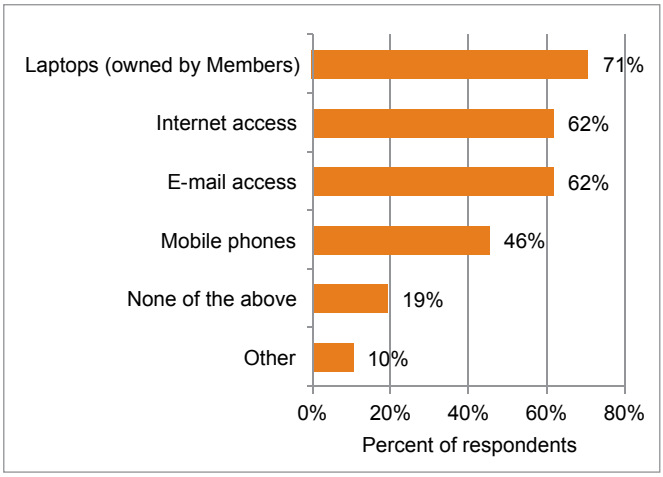
(Source: Survey 2009, Section 2, Question 21; 82 respondents – 61% responding "yes" to Question 20)

Digital displays are used in the plenary halls of 62% of parliaments, and an additional 19% are planning or considering their use.[10] The purpose identified by most parliaments in Figure 7.8 is to display text (88%), followed by the display of graphics (65%), and video streaming (56%).

9 Source: Survey 2009, Section 2, Question 16.
10 Source: Survey 2009, Section 2, Question 20.

Just over half of all parliaments either provide members with a PC in the plenary room or are planning or considering it (29% and 25% respectively).[11] However, 71% allow members to bring their own PCs into the chamber and most permit Internet and e-mail access. Mobile phones are permitted by 46% of parliaments (see Figure 7.9).

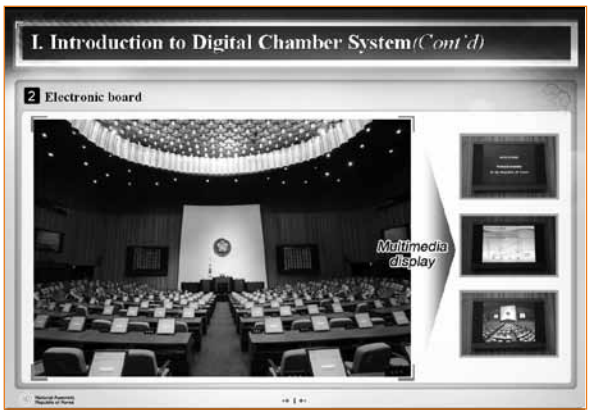
Figure 7.9: Technologies and services permitted in plenary



(Source: Survey 2009, Section 2, Question 24; 134 respondents)

Among the chambers that have introduced workstations on the floor are the National Assembly of the Republic of Korea – using touchscreens for voting - and the Parliament of Ukraine. They both refer to their plenary as "digital chambers" and made fast progresses in linking system, databases and services to each member's workstation on the floor (see Figures 7.10 and 7.11).

Figure 7.10: Use of digital displays and workstations at the National Assembly of the Republic of Korea



(Source: Presentation by Shin Hang Jin, Director, Legislative Information System Office, National Assembly of the Republic of Korea, at the World e-Parliament Conference 2009)

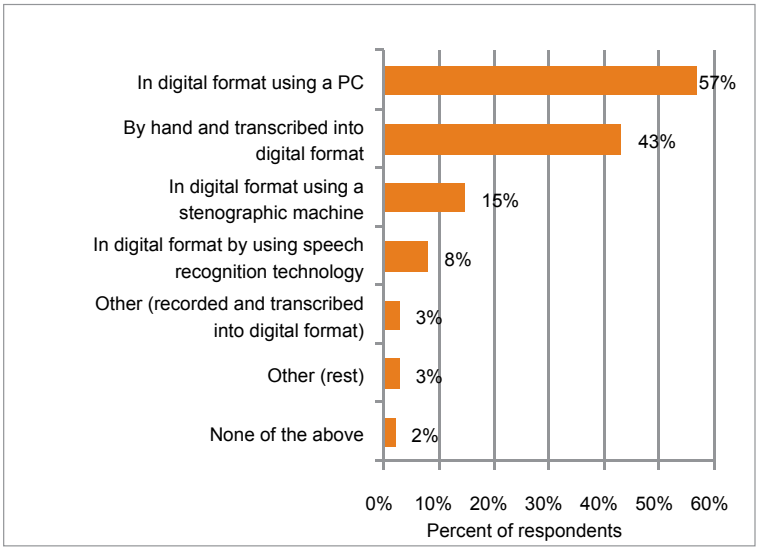
Figure 7.11: Members' workstation of the Parliament of Ukraine

(Source: Presentation by Oleksiy Sydorenko, Head, Computer Systems (IT) Department, Parliament of Ukraine, at the World e-Parliament Conference 2009)

11 Source: Survey 2009, Section 2, Question 22.

Parliaments employ a variety of techniques to prepare verbatim reports of plenary sessions, and 25% reported using more than one (see Figure 7.12). Technology is essential for enabling parliaments to provide current records of their proceedings both for themselves and for the public. As noted in Chapter 2, a number of parliaments are now offering video webcasts of plenary proceedings (43%) or are planning or considering it (29%). Depending on how many parliaments decide to implement this technology, webcasting may become one of the predominant modes for providing timely verbatim records.

Figure 7.12: Preparation of verbatim reports



(Source: Survey 2009, Section 2, Question 25; 134 respondents)

Digital text versions, however, still offer a number of advantages, such as ease of searching and the ability to read through a report quickly. For these reasons, and because webcasting technologies are still comparatively more expensive, both for the provider and for the recipient, many parliaments, especially those in low income countries are still seeking affordable but efficient methods for creating plenary records. This sentiment was clearly expressed by participants at the World e-Parliament Conference 2009 during the session on technology options for recording and reporting floor and committee proceedings.[12]

It is highly likely that the applications that have been developed to support plenary sessions, together with the technologies that have been introduced on the floor have helped to improve the distribution of documents, make operations more efficient, and enable the record to be made available more quickly. They also provide the underpinnings to transparency and accountability.

What is not known from the survey and requires further research is how helpful the individual members find these technologies to be in their deliberations and which ones they find to be the most useful. Parliaments need to be as efficient as is reasonable given the nature of their mandate, but the legislative process is one of proposal, discussion, and compromise. This process is dependent on accurate and current information and analysis, and the availability of convenient (and sometimes confidential) communication channels. To be of the greatest benefit to parliaments and legislators, chamber technologies need to be planned to support all of these requirements.

12 United Nations, Inter-Parliamentary Union, U.S. House of Representatives, Global Centre for ICT in Parliament, *World e-Parliament Conference 2009: 3-4-5 November 2009, U.S. House of Representatives, Washington D.C; Report*, [New York]: United Nations, 2010 [http://www.ictparliament.org].

Service levels and ICT staff

Having agreements with external contractors on the level of service to be provided - and the means for measuring those levels - is a best practice in ICT. Figure 7.13 shows the percentage of parliaments that have service level agreements (SLAs) with external contractors and with internal clients - i.e., structures within the parliament for whom the ICT department provides equipment or services.

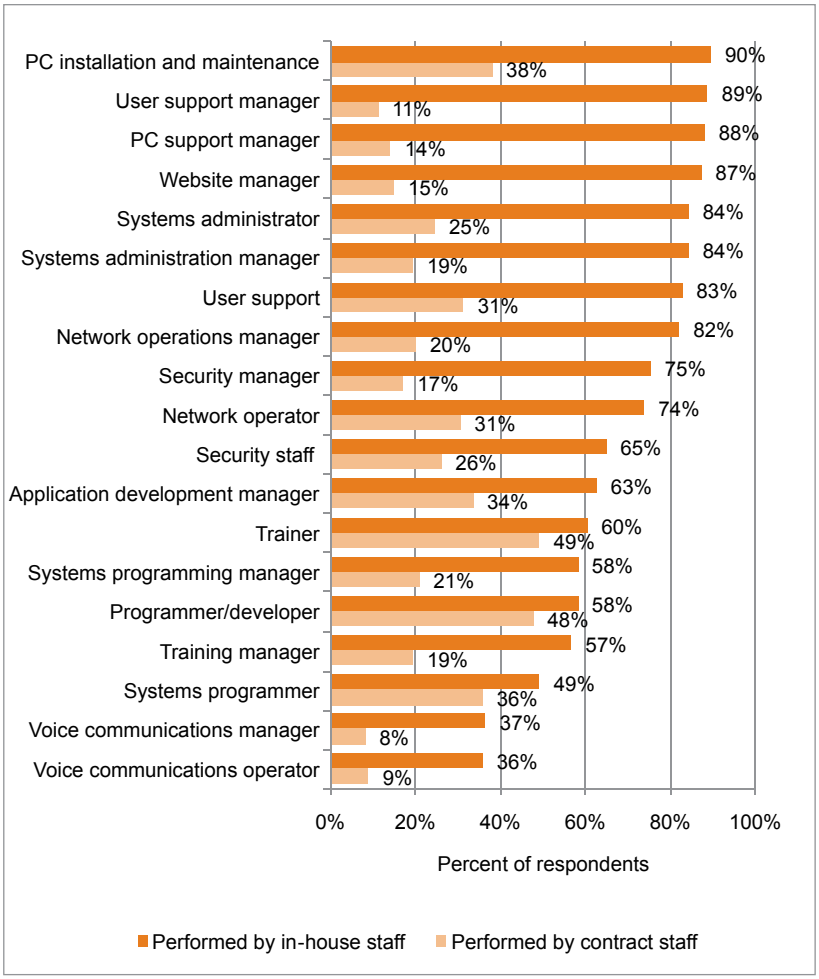
As Figure 7.13 indicates, parliaments are more demanding of external contractors than they are of their own ICT departments for achieving specific levels of service.

Figure 7.13: Service level agreements

Service level agreements	with contractors	with internal clients
Yes with all	24%	11%
Yes with some	61%	28%
Planning or considering	9%	24%
No, and not planning or considering	7%	37%

(Source: Survey 2009, Section 2, Questions 11-12; 123 and 120 respondents respectively)

Figure 7.14: Functions performed by in-house staff and contractors



(Source: Survey 2009, Section 2, Question 26; 134 respondents)

Data from the 2009 survey suggest that parliaments tend to rely more on internal staff than on contractors. For all respondents, the average number of internal ICT staff is 38 compared to 13 contractors. For the 2009:2007 Compare Group the numbers show an almost 40% increase in the average number of internal staff (from 34 in 2007 to 47 in 2009). For contractors the 2009:2007 Compare Group shows a 20% decline (from 23 in 2007 to 18 in 2009).[13]

In this context it is useful to note how parliaments tend to use external contractors versus internal staff. Figure 7.14 shows the functions performed by these two groups.

13 Source: Survey 2009, Section 1, Questions 15 and 16; Survey 2007, Section 1, Questions 12 and 14.

As was found in the 2007 survey, parliaments tend to use their own staff rather than contractors to *manage* ICT functions. They also show greater reliance on internal staff for functions that are closer to the user, such as PC installation, maintenance, and support and user support. There are no functions for which more parliaments reported using external contractors than internal staff.

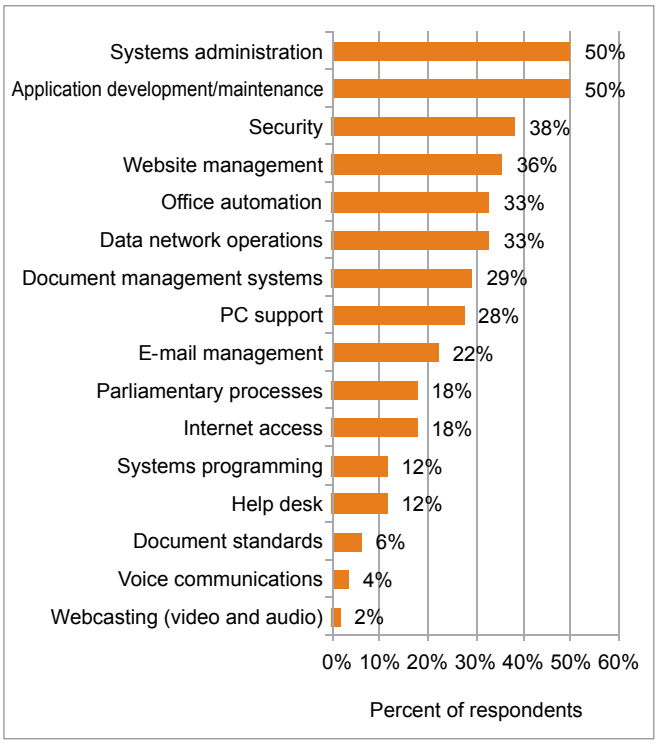
Two areas in which contractors play a relatively larger role are Application Development - both as managers and as programmers/developers - and Training - both as managers and as trainers. Based on the analysis of the responses by the 2009:2007 Compare Group, the percentage of parliaments using internal managers and staff for Application Development actually declined by about 10% in the past two years; the percentage of parliaments using contractors as programmers/developers increased by more than 25%.

Interestingly, results from the 2009:2007 Compare Group indicate that the percentage of parliaments using both internal staff and contractors for Training increased. This suggests that parliaments are placing more emphasis on training and are more likely to use both parliamentary staff and contractors for this function. Given other findings from the survey and the emphasis placed on the need for training by many participants at the World e-Parliament Conference 2009, this is a positive sign.

Training

84% of parliaments provide training, through either internal or outside services, for in-house ICT staff. Although the wording of the question regarding training in the 2007 survey was somewhat different, it was similar enough for comparison purposes. The analysis of the responses of the 2009:2007 Compare Group shows a substantial and positive increase, from 67% to 82%.

Figure 7.15: Training priorities



(Source: Survey 2009, Section 2, Question 29; 112 respondents – 84% responding "yes" to Question 27)

The average percentage of staff receiving training is 46%; the median is 40%. The figures for 2009:2007 Compare Group are similar and have remained the same during the past two years: the average was 49% and the median was 50% for both years of the survey.[14] These findings may mean that while more parliaments have recognized the need for and the value of training for their own staff, there are limits to how many can be provided with training in a year.

Figure 7.15 shows a wide range of training needs for ICT staff. One half of all parliaments listed systems administration and application development among their top five priorities. Four other areas were listed by approximately one third of respondents: security (38%), website management (36%), office automation (33%), and data network operations (33%). Given the increasing concern

14 Source: Survey 2009, Section 2, Questions 27 and 28; Survey 2007, Section 2, Question 16 and 17.

over security, it is a good sign that parliaments are seeking training for their staff in this critical area. The fact that many parliaments also listed office automation indicates the basic level at which many legislatures must begin their training.

The importance of training for others besides ICT staff is also being recognized. Figure 7.16 shows the percentage of parliaments that provide technology training or orientation for members and for non-ICT staff. The fact that almost 90% of parliaments either have such training/orientation programmes or are planning or considering them is very positive.

Figure 7.16: Provision of training to members and non-ICT staff

Response	Members	Non-ICT Staff
Yes	61%	71%
Planning or considering	26%	19%
No, and not planning or considering	13%	10%

(Source: Survey 2009, Section 2, Questions 30 and 31; 134 respondents)

SUMMARY

E-parliament is built on the foundation of a robust and responsive technical infrastructure. That foundation must include hardware, software, applications, services and security, and a well trained staff that understands the legislative environment. Advances in PCs and servers, software (particularly open source), networks, applications, and communications (especially web-based social media and mobile communication services), are providing more technical options at lower costs for parliaments to become more efficient and to increase their levels of transparency, accessibility and accountability. Well trained staff, however, including both internal and external contractors, are the single most important requirement for building and supporting the necessary infrastructure. The need for educating members and staff of the secretariat, who are primary users of technology is also being recognized. The infrastructure cannot be maintained, however, without a dedicated commitment to multi-year financial resources.

Findings from the 2009 survey regarding the technical infrastructure of parliaments suggest that there have been some advances, but also a number of continuing challenges. For example, there was an increase in the number of parliaments lacking reliable electrical power. This is an obstacle as fundamental and as serious as the digital divide.

Most parliaments, however, are doing reasonably well in providing members with the basic technology to support their legislative and oversight work and to be able to communicate with citizens. Among parliaments that have local area networks, though, almost 30% report that not all members and committees are connected. This can lead to duplicate work and to the risk of not providing timely access to information and documents to all concerned.

The use of open source software among parliament is still at a relatively low level and tends to be concentrated in a few areas, such as server operating systems.

Given the importance of websites for providing transparency and accessibility to the parliament, it is a positive finding that management and support of the website is the function supported by

the largest percentage of parliaments (87%). It is a concern, however, that of the five functions that relate to legislation, only one – a database of laws passed by the parliament – ranks in the top 10, and one other – the status of bills – has been implemented by only 55% of all parliaments. The remaining three legislative applications – bill drafting, amendment drafting, and amendment status – fall below 50%. And functions supporting oversight and budget review fall below these three.

There is considerable support for the work of the plenary. Among the top 10 activities supported through ICT by the most parliaments, the largest number (4) relate to the plenary. ICT help these sessions be more efficiently conducted and reported. Many parliaments have introduced or are planning or considering introducing a number of technologies on the floor. This includes those that have e-voting systems (81%) and digital displays (62%), and provide or are planning or considering providing personal computers (54%). Parliaments also employ a variety of techniques, including webcasting, to record and provide verbatim reports of plenary sessions. What is not known from the survey and requires further research is how helpful the individual members find these technologies to be in their deliberations and which ones they find to be the most useful.

Data from the 2009 survey also suggest that parliaments are relying more on internal staff than on contractors. Most parliaments use their own staff rather than contractors to manage ICT functions and for functions that are closer to the user, such as PC installation, maintenance, and support and user support. Two areas in which contractors play a relatively larger role are Application Development and Training.

There are indications of a growing recognition of the importance of training. 84% of parliaments now provide training for in-house ICT staff, a decisive increase from 2007. Also, there has been an increase in the percentage of parliaments that assign both internal staff and contractors to this function. The average percentage of staff receiving training each year among all parliaments is close to 50%, a figure comparable to the findings of 2007. Among the top training priorities for the most parliaments are systems administration, website management, and security. A large percentage of parliaments are also providing ICT training or orientation courses for members (61%) or are planning or considering providing it (26%). Even more of them already provide training to non-ICT staff (71%), and 19% are planning or considering it.

The overall sense from these findings is that many parliaments are making progress in implementing a robust and responsive infrastructure, particularly in providing technical support for members and plenary activities, and in conducting training programmes. However, in addition to the serious problems faced by those that do not have reliable electrical power, areas of concern are the lack of connectivity of all members and committees to intranets and the lag in development of applications that support legislative activities.