An Ethical Approach to the Development of Systems for Electronic Democracy

A thesis submitted for the degree of Doctor of Philosophy to Charles Sturt University by Michael Edward Bowern BSc.(Eng).Hons, MEng.(QM)

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Certificate of authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Charles Sturt University or any other educational institution, except where due acknowledgement is made in the thesis. Any contribution made to the research by colleagues with whom I have worked at Charles Sturt University or elsewhere during my candidature is fully acknowledged.

I agree that this thesis be accessible for the purpose of study and research in accordance with the normal conditions established by the Executive Director, Library Services or nominee, for the care, loan and reproduction of theses.
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Abstract

The research question addressed in this thesis is how can the use of ICT in democratic processes provide a society with an improved democracy? There are two presuppositions in this question: a) that democracy needs improving, and b) that ICT can contribute to any improvement in democracy.

Over the last thirty years, the dominance of market economics and globalisation, and the increased influence of business on government decision making, has resulted in a loss of trust by citizens in their governments, suggesting the need to improve democratic processes.

Examples show that ICT has already been used with some success in electronic voting and vote counting. ICT also could also provide opportunities for greater participation by citizens in their political society. However, problems can arise from the use of ICT in democratic processes. The rate that new innovations occur, and the invisibility factors of software, result in policy vacuums; meaning there could be violations of democratic principles through the use of ICT.

The conclusion reached is that improvements to democracy should be implemented by designing new democratic processes which maximise methods of participation and deliberation; and which apply democratic principles such as political equality and transparency. When the process has been designed, the role, if any, for ICT can be identified.

It is argued that the rigorous methods followed to develop high-integrity computer systems, such as those for aviation, should be used to develop applications for democratic processes. These methods are summarised as four principles for the use of ICT in systems for democracy - use appropriate technology, use open standards, use rigorous development processes, and use superior governance.
Chapter 1. Introduction to the thesis

1.1. Introduction

Chapter 1 is in three main parts. It starts by providing a statement of the problem addressed in this thesis, with reference to examples of what some people perceive as failures in the actions of modern representative governments in the western liberal tradition. The opportunities and problems of using information and communications technology (ICT) in solutions to these problems of democracy are also part of the problem statement. The aim of this thesis is identified from the problem statement, which is to answer the research question:

How can the use of ICT in democratic processes provide a society with an improved democracy?

‘Ethics and electronic democracy’ is a broad topic and it is not possible to explore all aspects in detail. Therefore the second part of the chapter includes the assumptions that have been made, together with other limits placed on the areas being considered. The definitions of some of the terms used in the thesis are also supplied.

The third part of this chapter is an outline of the structure of the thesis, through a summary of the remaining chapters.

1.2. The problem statement

Many forms of Government have been tried, and will be tried in this world of sin and woe. No one pretends that democracy is perfect or all-wise. Indeed, it has been said that democracy is the worst form of government except all those other forms that have been tried from time to time (Churchill, 1947).

The idea that democracy is the preferred way to form the government of a society came into global prominence in the second half of the 20\textsuperscript{th} century, particularly after the Second World War and the formation of the United Nations. Article 21 of the UN Universal Declaration of Human Rights states that every person has the right to take part in the government of his country. As colonies gained their independence many chose to establish some form of democratic government. In addition, the established western democracies instigated reforms to enhance their particular models of democracy.
The last sentence of the quotation above, by Winston Churchill, is often mentioned in debates and discussions about democracy. In some ways it is paradoxical, and probably would have been forgotten had anyone else said it. However, the problem statement can be partly explained by considering what the quotation implies. That is, in spite of the contestation over the meaning of democracy and how it should work in practice, we should continue to use government by this method, because any other form would be much worse. In addition, we can still search for the best form of democracy from the many forms that are available.

In a nutshell, this thesis is about a set of the current problems of societies as representative democracies, particularly in established democracies such as Australia; and whether the use of ICT can provide solutions to these problems.

1.2.1. Democracy

An initial issue is the definition of democracy. Churchill led the government of the UK, which is a constitutional monarchy, as is Australia. France and the USA are republics. All four nations consider themselves to be democracies, as do many other nations. Literally, democracy means rule by the people, sometimes referred to as the will of the people. Therefore democratic systems of government involve the citizens in some way. The usual, but not the only way is for citizens to elect representatives from among their number, on a regular basis, to form a government. These representatives make laws, collect and spend taxes, and implement policies.

Those ‘other forms’ of government to which Churchill refers would include, for example: an absolute monarchy, often based on an hereditary line; a dictatorship, military, benign, or otherwise; an oligarchy, ie. rule by a few people; and an aristocracy, ie. rule by an elite group. These are not democratic governments because they are ruled by one or a few people rather than by the citizenry or their elected representatives.

However, if ‘rule by the people’ means rule by those representatives who receive a majority of the votes cast by citizens in a free and fair election, it raises issues such as:

a) how a ‘citizen’ is defined;
b) who is allowed to elect the representatives;
c) who can be a representative;
d) what are free and fair election processes;
e) how the needs of minorities are addressed;
f) how citizens can participate in their society, apart from voting; and
g) how citizens can ensure that elected representatives do not misuse their power?

These have been issues of contention over the ideas of democracy for many centuries, and perhaps this range of issues provides some of the reasons why Churchill thought democracy was the ‘worst form’ except for all the others.

The developed democracies have found answers to many of these issues. Australia has a clear definition of a citizen, based on age and residency qualifications; it has established reliable and transparent electoral systems; citizens do have ways to participate in addition to voting, for example by voting in a referendum for changes to their Constitution; and importantly, there are some processes to improve aspects of the democratic system.

1.2.2. Contention in democracy

There is no agreed definition of democracy, and no particular implementation or model is considered truly satisfactory.

Democracy, as an idea and as a political reality, is fundamentally contested. Not only is the history of democracy marked by conflicting interpretations, but also ancient and modern notions intermingle to produce ambiguous and inconsistent accounts of the key terms of democracy, among them the proper meaning of ‘political participation’, the connotation of ‘representation’, the scope of citizens capacities to choose freely among political alternatives, and the nature of membership in a democratic community (Held, 1996, p xi).

Held refers to contestation in two areas, the idea of democracy, and democracy as a political reality. The list in the previous sub-section provides some examples of the areas of contention in the idea of democracy. The second area of contestation in the quotation above is between:

a) what happens in a society professing to be democratic, that is the fact of democracy; and
b) what ought to happen in a society which is actually democratic, that is the norm of democracy.

This second area of contention is the focus of the research question in this thesis.

1.2.3. Political equality and political liberty

There are several principles which apply to the various versions of democracy, and which contribute to how democracy ought to be implemented. These principles are
described in detail in later chapters. However, there are two basic principles, political equality and political liberty, which should be practiced in any democratic system. Orr summarises political equality and political liberty as follows:

Political equality should be a core value in any democratic society. It is based on the idea that all are born equal, deserve equal respect and opportunity, and should have equal voice. Put this way, the ideal of political equality is a rich but deceptively simple one. It exists in a creative tension with another fundamental value, political liberty. Liberty asserts that people are born free and should, as far as possible, be the authors of their lives. Political liberty, then, is the ideal that people should be free to develop, express and advance their beliefs about what makes a good life in a good society (Orr, 2004, p1).

The ‘creative tension’ between these two values has resulted in a major point of contention in the idea of democracy, namely how these values ought be implemented in practice.

Representative democracy, as the current form in most societies, has grown out of a focus on political liberty, but political equality can be recognised in this form in the idea of free and fair elections. However, some believe that political equality should mean more than just voting for representatives, and this view can be seen in the emerging ideas and methods of participatory democracy.

Detailed descriptions and analysis of the various models of representative and participatory democracy, and how these and other principles might be applied in practical democratic decision procedures, are provided in later chapters.

1.2.4. The thesis meaning of democracy

While it is not the role nor the purpose of this thesis to define which model or conception of democracy is the ‘right’ or the ‘best’ one, it is appropriate to define what I take democracy, as the will of the people, to mean. Thus:

Democracy as popular power should be seen as a continuous process of interaction between government and society, with a maximum involvement of the people in public decision-making at every level. The substance of democracy is the power of the people to make governments, and make their representatives accede to the popular will and popular demands. The process is participatory and deliberative. Policies are not simply proposed and debated, but are evolved through discussion and by taking into account, as far as possible, the variety of interests and viewpoints expressed by those involved. It is the people, not the government or parliament who are sovereign, and it is the business of government to accept and to implement the popular will. (Arblaster, 2002, p90-94)

This statement describes how I think a democratic society ought to act. It recognises the importance of representative government, and stresses the need for
on-going participation and deliberation by the people ‘at every level’. While it appears to be idealistic, it is consistent with the views of other commentators, for example Saward (2003b). Although an ideal vision of democracy may never be reached, it should always be possible to improve the practical applications of democracy, through a ‘continuous process of interaction between government and society’. This meaning is adopted because the current manifestation of representative democracy in Australia and elsewhere could be improved, as described in chapter 4.

1.2.5. Some problems with representative democracy

Australia is one of a group of nations described by Beetham (2005, p44) as ‘old’ democracies. Others include the democracies of Western and Northern Europe, North America and New Zealand. Beetham describes the ways that many citizens in these societies have become justifiably disillusioned with their representatives, because of a decline of government, in its:

a) autonomy – attributed to the increasing influence of businesses on government, and the privatisation of public services;

b) capacity - attributed to economic globalisation resulting in greater inequalities; and

c) credibility – for example through the politicisation of government agencies.

This disillusion is described in detail in chapter 4.

This thesis was written between 2004 and 2008. Until November 2007, when a federal election was held, a government from the political right was in power, with Prime Minister John Howard leading a coalition of the Liberal and National Parties. During this period, there were instances in Australia of what some might call misuse of power by this government, which are described later in this section.

While these examples focus on a particular government and its leader, it must be stressed that similar examples could apply to another government, at another time. They are consistent with Beetham’s (2005) examples for Europe, and support his analysis of the way that representative democracies have evolved since the mid 20th century.
The rise of prime ministerial power

One aspect of this evolution is the increase in the power of the leader, particularly the Prime Minister (PM), in governments following the Westminster System. Up to the mid 20\textsuperscript{th} century the PM was considered to be the ‘first among equals’. Generally this meant that, in theory, all Cabinet members had an equal role in making cabinet decisions, and all abided by those decisions, regardless of their personal views, and typically the PM was the public voice of the Cabinet.

In the latter half of the 20\textsuperscript{th} century prime ministers became more dominant, both through the power they took for themselves in government, and in the way they took on a prominent public role in the nation. Walter and Strangio (2007) describe this rise in prime ministerial power; from the Australian Labor Party (ALP) leader Gough Whitlam in 1972, through the period of three other prime ministers, both ALP and Liberal, to John Howard, elected in 1996. The end result of this rise in power has resulted in what Kelly (2005) describes as ‘prime ministerial government’.

Walter and Strangio state that functioning liberal democracies ‘ensure that leadership is diffused across institutional spheres’, in Australia these being the various levels of parliaments, governments, courts, plus the parties and the public service. They are ‘constrained to work collectively for the common good, with each elite…being held to account by leaders in another sphere’ (Walter and Strangio, 2007, p70). They note that the dominance of the PM has arisen as some institutions, such as parliament, political parties and the public service, have diminished. The findings of Beetham (2005) on citizens disillusion with governments, mentioned above, support this view.

At the Australian federal election in November 2007 the Coalition government was defeated by the ALP. As yet there is no indication that there will be any reversal towards the earlier concepts of the Westminster System.

Misuse of power

The question g) in 1.2.1 above, about the misuse of power by elected representatives, is one of on-going concern to some citizens. The following examples of misuse of power describe a serious decision which should have had the consent of citizens; and two other cases, being part of a pattern of political opportunism.
Going to war is always a controversial issue, and if a democratic nation decides to do so it should be done with the consent of citizens, at the very least through a parliamentary debate and vote. There was very strong public opposition to the decision to send Australian forces to participate in the invasion of Iraq in 2003 (Brett, 2007, p34), but there was no parliamentary debate before this decision was taken, to make it legitimate in the eyes of citizens. The Australian government would claim that it had been democratically chosen to represent the people, and by virtue of winning an election it had a mandate to make this decision. This is one example of a number of decisions made by the government which were considered unpopular by almost half of the electorate, who saw the PM ‘primarily as a partisan figure of conflict and division’ (Brett, 2007, p4).

The first case of a misuse of power as political opportunism is about changes to electoral laws for political advantage. Australia’s system of government is based on a Constitution which gives Parliament the power to enact laws setting up electoral systems and other aspects of democratic processes, such as political donations. Changes to the Australian Constitution are made democratically, that is they must be voted for in a referendum of all citizens. On the other hand, changes to the laws which define the detail of Australia’s electoral systems do not require citizens approval. This means it is possible for a government to enact electoral laws to their own benefit. In 2006, several amendments to the electoral legislation affected the right and obligation to vote, and the control of political donations. These changes, and the way they were implemented, are described by Hughes and Costar (2006, p7) as an erosion of Australia’s democratic system. Details of this case appear in section 3.4.4, as part of the report of an audit of Australia’s electoral systems.

The second example of misuse of power is about the relationships between the government and institutions such as statutory authorities, non-government organisations (NGOs), and universities. These institutions play an important role in a democracy, because they provide a wide range of advice, public debate, comment, and information to government, to enable it to develop and implement effective, evidence-based policies. Sometimes the advice and comment will be critical of the government, and this provides feedback which could be used for policy improvement. *Silencing Dissent* by Hamilton and Maddison (2007) includes descriptions of how a number of these institutions were undermined or silenced, and had their membership manipulated by the government. Hamilton and Maddison
(2007) saw these events as a way to control public opinion, and silence debate and dissent from government decisions and policies. Examples include:

a) restricting public comment on climate change policy by an eminent CSIRO atmospheric scientist (p61);
b) political appointments to advisory bodies, rather than choosing the most qualified (p72);
c) political appointments to statutory authorities such as the ABC (p154) and the National Museum (p168); and
d) attacks on NGOs, particularly those that disagreed with the government’s views and values (p82).

The political reality of democracy has been an on-going process for hundreds of years, and many developments have been beneficial; a very basic but important example being expanding the franchise to include women. However, as this section shows, there have been setbacks, where the gap between the fact and the norm of representative democracy has widened.

From these examples, and further analysis in later chapters, it appears that democracy could be improved. Initial improvements could provide better methods to hold elected representatives to account, and ways to provide transparency in decision making. These would be small but important contributions to achieving the meaning of democracy used in this thesis.

1.2.6. The role and problems of using ICT in democracy

It was stated earlier that developed democracies have found answers to a number of the questions about what is meant by democracy. For example, Australia has well established, and generally reliable, electoral systems for the selection of parliamentary representatives. For over thirty years ICT has been used to support electoral systems, mainly for management and administration purposes. However, in more recent times computers have been used in elections, for what is sometimes called electronic voting, and in some instances for counting votes also.

Australia has taken a cautious approach to the use of ICT in its voting systems, and the results have been generally satisfactory, and accepted by citizens (ACTEC, 2002a). This is not the case in other countries, particularly the USA, where there are regular reports of failures of electronic voting machines (for example, Wired, 2007). These failures include lost votes, machine failures, incorrect results, inaccurate touch screens, and inadequate election administration.
and training procedures. The problems which could arise from the large scale adoption of ICT in voting and vote counting systems are described in chapter 6, including a case study comparing electronic voting in Australia and the USA.

It was stated earlier that citizens have other ways to participate in democratic processes apart from voting for representatives, for example Australians voting in a referendum to change their Constitution is one important way. Chapter 2 includes descriptions of other forms of participatory and deliberative democracy, which enable citizens to make contributions to the decisions made in their society. At present in Australia, participation is not established as part of regular democratic activities, and little use is made of ICT. However, ICT could be used in the systems to support these processes, and provide a greater degree of citizens participation, as described in chapter 8.

The problem of using ICT

The nub of the problem statement concerning ICT is that this technology has both the ability to enhance democratic systems in ways that have never before been possible; and, by its nature, the ability to corrupt or destroy well established democratic principles and practices. For example, the widespread adoption of the Internet and the World Wide Web (WWW) has resulted in proposals for on-line voting systems, but the adoption of this technology raises several issues concerning its ability to guarantee transparent, free and fair elections, including:

a) added opportunities for voter coercion and vote buying;
b) the reliability of the wide range of computers which would be used in such systems;
c) the reliability and transparency of proprietary software;
d) the problems of certifying hardware and software as being suitable;
e) the possibility of intentional denials of service and other hacker activities;
f) the possibility of unintentional denials of service; and
g) the possibility to corrupt the election results through the use of a network with global access.

The benefits and shortcomings of electronic voting systems are described and analysed in chapter 7.

Many of the issues listed above arise because there are characteristics of ICT which separate it from other types of technology. One of these characteristics is the logical malleability of computers, which makes them a universal tool, with a wide
field of applicability. This malleability is mainly achieved through the use of software. Often computer applications are implemented before all of the consequences of the system are understood or even known, and sometimes they transform human activities and social institutions. This transformation may result in policy and conceptual vacuums about how this technology should be used. Of course policy vacuums can occur with other technologies, but a major source of policy vacuums with computer technology is a number of invisibility factors, again related to software. Invisibility factors include misuse, such as an invasion of privacy and identity theft; invisible programming values, such as bias in decisions made by software; and invisible complex calculation, raising matters of trust, for example in the software used for counting votes (Moor, 1985). These issues are part of the study of computer ethics, and are addressed in chapter 9.

1.2.7. The research question

The aim of this thesis is to answer the question:

*How can the use of ICT in democratic processes provide a society with an improved democracy?*

There are two presuppositions of this question, namely:

a) that democracy needs to be improved; and

b) that ICT can contribute to that improvement.

The background to these presuppositions is provided in the previous sub-sections. The ‘how’ part of the question is also in two parts, being:

c) how could ICT be used to support a democratic decision procedure considered as a ‘product’?; and

d) how would a democratic decision procedure using ICT be designed and developed, that is, what process should be followed?

1.3. Assumptions and limits - scope of the thesis

The different definitions and implementations of ‘democracy’ and the wide range of areas in which a democratic approach is or could be used, means that some limit should be placed on the scope of the thesis. These are described below, together with the definitions of some of the terms used in the thesis. A glossary of terms has also been provided after chapter 10.
1.3.1. Focus on Australia

The main focus is on democracy and government in Australia because Australia’s current democratic systems are established and stable, and in a position for further improvement. The focus is on Australia’s federal government, rather than on those of the various states. This is appropriate because although the various state/territory and federal government models are not the same, they are similar enough for the arguments and conclusions to be applicable to all Australian legislatures. Where relevant, the states and territories are considered, for example in the use of electronic voting in the Australian Capital Territory (ACT) Legislative Assembly elections. The Australian local government level is not included in any analysis.

Some reference is made to systems of democracy and the use of ICT in overseas legislatures, for comparison purposes; in the section on ranking democracies in chapter 3, the problems with some established democratic systems in chapter 4, the evolution of electronic democracy in chapter 5, and in the analysis of electronic voting in the USA in chapter 6.

1.3.2. Society

The word ‘society’ can have several meanings, two being

a) a collection of individuals composing a community or living under the same organization or government; and

b) a partnership or combination in or with respect to business or some commercial transaction (OED, 2008).

Definition b) also includes organisations such as a trade union, a profession, and professional association. The majority of uses of ‘society’ in this thesis are in the first category.

Although many of the societies in the second category also adopt some form of democratic model for their operation, the implementation of systems for democracy in corporations, unions, associations, etc. is not covered. However, there is no reason why the models and systems for democracy currently in use, and those proposed for future use by legislatures, including those using ICT, should not be used in some of these other forms of society. In addition, the ideas developed in chapters 8 and 9, covering improvements in democratic decision procedures and the ethical development of ICT systems for democracy, could also be applied in the second category of society.
1.3.3. Political philosophy and science

It is not the purpose of this thesis to provide a philosophical analysis of democracy. However, chapter 2 includes a summary of the various models of democracy; first from an historical perspective and second, in more detail as a working analysis of the 20th century variants. This account is for two purposes: a) to clarify my own understanding of the meaning and models of democracy; and b) to identify democratic processes to which ICT might be applied.

Likewise, the theoretical aspects of social choice theory and voting, such as voting methods based on Arrow’s Theorem and the Condorcet voting method, are beyond the scope of the thesis. Software routines can be written to process votes in an election regardless of the voting method used.

1.3.4. Electronic democracy

*Electronic democracy* and *e-democracy* have become convenient shorthand terms for the many uses of ICT for democratic purposes, either current or planned. Definitions of electronic democracy usually refer to the use of ICT in democratic processes, such as voting and participation. Often there are specific references to the Internet, and in these definitions they frequently imply on-line participation by citizens in their democracy. A typical definition is

The direct and indirect use of electronic technologies (information and communications technologies) to participate in the democratic process. Direct forms of electronic democracy include electronic and online voting, participation in consultation, and interactions between elected representatives and constituents (VIC Govt, 2005, p232).

For the purpose of this thesis, a new definition is proposed, which does not refer to specific technologies such as the Internet, or specific applications. The thesis definition is

*electronic democracy means processes which use ICT to apply democratic principles.*

This definition is complementary to the answers to the research question developed in the thesis. The reasons for proposing a definition, focussing on democratic principles, rather than specific democratic processes, are given in chapter 5.
1.3.5. Other definitions

The following terms used throughout this thesis are defined as shown. For completeness, some of them may be repeated within the text. Other terms are described as they are used.

The Internet has two meanings in the thesis. The capitalised version, Internet, refers to the World Wide Web and the many software applications for commerce, education, and entertainment that are now so dominant in modern societies. The lower case version, internet refers to the underlying infrastructure which enables national and international telephone and computer communications.

I could find no formal definition of decision procedure in the political context, so I define it as ‘part of a process to achieve the specified end result of a political decision; for example the selection of a representative, or the production of a piece of legislation’. The result of a democratic decision procedure would reflect the will of the people in some way in the result of the decision. Chapter 8 includes more on this point.

1.4. Thesis outline - overview of the study

1.4.1. Chapter 1 – Introduction to the thesis

The purpose of this current chapter is to explain the problem statement, and to provide a summary of the rest of the thesis.

1.4.2. Chapter 2 – Democracy

The purpose of Chapter 2 is to provide an overview of the meaning of ‘democracy’. The chapter contains brief descriptions of two historical aspects of the idea of democracy, leading into a number of 20th century variants. All modern democratic societies are based on some form of representative model, in which citizens elect representatives to govern in their name, and these are described.

Apart from voting, there are other ways for citizens to participate, and these are described by means of a spectrum of the opportunities available to citizens for participation and deliberation in the running of their societies. The various components of the thesis meaning of democracy can be identified in these descriptions.
1.4.3. Chapter 3 – Electoral systems

Regardless of the ways that the idea of democracy might evolve, voting will always be a primary function. The purpose of chapter 3 is to build on the material in chapter 2 by describing some of the ways that democratic representation might be implemented in practice, through the use of electoral systems.

A simple democratic decision-procedure is developed using the example of a university student common room association, and, in so doing, some of the issues to provide free and fair elections and political equality are identified and explained. These are then examined in more detail by considering the full requirements for the electoral system(s) of nation states.

The final sections of chapter 3 describe Australia’s version of democracy, its ranking in the world, and the findings of an audit of Australia’s electoral systems.

1.4.4. Chapter 4 – Disillusion in the old democracies

The ‘old’ democracies are those of many of the western nations, including the UK and Australia. The presupposition that democracy needs to be improved is supported in this chapter, by building on the information about models and systems of democracy in chapters 2 and 3.

Reasons for the disillusion of citizens in the old democracies are given, and the problems identified in section 1.2.5, about the Australian government, can be recognised in the examples from the UK. The disillusion is not because of a decline of interest in politics or of the idea of democracy. It is because citizens have lost confidence in their governments, and what ought to happen in a representative democracy. There has been a decline in the ability of citizens and the institutions of democracy to hold governments to account. I reach the conclusion that more opportunities for participation by citizens could help to stop this decline.

1.4.5. Chapter 5 – Electronic democracy

The second presupposition, that ICT can contribute to improvements in democracy is addressed in chapters 5, 6, and 7.

The proliferation of terms such as e-democracy, e-government, e-governance, and others are analysed with respect to their definitions, and objectives. While the e-prefix may often be a marketing gimmick, it may be useful in the context of government, administration and democracy - by indicating a system
which uses ICT to enable people to have more direct, and more convenient access to their government and institutions.

I conclude that electronic democracy is not a model of democracy because ICT can be used to support any model, and I define electronic democracy as meaning ‘processes which use ICT to apply democratic principles’.

The use of computer technology to support democracy has been mooted for about thirty years, and chapter 5 includes a review of the history of ideas about computers in democracy, an analysis of the results of the audit of electronic democracy in Australia from 2006, and more recent uses of ICT in Australian democratic processes. The Internet in the broader context of ICT is explained, and concerns about its proposed widespread use in democratic processes are raised.

The chapter ends with descriptions and analysis of electronic government and electronic governance, and how these relate to electronic democracy.

1.4.6. Chapter 6 - Electronic voting systems

The role of ICT in electronic voting and vote counting processes is described in this chapter. The experiences and problems of voting systems which occurred in the USA during the 2000 presidential election resulted in a specification of electronic voting best practices for the USA. Through the use of a case study of this specification, and a comparison between electronic voting practices in the USA and Australia, the issues related to the provision of reliable and trusted electronic voting and counting systems are identified and analysed, both for current times and the future.

1.4.7. Chapter 7 – Shortcomings and benefits of e-voting systems

In voting systems, be they manual, electronic or hybrid, there are hazard-points which are serious shortcomings in these systems. Hazard-points are potential points of weakness and risk, where there is the potential to disconnect the intention of the voter, being the vote recorded on the ballot, from what is ultimately counted. These points are described in chapter 7, for manual systems and a range of electronic systems, including systems for on-line voting.

On the other hand, there are clear benefits from the use of ICT in these systems, especially through its ability to enable disabled people to vote in secret, and through the provision of fast and accurate vote counting in complex election systems.
The conclusion reached is that the second presupposition of the research question, that ICT can contribute to improvements in democracy, is supported, but with qualifications. One of these qualifications is that ICT should only be used to automate manual and other electoral systems which are free and fair.

1.4.8. Chapter 8 – Beyond representation

Chapter 8 provides answers to how could ICT be used to support a democratic decision procedure, considered as a ‘product’.

Improvements in democratic processes should include more opportunities for citizens participation, but as with other aspects of democracy there is contention about how this could be achieved. An approach, called reflexive proceduralism, has been proposed by Saward (2003b) as a way to resolve some of this contention, by using a focus on democratic principles to implement new decision procedures. The theoretical aspects of this approach are described. A practical example of its use is given by describing a decision procedure which would provide the means for citizens to participate in the development of electoral laws, and to give their consent to them.

The application areas in which ICT has a role in this democratic decision procedure are identified, but detailed descriptions of the applications are considered to be outside the scope of this thesis. However, chapter 9 provides further information on how ICT should, and should not, be used in these applications, through a principle of using appropriate technology.

1.4.9. Chapter 9 – The ethical development of systems for democracy

The second part of the research question, how would a democratic decision procedure using ICT be designed and developed, is addressed in this chapter.

Safety-critical aviation systems are developed within an ethical and a technical framework to achieve high integrity. Systems for democracy should also be of high integrity, and it is argued that these should be developed in a similar framework. This requires that these systems should be developed by professional people with an understanding of computer ethics. The basic ideas of computer ethics are described to support this requirement.

A recent approach to systems development is Value Sensitive Design (VSD), which purports to bring an ethical dimension to the development of computer
The use of VSD as a development method for systems for electronic democracy is investigated. A number of critiques of VSD are examined, and it is concluded that this method may not be as useful as claimed, but it could be used as part of a more detailed framework of project governance and systems development techniques.

This framework is provided through the description of four new principles, to be applied when developing democratic decision procedures using ICT. These ICT principles are:

a) use appropriate technology;

b) use open standards;

c) follow systematic and vigorous development processes; and

d) provide superior governance.

1.4.10. Chapter 10 – Summary and conclusions

The various threads of the problem statement are brought together in chapter 10, by means of a brief summary of the thesis. Suggestions for further research work in some of the areas are also provided. The answer to the research question, in summary, is as follows.

The thesis meaning of democracy provides a statement of how I think democracy ought to be developed to improve the current state of affairs, regardless of the government in power. This implies that new decision procedures will be required, some of which will use ICT. Care must be taken when deciding what components of ICT are to be used in these decision procedures. The people and organisations who design, develop, implement and operate these decision procedures should apply the four ICT principles. In this way, electronic democracy will become processes which use ICT to apply democratic principles. The contributions to the body of knowledge from this research work include:

a) a new definition of electronic democracy;

b) extensive analysis of the shortcomings and risks of on-line voting systems using telephony and the Internet, and the identification of the hazard-points in these systems;

c) an approach to the development of democratic decision procedures, called reflexive proceduralism, is extended to show how ICT could be used in these procedures; and
d) a proposal for four ICT principles to be applied to the development of systems for democracy.

1.5. **Method - Research design**

The topic of this thesis covers several areas of study, and the approach to the research has been eclectic. Creswell (2003, p 6) uses the term ‘knowledge claim’ or ‘paradigm’ to identify the assumptions about how, and what, a researcher will learn during his or her enquiry. Creswell identifies four knowledge claim positions, as follows, with my very brief summaries:

a) **Postpositivism**, this is typically the scientific method, mainly based on quantitative research, empirical observation and measurement, and verification of theory;

b) **Constructivism**, where the goal of the research is to rely mainly on the participants’ views of the problem area through open-ended questioning, and where the researcher’s theory is developed through trying to make sense of the meanings that other people have about the world;

c) **Advocacy/participatory**, where the inquiry is intertwined with politics and a political agenda, as a way to assist marginalised and/or disenfranchised groups such as by race, class, gender or disability; and

d) **Pragmatism**, where a researcher uses both quantitative and qualitative methods, and many approaches, techniques and procedures which best meet his/her purpose, and is oriented to real world practice. (Creswell, 2003 p 6 to 12)

As my approach is eclectic, the paradigm in Creswell’s list which is closest to this research is **pragmatism**. As outlined in section 1.2, the purpose of the research is to answer the question - *How can the use of ICT in democratic processes provide a society with an improved democracy?* To arrive at an answer to this question requires knowledge and understanding of a number of topics, such as:

a) the components and variants of democracy;

b) voting and electoral systems;

c) issues and problems of democratic societies, and ways to resolve these;

d) ICT and its use in democracy and electoral systems;

e) Issues and problems in the use of ICT for democratic processes, and ways to resolve these;

f) computer ethics; and
g) methods for the governance and management of ICT development projects.

The overall approach taken is shown in the flowchart following, in Figure 1.1. The chart shows two parallel streams of research, basically covering democracy and technology. The research question has been divided into a number of subsidiary questions, following these two streams, leading to an answer to the main question. The chart indicates the chapters which address the subsidiary questions.
Research Question: How can the use of ICT in democratic processes provide a society with an improved democracy?

<table>
<thead>
<tr>
<th>What does democracy mean? What are the democratic processes?</th>
<th>Ch 2 Ch 3</th>
</tr>
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<tbody>
<tr>
<td>What is the role of ICT in democracy?</td>
<td>Ch 5</td>
</tr>
<tr>
<td>What are the issues and problems of democratic societies?</td>
<td>Ch 4</td>
</tr>
<tr>
<td>What are the issues and problems of using ICT in democratic processes?</td>
<td>Ch 6 Ch 7</td>
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</tbody>
</table>

How can improvements be made?

<table>
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<tr>
<th>How can contention be resolved, and improved decision procedures be developed?</th>
<th>Ch 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>How can ICT be used in decision procedures, and to contribute to democratic principles?</td>
<td>Ch 9</td>
</tr>
</tbody>
</table>

By focusing on the four democratic principles of:
• Equality,
• inclusion,
• freedom, and
• transparency.

By focusing on ICT principles covering:
• Appropriate technology,
• Open standards,
• Systematic processes, and
• Superior governance.

An answer: ICT can be used to improve a society’s democratic processes by applying ethical ICT principles which do not detract from democratic principles.

Figure 1.1 Flowchart of research method
1.5.1. Literature reviews

An initial literature review covered the research and writing on democracy and democratic models; the use of computer technology to support democratic processes; computer ethics; value sensitive design; and other development methods related to ICT systems. This information provided material for the early chapters, and help the planning of subsequent work. On-going reviews of the literature related to more specific aspects of the thesis, as follows.

Beetham and Saward are UK academics, and their work covers both political philosophy, that is the theoretical ideas about democracy, and political science, being the practical approaches to the problems and contestation in democracy. Their practical work has assisted me to provide a practical solution to the research question.

In addition, Saward has proposed a practical approach to contestation through his idea of reflexive proceduralism, described in chapter 8. This approach provided the opportunity for me to consider how ICT might be used in the various stages of developing a new decision procedure. Also, reflexive proceduralism has a focus on principles of democracy, which prompted me to develop my four ICT principles for developing systems for democracy.

Part of chapter 5 focuses on the work of Barber in the USA and McLean in the UK, to describe the early uses of computers in democracy. The work of these authors is complementary, and it provided the source of ideas for modern direct democracy from Budge.

James Moor is a philosopher who has published widely in the field of computer ethics and the philosophical aspects of ICT. In chapter 9, my purpose is to apply a widely used and accepted theory to provide an overview of computer ethics, and I use material from his seminal essay *What is computer ethics?* Written in 1985, this essay is still widely cited in academic literature. Moor’s essay describes the factors which make ICT different from other technologies, namely its transformational aspects, policy and conceptual vacuums, and invisibility factors. This essay, and another by Moor covering a framework to address policy vacuums, provide the background to computer ethics to support my proposed four ICT principles.
1.5.2. Internet searches and other material

Internet searches provided reference material not available from other sources, such as journal articles by recognised authors; and other relevant material such as formal reports by governments.

The on-going and rapid development of computer technology and the Internet means that there is a steady stream of new initiatives, including those for electronic democracy. The Internet and material from the conventional media were used to report on these initiatives. For example, newspaper articles on the use of the Internet for political and democratic purposes in Australia were used to supplement associated material. Likewise for commentary on the use of electronic voting machines in the USA presidential elections.

1.5.3. Case study

Chapter 6 uses a case study approach to compare electronic voting systems in Australia and the USA, to inform other aspects of the research into an ethical approach to electronic democracy. The purpose of the chapter is not specifically about the problems of electronic voting machines, although these are included. The main point of the case study is to compare the ‘electronic voting best practices’ in the Report developed in 2004 by the experts at the Kennedy School of Government Harvard, with the experience of developing an electronic voting and counting system for the ACT Legislative Assembly. I was one of the development team for that system. My experience from this project, and that from many years working in the ICT industry, has informed much of this thesis.

When chapter 6 was being written the KSG report seemed to be the only document with an emphasis on best practices, as opposed to the detailed analysis of individual problems and technical solutions with e-voting. The participants at the KSG Workshop, and especially the authors of the report, were respected authorities in their field. The material in this chapter contributes to the development of the ICT Principles in chapter 9.

1.5.4. Value Sensitive Design

When the thesis was commenced in 2004, an approach to systems development called Value Sensitive Design (VSD) was receiving serious attention from the computer ethics community, because it seemed to offer a practical approach to the ethical use of ICT. An early version of my research question had included a specific
reference to VSD. However, in subsequent years, some of the claims made by the developers of the VSD method were brought into doubt. I have included an analysis of VSD in chapter 9 because of these claims and doubts.

1.5.5. Thesis structure

The pragmatic approach adopted for research is reflected in the overall structure of this thesis, as described in section 1.4, and in the flowchart at figure 1.1. The structure of this chapter is based on an outline provided by Evans and Gruba (2002, p58 to 66).
Chapter 2. Democracy

2.1. Introduction

The contention about democracy as a political reality is between what ought to happen, the norm, and what actually happens in a society purporting to be democratic. For a society to become a democracy it would typically adopt a particular approach or model of democracy, from a wide range of options. It would implement this model in a way to reflect the society’s characteristics and objectives, through perhaps a constitution, policies and laws. In so doing, the democracy norm for that society is established. The purpose of chapter 2 is to describe that range of options as a way to provide an understanding of what ‘democracy’ could mean as a norm.

First, the historical basis of direct and representative democracies is described, to set the scene for democracy as it is now practiced.

The evolution of democracy to the late twentieth century has been extensively documented by Held (1996), and this work has been used to describe representative democracy as it is now practiced, because that is the dominant version of democracy adopted by societies.

The ideas of participatory democracy and modern direct democracy are also described and analysed, drawing on Held and other sources.

2.2. Historical ideas about democracy

Civilisations are a special kind of culture: large, complex societies based on the domestication of plants, animals and human beings. Civilisations vary in their makeup but typically have towns, cities, governments, social classes, and specialized professions. (Wright, 2004, p33, emphasis added)

It is generally agreed that the first civilisations were those of Sumer in southern Mesopotamia (now Iraq), and Egypt, both arising at about 3000 BC. Over the next 2000 years, civilisations were established in India, China, Mexico, Peru, and in parts of Europe (Wright, 2004, p33). Of course there were other parts of the world where groups of people had established societies with some of these aspects of a civilisation, by domesticating plants and animals and specialising in particular trades and crafts, for example.

All of these groups would have established some rules for running their societies, and what we might call governments in the larger groups. The societies
considered as civilisations would have been governed by one or several people from the wealthier social classes, typically, but not always, by the men. If the society was ruled by one person it would be called an *autocracy*, perhaps a *monarchy* or *dictatorship*, depending on how that person came to be the ruler. If a few people ruled the society it would be called an *oligarchy*. Originally, if these few people were the best and most outstanding of the society, it would be called an *aristocracy*, although the more common meaning of the term now refers to the wealth of these people, rather than to their intellects or their humanity. Also modern aristocracies involve heritage lines, while meritocracies do not. If the power and position of the ruling class did stem from its wealth, it would be called a *plutocracy*.

In about 600 BC, in ancient Greece, a number of cities developed methods of government in which more, if not all, of the citizens were involved in running their societies. The most well known of these cities was Athens.

### 2.2.1. Athenian democracy

The word ‘democracy’ is derived from the Greek words *demos*, meaning ‘the people’ and *kratia* meaning ‘to rule’. The Athenian system of government is usually held up as the best example of an early form of democracy. In this system the *demos* comprised about 40,000 citizens of Athens, and a citizen was male, over 20 years old, and of direct Athenian descent on both sides of his family. Women, slaves and immigrants were excluded from participating in the Athenian democracy (Held, 1996, p21-23).

Although Aristotle did not support the Athenian idea of democratic government, he provided ‘probably the finest and most succinct statement of classical democratic institutions’ (Held, 1996, p19). Below is Aristotle’s summary of the fundamental principles and features of Athenian democracy.

The foundation of the democratic constitution is liberty. People constantly make this statement, implying that only in this constitution is there any share in liberty at all; every democracy, they say, has liberty for its aim. ‘Ruling and being ruled in turn’ is one element in liberty. Then there is the democratic idea of justice as numerical equality, not equality based on merit, and when this idea of what is right prevails, the people must be sovereign, and whatever the majority decides that is final and that is justice. For, they say, there must be equality among the citizens. The result is that in democracies the poor have more sovereign power than the men of property; for they are more numerous and the decisions of the majority prevail. That is one aspect of liberty, one which all democrats regard as part of the definition of their constitution. Another is the ‘live as you like’ principle. For this too is the mark of a free man, just as its opposite, living not as you like, is the mark of one enslaved. This is the second defining feature of
democracy and from it has come the principle of ‘not being ruled’, not by anyone at all if possible, or at least only in alternation. This is an element in liberty that is based on equality.

From these fundamental principles, and in particular from the principles of ruling and being ruled, are derived the following features of democracy:

1) Elections: all citizens eligible for all offices;
2) rule: all over each and of each in turn over all;
3) offices fill by lot, either all or at any rate those not calling for experience or training;
4) no tenure of office dependent on the possession of a property qualification, or only on a very low one;
5) the same man not to hold the same office twice or only very rarely - a few permitted exceptions, notably offices connected with warfare;
6) short term of office for all offices or as many as possible;
7) jury-courts all chosen from all the citizens and adjudicating on all or most matters and always on the most important and far-reaching, such as those affecting the constitution, investigations, contracts between individuals;
8) the Ecclesia or Assembly is the sovereign authority in everything, officials having no sovereign power over anything except quite minor matters, or else the Council is sovereign in matters of greatest importance.
9) Next, payment for services, in the assembly, in the law-courts, and in the offices, is regular for all (or at any rate the offices, the law-courts, council, and the sovereign assemblies, or offices, where it is obligatory to have meals together).
10) Again, as good birth, wealth, and culture are the marks of the rule of the few, so their opposites, low birth, low incomes, and low tastes are regarded as typical of the rule of the people.
11) Perpetual tenure of office is not favoured by democracy: and if any perpetual office remains in being after an early revolution, we note that it has been shorn of its power and its holders selected by lot from among picked candidates.

These are the general characteristics of democracies.


Some of these characteristics, such as the payment of officials, and holding an office not being dependent on owning property, still exist in modern democracies.

This Athenian government was a direct democracy because of the involvement of all citizens, and it was very demanding on their time. The assembly met for a minimum of 40 sessions a year, and a quorum for a plenary session of the assembly was 6000 citizens. As the features above indicate, citizens were expected to participate in the assembly, committees, and juries, and hold other offices in the government of the Athenian city-state. Some of the positions were filled by election, and others by drawing lots (Held, 1996, p22).

The evolution of the Athenian democracy is considered to have started about 594 BC with Solon’s constitution for the city, and there were major reforms in 508
Popular government was established by 462 BC, and lasted until 322 BC, when Athens was conquered by the Macedonians (Arblaster, 2002, p16-17). Thus, for 140 years Athens ‘…came as near as any community ever has to achieving the democratic ideal of government by the people themselves, through citizen participation…’ (Arblaster, 2002, p21). There are a very few modern nations which attempt to run themselves by direct democracy. Switzerland is the usual example cited, but Switzerland is actually a hybrid, with components of a direct democracy combined with a parliamentary system.

For about 2,000 years following the Athenian democracy, societies mainly continued with one or other of the non-democratic methods of government mentioned above, a monarchy for example. However, over time, the people in the upper social classes wanted, and gained, more participation in the running of their society, particularly in the taxation system. Then some of the ‘common’ people, those people without property or wealth, wanted the same. This led to the next stage in the development of democracy, the idea of citizens being represented by other citizens in an assembly or parliament.

2.2.2. Early representative democracy

The following quotation is one of the earliest descriptions of a system of representative democracy, and in which the features of modern representative democratic models can be recognised.

Really, I think the poorest he that is in England hath a life to live as the richest he. And therefore truly I think, Sir, it is clear that every man that is to live under a government ought first by his own consent to put himself under that government and I do think that the poorest man in England is not at all bound in a strict sense to that government that he hath not had a voice to put himself under. Every man born in England, cannot, ought not, neither by the law of God nor the law of nature, to be exempted from the choice of those who are to make laws for him to live under and for aught I know, to lose his life under (Lindsay, 1948, p12-13).

These quaint, but inspiring words were spoken after the English Civil War by Colonel Rainborough, one of the Levellers, a radical political group formed in the 1640s. ‘The Levellers were the party of the most advanced revolutionary sections of the lower-middle class, the independent peasantry, the smaller tradesmen and artisans and perhaps the journeymen of the bigger cities’ (Morton, 1990, p95).

The speech was made at the grand council of officers, held at Putney in October 1647. It calls for adult male suffrage; and promotes the ideas of political equality; government by consent, especially political obligation resting on consent;
representative government; and acceptance of the rule of laws made by those representatives.

There were others at the Putney meeting who were strongly opposed to the idea of adult male suffrage, which in some sense reflects the debates we sometimes still have; the arguments based on ‘expediency and experience’ (Lindsay, 1948, p12), by those on the pragmatic side of the debate, against the arguments of the idealists, those with visions of a better life for all citizens regardless of their place in society.

The pragmatists at Putney held the view that owning property should be a requirement before anyone should be allowed to vote, and common, uneducated men, soldiers for example, should not have this right. Of course, even the commoners held that women should not vote, and it took about another three hundred years after the Putney meeting for all women to have the vote in the UK. Even today there are people, albeit a small minority, who believe that others should be excluded from voting, because of their circumstances, such as being a prisoner, and/or their perceived lack of education.

2.2.3. Classic models of democracy

In the three hundred and sixty or so years following the Putney meeting, the fundamental requirements of democracy have been debated, developed and adapted to produce the many examples of mainly representative democratic societies and governments which now exist throughout the world.

Held (1996) has developed one set of models which illustrate the historical and more recent development of the variants of democracy. His models fall into two categories; the Classic models and Twentieth-century models, their relationships being shown in figure 2.1, which is taken from his book. The four Classic models are shown across the top of the diagram. The evolution of other models and variants leading to Twentieth century democracy, described in the following paragraphs, are shown vertically down the diagram.
The Athenian version of democracy described previously is the *Classical* democracy in figure 2.1. The historical development of democracy since Athens is reflected in the main models - from *Republicanism*, through *Liberal (representative)* democracy to *Direct* democracy, giving rise to a number of theoretical variants (eg. *Developmental Republicanism*) on the way.

The meeting at Putney, mentioned above, relates to one event which resulted in the brief period of the British Republic, and ultimately the British version of liberal democracy, the third Classic model in figure 2.1. *Liberal* democracy emphasises

‘the liberal focus on constitutional guarantees of individual freedom and rights, among them rights to equality of voting power. In close conjunction with *competitive elite* democracy and *representative* democracy, it is so prominent as an ideal and a practice that it is often used as a synonym for democracy itself’ (Saward, 2003a, p148).

Held’s fourth Classic model has the full title of *Direct Democracy and the End of Politics*. It covers the ideas of Marx and Engels, and the model includes the key features of socialism and communism (Held, 1996, p152-153).

The tension described in section 1.2.3 between the ideas of political freedom and political equality occurs in the evolution of the *Protective* and *Developmental* variants, in the historical development of Held’s Classic models shown in figure 2.1. In both cases citizens may be ‘free and equal’, but different variants place more
emphasis on one of these values rather than the other. These two variants of the Classic models have strongly influenced the Twentieth-century models.

2.2.4. Twentieth-century models

One way to examine Twentieth-century democracy is to consider the spectrum of models showing the extent of a citizen’s involvement within the processes of these models. At one extreme of the spectrum there is a basic model of representative democracy, where citizens voluntarily vote for representatives to form a government, and have negligible involvement until the next election is called. At the other extreme is a model of direct democracy, where all citizens have the opportunity for full participation in the running of their society. Between these two extremes there is a large number of intermediate conceptions of democracy, their position on the spectrum depending on the level of participation by citizens. Saward (2003a, p145-151) has produced a selective list of over thirty of these conceptions, which he has referred to as ‘prefix democracies’, some of which have been used in this chapter.

2.3. Representative democracy

Held’s model of Legal democracy has evolved from the Protective model, and has been influenced by the Developmental and Competitive elitist models. These are all representative models, and emphasise political liberty over political equality. The key features of the Competitive elitist model are

a) a parliamentary government with strong executive;
b) competition between rival political elites and parties;
c) domination of parliament by party politics;
d) centrality of political leadership;
e) bureaucracy: an independent and well-trained administration; and
f) constitutional and practical limits on the ‘effective range of political decision’.

The general conditions for this model include

g) an industrial society;
h) a fragmented pattern of social and political conflict;
i) a political culture which tolerates differences of opinion;
j) a poorly informed and/or emotional electorate;
k) emergence of a skilled strata of technically trained experts and managers; and
l) competition between states for power and advantage in the international system. (Held, 1996, p197)

Individual democracies are not static and, from Figure 2.1, they could develop their political systems in one of two ways; by continuing towards the Legal model, or by adopting a more participatory approach. The key features of Legal democracy are

a) a constitutional state (modelled on features of the Anglo-American political tradition, including a clear separation of powers);

b) rule of law;

c) minimal state intervention in civil society and private life; and

d) a free-market society given fullest possible scope.

The general conditions for this model include

e) effective political leadership guided by liberal principles;

f) minimisation of excessive bureaucratic regulation;

g) the restriction of the role of interest groups, particularly trade unions;

h) an international free-trade order; and

i) the minimisation (eradication, if possible) of the threat of collectivism of all types. (Held, 1996, p261)

The representative models above have mainly evolved to represent the views put forward by those on the political right. A leader in this school of thought was Schumpeter, an economist who defined the democratic method as ‘that institutional arrangement for arriving at political decisions in which individuals acquire the power to decide by means of a competitive struggle for the people’s vote’ (Schumpeter, 1943, p269).

Therefore, in Schumpeter’s model, the only role for the citizen is to cast a vote when required, to help select a government from a number of groups of elites within a free market, (see key feature d) above in Legal democracy). Like many other markets, the market to select a government may not be particularly free, however; given the dominance of the major parties, and the attention given to these by the news media. This may be to the disadvantage of other candidates who are in minor parties, or independent candidates.
Various versions of the *Competitive elitist* and *Legal* models appear in many of the established democracies. Chapter 4 describes how the operation of many of their governments has resulted in disillusion of their citizens.

### 2.3.1. Institutions and accountability

Returning to Held’s models, his features and conditions for representative models, listed above, have omitted some of the conditions which are required to ensure an acceptable level of *accountability* in these models. Beetham’s description of democracy includes the conditions that should exist so that members of a group or society could accept the decisions made by their representatives.

For such an arrangement not to degenerate into *oligarchy*, however, a number of conditions have to be met. Members must be guaranteed an equal right to vote, to stand for elective office, to engage freely in political or campaigning activity, and to *hold their representatives continuously to account*. They should have *full and accurate information* about the reasons for decisions taken on their behalf. And they should have the *right to change* the terms of the relationship between themselves and their representatives. These conditions provide the rationale for the typical institutions of a modern representative democracy. They also provide the standard against which the democratic character of these institutions should be judged (Beetham, 2005, p165, emphasis added).

A simple model which provides accountability of government comprises three institutions; the parliament, the executive, and the public service. Basically, the public service is accountable to the executive for its implementation of government policy; the executive is accountable to the parliament for its actions; and the parliament is accountable to citizens through the election process.

Beetham (2005, p31-36) also provides a more detailed list of institutions to provide accountability of an executive government, in four categories, namely:

- **Legislature**
  - Opposition parties, chambers and committees, audit commission
- **Legal bodies**
  - Courts, ombudsmen, special commissions
- **Public opinion**
  - Media, organised publics, independent experts
- **Electorate**
  - Elections

For members of an executive government to give an account of their performance means that there must be ways by which they can explain and justify the policies, decisions and actions related to the power and authority that they have. This means that there must be people in various formal (e.g. the opposition parties) and informal (e.g. the media) institutions or groups which have *power* to review
these accounts, and impose some form of sanction if the power and/or authority of the executive has been exceeded. For example, a common sanction is for a minister to lose his/her portfolio for breaking a ministerial code of conduct. The ultimate sanction is for a government to be voted out of office at an election by the citizens.

For this process of accountability to work effectively there must be sufficient and accurate information available to all of the institutional categories in the list above. The right to information is addressed in chapter 8.

2.3.2. Civil society

The list of institutional categories above are those that Beetham identifies as being required to hold representative governments to account. The category of public opinion is the link between the formal institutions for accountability and the many other institutions which go to make up what is usually known as the civil society. Civil society has many definitions, that of Lummis being typical: ‘…in general it refers to that sphere of society which organizes itself autonomously, as opposed to the sphere that is established and/or directly controlled by the state’ (Lummis, 1996, p30). Typically, civil society institutions include:

- academia
- professional associations
- trade unions
- religious organizations
- non-profit organizations
- charities
- environmental groups
- women's groups
- cultural groups
- community organizations
- consumers/consumer organizations
- non-governmental organizations

At present, Held’s model of Legal democracy, summarised above, is the end result of the evolution of liberal representative democracy. A particular condition to note is c) minimal state intervention in civil society and private life. This means there is also minimum state involvement with civil society, reinforced with condition j) the restriction of the role of interest groups, particularly trade unions; and k) the minimisation (eradication, if possible) of the threat of collectivism of all types. By closing off the opportunities for interaction with citizens through the institutions of civil society, governments of this type tend to become less representative of citizens, and more beholden to the groups which are the major sources of political donations. This point is covered further in later chapters.

The models and variants of representative democracy described above favour political liberty over political equality. Ways to realise political equality in
participatory models, while attempting to maintain a level of political liberty acceptable to citizens, are described in the next section.

### 2.4. Participatory democracy

The second trend in the development of Held’s Twentieth-century models of democracy is that of *Participatory democracy*. The *Participatory* model has been influenced by the *Classical* and *Direct* models and *Pluralism*, as shown in figure 2.1 above. The *Developmental* variants have also had an influence on participatory models, through their focus on the political equality of citizens and the positive development of communities through citizens participation. Saward describes the conception of a pluralist democracy as

‘…emphasising multiplicity of interests and the multiplicity of interest groups to speak for them, in democratic systems. Its advocates often downplayed the electoral mechanism in favour of regarding the interest-group system as the heart of democratic politics, and accordingly emphasised the informal rather than the formal or constitutional aspects of democracy’ (Saward, 2003a, p149).

Pluralism is also influenced by the *Competitive elite* model, for example where political equality in the representative approach is enhanced through adopting proportional representation, ie. multi-member electorates, in electoral systems.

In the spectrum of democratic models, *Participatory* democracy would lie between representative and direct models; the exact placement depending on the scope of citizens participation, in terms of the opportunities for individual citizens, and in ‘the multiplicity of interests and interest groups’, eg. the degree of pluralism. The key features of *Participatory* democracy are:

a) direct participation of citizens in the regulation of the key institutions of society, including the workplace and local community;

b) reorganisation of the party system by making party officials directly accountable to the membership;

c) operation of ‘participatory parties’ in a parliamentary or congressional structure; and

d) maintenance of an open institutional system to ensure the possibility of experimentation with political forms.

The general conditions for this model include:

e) direct amelioration of the poor resource base of many social groups through redistribution of material resources;
f) minimisation (eradication, if possible) of unaccountable bureaucratic power in public and private life;

g) an open information system to ensure informed decisions; and

h) re-examination of childcare provision so that women as well as men can take up the opportunity to participate in public life. (Held, 1996, p271)

In this model, Held does include the need for institutions and their role in providing accountability in a democratic society. The requirement for accountability also applies to participatory democracy because there will continue to be elected representatives in such a society, and there should be ways to hold to account these representatives, plus the other citizens who also participate.

2.4.1. Barber’s vision of participatory democracy

Benjamin Barber is a proponent of participatory democracy, which he calls ‘strong’ democracy, as opposed to the ‘thin’ democracy of liberalism. He argues:

…first, that the great aberrations of twentieth-century political culture – majoritarian tyranny, mass society, and totalitarianism – have resulted more from the thinness of liberalism than from the participatory aspirations of strong democracy; and, second, that while the illusions of Man Alone may breed the malignancy of unitary government, strong democracy may offer in the idea of mutuality a genuine remedy (Barber, 1984, p92).

The following list of Barber’s suggestions for participatory democracy has been reproduced in full because it is the only programme that could be found in the literature which gives a number of practical suggestions on ways to enhance democratic processes in a society. Participatory democracy requires ‘politics as a way of living’, with a focus on citizenship, and with more participation by citizens in the running of their society. Barber lists a ‘Strong Democratic Program for the Revitalization of Citizenship’ as follows (Barber, 1984, p307, emphasis added).

1. A national system of Neighbourhood Assemblies, of from one to five thousand citizens, these would initially have only deliberative functions but later would eventually have local legislative competence as well.

2. A national Civic Communications Co-operative to regulate and oversee the civic use of new telecommunications technology, and to supervise debate and discussion of referendum issues.

3. A Civic Videotex Service and a Civic Education Postal Act to equalize access to information and promote the full civic education of all citizens.

4. Experiments in Decriminalisation and Informal Lay Justice by an engaged local citizenry.
5. A national **Initiative and Referendum Process** permitting popular initiatives and referenda on congressional legislation, with a multi-choice format and a two-stage voting plan.

6. Experimental **Electronic Balloting**, initially for educational and polling purposes only, under the supervision of the Civic Communications Cooperative.

7. Selective local elections to local office by **Lottery**, with pay incentives.

8. Experiments with an **Internal Voucher System** for selected schools, public housing projects, and transportation systems.


10. Public sponsorship of **Local Volunteer Programs** in ‘common work’ and ‘common action’.

11. Public support of experiments in **Workplace Democracy**, with public institutions as models for economic alternatives.

12. A new **Architecture of Civic and Public Space**.

These proposals are mainly aimed at the USA system of democracy, with a focus on activities at the local level, with one proposal for workplace democracy (item 11). The list was prepared in 1984 and the ideas were very prescient, although some are outdated now, but clearly the later developments of ICT could contribute to, and enhance some of these items. Some of the ideas for the use of technology are the forerunners of electronic democracy, described in chapter 5.

**2.4.2. Deliberative and discursive democracy**

In point 1 above, Barber mentions ‘deliberative functions’, with the idea that deliberation is a practical example of citizens participating more in their democracy. Held (1996) has not identified a specific model of deliberative democracy, and deliberation is rarely mentioned. I assume that he considers that deliberation would be a natural and significant component of participatory democracy.

Saward defines deliberative democracy as ‘a conception of democracy which emphasises the importance of talk, discussion and debate to democratic practice, rather than voting’ (Saward, 2003a, p147). A more comprehensive definition comes from Gutmann and Thompson, who define deliberative democracy as

> a form of government in which free and equal citizens (and their representatives), justify decisions in a process in which they give one and another reasons that are mutually acceptable and generally accessible, with the aim of reaching conclusions that are binding in the present on all citizens but open to challenge in the future (Gutmann and Thompson, 2004, p7).

Dryzek states
The essence of democracy itself is now widely taken to be deliberation, as opposed to voting, interest aggregation, constitutional rights, or even self-government. The deliberative turn represents a renewed concern with the authenticity of democracy: the degree to which democratic control is substantive rather than symbolic, and engaged by competent citizens (Dryzek, 2000, p1).

Some authors tend to use the words ‘deliberative’ and ‘discursive’ interchangeably, but Dryzek believes they are related but different categories of democracy. He has developed a theory of discursive democracy which is broader in approach and application than his view of deliberative democracy, which he sees as ‘a model confined to politics in the vicinity of liberal constitutionalism’ (Dryzek, 2000, p3). In this liberal model the approach to deliberation is restricted by the characteristics of politics and particular methods of argument. He favours a more ‘tolerant’ approach which would allow ‘argument, rhetoric, humour, emotion, testimony or story telling, and gossip’ as means of communication to ‘induce reflection upon preferences in non-coercive fashion’ (Dryzek, 2000, p1-2). From this I infer that Dryzek is arguing that discursive democracy could provide activities which allow participation by a wider range of citizens than is currently available or possible.

The broader application of Dryzek’s discursive democracy includes discourse across national boundaries, and discourse between many other institutions than those which are typically part of the liberal democratic system. In addition, Dryzek extends the current ideas of environmental politics and green parties, by suggesting that discourse could be within bio-regional areas which would be across regional or national boundaries, and the discourse would be with the human and non-human occupants of the bio-region.

For example, in Australia the Murray-Darling River System flows through four states, and is vital to the economies of each of them. Because of extensive use, abuse, and long periods of drought, this bio-region is in a very poor condition, and attempts to provide a solution to the management and control of this vital resource have been unsuccessful. To apply Dryzek’s discursive approach to the many problems of this bio-region would entail the active involvement of a wide range of people; many more than the politicians, government officials, and academics who are usually involved in such an enterprise. It would also require discourse with the non-human actors of the bio-region, the flora, fauna, geological and other environmental components of the river system. In other disciplines, such as ICT
systems development, and business and quality management, this large group of human and non-human actors are known as *stakeholders*.

As Dryzek (2000, p149) states, nature ‘speaks’ to us in a variety of ways, and we have many techniques to measure the health of this bio-region, and to take curative action as necessary. Therefore there would need to be other people, mainly scientists, technicians, and activists, who would represent the environmental stakeholders in the discussions. By using discursive democracy, over time an acceptable set of solutions to the many problems of the Murray-Darling River System would be found; because it would be a process inclusive of all citizens who have an interest in a successful outcome; and environmental aspects would be considered to be at least equal to economic aspects. The solutions which are identified in this manner are called *discursive designs* by Dryzek (2000, p49-50).

In the example above, an alternative argument could be that the Murray-Darling problems were in part caused by taking the opinions of too many people into account, and it is usually not in anyone’s short-term interest to take a broader view. This is because the short-term incentives usually outweigh those of the long-term. However, these points highlight some of the problems of the current representative model where the ‘short-term’ is driven by the electoral cycle. The aim of deliberative or discursive democracy is to provide an alternative approach to making decisions.

### 2.4.3. Contesting deliberative democracy

As with other aspects of democracy, there are several areas of contestation in the idea of deliberative democracy and Saward, for example, suggests that deliberative theory ‘lacks basic coherence and consistency, and that it contains worrying elitist threads’ (Saward, 2000, p66). He summarises his position, and contradicts Dryzek, by writing ‘there can be no such thing as the deliberative model of democracy’, because a functioning, dynamic democratic system requires constitutional structures; formal (and to some degree hierarchical) organizations; voting and other decision mechanisms that can be decisive in the last instance; and institutionalized equal respect for all citizens regardless of (for example) their willingness or even capacity to engage in deliberation or other distinctive forms of political participation (Saward, 2000, p77).

Saward is not against deliberation as an important and desirable process in any democratic system, but he does not accept that it is a model of substance and the source of political legitimacy in a democracy. His criticism of its lack of ‘basic
coherence and consistency’ is partly based on his view that deliberative democrats have not stated where the sites for deliberation should be. Table 2.1 below shows Saward’s selection of some of the options, or ‘sites’, for deliberative forums.

<table>
<thead>
<tr>
<th>Deliberative forum</th>
<th>Formal</th>
<th>Informal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Does the forum contribute to the making of government policy?</td>
<td></td>
</tr>
<tr>
<td>Representative</td>
<td>A. Parliament and linked institutions such as Select Committees; deliberative opinion polls linked to referendums or initiatives?</td>
<td>B. Deliberative opinion polls which are not state-sponsored; citizens juries; some ‘focus groups’</td>
</tr>
<tr>
<td></td>
<td>C. Supreme or High courts with constitution-interpreting functions; cabinets in appointive systems (eg. US)</td>
<td></td>
</tr>
<tr>
<td>Non-representative</td>
<td>D. Associations (state-sponsored or otherwise); political parties (state-funded or otherwise, especially in multi-party systems); ‘protected enclaves; ‘subaltern counterpublics’; ‘discursive designs’</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.1 A typology of deliberative forums.  
(Saward, 2000, p71, explanation of header and stub added)

Some of the instances of deliberation in the formal forums (cells A and C) in Table 2.1 already exist in Australia, for example the deliberative poll related to Australia becoming a republic described below, and the High Court of Australia’s role in interpreting the Constitution.

In cell D, Protected enclaves and subaltern counterpublics are terms used to denote oppressed and minority groups in a society. Their involvement in deliberation provides diversity of ideas and support for political equality. Dryzek’s discursive democracy would also be placed largely in cell D. Deliberative opinion polls and citizens juries in cells A and B are described in the following sections.

This section on contention will conclude with a final point from Saward (2000). This reference is a chapter in his book on democratic innovation which focuses on a rebuttal of the claims made by some deliberative democrats that deliberation is the source of democratic legitimacy. 'Broadly defined, deliberative democracy refers to the idea that legitimate lawmaking arises from the public deliberation of citizens’ (Bohman and Rehg, 1997, p ix) is an example of this claim. The rebuttal is summarised above at the start of this sub-section, but elsewhere he asks the question ‘if deliberation is so vital to legitimacy, why not formalise it and put it on a representative basis?’ (Saward, 2000, p72).
2.4.4. Deliberative opinion polling.

The concept of Deliberative Polling® was originally developed by Fishkin in 1988, and was later published in *Democracy and Deliberation* (Fishkin, 1991). Fishkin has registered the name ‘deliberative polling’. A more accurate name is ‘deliberative opinion polling’, because the basis of the process is an opinion poll. Fishkin does not include ‘opinion’ in his title, and his term could imply polling as voting, which is not the case. In this thesis, Deliberative Polling® is used to indicate Fiskin’s product.

Ordinary (that is non-deliberative) opinion polls are regularly taken for many reasons. For example, when I have participated in such an opinion poll, in the same interview I have been asked if I:

a) have heard of a particular product or service;

b) have seen a particular advertisement;

c) have a preference for a particular design;

d) hold a particular political opinion; and

e) have a preference for a particular politician.

Whatever my responses are to the questions about the product, they provide useful data for the marketing organisation conducting the opinion poll and for the vendor of the product. For example the responses can tell them something about the effectiveness of an advertising campaign, and the relevance of the product to people in a particular demographic category. This is even if I have never seen the advertisement or heard of the product.

In the same way, even if I am quite ignorant of a political matter, my response is still seen as useful input to the people who commissioned the opinion poll. Although I may be politically aware, there is usually not enough time allowed to consider my response to what may be a complicated and/or significant issue. This means that my responses are not the result of a process of deliberation.

Political opinion polls such as these are taken on a regular basis using a random sample of people, considered large enough to be statistically significant. The results of simple questions on the popularity of political leaders or on voting intentions may be valid. They certainly provide material for analysis and commentary in the print and electronic media. However, if the question is about a political issue of substance and significance, there is a good chance that those being questioned are not informed of the matter. In this case the result of the poll is likely to indicate the opinion of an uniformed citizenry. The method of deliberative
opinion polling has been developed to provide a more informed answer to questions of political significance. The deliberative opinion poll process can be summarised as:

a) a random sample, typically less than 400 people, representing a cross-section of citizens, is selected to deliberate the matter under consideration;
b) each member of the group is surveyed on their views of the topic, the result being what would be produced from an ordinary opinion poll, and represents, in general, what uninformed citizens would decide, or believe about a particular issue;
c) the selected group receives briefing material on the topic to be deliberated, in which all sides are represented and all issues canvassed;
d) the group meets, typically for two to three days, to discuss the issues and to question experts representing the alternative positions; and
e) when ready, the group is surveyed again, the result of that opinion poll being, in general, what an informed citizenry would decide if they had the same opportunity and information to consider the matter in detail.

Since 1994, Fishkin and his associates have conducted about thirty Deliberative Polls at the national, state, and regional levels in the USA, UK, Europe, Canada, China and Australia. The Australian polls at the national level have covered Aboriginal Reconciliation, an Australian Republic, and Muslims and non-Muslims in Australia. In addition, the Australian Capital Territory also held a Deliberative Poll on the need for a Bill of Rights for the ACT.

Several benefits are derived from this method of political participation, and feedback from the citizens who have taken part in a deliberative opinion poll is usually extremely positive. People appreciate the opportunity to participate in a democratic process to consider an important matter; they learn much about the particular issue being considered and some wider aspects of how their society works; they enjoy working with other citizens and meeting other people who are experts in their fields; and, in Australia certainly, there is something special and symbolic about holding the deliberation sessions in an historic building – Australia’s Old Parliament House – which adds to the sense of occasion. In addition, the deliberative opinion poll receives ample media coverage, including some sessions being televised; thus more citizens have their opportunity to consider their positions on the matter, and to deliberate the result of the poll in groups or individually.
In Australia, deliberative opinion polling has no formal authority. The government need take no notice of the final result of the poll, even though it purports to be the informed views of a representative sample of citizens. For example, after the poll on Aboriginal Reconciliation in 2001, in which there was substantial support for the federal government to address the many areas of disadvantage in indigenous communities, the relevant minister at the time dismissed this as ‘just another poll’, because the recommendations were against current government policy (Gollop, 2005). A second example is from the October 1999 poll on whether Australia should become a republic. There was strong support for Australia to become a republic, but there were strong and competing views on the method to choose the president. The government did take notice of these views, and subsequently framed the question for the November 1999 national referendum on the republic to include reference to a particular method of choosing the president. The ‘No’ position was successful.

Apart from the issue of authority, there are other matters of some concern regarding the deliberative opinion poll process. In Australia a typical national opinion poll asks its questions of between 1000 and 2000 randomly selected people, 1800 is a typical sample to provide a result with an acceptable level of error. Australia’s deliberative opinion polls have included less than 400 people, and while this may have been a sufficient sample for the ACT poll, it may not be truly representative at the national level. Also, regardless of the number of people in the group and how representative it may be, the result is still derived from the majority of a subset of citizens, which raises doubts about how democratic it can really be. In chapter 8 this point is considered again, and a decision procedure is described which provides opportunities for citizens participation, and concludes with a referendum to provide the opportunity for all citizens to ratify the decision.

Gastil is supportive of deliberative opinion polls, but he also sees additional shortcomings in the process, including the lack of opportunity for face-to-face deliberation amongst citizens; and the short time available, usually up to three days, provides only a limited period for ‘education, discussion, and reflection’. The group discussions are focussed on preparing questions for the experts and partisans rather than working through the views of citizens. He proposes more structured and moderated processes for the meetings between citizens, and for the interaction with experts and partisans. In this way he believes the result of the final post-deliberation ballot would be more representative of the deliberations of citizens (Gastil, 2007).
2.5. **Modern direct democracy**

It is generally held that the Athenian model of direct democracy is not possible in modern nation-states, but there is also the view that some form of direct democracy could be implemented, by extending representative models with the ideas of participation and deliberation, described in section 2.4.

2.5.1. **Methods of participation and deliberation**

Previously, the concepts of participation and deliberation have generally been regarded as minor additions to a representative system, with a small number of citizens taking part in events which often have no authority over the representative government. Therefore, any new form of direct democracy should include methods of participation preferably by significant numbers of citizens, and which should produce outcomes of substance and authority. Table 2.2 shows a list of participatory methods with brief descriptions and some indication of the number of people involved. Some of these methods include refinements and variations of deliberative and discursive democracy, one of which is the *citizens jury*, mentioned previously in Saward’s analysis of deliberation.
<table>
<thead>
<tr>
<th><strong>Method</strong></th>
<th><strong>Objectives and Brief definition</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>21st Century Town Meeting</td>
<td>To engage thousands of people at a time (up to 5,000 per meeting) in deliberation about complex public policy issues. A forum that links technology with small-group, face-to-face dialogue to engage thousands of people at a time in deliberation about complex public policy issues.</td>
</tr>
<tr>
<td>Charrette</td>
<td>To generate consensus among diverse groups of people and form an action plan. An intensive face-to-face process designed to bring people from various sub-groups of society into consensus within a short period of time.</td>
</tr>
<tr>
<td>Citizens Jury</td>
<td>To produce a decision that is representative of average citizens who have been well informed on the issue. The Citizens Jury method is a means for obtaining informed citizen input into policy decisions. The jury is composed of 12-24 randomly selected citizens, who are informed by several perspectives, often by experts.</td>
</tr>
<tr>
<td>Consensus Conference</td>
<td>To achieve consensus and a decision on a controversial topic. A public enquiry centred around a group of 10 to 30 citizens who are charged with the assessment of a socially controversial topic. These laypeople put their questions and concerns to a panel of experts, assess the experts’ answers and then negotiate among themselves.</td>
</tr>
<tr>
<td>Deliberative polling*</td>
<td>To get both a representative and an informed (deliberative) view of what the public thinks and feels about an important public issue. This is the Fishkin method, described in the previous section, however see the comment following this table.</td>
</tr>
<tr>
<td>Delphi</td>
<td>To expose all opinions and options regarding a complex issue. An iterative survey of experts where each participant completes a questionnaire and is then given feedback on the whole set of responses. This is repeated until consensus is reached.</td>
</tr>
<tr>
<td>Expert Panel</td>
<td>To synthesise a variety of inputs on a specialised topic and produce recommendations. An expert panel synthesises a variety of inputs – testimony, research reports, outputs of forecasting methods, etc. – and produces a report that provides a vision and/or recommendations for future possibilities and needs for the topics under analysis.</td>
</tr>
<tr>
<td>Focus Group</td>
<td>To expose different groups’ opinions on an issue and why these are held (reasoning). A planned discussion among a small group (4-12 persons) of stakeholders facilitated by a skilled moderator, to obtain information about (various) people’s preferences and values pertaining to a defined topic.</td>
</tr>
<tr>
<td>PAME</td>
<td>meaning Participatory Assessment Monitoring and Evaluation. To evaluate and learn. An opportunity for the stakeholders of a project to stop and reflect on the past, in order to make decisions about the future.</td>
</tr>
<tr>
<td>Planning Cells</td>
<td>To learn about, and choose between multiple options regarding an urgent and important issue, and develop an action plan. A group of approximately twenty-five randomly selected citizens, who work as public consultants for a limited period of time (e.g. one week), in order to present solutions for a given planning or policy problem.</td>
</tr>
<tr>
<td>Scenario building exercise</td>
<td>To assist in planning and preparedness for an uncertain future, and for vision-building. An activity for anyone, to produce scenarios, which are narrative descriptions of potential futures that focus attention on relationships between events and decision points.</td>
</tr>
<tr>
<td>Technology Festival</td>
<td>To provide a means for public debates about societal issues of science and technology A broad, easily accessible public event that is centred around one clearly defined subject, to provide a means for a popular and more comprehensive dialogue about socio-political issues that are complex, controversial and multi-faceted.</td>
</tr>
<tr>
<td>The World Café</td>
<td>To generate and share ideas. A creative process for facilitating collaborative dialogue and sharing knowledge and ideas, to create a living network of conversation and action.</td>
</tr>
</tbody>
</table>

**Table 2.2 Participatory methods**  
(after Steyaert and Lisoir, 2005, p27)
The manual on participation methods produced by Steyaert and Lisoir includes a detailed chart for comparing these various methods, covering their advantages in particular situations, and other practical aspects including their indicative costs. They point out that while the Deliberative Polling® method is available to all, ‘the presence and authorization of the owners is required for all events which make explicit mention of the name of their method. In such cases this implies that all costs linked to their presence must be covered and that the owners shall be entitled to charge a fee’ (Steyaert and Lisoir, 2005, p81). Given the variety of other, similar methods, this could be good reason to use one of these, instead of the Fishkin method.

2.5.2. Voting in a direct democracy

To summarise this section so far, a modern direct democracy would continue to have elected representatives, to enact legislation for example, but their decisions would be informed and enhanced by the participation of citizens in some way. There are also reasons for voting in addition to the election of parliamentary representatives.

Direct democracy is sometimes the term used to describe particular forms of vote within any democratic system. The term direct democracy is commonly used to refer to three distinct types of vote:

a) referendums, which are votes on a specific single issue or piece of legislation (rather than for a party or candidate);

b) citizen initiatives, whereby citizens can propose new legislation or constitutional amendments by gathering enough signatures in a petition to force a vote on the proposal; and

c) recall, under which citizens can force a vote on whether to oust an incumbent elected official by collecting enough signatures in a petition.

The common characteristic of these mechanisms is that they all place more power directly in the hands of voters, as opposed to elected representatives. Direct democracy is therefore often seen as conflicting with representative democracy, in which voters elect representatives to make decisions on their behalf. In contrast, under direct democracy, voters can themselves make decisions about specific policies or issues (ACE, 2008 italics added).\(^1\)

There are examples of these types of vote in various nations around the world. Australia uses a referendum for citizens to vote on proposed changes to its

\(^1\) ACE stands for Administration and Cost of Elections. This ACE Electoral Knowledge Network is supported, amongst others, by the United Nations and the International IDEA. More details of IDEA are included in chapter 3.
Constitution. Also there have been attempts at various times to introduce citizens initiated referenda (CIR). These have failed, usually through lack of bi-partisan support at the time, but sometimes because the CIR is seen by some as a threat to representative government.

The focus of the ACE project is representative democracy, elections and voting, so the above definition of direct democracy is understandable. Similarly, the ACE project information on participation is focused on citizens participation in elections. It is likely that some societies would introduce these additional reasons for voting as methods to provide other means of citizens participation.

Methods of voting and participation have been defined as democratic devices, and these are revisited in chapter 8, where ways to use them in decision procedures are described.

2.6. Summary and conclusion
One of the presuppositions of the research question - *how can the use of ICT in democratic processes provide a society with an improved democracy?* is that democracy needs to be improved. This implies that there is contention between what a society ought to be doing to be democratically active, and what it actually does in this regard. In this chapter a wide range of models and ideas for democracy has been described, in order to establish what a norm for democracy could be, that is what the society ought to be doing.

The range of models described covers representative, participatory and direct democracy in various forms. Because of the predominance of representative versions of democracy in modern times, additional information on electoral systems is provided in Chapter 3. From this information, the essential requirements for electoral systems using ICT can be derived. Then, to conclude the description and analysis of democracy, chapter 4 includes some evidence that the political reality of some of the western democracies is in contention with what ought to be happening, supporting the point of the need to improve democracy.
Chapter 3. Electoral systems

3.1. Introduction

The purpose of chapter 3 is to build on the material in chapter 2 covering representative models of democracy, by describing some of the ways that democratic representation might be implemented in practice, through the use of electoral systems.

It should be noted that while the emphasis of this chapter is on democratic methods to elect representatives to government, electoral systems have a role in any democratic society. As Saward (2000, p77) points out, even highly participative and deliberative democracies will still need voting and aggregative decision making methods to determine the final position on an issue.

The term ‘decision procedure’ used in this thesis refers to the way that a decision might made by a group of people, in a political context. In a representative democracy the decision procedure usually refers to the way that candidates are elected to form a government. It has a wider meaning when citizens participation goes beyond voting, as described in chapter 8.

The chapter starts by developing the requirements of a decision procedure for a small organisation, and in this way some of the issues to provide free and fair elections and political equality are identified and explained. The full requirements of voting and electoral systems for nation states are then described. These requirements are covered in detail in order to define and understand the scope of such systems. From this understanding, the role that ICT could play to address the opportunities and shortcomings of voting and electoral systems can be examined in later chapters.

The latter part of the chapter describes Australia’s democracy, and the findings of an audit of Australia’s electoral systems.

3.2. A simple decision-procedure

A simple decision-procedure, such as might be used by a democratic university common room association, is described in this section. From this simple model, the requirements of a full electoral system are identified, for example one that might be used in a nation state.
Consider a group of university residential students who belong to a common room association run as a democracy. The association has meetings where all members who are present make decisions about the things they want to do, or on what to spend the group’s money, perhaps another newspaper for the common room. A very simple decision-procedure for the democratic association might be:

* A decision on any matter brought before a meeting of the association is made by the members present, voting for or against the matter by a show of hands, the majority view being taken as the decision of the meeting.

This is the way that many formal decisions are made daily by small groups of people, for example in a workplace committee or a community organisation.

Suppose that there are 100 members in the common room association. A show of hands would be quite difficult to count accurately at a meeting attended by all 100 students, so another way is needed to record the votes of the students. Perhaps those for the decision should line up on one side of the common room, and those against, on the other side. This may make counting people easier, but showing hands is not a secret vote, which may be necessary for sensitive matters. A paper ballot could be used, which would provide some secrecy, but raises other complications. There might be the need for official ballot papers to avoid the possibility of false papers being introduced to the vote. There might be the need for rules for counting the ballot papers, and checking on the result, for checking that the ballot box is empty before the vote is taken, and for the disposal of the ballot papers when the result is confirmed.

The ‘majority view’ of the full meeting of 100 members may only be 51 students, and such a close decision may be considered unfair by the other 49 members. Perhaps the rule should be that for the decision to go ahead requires a vote of agreement by 75% of those at the meeting. However, if, for example, only 48 students attend the meeting, the 75% rule means that the decision could be agreed to by 36 students, just over one third of the membership. Perhaps it is desirable for students to have a way to vote if they cannot attend the meeting. This would make the decision more representative of the association, but raises other issues, such as the possibility of the student being coerced to vote a particular way if he cannot vote at the meeting.

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2 This scenario is taken from Singer (1973)
The rules for this decision-procedure are now becoming complicated and should be written down. Table 3.1 is an example of a model decision-procedure for the common room association, with the focus on the method of voting at a meeting.
### Document Information

*This section could contain information about the version of the procedure, who had reviewed it, and when it had been adopted by the students.*

<table>
<thead>
<tr>
<th>1. Purpose:</th>
</tr>
</thead>
<tbody>
<tr>
<td>This procedure describes the way that members of University College vote for decisions which affect the operation of the Common Room.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Scope:</th>
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<tbody>
<tr>
<td>The decision-procedure is to be used for all matters brought before the Association which require a decision.</td>
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</table>

<table>
<thead>
<tr>
<th>3. Voting</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 A decision on any matter brought before a meeting of the Association is made by the members present, by voting in a secret ballot, or by members casting an absentee vote within three days before the day of the meeting. A quorum for the meeting is 30% of the members. Each member of the Association has one vote only. Proxy votes are not allowed.</td>
</tr>
<tr>
<td>3.2 At a meeting before a decision is to be made, the members shall appoint two members to perform the count, and two members to be scrutineers. The term of these appointees shall not exceed three months, and these members may not hold these positions again in the same year.</td>
</tr>
<tr>
<td>3.3 Members shall record their name on the voting register at the meeting before they vote, or when they cast an absentee vote. All votes are cast in secret.</td>
</tr>
<tr>
<td>3.4 Official ballot papers shall be prepared, one for each member of the Association. One ballot box shall be used. It shall be kept secure during the voting period, which is from three days before the day of the meeting, until the close of the meeting, when the result is announced. Scrutineers shall ensure that the ballot box is empty at the start of the voting period.</td>
</tr>
<tr>
<td>3.5 A valid vote is cast on the official ballot paper by making a clear mark against the choice of the member, either ‘Yes’ to accept the decision, or ‘No’ to reject the decision. A ballot paper which has no mark, or a mark against both options, or other markings, is considered invalid. The number of invalid votes is recorded.</td>
</tr>
<tr>
<td>3.6 Counting shall commence when all votes have been cast at the meeting. All valid votes which have been cast at the meeting or cast as absentee votes shall be counted. The count shall record the number of ‘Yes’ votes, ‘No’ votes, and invalid votes. The total of these should equal the total number of members on the voting register. The number of unused ballot papers should equal the difference between the total number of members and the number who are recorded on the voting register. Any discrepancy shall be reported to the meeting when the decision is announced.</td>
</tr>
<tr>
<td>3.7 A decision is taken to be accepted if a majority of voters (50% +1) vote ’Yes’ to the matter.</td>
</tr>
<tr>
<td>3.8 after the result is announced, the ballot papers shall be destroyed by the scrutineers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>All financial members of the Association are expected to attend meetings and cast a vote for or against the matter. If attendance at a meeting is not possible, an absentee vote should be cast within the time allocated. While voting is strongly encouraged, it is not compulsory. Those responsible for counting votes shall ensure all votes are counted. Scrutineers shall ensure that the count is fair and accurate.</td>
</tr>
</tbody>
</table>

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**Table 3.1 Decision-Procedure for University College Common Room Association for Residential students**

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In Table 3.1 the decision-procedure for voting is shown, but more rules are needed to cover other aspects. This example has the members at the meeting making the decisions, but it does not describe how the meeting might be organised. Since this is about democracy we could assume that this is not an anarchical situation, one which does not have any form of governing body. Therefore, there will be people who have specific functions for the running of the decision-procedure.

Point 3.2 of the decision-procedure shown in Table 3.1 states that the members should appoint people to count the vote and act as scrutineers. There will also be roles for other people in the association; such as a chairman to run the meeting, a secretary to give notice of the meeting and record its decisions, a treasurer to maintain the accounts of financial transactions, and perhaps other roles, such as a social events organiser. This group of people might be called a management committee, and in a democracy they would be selected from the membership of the association. It may be desirable to appoint an independent Returning Officer from another college to oversee the conduct of an election. The rules which describe how the meeting should be run by these people should be included in the association’s decision-procedure.

In addition, the decision-procedure which currently covers the rules for voting for decisions should be updated to include the rules about electing the management committee. These rules might cover the conditions for a member to be eligible to stand for election, whether a member may stand for more than one position in any election, how choices might be recorded on the ballot paper, and any rules about counting the votes.

Of course, the management committee may not be elected, the positions could be filled using some method of rotation, or perhaps by ballot, as happened in Athens. The rules which cover the method of appointing a small committee from a group of 100 people need not be complicated, but they do need to be fair and reflect the choice of the whole membership of the organisation.

To summarise, this section started with a description of a simple decision-procedure for a common room association, which would enable members to decide on a matter by voting for a decision to proceed. It was then necessary to add rules to the simple procedure to ensure the matter was really decided democratically. Then further rules were added to cover ways the association’s meetings should be run, and how the people who run the meetings should be chosen, also in a democratic way.
In this way, the decision-procedure started as a simple voting system, which then developed into a simple electoral system, suitable for an association of about 100 people. The final decision-procedure of the association should meet the conditions required for members to accept and obey the decisions reached. These conditions are that the procedure is a fair compromise between the competing claims of the members, and that members should participate in the decision-procedure.

In the next section, where the requirements of an electoral system for a democratic society are identified, it will be seen that even the simple decision-procedure for the common room association includes several aspects of a large scale electoral system.

3.3. Electoral systems

It is most likely that any society which, for the first time, is adopting democracy as the way to govern itself will choose the representative model, and the design and development of an electoral system would have a high priority.

A key component of an electoral system is a voting system, which covers the method of voting to select representatives from the list of candidates, and the rules for counting the votes cast in favour of the candidates for election. In addition, the electoral system has other processes to support and complement voting; covering aspects such as the design of constituency boundaries, the rules about who can vote, who can be a candidate, how the election would be administered, and the duties and training of polling and administrative staff.

Voting would also be used in a more participative democracy, in fact voting is a common element of all democratic models.

3.3.1. Voting methods

The method of selecting people to be representatives in a parliament, or to decide the question in a referendum, is important to the success of a democracy. As voting is often the only way that citizens can participate, they need to be assured that the result of the vote is fair, and is considered as a reflection of the will of the people. A brief overview of the various methods which can be used to vote for members of a democratic legislature follows. This section draws on the Australian Parliamentary Library Research Brief on Electoral Systems (Newman and Bennett, 2006).

The Introduction to this Brief acknowledges that the term ‘electoral system’ is regularly used either narrowly, to describe the various methods of voting, or
broadly, to describe ‘all the structures and operations that are used to run an election’ (Newman and Bennett, 2006, p2). While these authors have chosen to use the narrow meaning in their brief, I use the broader meaning in later sections of this chapter.

Table 3.1 above includes: 3.7 A decision is taken to be accepted if a majority of voters (50% +1) vote ‘Yes’ to the matter. This is known as the first-past-the-post (FPTP) method, and in this case, because there are only two options from which to choose, it can be included as part of the family of voting systems known as ‘majority’ systems. In these systems an absolute majority, that is more that 50%, of the vote is required to select a winner. An absolute majority is taken to represent the will of the people. However, the FPTP method is not confined to voting for just two candidates.

The FPTP method is widely used in democratic voting systems to elect representatives in a legislative assembly or parliament. Each voter receives a ballot paper on which the names of the candidates are listed, and the voter makes a mark, typically a cross, against the name of his or her choice of candidate. The candidate who receives the most crosses becomes the elected representative. This is the simplest method of voting, and can be used in democratic societies where there is a high level of illiteracy. For example, in India the names of candidates are also associated with symbols, such as pictures of animals, to help those who cannot read to choose their candidate.

If there are just two candidates in a FPTP ballot, one will always have majority, unless there is a dead heat. If there are several candidates it is quite possible that none of these will gain an absolute majority. If it is decided that the candidate with the most votes will become the representative, even if he or she does not have an absolute majority, it is called a ‘plurality’ system. In an election in a plurality system with, say, four candidates it would be possible for a representative to be elected with less than 50% of the vote, and more candidates could mean a candidate is elected with an even lower percentage of the total votes. An absolute majority is the most basic way to decide the people’s choice, and the plurality system frequently can fail this simple test of democracy.

A majority system can still use the FPTP method of voting, but one or more extra ballots are required. A second ballot, just between the two candidates with the highest number of votes, will produce a majority decision. Alternatively one or more extra ballots could be used to select a winner from the candidates who
received more than a certain percentage of votes in the initial ballot. There could be criticisms that this method is expensive and time consuming, and delays the decision, but, by selecting a candidate with an absolute majority, it does overcome a main objection to the plurality system.

Another way to overcome the criticisms of the FPTP majority system is to allow voters to number the candidates on the ballot paper in their order of preference, rather than just voting for one person. Variations on the ‘preferential’ voting system, as this is called, are used throughout Australia. If a candidate receives an absolute majority of first preference votes he or she is elected. If there is not an outright winner, the candidate with the least first preference votes is eliminated and the second preferences of those who voted for this person are distributed to the remaining candidates. This process continues until a candidate gains an absolute majority. This is also sometimes known as the ‘alternative vote’ or ‘instant runoff’ method.

A ‘compulsory preferential’ system requires that a preference is allocated to all candidates, which can be a complicated process if there are many of them. Ballot papers which do not show all preferences may be rejected as not being a formal vote. So if an unintentional mistake is made on the ballot paper, such as missing a number in sequence, or not marking one candidate, the voter is disenfranchised.

An alternative to this method is the ‘optional preferential’ system, in which the voter is required to allocate one preference to cast a valid vote, and may allocate up to as many preferences as there are candidates. This reduces the possibility of error, and the voter need not cast a vote for someone to whom he or she seriously objects.

Some voters allocate their preferences for candidates in sequence down the list, meaning the first preference is given to the name at the top of the list. This is known as a ‘linear vote’, often called by the offensive term a ‘donkey vote’. Therefore, the order that the candidates names appear on a preferential ballot could be important, giving an advantage to the person allocated the first place on the list, whether by alphabetical order or by random or some other method of order selection. To overcome this issue, a statistical method known as the ‘Robson Rotation’ (PRSA, 2004) is used in some legislatures to provide a number of versions of a ballot with candidates names in different orders. This makes the election fairer by sharing the linear vote more equally between the candidates, but it has an extra cost.
So far, the examples given have resulted in just one candidate being elected as a representative for each electorate, and while the preferential voting method may provide a fairer demonstration of the people’s choice, there is always a minority of voters who may feel unrepresented, especially if they are strongly opposed to the party policies of the winning candidate. Proportional representation is an attempt to address this weakness in a representative democracy.

Given that the vast majority of representative democracies are based on political parties, ‘proportional representation’ includes a number of voting systems which try to produce a legislature in which the proportion of seats won by political parties, independent candidates and groups, are to the proportion of votes they received in the election. Of course the method would still work if there were no political parties, just independent candidates. In Australia, the Senate, the Legislative Assemblies of Tasmania and the Australian Capital Territory (ACT), and the Legislative Councils (upper houses) of four states use methods of proportional representation.

In this method voters elect several people to represent their constituency; for example the ACT has two electorates with five members and one with seven members, and each Australian state has twelve Senate seats. Members are chosen using preferential voting. Some may be elected solely on first preferences by reaching a quota (see below), and others gain seats through the allocation of preferences of the lowest ranked candidates. This method is also sometimes known as the Single Transferable Vote (STV), and the ACT and Tasmania use a version called the Hare-Clark system.

There are many variations in proportional representation systems. Some may use one of a number of ways to calculate a ‘quota’, that is the minimum number of votes required to award a seat. Others do not use a quota, and have various methods of counting votes for the allocation of seats to parties. There are different ways to allocate seats to candidates who do not receive a full quota in a preferential ballot. In other options voters do not vote for individual candidates, but for a list of candidates in a party. An example of this option is with the Australian Senate ballot where voters can cast single vote ‘above the line’ for the candidates nominated by a party, rather than cast individual votes according to their preference. With this method, voters cast a single vote for a party above a thick line printed on the ballot paper, instead of allocating individual preferences to the candidates shown below a line, hence the name. By voting above the line candidates have chosen the
preferences decided by party officials, rather than making their own choices. This method favours parties rather than candidates, whereas the Hare-Clark system, which does not have ‘above the line’ voting, gives greater weight to individual candidates.

This range of options for voting systems has shown the development of ideas from a simple FPTP plurality method, through preferential voting, to the various of methods of proportional representation. Each option has added more complexity, as ways have been sought to provide a method of selecting members which reflect most closely the will of the people in a representative legislative assembly. Some methods increase the complexity for the voters, and others increase the chance of errors being made when votes are being manually counted, perhaps resulting in an invalid outcome; and the cost of an election can increase as each of these initiatives are implemented.

The previous detailed description of voting systems have laid the groundwork for the use of ICT in voting systems, described in chapter 6. For example electronic vote counting, particularly in preferential and proportional systems, can be very reliable and economical, compared with manual methods. However, as shown in chapter 6, ICT can only resolve some of these issues, and the use of technology can sometimes be a hindrance to free and fair elections.

### 3.3.2. Requirements of an electoral system

A voting system is just one, but a significant part of an electoral system, which includes all of the other components of an election, and their design and operation. These are covered in this section.

The International Institute for Democracy and Electoral Assistance (IDEA, 2007) is an independent organisation founded in 1995 by 12 member states, including Australia, to provide advice and support to societies to establish their democratic systems. IDEA has issued a number of publications to support democratic activities, including one that describes the design criteria for electoral systems.

IDEA’s Handbook on *Electoral Systems Design* lists ten criteria for the design of electoral systems (Reynolds et al, 2005, p9-15). Developing countries are the main focus of the activities of IDEA, and these criteria are mainly addressed to a society setting up a representative democracy for the first time. Such a society will, most likely, already have some form of government and a political environment,
based on political parties or perhaps on tribal groups. One of the purposes of a representative government is to address and resolve matters of disadvantage and conflict in a society in a peaceful way. Therefore the advice given in the IDEA Handbook is particularly focused on ways to ensure that the system of government and its supporting electoral system are free and fair, and designed to provide stability. As the Handbook states (p9) the list is not exhaustive, and some aspects of the criteria may be contradictory, meaning that trade-offs may be required, but this is a common occurrence in the design of any complex system.

It should be noted that these criteria could also be considered by a society which is reforming an established electoral system, perhaps to meet changes in legislation, and certainly if it was adopting ICT or other technology.

For the purposes of this section the design criteria are presented in a different order from that in the Handbook, and some have been combined to minimise repetition. The conditions identified in section 2.3.1 as being necessary to prevent a representative government degenerating into oligarchy can be identified in these design criteria.

3.3.3. The design criteria

The last of the criteria in the Handbook is *Taking into account ‘International Standards’* (p14), which identifies the ‘standards’ to be considered as ‘international covenants, treaties, and other kinds of legal instruments affecting political issues’. The 1948 Universal Declaration of Human Rights and the 1966 International Covenant on Civil and Political Rights are given as two examples of these standards, and there are others made by regional organisations. In effect, these standards provide very high level requirements for running a society, such as ‘free, fair and periodic elections’, and they guide the specific content of the society’s own constitution and legislation to support its representative democracy. A set of laws and regulations defining the electoral processes would be part of this legislation.

One objective of the electoral system to be designed to meet the requirements of this legislation is the criterion *Facilitating stable and efficient government* (p11). There are three main questions to address to achieve stable and efficient government, namely: do citizens perceive the electoral system to be fair; can the government enact legislation and govern efficiently; and does the system avoid discriminating against particular parties or interest groups? Many of the following points include the objective of addressing these questions.
An advantage of an electoral system is that it can provide a way to manage or mitigate conflict in a society in a peaceful way; especially if that society has had serious tensions between groups of different ethnicity, language, or tribal affiliations. The criterion Providing incentives for conciliation (p10) suggests that the requirements of the electoral system might include constituencies with boundaries which ignore the traditional boundaries dividing these different groups, and which include preferential voting and/or are multi-member electorates.

Encouraging political parties (p12) is another criterion to assist stable government, and, to be consistent with the sentiment of the previous paragraph, it is desirable that political parties are not based on narrow ethnic, racial or regional lines, if possible. The electoral system should encourage strong and effective political parties, with a few large parties based on broad political values being established, rather than a greater number of small parties with minimum support. This approach may be necessary when setting up a new democratic government. However, in a well established democracy the choice for voters to choose from a number of parties and independent candidates means they can elect a parliament which is more representative of the whole community. This multi-party approach would help the electoral system to address another design criterion, that of Promoting legislative opposition and oversight (p13). An effective opposition to a government is an important component of representative democracy, to ensure that the government is held accountable to the parliament, legislation is reviewed properly, the opposition’s constituents have voice in the parliament, and the rights of minority groups are considered.

Another accountability criterion, Holding the government accountable (p12), stresses that the electoral system should be designed to ensure that the government is responsible to its citizens, who should have the power to change the government, at an election, if it is not satisfactory. However, it is possible for a government to be elected with a majority of seats, although it did not receive a majority of votes across the society, as happened in Australia’s federal elections in 1987 and 1998, for example. To reduce the chances of this happening, the electoral system should be designed to ensure that the a rule requiring each person to have one vote with the same value is followed as closely as possible.

At the level of an individual constituency, the relevant criterion is Holding individual representatives accountable (p12). This may appear to be a simple process, but in societies with strong and well established political parties, there
could be other issues. For example, a very effective local candidate may lose his or her seat through being a member of an unpopular government party. On the other hand, parties may select candidates who are sporting or media celebrities, or well-known people from business organisations or trade unions. While there may be no reason to doubt the ability or the motivation of these people to be candidates, the electors may prefer to choose someone local, who is well known in the community, and has intimate knowledge of the constituency, especially when the society is setting up its electoral system.

The criterion *Making the election process sustainable* (p14) addresses the costs of the components of an electoral system, particularly those costs related to the administration of the particular method of voting and counting votes. For example, counting the votes by hand in the FPTP method would cost less than a method using preferential voting. If the counting was done by computer, however, there would be no difference in cost, whatever the method. Other administration costs would cover the wages and training of staff and the infrastructure to support an election, and the use of ICT could help to minimise these costs.

The criterion *Providing representation* (p9) outlines four main forms of representation which could be provided in a legislature, namely; *geographical, ideological, party-political*, and *descriptive*, described as being ‘a mirror of the people’. It is hoped that the representatives of any legislature would reflect ‘the people’, and in practice a legislature would consist of components of each of these forms. To summarise this criterion, quoting the Handbook, ‘An adequately descriptive legislature would include both men and women, the young and the old, the wealthy and the poor, and reflect the different religious affiliations, linguistic communities and ethnic groups within a society’ (p9).

From the voters’ points of view the criterion *Making elections accessible and meaningful* (p10) is particularly important. *Accessibility* requirements, cover the ‘ease of voting’ and include a number of factors, which go to define the voting process of an electoral system. The following are the basic requirements of such a process.

a) A voter registration process and an up to date electoral roll. This requirement includes the ability for first-time electors (eg. young people or newly arrived citizens) or those who have changed their address, to be able to register within a reasonable time after an election is called.
b) The location and availability of polling places, which is an important issue for people living in rural and remote regions.

c) The facilities at a polling place, to ensure each ballot is cast in secret, and which have provision for voters who have physical disabilities, eg. blindness.

d) The training and ability of the electoral system support staff to provide assistance to voters, receive complaints from voters, and to meet statutory requirements such as polling place opening times and the availability of ballot papers.

e) The design of the ballot, especially for complex voting systems including preferential voting and proportional representation.

f) Clear instructions on how to complete the ballot, in multiple languages if necessary.

g) Methods of voting other than attending a polling station on voting day, such as postal votes and the ability to vote away from one’s constituency. This is critical if the society has adopted compulsory voting.

The requirements to make an election meaningful mainly cover the particular voting method, such as FPTP, or preferential voting, as described in above. Also, a constituency may be a ‘safe seat’ for a particular candidate or political party, meaning there is a wide margin of votes between the elected candidate and the other candidates. For the voters who selected the candidates in the minority, the election may not be meaningful if they consider their vote wasted.

This section has covered the criteria outlined in the IDEA handbook on electoral system design. The handbook has been written particularly for societies which are moving towards a democratically elected representative government for the first time, and therefore it describes many aspects which are already in place in established democracies.

3.3.4. Use of ICT in an electoral system

The focus of this thesis is on the role of ICT in democratic decision processes procedures involving representation and participation. However, for completeness, this section describes briefly the role that ICT can play to support the administrative functions of electoral systems.

As might be expected, administration and management processes of electoral authorities are supported by ICT in the same way that these processes are supported
in other organisations. Using Australia as the example, the use of ICT is well established to support electoral system management, administration and processing. ‘What voters don’t see at their polling places are the sophisticated uses of technology that have gone into making Australian elections run so smoothly, in world terms’ (Green 2000). Green cites the use of technology for:

a) the maintenance of the electoral rolls which are continuously updated using a national computer network;
b) printing the lists of electors and checking them for non-voters and for those who may have voted multiple times;
c) recruitment, training, and payment of polling place staff; managing postal voting and polling place equipment;
d) providing information and services to citizens by electoral authorities; and
e) the analysis of election results.

**Electoral rolls**

The starting point of any electoral system is to provide the means to register people as voters when they reach voting age, or when they are accepted as new citizens. The next step is to produce and maintain an electoral roll, or rolls, if there are multiple tiers of government, such as federal and state. There are processes to keep these rolls up to date, as people register as new voters, change their address or electorate, or die. Copies of the relevant parts of the roll have to be available at all polling places on election day, and during pre-poll periods. As with many other record keeping systems, ICT has played an important part in building, up-dating and maintaining electoral rolls for many years.

In the 2008 ACT election, Personal Digital Assistants (PDAs) containing the full Territory electoral roll were used by election officials, instead of a paper roll. This saved time at the polling places as citizens collected their barcodes or ballots; eliminated the cost of preparing many hard-copy versions of the roll; and made the production of election statistics easier and at a lower cost.³

**Ballot preparation**

When an election is announced, ballots are prepared, their formats depending on:

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³ The use of this technology built on the experience of PDA usage by Queensland in 2006 and Victoria in 2007.
a) the number of candidates standing in an electorate and their parties or other groupings;
b) the voting technology used;
c) the voting method, (preferential voting or first-past-the-post (FPTP) for example); and
d) other techniques to provide a more democratic result.

**Election administration**

Technology is also commonly used to manage and run an election, covering administration tasks such as:

a) booking and equipping polling places;
b) recruiting and training polling place staff;
c) advertising, and post election reporting;
d) providing security for the ballots (both paper and electronic), before and after votes are cast, and then counted; and
e) providing any number of audit and assurance activities for both the electoral processes and the voting technology used.

**Election results**

Some method to display the results of the election is needed, and there are several ways to do this. Electronic means for publishing in print and TV media have been common for many years, and publication via the Internet is becoming more common. For example, the progress of the count could be sent electronically to television channels to inform the TV coverage of the election, and/or be displayed on an election website.

3.4. **Australia’s democracy**

So far, in this chapter the requirements of voting and electoral systems in general have been described. These final sections will introduce a practical element by describing how Australia runs its political democracy; and by identifying areas which could be improved, through analysing the result of an audit of Australia’s electoral systems. Article 21 of the United Nations Universal Declaration of Human Rights states:

> Everyone has the right to take part in the government of his country, directly or through freely chosen representatives.
> Everyone has the right to equal access to public service in his country.
The will of the people shall be the basis of the authority of government; this will shall be expressed in periodic and genuine elections which shall be by universal and equal suffrage and shall be held by secret vote or by equivalent free voting procedures.

Article 21 declares that democracy is a human right, by stating that ‘Everyone has the right to take part…’ and ‘The will of the people shall be the basis…’; and that this right can be expressed through either direct or representative democracy.

About 50 years before the UN Declaration, the Commonwealth of Australia had established its Constitution, which defined the requirements of a constitutional monarchy. The head of state is the queen (or king) of the UK, represented in Australia by a Governor-General. The Governor-General, the Senate, and the House of Representatives form the Federal Parliament, which holds the legislative power of the Commonwealth of Australia. Apart from the Governor-General, the members of the Parliament are representatives elected by the citizens. Elections are governed by laws set by the Parliament, and the voting systems follow representative democratic principles consistent with the UN Declaration. There is one direct democracy function in Australia, that of the method of changing the Constitution by a referendum of all citizens.

More details of Australian voting systems for parliamentary representatives are given below. At this point it is relevant to note that many citizens would prefer to replace the un-elected monarch and her Governor-General with a president of Australia, and thus for the country to become a republic. If and when the time comes for this to happen it will require one or more referenda to make the required changes to the Constitution.

In the introduction to their book Limiting Democracy, Hughes and Costa contest the common view that the United States is ‘both the finest flower of the democratic experiment and its longest continuous example’. However, by comparing the historical developments of the US and Australian systems they conclude that ‘…Australia, and New Zealand share the honour of being the oldest continuous, modern democracies’(Hughes and Costar, 2006, p8).

One important contribution to the longevity of the Australian democracy is its Constitution. Craven has identified the significance of the Constitution, ‘…it is so staidly civilized: because it is not a product of, nor has it presided over fire, pestilence and revolution’. When compared with the constitutions of similar nations (US, UK, Canada, New Zealand, and South Africa) it is the only one which was initially drafted by elected parliamentary representatives and adopted democratically.
by Australian citizens. Also it is the only constitution from this group of nations which can be amended by its citizens, and thus has genuine democratic authority. ‘Alone of comparable documents it genuinely is a constitution by the people, of the people, for the people’ (Craven, 2004).

Some people might argue that this Constitution was set up with no recognition of, or support from women, the indigenous population and immigrants, but Craven argues that this is irrelevant. He agrees that the complaint is about true events, but the Constitution reflected the values of the Australian people and politicians of the late 19th century, when it was debated and written. However, the Constitution’s strength is that it can be changed to reflect and promote the changed values of citizens, as has happened with votes for women, the advent of multiculturalism and the recognition of indigenous people.

Like the USA, Australia is a federation of states and territories which, with local councils, provide a three tier system of government. The Federal Parliament comprises two elected houses, the lower House of Representatives, and the upper house, the Senate. Five of the six states also have bicameral parliaments, while the sixth state (Queensland) and the two territories each have just one elected legislative assembly. The third tier of government currently includes over 700 local government councils, covering the day-to-day administration of a diverse range of metropolitan, regional, rural, and indigenous communities.

Since the middle of the 19th century, that is before the federation was formed, Australia and its colonies/states have been leaders in the development of electoral systems. They have initiated: secret ballots; female suffrage; payment of elected members; no requirement to own property in order to be a lower house representative; compulsory registration of voters; and independent electoral officials and organisations; amongst others. The significance of these initiatives, and a comparison between the Australian and USA electoral systems are described in chapter 6, in a case study on electronic voting. That chapter argues that if the fundamental requirements of an electoral system are not well established, then the use of ICT cannot improve that system, and may even be to its detriment.

3.4.1. Australia’s democracy ranking in the world

It is useful to know how a nation’s democratic institutions and practices compare with others, as this may provide ways to identify opportunities for improvement.
Also, if the ranking is done on a common basis at regular intervals it is possible to see if a nation is improving or declining. So how does Australia fare?

The Economist Intelligence Unit (EIU) conducted a survey to produce a democracy index for 2006, ranking 165 independent states and two territories, according to the state of each democracy, measured against 60 indicators in the categories shown below (Kekic, 2007). The scores for the questions in each category are summed and converted to a score of 0 to 10. The mean of the five category scores provides the overall score (9.09 for Australia in this survey), and so the countries can be ranked. Australia’s score out of ten for each category is shown.

1. Electoral process and pluralism (10)
2. Functioning of government (8.93)
3. Political participation (7.78)
4. Democratic political culture (8.75)
5. Civil liberties (10)

Although information on the 60 questions and the scoring method is available, without additional information it is not possible to identify the particular shortcomings for Australia in categories 2, 3 and 4.

In this survey, Australia is ranked 8th, with Sweden 1st, Iceland 2nd, followed by another five European states, Netherlands, Norway, Denmark, Finland, Luxembourg.

Australia is the highest ranked nation which has English as its first language. Canada is 9th, New Zealand 11th equal with Ireland, the USA is ranked 17th, and the UK is 23rd in the survey.

The EIU ranking system compares democracies by asking questions which can be answered by simple responses such as ‘yes’, ‘no’, ‘maybe’, or ‘high’, moderate’, ‘low’. These answers would be scored ‘1’, ‘0.5’, ‘0’ respectively. Other questions rely on results from the World Values Survey opinion poll, such as ‘% of people who are very or somewhat interested in politics’. In this example, the answer would be scored ‘1 if over 60%’, ‘0.5 if 40% to 60%’, ‘0 if less than 40%’.

In chapter 5 this survey is used again to see if there is a relationship between a nation’s democratic ranking and its ranking in implementing electronic government.

Ranking nations in this way may have some benefit, by providing those lower down the list with a challenge to improve, or by providing successful models of democracy to emulate, but these reasons may not apply to those countries, such as Australia, which are high on the list. These nations already have well established
democracies, according to the ranking criteria, and a better approach to improve them would be to focus on specific areas. Conducting an audit of a democratic system is a better way to identify these specific areas for improvement.

3.4.2. Auditing

The common use of the term ‘audit’ relates to the examination of financial accounts to check on their accuracy. However, as shown in the ‘draft additions’ to the OED definition below, audits can cover other areas, these being defined by a modifying word. This thesis will consider democratic audits in this chapter. Software and systems audits are included in later chapters.

For a democracy it is convenient to consider the audit process used in business and similar organisations such as non-profit enterprises. The on-line Oxford English Dictionary (OED, 2008) defines such an audit as:

**Business.** An evaluation (esp. by formal, systematic review) of the effectiveness of the management, working practices, and procedures of a company or other professional body, usually conducted by independent auditors or external consultants. Also: the practice of carrying out such investigations at regular intervals or as part of a continuous process. **Draft Additions June 2002**

Such an audit may investigate an organization as a whole or specific aspects of its operations; hence freq. with modifying word (cf. efficiency audit, personnel audit). The process is sometimes described as having three distinct stages - observation, documentation, action - known as the ‘audit cycle’.

The important features of any audit process are:

a) a formal, systematic process;

b) the need for auditors to be independent of the activity being audited;

c) some type of standard or benchmark against which the activity can be assessed and measured;

d) a documented report of the findings;

e) actions to implement the recommendations of the audit report; and

f) additional checks (perhaps another audit) to confirm that the recommended changes or improvements have been implemented.

The standard or benchmark for business audits could be a national or international standard, for example the Australian Finance Standards, or the international standard ISO 9001: 2000 for Quality Management Systems. Alternatively, it may be a less formal, but still recognised industry standard or model of excellence. A usual requirement of these standards is that the top executives of these organisations take
responsibility for ensuring that the business systems are implemented, operated and maintained in accordance with the relevant standard; regular audits are conducted; and the recommended improvements are implemented.

3.4.3. The democratic audit of Australia

Democratic audits follow this process to some extent. For the Democratic Audit of Australia (DAA), started in 2002, the auditors are independent, the team mainly being academics from the Australian National University (ANU) initially, and later from Swinburne University. Funding for the audit comes from the Australian Research Council; and other support comes from the Academy of the Social Sciences in Australia, the National Social Science Visits Program, ANU, International IDEA, the Swedish Government, and the Centre for Democratic Institutions.

Regular audit reports and discussion papers are published and are freely available. However, unlike audits of business activities, there is not a formal process to correct the adverse findings from the audits of democratic activities. The Australian Electoral Commission does receive these reports, which are circulated among the organisation. While they may generate interest and discussion at various levels of the organisation, there does not seem to be a formal process to note the recommendations of the audit (AEC personal communication).

Also, there are no national or international published standards against which activities and components of a democracy can be audited. However, an initial framework was devised for a democratic audit in the UK with thirty questions over four areas covering components of democracy, namely:

a) The electoral process;
b) Open and accountable government;
c) Civil and political rights; and
d) Quality and vitality of the democracy expressed through civil society and formal institutions. (Beetham, 1994, p36-39)

Some of these areas are similar to those of the Economist Intelligence Unit’s survey described above. This framework has been developed further, and tested in a number of countries. Australian contribution has been to add to the framework by considering the institutions of federalism, and to consider in more detail the conflict which can arise between democratic values.

Australian democratic audits have three main aims:
The work of the audit team covers a number of areas. There is a Main Audit, which addresses five key areas:

a) Citizenship, law and rights: eg. protections for minorities;

b) Representative and accountable government: eg. the level of corruption in government;

c) Participation and government responsiveness: eg. modes of public consultation;

d) Democracy beyond the state: eg. meeting international obligations; and

e) Democracy and federalism: eg. open intergovernmental decision-making.

(DAA, 2007b)

The report covering the Main Audit is scheduled to be published as a book in 2009. To date there have been ten focussed audits covering specific topics, two of which are analysed in this thesis, namely:

a) Electoral systems and political equality (see below); and

b) Electronic democracy (see chapter 5).

Other topics cover political parties, political finances, corruption and democracy, and how well democracy serves minority groups (DAA, 2008).

The final component of the DAA’s work is the publication of a collection of over 150 academic, discussion and background papers, covering a wide range of topics and issues.

3.4.4. The audit of Australian electoral systems

The design criteria and requirements of an electoral system are described earlier in this chapter. In general, Australian electoral systems are in good shape, the score of 10 for ‘electoral process and pluralism’ in the survey conducted by the Economist Intelligence Unit (Kekic, 2007) is a basic indication of this. However, in complex systems there is always room for improvement, and this section is a summary of the findings of an audit of Australian Electoral Systems, conducted in 2004 (Orr, 2004).
The full title of the DAA report is *Australian Electoral Systems - How well do they serve political equality?* The audit considered political equality in Australia’s electoral systems in the five areas described below. Some of the findings reflect the issues raised in chapters 1 and 4.

**Audit area a) - who votes?**

In Australia there is now no longer discrimination from voting on the grounds of race, gender or class, and it is generally accepted that people of unsound mind should not be required to vote. The current issues of political equality about who should vote in Australia now include *citizenship, age* and *criminal conviction* (Orr, 2004, p6).

Visitors to Australia who have been granted permanent residency but have not been through a naturalisation ceremony are not allowed to vote. Some permanent residents do not become naturalised because they would have to give up their original citizenship, for example citizens of The Netherlands. However, other nations do allow their citizens to have dual citizenship with Australia. Good reasons for permanent residents to have the vote are that they pay Australian taxes, they are subject to all other Australian laws, and they make contributions to their community, as Australian citizens do. The audit report concludes that adopting a residency franchise rather than a citizen franchise would assist Australia to meet the ideal of political equality and provide a symbolic definition of Australia’s political community, ‘as an immigrant nation in a globalising world’ (Orr, 2004, p8).

Since 1973, the minimum voting age for federal elections has been 18 years, and this is now common across all Australian jurisdictions. It has been proposed by some that there should be voluntary registration and voting for 16- and 17 year-old Australians; since young people can be licensed to drive at 17, women can marry at 16, some are paying taxes, and many are becoming politically aware at this time in their life (Orr, 2004, p8). The audit report states that political equality may require that citizens of this age have a vote, perhaps on a voluntary basis. It concludes

…lowering the age will force politicians to engage more with youth issues, and a robust public debate on the issue, if it were to be inclusive of youth, might in itself increase awareness and participation rates (Orr, 2004, p9).

There is no consistency in Australian legislatures on whether convicted criminals should be disqualified from voting. The audit position is that prisoner disenfranchisement is unsupportable on political equality grounds. At the time of
the audit in 2004, prisoners serving sentences of five years or more were disqualified from voting. After 2004, some jurisdictions reduced this to disqualification for a sentence of more than three years.

As stated above, there is no formal process for acting on the findings of a democratic audit, and even no obligation for anyone to consider the findings; certainly none of the 2004 audit findings were acted upon. In fact changes were introduced which had adverse effects on Australia’s political equality.

One of the examples of dissatisfaction with the Australia’s democracy, cited in chapter 1, came from Hughes and Costar (2006), and relates to the amendments made to the Commonwealth Electoral Act in 2006, which included:

a) closing the electoral roll before a federal election after three days, as opposed to the previous time of seven days, this having the possibility of disenfranchising Australians who are eligible to vote;

b) making new and changed enrolments less straightforward by requiring production of additional proof of identity, with the possibility of discouraging electors from enrolling in the first place; and

c) depriving all prisoners of the right to vote, when previously those serving less than three years did have the franchise.

(Hughes and Costar, 2006, p31-32; and Kelly, 2006)

Amendment c) was challenged, and the High Court ruled the amendment was invalid because it was contrary to the Constitution (AEC, 2007a, p146).

The other changes to the Act show a diminution in the political equality of Australian citizens because they have the potential to deny the opportunity to vote, particularly for young citizens and those who change their address close to the calling of an election.

**Audit area b) – how we vote**

Australia has compulsory voting, and this presents ‘a collision of equality values and liberty values’, although most Australians favour compulsion, as regularly reported in opinion surveys (Orr, 2004, p12-13). From the liberty point of view, there are some people who have objections to voting on religious grounds⁴, and are exempt from voting on this basis. However there are others who may have principled political objections to voting but must still vote, and it has been suggested that there should be a statutory exemption for conscious objection. Alternatively,

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⁴ for example the Exclusive Brethren
the ballot paper could be designed to include an option of ‘none of the above’, thus allowing citizens to register their dissent, as an alternative to informal voting.

In Australia, apart from South Australia, it is not clear whether informal voting is lawful, or unlawful but untraceable, and the ‘only point of this legal obscurity is to hide a legislative unwillingness to bite the bullet’ (Orr, 2004, p25). In South Australia the law is that no-one is obliged to mark their ballot paper, and the ballot paper includes this information. This is also the case with electronic voting in the Australian Capital Territory, where the Electoral Act 1992, clause 118A(2)(d) states that the e-voting ‘program will allow an elector to make an informal vote showing no preferences for any candidate’ (ACTEC, 2007a). The audit report states that the ‘purpose of compulsory voting is to encourage engagement, not to force the formation of opinions’ (Orr, 2004, p25). If, as is likely, compulsory voting will continue in Australia, then it seems reasonable to expect legislatures to allow informal voting, and to provide the ballot paper option of selecting ‘none of the above’.

The description of voting methods in section 3.3.1 noted that Australia has a mix of systems; some based on optional preferential voting, others with compulsory preferential voting, and others where legislatures combine one of these methods with proportional representation. This has been the cause of inequality for some people through the complexity of some of the voting methods and the inconsistency of methods between legislatures.

The audit report considers that a uniform system of optional preferential voting (OPV) ‘would be a practical and democratic improvement’ for all lower house elections; and an agreed variant of the Senate proportional voting system should also be adopted for all upper house elections. The ACT and Tasmania, which now have proportional representation and partial preferential voting for their lower houses, would be excluded from this reform of Australia’s voting systems. The uniform adoption of OPV would give overall greater choice to electors, without making voting more complex, by removing the requirement for voters to decide how to cast their vote for all candidates. This method would also help to enhance political equality, as it is less likely to distort representativeness, by requiring voters to make a random or insincere choice of candidates when they have no real preference for them (Orr, 2004, p20 and p24).

Another disadvantage of full or compulsory preferential voting is that, because the voter is required to give a preference to every candidate on the ballot
paper, there is an increased risk of casting an informal vote unintentionally, especially if there is a large number of candidates on the ballot. With electronic voting, where the software allocates the selection in sequence, this risk is removed, so the elector can only ‘formally’ cast an informal vote.

As a way to minimise the risk of informal voting and the complexity of choosing from a long list of candidates, some state legislatures and the Senate provide an ‘above the line’ option. With this method, voters cast a single vote for a party above a line on the ballot paper, instead of allocating individual preferences to the candidates shown below a line, hence the name. This means that they have chosen the preferences decided by party officials, rather than making their own choices. This is different from using the parties’ ‘how to vote’ cards because with these the voter always has the opportunity to vary the order of recommended preferences. Voting above the line can introduce an inequality in the final representation in a legislature, when preference deals amongst parties can result in a minor party candidate being elected, and possibly holding the balance of power, with a very low primary, or first preference vote. For example, in the 2004 half-Senate election, a candidate for the minor Family First party was elected in Victoria with 1.9% of the primary vote (56,376 votes), although three other minor parties gained more primary votes than this, including The Greens with 263,481 votes. (Brent, 2004, and Green 2004).

As indicated above, electronic voting has a role in helping to achieve political equality in electoral systems. The comments on electronic voting in this audit report are covered in later chapters, together with another Democratic Audit of Australia report devoted to electronic democracy.

Audit area c) - who we can vote for

In section 3.3.3, the design criterion for electoral systems covering providing representation (Reynolds et al, 2005, p9) requires ‘An adequately descriptive legislature would include both men and women, the young and the old, the wealthy and the poor, and reflect the different religious affiliations, linguistic communities and ethnic groups within a society’. Australia’s representative legislatures generally do not meet this political equality criterion well in the case of Aborigines for example.

The audit report addresses the arguments for and against a number of ways to achieve greater political equality, such as:
a) the distribution of seats and electoral boundaries to achieve one-vote, one-value;
b) mixed member proportional representation;
c) reserved seats for minorities, eg. aborigines;
d) the qualifications of candidates and the difficulties for public servants to stand for federal parliament through the ‘office of profit’ disqualification;
e) the matter of single issue and micro-parties, and their effect on the final representation in upper houses; and
f) matters of party preselection practices and the need for internal democracy in parties.

Audit area d) – campaigning

Much political campaigning covers the provision of information about candidates and policies, and communicating this to citizens, so it is natural that information and communication technology should play a role in the election campaigns of political parties and candidates. Throughout much of the 20th century each new technology, from radio, to television, to on-line interactive communication via the Internet, has played a part in campaigning. The particular issues related to the present and future use of ICT are covered in later chapters. Regardless of the type of technology used, there are issues in campaigning identified by the democratic audit (Orr, 2004, pages 49-61), including:

a) options for the regulation of television advertising during an election;
b) the need for formal rules covering televised debates between opposing leaders and other senior figures, to remove the benefit of incumbency in setting the number of debates and when they are held;
c) options for the conduct and publishing of opinion polls, including the possibility of outlawing ‘push polling’ in which leading and misleading questions are asked (as if part of an opinion poll) which are designed to influence the voter to a particular view;
d) options for regulating misleading political statements and providing truth in political advertising, without stifling free speech; and
e) the problem of polling hours across different time zones, and the effects of early results of the eastern states being broadcast before citizens in Western Australia have finished voting.
I would add to point b) above, the opportunity for the leaders of the minor parties to participate in at least one televised debate to provide equality of political competition and a fully informed electorate.

**Audit area e) - money politics and incumbency benefits**

Money politics in Australia is the ‘most pressing question facing electoral equality today’ (p62), and ‘…the equality principle is given short shrift in the laissez-faire system of money in politics’ (p72). There is no maximum limit to the amount that an individual or corporation can donate to an Australian political party; and, unlike Canada, New Zealand and the UK, there is no limit to the amount that can be spent on an election campaign (p68).

Section 1.2.5 refers to a case which, according to some commentators, show that Australia’s system of democracy was undermined by the federal government in 2006. Amendments made to the Commonwealth Electoral Act in 2006 included making political donations less transparent, by increasing the threshold to disclose political donations from $1,500 to $10,000, and by increasing the level of tax deductible political contributions from $1,000 to $1,500 (Hughes and Costar, 2006, p31-32). The new Australian federal government is addressing this matter (SMOS, 2008).

Political parties are also partially funded by the taxpayer and this money, combined with the opportunity for unlimited donations and election expenditure, ensures a very liberal model which provides major benefits to the major parties, to the detriment of the minor parties and independent candidates.

Parliamentarians and their parties have several incumbency benefits such as parliamentary, ministerial, and electorate staff; parliamentary allowances for printing, communications, travel and for electorate matters; and exemption from the Privacy Act, which allows them to profile and target individual electors in their constituencies through direct political marketing. These benefits reflect political inequality because they are applied in an hierarchical way; the governing parties and members benefit more than the Opposition, which benefits more that the minor parties and independent members; all of which benefit more than the challengers at the next election.

Perhaps the greatest incumbency benefit accrues to the government through the availability of public funds for advertising and providing public information. An allocation of funds for government advertising, for example a recruitment drive for
defence forces, or for information about changes to legislation or public safety (eg. avian flu precautions), is necessary and acceptable. However, the last federal government is reported to have spent $1.7 billion on advertising in its life of eleven years (Hartcher, 2007). Much of this advertising was party political, rather than for public information or benefit.

3.4.5. Summary and conclusion

Most modern democratic societies are based on variations of the representative model described in chapter 2. Whatever representative model is adopted, it should be designed to ensure that the decision procedure to select government representatives is free and fair. This means that every citizen should have the opportunity to participate in making the decision, and the procedure should be fair, and seen to be so; in order that any citizen can accept the decision, even if it was not the choice of that person. The first part of this chapter contains a description of the wide range of components and functions of electoral systems necessary to ensure a decision procedure is free and fair. Some of these components and functions can be automated using ICT, as described in later chapters. A major theme of those chapters is the need to ensure that the use of ICT does not cause the decision procedure to become less free and fair.

The second part of the chapter covers a description of Australia’s electoral systems, including a report of an audit of those systems. The audit reveals that there are shortcomings in Australia’s representative democracy, in spite of its high ranking in a global survey of democracies. Australian governments and electoral agencies have adopted a cautious approach to the use of ICT in elections. This caution has resulted in electronic voting systems being successfully implemented for the ACT Legislative Assembly and the Senate, as described in chapters 6 and 7.

Some of the shortcomings identified in the audit are consistent with those found in other democracies, and have led to citizens being disillusioned by their systems of government. An analysis of this disillusion is the topic of the next chapter.
Chapter 4. Disillusion in the old democracies

4.1. Introduction

The research question, - How can the use of ICT in democratic processes provide a society with an improved democracy? - presupposes that some societies might need to improve their democracies. The purpose of this chapter is to examine in detail this presupposition by examining the performance of some of the established democracies.

Section 1.2 introduces the notion of contestation in democracy, in terms of democracy both as an idea, and as a political reality, and chapters 2 and 3 include descriptions of the first part of this notion. This chapter outlines some of the issues of democracy as a political reality by describing the work of Beetham (2005, chapter 3). Beetham’s work covers research into ways to measure democracy (Beetham, 1994), and in the development and use of democratic audit processes.

One of the principles of democracy is expressive freedom, which would include the right for citizens to criticise their democratic system and representatives. Recently in Australia this principle was demonstrated through the publication of a number of books commenting on political issues, for example Hamilton and Maddison (2007), Hughes and Costar (2006), Lucy and Mickler (2006), Marr and Wilkinson (2003), and Walter and Strangio (2007); and some of the issues raised in these texts were introduced in section 1.2.5. The report of the Australian democratic audit of Australia’s electoral systems, which concludes chapter 3, is another example of this principle in action. There have been similar publications in the UK, for example (Hutton, 1996), and the report of a comprehensive democratic audit, Democracy under Blair, (Beetham, et al, 2002).

Australia, New Zealand, North America, and the countries of Western and Northern Europe, described by Beetham as the ‘old’ democracies, have established working democratic systems, some for over 100 years. In his analysis of how these democracies perform in practice, Beetham has provided a description of the disillusion and dissatisfaction by citizens. The disillusion is neither with the idea of democracy, a lack of interest in politics, nor in people being unwilling and unprepared to participate in democratic activities. It is a decline in the confidence of citizens in their governments, and in the representative processes of democracy. Beetham identifies three trends which feed this disillusion; a decline in the autonomy, the capacity and the credibility of governments (Beetham, 2005, p45).
This chapter focuses on his work because it provides a clear summary of the issues involved.

Beetham has used evidence for this disillusion from analysis of public opinion surveys over several years, which show an erosion in support for politicians and political institutions; a decline in voter turnout at national elections; and a decline in the membership of political parties. These findings were supported by the result of a subsequent independent inquiry into Britain’s democracy, which found ‘there is now a well-ingrained popular view across the country that our political institutions and their politicians are failing, untrustworthy, and disconnected from the great mass of the British people’ (POWER, 2006, p28). Australia does not suffer from declining voter turnout because of its policy of compulsory voting, but the democratic audit report and the other publications referred to above, suggest that the Australian situation is consistent with Beetham’s analysis.

4.2. Trend 1 – Decline of government autonomy

This trend relates to the reduced ability of a government to determine policies in the public interest because of their subordination to the requirements of business interests in a market economy. Drawing on Lindblom (1977), Beetham refers to the way that, in a market economy, a government does not directly control economic activity, but it relies on the decisions of private business for investment, production and the delivery of employment and services. Therefore, the government can only achieve its economic goals indirectly, by making conditions favourable to business and giving priority to business interests. While this situation may be unavoidable to some extent in these ‘market democracies’, it does mean that the business sector has gained an unfair advantage in its relationship with government compared with other interest groups, through its greater wealth, and ability to lobby elected representatives and officials and influence public opinion. This suggests that business cannot be regarded as just another interest group competing for government attention and support with groups such as trade unions and the environmental and welfare lobbies. In some instances business constitutes a power equal to that of government.

When Lindblom wrote his book in 1977 this situation may have been tolerated and tolerable for the sake of growing economies. Whatever the reason, it is still against the idea of democracy meaning political equality, representative government and a government responsive to the needs of a wide range of interests.
and needs. However, in the subsequent thirty years the power balance has shifted even further towards business, for the following reasons.

4.2.1. Cost of elections

The first reason is the increasing cost of elections, particularly that of political campaigns, and the reliance by candidates and political parties on donations, particularly from wealthy individuals and businesses. It would be naïve to think that these donors would not expect some favour from the elected government in return. Beetham gives examples of the practices in the USA, and notes that while the practices in the European democracies are not as extreme as in the USA, they are moving in a similar direction. Ginsborg supports this view, ‘Politics and plutocracy have joined hands, with the outcome of elections ever more dependent upon big, or very big money……You win elections in order to govern, but also to award lucrative contracts to those who have financed you, or else to place your friends, and in many democracies your relatives, in positions of power and prestige’ (Ginsborg, 2008, p29). The democratic audit findings in section 3.4.4 address this matter in the Australian context.

4.2.2. Privatisation

The second reason for the decline of government autonomy is the increasing use of the private sector for the provision of public services. The privatisation of the power, water, telecommunications, and public transport utilities has been a common activity in the old democracies being considered, and ‘claims for the economic advantage of such schemes have proved to be considerably inflated, …’ (Beetham, 2005, p50). In addition, the privatisation of utilities have resulted in a loss of public accountability through the use of commercial confidentiality terms in contracts; and the quality of services compromised through the need to make a profit. In a similar vein, joint public and private funding schemes for civil engineering construction projects run by private contractors often result in the financial risks being borne by the public sector.

The privatisation examples above, coupled with the outsourcing of public service operations such as computer systems development and operations and management, and other public welfare services, have also resulted in the widespread loss of technical expertise and operational knowledge within the public sector. Again, this has made government closer to, and more reliant on business.
4.2.3. Expert connections

The third reason for the decline of government autonomy is the growing practice of governments relying on external advice, such as advisory committees, for guidance and the review of policy. Examples from the UK and the USA, Beetham (2005, p51-52) identify the domination by business people on these committees, and a trend for scientific advisors to have the independence of their advice compromised by being the recipients of funding from the private sector.

Chapter 1 includes a reference to a similar trend in Australia, where many of the institutions of the civil society have been undermined, silenced or ignored, to suppress debate of, and dissent from government decisions and policies. For example, ‘…the Government’s climate change policies have been not so much influenced but actually written by a tiny cabal of powerful fossil-fuel lobbyists,…representing the very corporations whose commercial interests would be affected by any move to reduce Australia’s burgeoning greenhouse gas emissions’ (Hamilton and Maddison, 2007, p84).

4.2.4. Revolving doors

The final reason for the decline of government autonomy is the way that business and government have become virtually integrated by the ‘revolving door’ practice. This refers to the practice whereby retired politicians, senior public servants and political advisors move into senior business positions, and business people are recruited into government. This latter practice is prevalent in the USA; chapter 6 gives an example of executives of companies manufacturing electronic voting equipment being appointed as senior officials for the administration of elections, including the purchase of voting equipment.

In Australia there are examples of the former practice from both sides of the political fence. For a recent example, Farnsworth (2002) gives details of a retired minister for defence immediately joining a major defence organisation as a consultant in ‘government relations’; and a retired minister for health joining the health lobbying industry.

4.3. Trend 2 – Decline of government capacity

The old democracies are nation states which were set up and developed using the ideas and values of representative democracy to provide accountable government to the people of a clearly defined territory. The points in the previous paragraphs
about the decline of government autonomy largely relate to the businesses which
belong in the nation state. These businesses are often part of their community, and
contribute to it in a number of ways. Also, they accept the policies and laws that
their government makes through the democratic processes of their society.

4.3.1. Economic globalisation

A decline in this capacity of governments to make policies and laws for their
citizens without external influence or constraint is another reason for the disillusion
in the old democracies. One cause of this decline is economic globalisation, and
while the meaning of globalisation is debatable it does ‘point to real economic
processes at work at the international level, which substantially limit the policies
national governments can pursue’ (Beetham, 2005, p55).

With the rise in international trade and investment over at least the last
twenty years there has been a concomitant rise in the power and influence of
multinational corporations over national governments. These corporations have the
ability to move their investment and production plants to where the conditions are
most favourable, meaning where wages and company taxation are low, and
industrial and environmental regulations are lax or non-existent.

In some ways governments may be powerless to prevent these activities, but
in other ways they support and collude with multinational corporations to assist this
decline in democracy. Monbiot (2000) describes the plans of the participants of a
treaty called the Multinational Agreement on Investment (MAI) to write ‘the
constitution of a single global economy’. The participants were the twenty-nine
richest nations and the world’s largest multinational companies, who set up the MAI
in secret, until it was leaked in 1997. Australian Treasury officials were part of these
secret MAI negotiations under the auspices of the OECD (Davidson, 1998).
Amongst its objectives the MAI could allow corporations to challenge laws made by
national and local governments which were designed to protect the workforce,
consumers and the environment.

A leaked copy of the draft document was made available on the World Wide
Web in 1997 by a Canadian bureaucrat (see MAI, 1997, for details of the
campaign), and e-mail and web sites were used to plan and coordinate
demonstrations against the MAI, probably one of the earliest uses of this technology
for political dissent. (Drohan, 1998). Through this opposition the treaty process
collapsed in 1998, but the participants continued to work towards their objectives,
first through the World Trade Organisation (WTO) and then through other agreements made between the major trading blocs (Monbiot, 2000, p302-306).

According to Monbiot,

The struggle between people and corporations will be the defining battle of the twenty-first century. If the corporations win, liberal democracy will come to an end. The great social democratic institutions which have defended the weak against the strong – equality before the law, representative government, democratic accountability, and the sovereignty of parliament - will be toppled. If, on the other hand, the corporate attempt on public life is beaten back, then democracy may re-emerge the stronger for its conquest. But this victory cannot be brokered by our representatives. Democracy will survive only if the people in whose name they govern rescue the state from its captivity (Monbiot, 2000, p17).

Arblaster (2002, p99) also quotes this paragraph, although he omits the last two sentences which stress that it is the people, not the elected representatives, who can restore the capacity of elected representatives to govern.

4.3.2. Intensified inequalities

An outcome of economic globalisation is the tendency for markets to intensify inequalities between people. As a result the financially advantaged citizens have increased their wealth, while the disadvantaged have been penalised further. This increase in social inequality is reflected in a reduction in political equality for these people, and is another example of the disillusion of citizens.

4.4. Trend 3 – Decline of government credibility

The last of the three trends which feed the disillusion with the old democracies is the decline in the credibility of governments. This is because of an increase in the management and control of the media, the rise of ‘spin-doctoring’ and its perpetrators, particularly the media and policy advisors in the offices of the prime minister and other ministers, and the politicisation of some public service agencies and other institutions.

As governments’ scope for achieving their goals has shrunk, so their preoccupation with presentation has grown proportionally. … We no longer raise our eyebrows when governments create diversions so as to ‘bury bad news’, when they ‘dig for dirt’ on their critics or opponents rather than address their arguments, or when they marginalise critical experts and induce others to give opinions favourable to government policy. Yet our confidence in their integrity is reduced as a consequence (Beetham, 2005, p61).

The quote above has resonance with events in Australia in a similar period. The use of false and ‘sexed-up’ intelligence about the weapons of mass destruction was used
by the coalition of forces from Australia, USA, UK, and others, as the reason to invade Iraq. Chapter 1 refers to this event, and Wilkie, a former Australian army officer, intelligence analyst and whistle-blower describes the politicisation of the Australian military and intelligence services in Hamilton and Maddison (2007, p175-198).

**4.5. Summary and conclusion**

To provide part of the answer to the research question – *how can the use of ICT in democratic processes provide a society with an improved democracy?* – it is necessary to understand what is meant by democracy, and to examine the supposition that democracy needs improving. The purpose of chapters 2, 3, and 4 has been to examine these two points.

The meaning of democracy is addressed in chapter 2, through an overview of the ideas about democracy; and in chapter 3, by describing the practical aspects of electoral systems. These two chapters also describe the contention in the ideas of democracy, and the dominance of representative models in modern societies. The supposition that democracy needs to be improved is addressed in this chapter, by describing the disillusion of citizens in their elected governments.

The disillusion of citizens is not with the idea of democracy or a lack of interest in politics; nor is it in people being unwilling and unprepared to participate in their democracy. It is a decline in the confidence of citizens in their governments and in the representative processes of democracy, and a lack of transparency in those processes. The fear that a representative government might degenerate into oligarchy, raised in section 2.3.1 may have been partly realised, because citizens have not been able to hold their representatives to account, and they have not received full and accurate information about the reasons for decisions taken on their behalf.

The decline of governments has been classified in three areas, autonomy, capacity and credibility; and a major source of disillusion stems from the policies focusing on economic globalisation, and the privatisation of public utilities. These policies have resulted in increased social inequalities, and the global financial crisis in late 2008 can be attributed, in part, to them.

The quotation by Monbiot (2000) in section 4.3.1 above dramatically refers to the struggle between people and corporations as ‘the defining battle of the twenty-first century’. He states that action by the people is necessary to restore
democracy, by limiting the power of corporations. Action by the people implies a participatory approach by citizens, which is analysed in chapter 8.

Before coming to that chapter it is necessary to consider the second supposition of the research question, that the use of ICT can improve democratic processes. A number of commentators, for example Beetham (2005) and Ginsborg (2008), have suggested that ICT may have a role to play in revitalising democracy, if only because of the obvious ability of this technology to provide and manage information, and enable rapid communication. However, these commentators also identify some shortcomings with the use of ICT in democratic societies. The following chapters examine this second presupposition, by providing:

a) a description and analysis of the ideas of using ICT to support democracy (chapter 5);

b) a description and analysis of electronic voting systems (chapter 6); and

c) the benefits and shortcomings of using ICT in electronic voting, including on-line voting (chapter 7).
Chapter 5. Electronic democracy

5.1. Introduction

The various models of democracy covered in chapter 2 describe the changing ideas of how societies might be organised. They address the problems of representation and how citizens might participate in governing their society.

With the rapid development of ICT in the second half of the 20th century came a number of ideas about how computers and communications systems could be used for democratic purposes, which is known by some as electronic democracy. The purpose of this chapter is to consider the background to, and implications of these ideas.

Electronic democracy is not a new model of democracy, it is about how technology can be used in existing models. The ability of ICT to provide, for example, more and faster ways for communication and for information management is seen as being beneficial to democracy. However this may not necessarily be the case, and the use of technology could be detrimental to democratic principles and objectives. Therefore, after considering current definitions, a new definition of electronic democracy is proposed for the purpose of this thesis, to identify a reason why ICT should be used in democratic decision procedures.

The sections comprising the body of the chapter describe and assess:

a) the early ideas for the use of computer technology to support democracy;

b) the development of the internet and the World Wide Web;

c) the later ideas, in the light of the development of this new technology;

d) development of e-democracy in Australia; and

e) a number of other issues related to the use of the Internet for democracy.

Electronic democracy is sometimes related to electronic government and electronic governance and, for completeness and clarification, the final two sections of this chapter explain the meanings of these two terms, the development of electronic government, and how it differs from electronic democracy.

To aid the understanding of the technical aspects of the rest of this chapter the meaning of electronic technology is now given, together with comment on the practice of attaching ‘e’ as a prefix to many words associated with the use of ICT.
5.1.1. Electronic technology and the e-prefix

The word ‘electronic’ originated as an adjective to describe devices which depend on the flow of electrons, i.e. a small electric current, to provide their functions, as opposed to mechanical devices, for example.

The invention of the transistor in the late 1940s led to two significant, and complementary, advances for electronic devices. First, the application of Boolean algebra, which uses only two states (‘on’ and ‘off’, or 0 and 1), provided a number of arithmetic, logic and control functions for these new devices, now known as products of digital electronics. Second, the development of solid state components, or ‘chips’, meant that more functionality could be provided in a much smaller physical space at a higher speed and with lower power consumption, than that available from earlier devices using thermionic valves and discrete components.

Information and communications technology, or ICT, comprises these digital devices. Computers and digital communications equipment, which go to make up the internet and other communications networks are components of ICT. However, radio and television, including digital radio and television, mobile telephony, and the recent portable consumer devices such as laptop computers, Personal Digital Assistants (PDAs), and digital video cameras could also be included.

The pervasive nature of this technology should be borne in mind, because of the impact it could have if used in future electronic systems developed to support democratic processes. Personal Computers (PCs), PDAs and mobile phones are all domestic consumer items. The functionality of these devices is merging, for example a PDA can have some of the functionality of a PC and a mobile phone, and mobile phones have the ability to perform many more functions than just mobile telephony.

This growing functionality, along with the ubiquity and the relatively low cost of these portable devices, will be attractive to the designers of systems using ICT products to support democratic processes. This opportunity raises some questions. For example, are these products, and particularly their software, secure and reliable enough to be used in applications such as electronic voting; and will the small screens and keypads of these devices be a hindrance to their use for voting or accessing public services? It is also important to remember that software is often a critical component of this technology, and software is frequently the component that fails in ICT systems. These issues will be addressed in more detail in this, and later
chapters, covering the electronic voting systems (chapter 6), and the ethical design of systems for democratic processes (chapter 9).

In recent years there has been a proliferation of terms with ‘e’, meaning electronic, as a prefix. In some ways this prefix is useful, by providing a shorthand way of referring to a system that is using information and communications technology. This might mean that by using ICT, people are able to have more direct and more convenient access to information and computer based services.

Thus, in the context of government and administration, ‘e-government’ might mean that citizens would have more convenient access to their government and institutions, including access to public services, sometimes called e-services. This convenience would include access to services from home by telephone, mobile phone, or personal computer, at times to suit the citizens, rather than at times to suit the service providers. E-democracy, might mean the use of ICT in democratic processes, for example for e-voting, or e-participation, or e-petitioning.

In the preceding paragraph there are six examples of e-prefix words, and by qualifying these things as being ‘electronic’ there is sometimes an implication that better government services and improved democratic processes will be provided through the use of ICT, usually through an increase in efficiency. However that is not necessarily the case, a point that is frequently argued throughout this thesis.

5.2. **Electronic democracy definitions**

Electronic democracy is one of a number of terms which Michael Saward (2003a, p145-151) refers to as ‘prefix-democracy’, where the purpose of the prefix is to define and describe a particular subset of the vast array of democratic theories and ideas. Therefore *industrial* and *corporate* democracy are terms indicating specific areas where some theory of democracy might be applied, in the workplace or in a business in these examples. Prefixes such as *participatory*, *deliberative*, and *discursive*, as used in chapter 2 of this thesis, describe specific activities in a democratic system; these examples indicating the involvement of citizens. Held’s (1996) models of democracy, also described in chapter 2, use prefixes to classify a wide range of variants of democracy. However the terms *electronic* - or *e*-, or *cyber*, or *digital* - *democracy* fall into their own separate category. They do not define a particular variant or activity of democracy, because technology could be used in any variant.
The common definitions of electronic democracy, and similar terms, refer to the use of ICT in democratic processes, such as voting and participation. Often there are specific references to the Internet, and in these definitions they frequently imply on-line participation by citizens in their democracy. The following definition from the *Report of the Inquiry into Electronic Democracy*, initiated by Australia’s Victorian State Government includes some of these points.

The direct and indirect use of electronic technologies (information and communications technologies) to participate in the democratic process. Direct forms of electronic democracy include electronic and online voting, participation in consultation, and interactions between elected representatives and constituents (VIC Govt, 2005, p232).

While not specifically mentioning the Internet, its use is implied through the reference to on-line voting.

In an earlier definition, in *A Strategic Perspective of Electronic Democracy*, Watson and Mundy propose ‘electronic government’ and ‘electronic politics’ as the elements of electronic democracy, using the following definitions for these elements.

E-government informs citizens about their representatives and how they may be contacted. It also improves government efficiency by enabling citizens to pay transactions online.

E-politics is defined as

…the use of Internet technology to improve the effectiveness of political decision-making by making citizens aware of the how and why of political decision-making and facilitating their participation in this process (Watson and Mundy, 2001).

These authors do not include other democratic activities in their definition of electronic democracy, such as those to choose elected representatives or to provide greater participation, and their paper does not address these aspects. The use of the Internet is regularly cited as a component of electronic democracy in their paper. Further definitions and analysis of e-government appear later in this chapter, together with analysis of the related topic of e-governance.

Kellner sees e-democracy and e-government as being separate things, and in summarising their difference he identifies two kinds of electronic democracy, ‘hard’ and ‘soft’, concepts which have not been found in other material. This definition has been provided in full because it makes several important points about the use of ICT in democracy and government.
Like a horse, e-democracy is easier to recognise than to define. It covers those arrangements by which electronic communications are used by those with power and the citizens they serve to interact with each other in order to inform and modify the way that power is used. e-democracy is NOT about paying speeding fines over the Internet (that is e-government); it IS about consulting on whether the speed limit on a particular stretch of road should be raised, lowered or left as it is. It may, one day, be used as a way of empowering citizens in the process of making major national decisions.

A broad distinction may be drawn between ‘soft’ e-democracy and ‘hard’ e-democracy. ‘Soft’ e-democracy concerns the way public institutions – not only local or national government – seek voluntarily to engage their clients and customers in order to inform their decisions. ‘Hard’ e-democracy concerns more formal changes in the way the electors choose their representatives and determine the policies that those representatives execute. ‘Hard’ e-democracy is in its infancy; ‘soft’ e-democracy is increasingly commonplace. By understanding the practice and potential of ‘soft’ e-democracy, we can begin to tackle the critical questions about how ‘hard’ democracy should develop in the future (Kellner, 2004).

From Kellner’s reference above to ‘public institutions’ ‘soft’ e-democracy could also include the use of ICT in democratic activities in other areas of society, in corporations, trade unions, and political parties, for example. The main focus of this thesis is on the use of ICT for democratic activities at the national level, that is ‘hard’ e-democracy, therefore ‘soft’ e-democracy which focuses on clients and customers will not be considered further.

As explained later in this chapter, e-democracy and e-government are considered as being separate entities, supporting Kellner’s position.

5.2.1. Thesis definition of e-democracy

Several different definitions of electronic democracy have already been mentioned, and while they have some common features there is not one generally accepted definition. There may never be an accepted definition, partly because of the variations in the meaning of democracy, and possibly because future versions of democracy could use ICT to such a great extent that the e- prefix becomes redundant.

For the purpose of answering the research question, a new definition of electronic democracy is proposed. This does not refer to the provision of government services and/or activities, it does not mention particular democratic processes or activities, nor does it include specific reference to the Internet. The thesis definition is
electronic democracy means processes which use ICT to apply democratic principles.

The reason for a focus on democratic principles is explained in detail in chapter 8. The reference to such principles is included in the definition to ensure that ICT is used appropriately in democratic processes. ‘Appropriate’ use means that when ICT is included in a democratic process the technology does not undermine democratic principles, although it may enhance them.

An example of ICT undermining the democratic principles of political equality and inclusion relates to the fact that some people may not be able to use computer technology, or have access to it. Elderly people, and/or those with disabilities, may have problems using computer keyboards and other access devices, and in reading computer screens. Other citizens may not be able to afford to buy this technology, or may choose not to acquire it. If the only way to participate in a democratic activity is through the use of computer technology, then these citizens may be disenfranchised. These issues relate to what is known as the digital divide, are described in more detail in section 9.6.4.

On the other hand, there may be benefits to disabled citizens through the use of ICT. An electronic voting system could apply the democratic principles of political equality and inclusion, by enabling blind citizens to cast their votes in secret, as sighted citizens do now. However, if the voting system uses proprietary software which cannot be audited, then the principle of transparency has been undermined, since it may not be possible to confirm that votes are being recorded correctly, and they are not being corrupted. A number of principles for the use of ICT which apply democratic principles are defined in chapter 9.

5.3. Electronic democracy before the Internet

Some of the early ideas for the use of information technology in democratic processes are described in this section, focussing on the work of Barber (1984) in the USA, and McLean (1989) in the UK. The development of the Internet is described in section 5.4 below.

5.3.1. Barber’s strong democracy

In chapter 2 of this thesis, Barber’s twelve point programme for Strong Democracy and the Revitalization of Citizenship is shown (Barber, 1984). While the main focus of this programme was on ways for citizens to meet together, deliberate, and
participate in the running of their society, it also included suggestions for the role that technology might play in these activities. Barber does not use the term ‘electronic democracy’, but he identified the potential for communications technology, particularly cable television, to support his vision of democracy.

In the early 1980s cable television was being established, and one quarter of all homes across America had cable wiring installed. Barber’s programme envisaged the use of interactive cable television for participation in on-line town meetings, and for on-line opinion polling during televised debates. This technology would also be used for providing on-line information, and enabling discussion and deliberation, including a balloting function on a range of questions on specific issues, as if the viewers were personally at a public meeting.

However he was, and still is cautious about citizens casting their votes from home with this technology, with the exception of those people unable to leave home, such as the elderly and infirm, or mothers with young children. This is because strong democracy has significant social and community functions, and voting itself, as the most public of all acts, should be true to its symbolism and allow itself to be celebrated in the most public of places – town halls, neighborhood schools, district assemblies (Barber, 1984, p290).

He thought that electronic technology could be used for voting in these public places, and currently this view continues to be the case for electronic voting in Australia, and other places.

Barber envisaged the use of videotext services for the education of citizens. Videotext, and the earlier technology of Teletext, were methods of selecting and displaying pages of text and images on television screens, for example, information about real estate listings, weather forecasts and airline information.

A significant proposal with strong democratic credentials was a Civic Communications Cooperative (CCC). The CCC was to be an independent and publicly controlled organisation, with the charter to ‘take primary responsibility both for the constructive civic uses of the new telecommunications technology and for protecting individuals against media abuse from the private and public sectors’ (Barber, 1984, p277).

5.3.2. McLean’s approach

Barber’s ideas for strong democracy related to the USA, and five years later McLean (1989) provided an early and comprehensive overview of the role that new technology could play in the democratic processes of the UK. The ‘new
technology’ in 1989 to which he referred included personal computers and associated applications such as word processing and spreadsheets; and the improved communications services provided by electronic switching, fibre optics and satellites. He did not refer to the Internet as such, but at that time a few universities in the UK, including McLean’s, and some universities in the USA were using the underlying infrastructure for electronic mail, document exchange, and bulletin boards.

McLean stated that the ‘new technologies most relevant to democracy are those which are revolutionizing direct mail, opinion polling and computer networking’ (McLean, 1989, p61). Direct mail is identified as a benefit for politicians to contact their constituents, including for fund raising. This is not referring to the e-mail services in common use today, but the use of PCs, word processing and automatic addressing software to print and address letters and other documents. McLean saw the negative social aspects of this use of technology when he wrote ‘Direct mail can be dressed up so that it does not look like “junk mail”…’ (McLean, 1989, p63).

The new technology could also be used for opinion polling through computer assisted telephone interviewing (CATI). This method of instant opinion polling is still in use today. It comprises interviewers using computer workstations which automatically dial a randomly selected telephone number. When the household answers the call they are interviewed for their opinions, and the answers are directly entered into the workstation. CATI enables the prompt publication of the opinion poll results.

Computer networks included the early use of interactive television, and he cited the same cable television services as Barber. In the UK, a service called Prestel used specially modified televisions connected to the telephone network, to provide a range of information services. The equipment and services were expensive to buy and use, and it was access to travel information and the ability to make on-line reservations that finally increased the popularity of this service. Prestel included the ability to respond to an opinion poll on a weekly topic, animal rights and racism, are examples mentioned.

Also in this period there were experiments which investigated on-line audience voting in game, quiz, and political shows, which McLean saw as a possible

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5 In Australia, ICT continues to support unsolicited correspondence from politicians, via e-mail, the postal services and recorded telephone messages.
pointer to direct democracy in the future, but was then limited by the telephone network infrastructure.

When all of the electro-mechanical telephone exchanges in Britain have gone, things will be better, but my hunch is that direct democracy will come in not through cable or viewdata\(^6\), but as a by-product of technology that has been installed for some other purpose (McLean, 1989, p85).

The use of electronic mail and bulletin boards were examples of this ‘other purpose’, for example the use of bulletin boards to arrange and conduct demonstrations against actions with environmental consequences.

McLean also believed that interactive computing, the use of a network of computers, including personal computers, had a role in on-line opinion polling, and would be particularly good for industrial democracy. Contrary to Barber’s view above, McLean then extended this idea to consider on-line voting and, in so doing, identified the on-going problem of how to ensure that only those entitled to vote can use the network. ‘But there seems to be no insuperable technical obstacle to have the Athenian Assembly in our living rooms and workplaces’ (McLean, 1989, p93), and technology could overcome some of the problems of Athenian democracy, arising from being an individual participant in a public debate of 6000 people. It is suggested that with new technology everyone could be on an equal footing.

McLean made two predictions for the near future from 1989 about developments in technology and its application to democracy, based on his knowledge of developments in ICT at that time. First, he suggested that voice recognition by home computers for on-line voting ‘is likely to solve some tricky problems of ensuring honesty in computer voting’, by asserting ‘that the capacity needed to recognize a voice is not far off’ (McLean, 1989, p96). He saw this technique as an antidote to vote theft when voting on line, but he did not address other important problems of on-line voting such as vote buying and voter coercion. The prediction for voice recognition was not fulfilled in the timeframe he suggested, although it is close now, (for example, Edentiti, 2008). However, the vote buying and voter coercion issues still remain, and chapter 7 includes an analysis of on-line voting by telephone amongst other methods.

His second prediction covered the gap he saw in vote counting software. He rightly identified the problems associated with manually counting votes in a

\(^6\) the technology used by Prestel
proportional representation (PR) system, compared with counting First-Past-The-Post votes.

Every PR system listed in chapter 2 could be fully described in a few lines of computer program. I would guess that even STV (single transferable votes), by far the most complicated, could be specified by less than a hundred lines of BASIC programming (McLean, 1989, p96).

McLean had a sound understanding of the developments in computer technology at that time, but he was not a software engineer, and the statement quoted above does not display sound knowledge of the problem. The size quoted of a hundred lines of code may be correct for the actual STV counting algorithm, but that is just a small part of any vote counting program, and it is most unlikely that BASIC would be the language used.

McLean’s academic field covers the mathematics and theory behind voting systems, public choice theory and opinion polling, and he provided comprehensive analysis and comment on these matters, with respect to representative and direct democracy. In addition, he identified some of the issues which later became topics for wide discussion in the computer ethics and e-democracy fields, such as:

a) the increasing use of opinion polls, their influence on voters and politicians, and problems of their accuracy;

b) the economics of political campaigning, and how computer technology is becoming a significant factor in assisting campaigns;

c) threats to civil liberties, including the effects of large scale data collections held by governments and private organisations, including privacy, security, and cross matching of personal information;

d) the role of stronger and more effective regulation and legislation in these and other areas; and

e) the wide-ranging ideas of what is now call e-government and ‘joined up government’ using information technology.

5.3.3. Summary of pre-Internet electronic democracy

Barber saw interactive cable television providing the vehicle for communication between citizens in virtual town meetings, and between citizens and their representatives in political debates and by feedback through opinion polling. Other uses of cable television for strong democracy included civic education, greater and

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7 For comparison, the size of the vote counting module of the electronic voting and counting system eVACS®, described in thesis chapter 6, is over 5,000 lines of code written in the C programming language.
more equal access to information, enhanced participatory discussion and debate across great distances. McLean had a similar vision for cable television, and later for Prestel and telephone voting.

The cost of providing interactive cable television services was too high for it to become widely available up to the mid 1990s, but by then the Internet and World Wide Web had arrived, and some of these visions of democracy were transferred to this new technology, as described below. Not all aspects were transferred, because the communications technology was not adequate for high quality video images to be provided across the Internet until the early 21st century.

However, television, as a free-to-air or a cable service had, and still has, a role to play as part of electronic democracy, through the provision of current affairs programmes, documentaries, political interviews, and debates during an election. On-line opinion polls are still taken after these debates, via the Internet or by telephone polling. In addition, McLean’s vision of direct polling during a political debate occurs now in Australia and elsewhere, through the use of the ‘worm’. This is a graph on the television screens of the viewing public, which shows the instantaneous reaction of the studio audience to statements from the political contestants during the debate.\(^8\)

### 5.4. The Internet and the World Wide Web

The following quote comes from a text book on the design of real-time computer systems, written in 1967. Although the technical words are not exactly the terms in current use, the quote could be a simple description of the internet.

Today, however, all data can be instantly available to the computer via direct-access files. Telecommunications lines can link the computer to any point and speed the flow of data to and from the machine. The users, many miles away, can be provided with keyboard or display devices which they operate in a “conversational” manner if necessary, and suddenly become face to face with the machine. ... The system can deliver information where it is wanted when it is wanted (Martin, 1967, p3-4).

From one point of view the internet is just a way to enable computers and people to communicate with each other, but the telephone network can also provide this facility. Indeed many sections of the internet still use the telephone system to make the connections between people and machines, in the way that this method was used

\(^8\) From my observation, this seems to show the studio audience’s opinion of the debaters rather than of their policies and ideas. In subsequent media analysis of the debate there is often as much comment on the worm as there is on the policies being debated.
in 1967. However, the Internet seems to have become something very special to
many people. They believe in the

undeniable fact that the Internet is having and will continue to have a
profound impact on the shape of the world. Essentially, wherever we live on
Earth, the Internet is affecting and will increasingly continue to affect almost
every aspect of our lives, including entertainment, work, sociality, the global
economy, and even global politics (Langford, 2000, p1).

These sentiments are common to those people who have a strong fascination with
the Internet, and Langford’s last point about global politics is often raised in the
context of the Internet providing the foundation for electronic democracy.

5.4.1. The evolution of the internet

When Martin wrote his book in the late 1960s, large scale computing was well
established in many developed countries including Australia, and technology to
enable these computers to communicate with each other using telephone systems
had been developed.

Telecommunications links speed the flow of data throughout the
organization. They place the computer center within easy reach of all parts
of a company. In certain more spectacular schemes, such as one designed for
British Overseas Airways Corporation, the computer has been made
immediately accessible to locations all over the world (Martin, 1967, p8).

At about the same time, Australia was also developing its data
telecommunications systems. Facilities for the transmission of data, known as the
Datel service, were introduced in 1969, with options of using the switched telephone
service for lower speeds, or leased lines for higher speeds. Modems, which were
supplied by the Australian Post Office, were an essential part of the service. By
1973 nearly 2,500 modems were in use (AUSTEHC, 2000).

The Australian Post Office was the successor to the Post Master General’s
Department (PMG), and these federal government organisations were responsible
for the supply and operation of Australian telecommunications services. At this
time there were some shortcomings in the use of the telephone system for data
transmission. The switched service, used for calls between people, was slow and
prone to error in data transmission. The alternative of leased lines provided a faster
and less error prone service, but it was expensive and the installation of the service
was slow. Therefore,

[i]n 1970, the APO, to provide for the increasing demand for data
communications by a number of large customers, such as airlines and
weather services, let a contract with the UNIVAC division of Sperry Rand
Australia Ltd. for the provision of a Common User Data Network (C.U.D.N.), with installations in all mainland State capital cities. CUDN was a store and forward message switching system, designed to transfer data quickly and reliably from one location to one or more specified distant locations, using magnetic disc packs for storage and with computers performing the routing functions. The system was designed to enable several customers to use the service concurrently. With hindsight, CUDN was an ambitious application of then current technology and commissioning ran well behind schedule. In this period other developments rendered CUDN unattractive to many of the customers it had been designed to serve and it was withdrawn from public service at an early date (AUSTEHC, 2000).

While not stated, the CUDN also included a basic e-mail service, and it was based on the packet switching techniques described below, which are the foundation of the internet

The on-going development of microelectronics\(^\text{10}\) storage technology, new software languages and development methods, and international and industry standards, contributed to the idea of a ‘global village’, where citizens, countries and corporations were connected by electronic media and technology. However, it was the space race between the USA and USSR, plus the Cold War, that were the main drivers for these technology developments, rather than any idea of peaceful universal cooperation.

In the late 1960s the US Department of Defense Advanced Research Projects Agency (DARPA) started work on the design of a communications system that could survive a nuclear attack on the USA. The basic idea was that the network would comprise a large number of computers, each one being connected to a number of others using telecommunications hardware and software.

Each of the computers would be identified by a unique address, and messages, for example e-mail or documents, would be sent from one computer to another until the message reached its destination computer. Because each computer in the network would be connected to several others, there would be many different routes for a message to follow. Since they could be of any length, each message would be broken up into small fixed length ‘packets’, which would include additional information to allow each packet to take a separate route to its

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\(^9\) Had the development of CUDN been successful, Australia would have been a leader in the provision of publicly owned internet services.

\(^{10}\) A technology using photographic and lithographic methods to produce a number of electronic components connected together and embedded in plastic. These devices are generically known as integrated circuits or ‘chips’, and some can contain the equivalent of over a hundred million discrete components such as transistors.
destination, and to reconstitute the message when it arrived there. This technique is known as packet switching. Additional computers could easily be added to the network to expand its capability and reliability. If any computers were removed, intentionally, because of malfunction, or through a hostile attack, the network would continue to function, because usually there would be another route for the packets to take.

A number of standards were necessary to enable a network such as this to function. The intention was that a range of computers, terminals and communications equipment from a variety of manufacturers would be attached to the network. Therefore, standards were required to define the physical connections of this range of devices, including the cables of the network. Other standards were required to define the way that these devices sent the message packets between each other. These are known as communications protocols, and through following these standards any computer could be connected to, and communicate with any other. In this way it was possible to build a network connecting computers around the world, in a similar way to that which connects the world’s telephones. In fact the telephone networks were used to provide much of the physical infrastructure for this network of computers.

During the 1970s and 1980s these basic functions were developed and expanded, and used mainly by defence organisations. Also, since some academic organisations had been part of the research project, they set up their own in-house networks, which were then able to communicate with each other.

It should be noted that there are other communications standards which enable computers to exchange information, for example to support very high security defence systems, and large commercial enterprises. These also use the physical infrastructure, perhaps by leasing dedicated cables in the national network.

This section has provided an overview of how the internet evolved. In this thesis, from now on the word will be shown as ‘internet’, to mean the underlying infrastructure which enables global telephone and computer communications. To repeat the quote at the beginning of this section, Langford believes that it is

An undeniable fact that the Internet is having and will continue to have a profound impact on the shape of the world. Essentially, wherever we live on Earth, the Internet is affecting and will increasingly continue to affect almost every aspect of our lives, including entertainment, work, sociality, the global economy, and even global politics (Langford, 2000 p1).
The thesis uses this capitalised version, Internet, to refer to the special thing which Langford believes will ‘affect almost every aspect of our lives’. It is important to identify these as separate and different forms, because it is argued below and in later chapters that the internet and other components of ICT can be used to support reliable, secure and transparent democratic activities, while the Internet cannot. To explain this difference the World Wide Web is now examined.

**5.4.2. The development of the World Wide Web (WWW)**

Much of the success of the internet can be attributed to the concurrent development of microelectronics. Microelectronic technology enables the development of new devices at low cost, low power consumption, and high functionality, and contributes to the expansion and flexibility of the communications network. A significant outcome of microelectronics in the 1980s was the personal computer (PC), which has now become common enough and priced to be considered as a domestic consumer item.

On-going development of microelectronics resulted in an increase of the power and functionality of the personal computer. Also, the growing domestic consumer market of these computers meant that the price dropped, and a relatively low cost device was available to use the basic features and applications of the internet, such as:

a) communication by electronic mail;

b) acquisition of information by searching on-line public databases and information libraries; and

c) the exchange of information by transferring files between computers.

Initially these functions relied on the PC user being able to type strings of commands to interact with the programs which performed these functions; but by the mid 1980s PCs were being sold with a combination of sophisticated software and hardware called a graphical user interface (GUI).

The GUI enables a number of windows to be displayed on the computer screen, and incorporates a mouse, a manual device used to control a pointer, or cursor, also displayed on the screen. Together these enable the user to select and initiate a function or computer application. Each function and application is usually represented by an icon, a symbol or image on the screen representing the activity to be performed.
By 1990, there was an established communications network - the internet; a growing number of computers in business, government and academia, providing access to information on-line; and a growing number of relatively low cost, powerful, easy to use personal computers, in the office and home. The scene was now set for the World Wide Web, or the Web.

The World Wide Web is a set of software applications, running on the internet, used to access and share information, using a standard called the Hypertext Transfer Protocol or HTTP. The Web utilises software browsers to access documents called Web pages or Web documents, which are linked to each other via hyperlinks. Hyperlinks typically appear on a computer screen as underlined words in blue text, and by using the mouse to click on the word the user is connected to another Web page or document. Web documents can also contain graphics, sounds, text and video images.

The Web is just one of the ways that information can be disseminated over the internet. The internet, not the Web, also uses other standards, such as the Simple Mail Transfer Protocol (SMTP) for e-mail services. However, e-mail services have also become incorporated into Web applications. Web browsers incorporate software applications called search-engines, for example Google, which provide the ability to search the Web for documents on any topic. People can set up their own web-sites, so that other people can look at their family photographs, or read their online diaries, for example. Other sites provide resources for people to display their home-made video clips. Newspapers and television stations have their own websites, and allow readers to provide their own comments on news items and programmes. These aspects of the Web are often referred to as the Internet, and they include what Langford (2000) means by ‘every aspect of our lives, including entertainment, work, sociality, the global economy, and even global politics.’

In addition to these developments, the Web has provided many other opportunities for global communication and the exchange of information. For example, opportunities for anti-social behaviour such as ‘junk’ e-mail and incessant advertising; criminal behaviour such as identity theft; and world-wide networks of paedophiles and pornography. These are negative aspects of the Internet.

5.5. Electronic democracy after the Internet

By the mid-1990s the Internet and WWW were well established, and the possibilities of using this technology for democracy were being explored in many
societies. This section describes a very brief selection of these initiatives, and the issues about this use of ICT which were coming to light.

5.5.1. The possibility of direct democracy

By the mid 1990s the overall impact, influence and symbolism of the Internet was such that the title on the cover of Budge’s (1996) book, on the possibilities of establishing direct democracy, was shown in the form of a Web address, budge://the.new.challenge.of.direct.democracy/, and Graham (1999) uses the same device for his book the internet:// a philosophical enquiry.

To Budge, while the traditional challenge of direct democracy was concerned with the limited participation of citizens in governing their society, the ‘new challenge of direct democracy lies in the startling fact that it is now technically possible’ (Budge, 1996, p1). Budge builds on the ideas of Barber (1984) and McLean (1989) to argue for a model of direct democracy.

His model would keep the representative democracy institutions of political parties, governments and parliaments. The judiciary and bureaucracy would continue to function as they do now, but would become more open, and more accountable and responsive to the public. Government by political party would continue, by debating and passing legislation, but it would seek votes of confidence from the population at large. Parliament would be an ‘advisory, investigative and debating committee informing popular discussion and voting, rather than substituting for it’ (Budge, 1996, p181). Budge does not introduce any further developments of ICT beyond McLean, nor any further detail on how ICT might be used in his model. This approach to direct democracy and greater citizens participation is explored further in chapter 8.

However, although there has been a substantial increase in the use of ICT throughout many societies, Budge’s vision is not yet realised, as the following subsections show.

5.5.2. A broader agenda for electronic democracy

In Digital Democracy: Policy and politics in the wired world, the editors, Alexander and Pal (1998) provide a series of essays, from the Canadian point of view, on the
use of ICT in electronic democracy. The following points provide a brief overview of the topics covered\textsuperscript{11}.

Electronic democracy, is what Cross (p132) calls Teledemocracy. In 1998 teledemocracy continued to use cable television and telephones, and the WWW is identified, with the main use of this technology being for party political purposes.

More importantly, the use of ICT was identified as having a bearing on, and making a contribution to a range of public policy matters and social issues. In 1998 these included:

a) ‘social forces in the Hypermedia environment’ identified as the globalisation of finance, the movement of money, civil society networks, and state security activities (Deibert, p23);

b) national security issues in a ‘wired world’, including the implications for trade (Alexander, p46);

c) the question ‘can information be property?’, raising issues about information and privacy legislation, and the need for reforms in this area (Thorburn, p149);

d) the issues of privacy, freedom and identity, and the need for privacy enhancing technologies (PETs), to ensure that personal information used in an aggregate form, for example for government or business purposes, is decoupled from the identity of individuals (Cavoukian, p181);

e) the political and social equality for women on-line (Davis, p87);

f) the use of the Internet for the mobilisation of people against the 1996 USA Communications Decency Act (Pal, p105);

g) regulation and the control of pornography on the Net (Mehta, p165);

h) gender, legal and ethical implications of high-tech health care (Alexander and Stafford, p195); and

i) issues and opportunities for North American indigenous peoples arising from the widespread use of ICT (May, p220).

Ten years later, many of these issues continue to be important, and are topics in the field of computer ethics.

These uses of ICT and their related issues were not unique to Canada, many of them were being raised in some form or other in other developed nations. For example, Gibson and Ward (2000) edited a series of essays which consider the role

\textsuperscript{11}In the following examples in this sub-section, the author of each essay is identified, with the first page number of the relevant chapter.
of ICT and the Internet as a way to invigorate democracy in British politics at the local and national levels in the UK. Brief summaries of some of the topics covered are given in the following points, for the situation in 2000. The authors of the essays are identified.

a) Most political parties in the UK had been using and developing web sites since 1996, with the main use being the dissemination of information to party members and supporters, the media and general public. Some small parties had web sites which were competitive with those of the main parties (Gibson and Ward, p107).

b) The adoption of ICT within the UK Parliament had been slow and piecemeal. However, the establishment of the Scottish Parliament resulted in the widespread adoption of ICT for members, and electronic publishing of all parliamentary documents (Coleman, p67).

c) An early use (in 1997) of the Internet for political dissent was identified in chapter 2, in the challenge to the Multilateral Agreement on Investment. By 2000 the Internet had been adopted by almost all branches of environmental activism, mainly using web sites and e-mail to complement traditional communications methods. (Pickerill, p129)

d) Issues covering policing and regulation of the Internet were receiving serious consideration in the UK and the European Union. These issues include the impact of growing electronic commerce, aspects of on-line security and privacy, illegal and harmful Internet content, and the need for balance between on-line human rights and policing the Internet for criminal and state security purposes (Wheeler, p151, and Akdeniz, p169).

A small but important democratic credit can be inferred from point a) above. The cost of developing an effective web site need not be directly related to the size of the party or its bank balance. Therefore the fact that small parties had competitive web sites hints at a degree of political equality amongst parties which use ICT in this way.

A conclusion reached in several of the essays is that the hope for greater participation by citizens through the use of technology had not been realised. As Gibson and Ward (2000, p205) conclude

While Parliament, local government, the parties and pressure groups have all captured the downward flows of information and service provision, a concomitant commitment to upward feedback does not materialise.
In effect, by 2000 the use of ICT by political parties was basically reflecting its use in the commercial field; to communicate within the parliament and the party (business administration), and to communicate with citizens (customers) by providing selective information (advertising). The opportunities available by using ICT for more interactive communication with constituents at the local level, and for greater citizens participation were not being taken up.

Coleman (p79), mentioning China, notes that a culture which has ‘deferential and authoritarian political attitudes’ will implant these patterns when using ICT. His points that good democratic citizenship, meaning a strong relationship between citizens and their representatives, depends on:

a) a residual culture of civic engagement and public discussion;

b) avoiding the use of ICT as a distraction or a ‘cosmetic substitute’ for real interaction; and

c) the need to devolve power away from an ‘institutional monopoly’ of deliberation, i.e. a parliament, towards citizens participation.

In 2000, these criteria were not being met in modern societies, as argued in chapter 4 with the description of citizens disillusion with the established democracies. The use of ICT as a distraction is still happening, as described later in this chapter with reference to the current use of the Internet by politicians in Australia.

5.5.3. Electronic participation

Although Gibson and Ward (2000, p205) reported a lack of participation by citizens, since then, in the UK, Europe and elsewhere, there has been an increase of research projects into the role of ICT to support citizens participation, particularly in local government. This focus on ICT has given rise to additional ‘e’ prefix terms, as shown below. A working definition of eParticipation, from Macintosh and Whyte is:

the use of ICT to support information provision and ‘top-down’ engagement, i.e. government-led initiatives, or ‘ground-up’ efforts to empower citizens, civil society organisations and other democratically constituted groups to gain the support of their elected representatives. Effective information provision is often seen as a corollary of effective engagement and empowerment (Macintosh and Whyte, 2006).

Macintosh and Whyte also provide an evaluation of the application of eParticipation to local government using four projects, namely:

a) an ePanel for citizen engagement, using website tools for discussion forums, surveys and live chats (Bristol City Council);
b) ePetitioning to help citizens lobby their local authority (Royal Borough of Kingston upon Thames);
c) a personalised survey tool for informing and consulting citizens, called Micro Democracy (Swindon Borough Council); and
d) partnership consultation on cross-cutting issues (Wolverhampton City Council).

The focus of this thesis is on democracy at the national level. However, the evaluation of these local government projects provides useful information for the use of ICT for participation at higher levels of government. The following points are taken from the information in Macintosh and Whyte (2006), with added observations.

The projects were funded for one year; the time allocated to recruit staff, arrange suppliers, design, develop, implement, test, publicise and conduct the eParticipation trials. This implies that the budget and timescale were decided before the objectives and requirements of each project were defined, a practice which could lead to the failure of the project. Therefore, any project to implement ICT to support democratic processes should follow professional practices, to mitigate these types of risk.

While there were five overarching objectives for the projects, their main focus was on the development and use of ICT tools for participation. This is opposite to the arguments in this thesis that the focus of electronic democracy should be on new decision procedures which might use ICT, rather than on the technology itself.

Because of the budget and time constraints, most of the projects were not fully implemented, and this meant that there were limits to the scope of the evaluation, but some findings are worth noting. A number of democratic criteria were identified as part of the evaluation design, to provide a framework for the evaluation. These criteria included the democratic principles of political equality and transparency. Since these are two of the principles addressed in chapter 8, the findings related to these have some relevance here.

The evaluation of political equality noted that each project showed strong potential for greater inclusiveness; and the amount of usage of the WWW, together with the responses from those participating, suggested that ‘the ground had been laid for strong and sustainable take-up’. The tools were actively used by hundreds of citizens in each of the local government areas, and there was some very limited
evidence that most of these people had not previously contributed to local
government decision making. The number of disabled and minority ethnic citizens
participating was almost in proportion to the local populations, but participants were
most likely to be male and middle class citizens.

The proportion of disabled and minority ethnic citizens to the whole
population does indicate equality, as does the indication of many people being
involved for the first time. However, the fact that participants were mainly male and
middle class does not indicate political equality for women and people in other
economic groups, and there is no information on the range age groups of those
taking part.

The evaluation of transparency found that the ePetitioner project was the
strongest because it had established a process for publishing the outcomes of a
decision. The other projects had the potential to enhance transparency, but they
should have first identified the transparency requirements of citizens. The
evaluation team noted that “”enhancing transparency” may be taken to mean either
providing detailed information, or hiding it in the name of simplicity’’. It is not clear
what this statement implies. For example, hiding the details of major capital works
contracts for ‘simplicity’, would never be transparent if the real purpose was to
conceal corrupt practices.

Macintosh and Whyte are proponents of electronic democracy and electronic
participation, and much of their work is on the development and use of ICT tools for
this purpose. Therefore it is not surprising that their conclusions in the evaluation of
these isolated projects focus on the tools themselves, rather than any problem that
the tools might being trying to address. However, one of their conclusions is that
‘usable and accessible technology is important but not enough to ensure enhanced
participation’. The argument of this thesis is that new democratic decision
processes should be identified and designed before deciding what ICT tools, if any,
are required.

To summarise, the use of ICT to enable citizens participation is still in its
infancy, and is focussed mainly on local government. Aspects still to be addressed
are the attitude of elected representatives to greater participation, and the way that
current democratic decision procedures can be modified to include greater input
from citizens.
5.5.4. ICT and deliberative opinion polling

Deliberative opinion polling was described in chapter 2. This method of participation, especially the James Fishkin (1991) version, has been tried in many places, including the USA, Australia, Europe and China.

The role of ICT in deliberative polls has been explored by the Southwestern Pennsylvania Program for Deliberative Democracy in a venture established by the Carnegie Library of Pittsburgh (CLP) and Carnegie Mellon University (CMU).

The CMU’s Digital Media Lab for Applied Ethics and Political Philosophy has developed an ICT software product called PICOLA (Public Informed Citizen Online Assembly) to be used in these deliberative polling events, using either a desktop PC or a mobile PC.

The operation of the poll included public meetings (CLP, 2005), remote participants using the PICOLA software (PICOLA, 2007), and television broadcasts of the event, analysis sessions and interviews with participants (WQED, 2004)\(^{12}\).

The screen shots of the software on the PICOLA web site suggest that this is a feature-rich product with a wide range of functions. However, no information could be found on the current status of the software, whether deliberative polls have been held since 2005, or any evaluation reports of PICOLA from the polls in which this product has been used.

5.6. Audit of Australia’s electronic democracy

The previous sections have described the development of electronic democracy in a selection of other nations. The next sections include a summary of Australia’s use of ICT for electronic democracy based on a 2006 audit report, and descriptions of later Australian developments. This Democratic Audit of Australia report (Chen, et al, 2006) is complementary to the audit of Australia’s electoral systems (Orr, 2004), described in chapter 3. It focuses on the four core areas of the Democratic Audit of Australia, namely:

a) political equality
b) popular control of government
c) civil liberties and human rights
d) the quality of public debate.

The implications of ICT in these areas were investigated in:

\(^{12}\) This reference is to an earlier, similar event, and gives information on the types of television contributions.
a) Australia’s system of party and representative rule;
b) elections and campaigning;
c) non-government organisations and civil society institutions; and
d) the public sector that serves government and the citizenry.

The questioning title of the report - Electronic Democracy? The Impact of New Communications Technologies on Australian Democracy – highlights the conclusions of the audit, that not all uses of ICT enhance Australia’s democratic systems. The findings include positive uses of ICT to enhance democratic values in the four areas investigated, and negative aspects in terms of lost opportunities to enhance democracy. On the positive side:

a) ICT had been used in innovations by political parties, particularly the minor parties, to enable greater participation in their operations, and as a way to bypass the mainstream media in promoting their views and policies;
b) the technology provided new forms of direct communication between the public and their representatives and candidates;
c) increased participation by government organisations was enabled by providing on-line information, enabling the public to comment on policy making, the use of electronic voting systems, and community access projects; and
d) some civil society institutions had developed alternative news and media outlets, which provided means for virtual protests and pressure groups, and citizens to become politically active.

The electronic voting systems referred to in c) above are described in detail in chapter 6. On the negative side:

a) the opportunities for ICT to enable the political elite to engage with citizens had not been used, and government and its agencies had avoided making direct communication with the people, for example in policy development;
b) ICT had not been used in electoral competition, and the powerful and concentrated mass media continued to dominate political communication;
c) Resource barriers for civil society prevented grass root participation and access to the policy processes of civil society and government;
d) Australia was becoming a surveillance society through the increasing use of ICT for monitoring citizens behaviour both on-line and in the community; and
e) the Australian community was reluctant to use ICT to become politically engaged. (Chen et al, 2006, p x-ix)

The data sources used in the audit date from 2001 to 2005, and, as would be expected, some of the findings have been superseded through the on-going development of ICT.

As explained in chapter 3, there are no formal ways for the findings of audits of democratic processes to be acted upon. Therefore, any developments in the use of ICT for democratic purposes are unlikely to refer to the findings of this audit for guidance, and the developments described in the next section are not a result of the audit.

5.7. **Australian e-democracy after the audit**

The Internet continued to be used in the positive ways listed above during 2007, and in the campaign leading to the Australian federal election in November. In addition, the Internet started to be used in the areas of political elite engagement and electoral competition, which related to the first two negative findings. Uses of the Internet of note were:

a) the use of social networking services, such as MySpace, Facebook and the Impact political channel, by Members of Parliament and candidates, including the leadership groups of the main parties;

b) the use of the video hosting service YouTube, for announcing new policies and for public political comment;

c) the formation of a new political party, Senator On-Line; and

d) the creation of an on-line archive of ministerial election websites by the National Library of Australia (NLA), after the election.

These initiatives do not always positively answer the research question *how can the use of ICT in democratic processes provide a society with an improved democracy?* for the following reasons.

5.7.1. **New networking services - initiatives a) and b)**

In the lead up to the election, many politicians used on-line social networking to set up a presence on the WWW, providing personal, contact, and political information including ‘blogs’\(^{13}\). These were interactive sites, enabling the politicians to receive and answer questions. They also provided links to their ‘friends’, being colleagues,

\(^{13}\) Short for web log, an on-line journal
and any other people who chose to register as such. These actions were attempts to engage with the younger generations of citizens in their milieu, particularly those about to vote for the first time. However, they could also be considered as the use of ICT ‘as a distraction or a “cosmetic substitute” for real interaction’, to repeat Coleman’s point in 5.5.2 above (Gibson and Ward, 2000, p79).

It is very easy, and free, to join these networks, registration is a simple matter of providing a name, e-mail address, date-of-birth, and a password. This freedom resulted in a number of fake sites being set up, by people assuming the identities of some senior politicians. Also, given the unmediated nature of these sites, it is not surprising that some of the feedback to politicians was offensive and obscene, to a much greater extent than would be allowed and acceptable in public meetings and the traditional media.

Another example of engagement with young people was the use of YouTube, by the prime minister, to make policy announcements on climate change and federal support for a hospital in Tasmania. Given the younger generation’s concern about climate change it was good politics to use this medium to make an important announcement on the topic. However, within hours, the opposition had posted an ALP video political advertisement showing the PM sleeping through climate change alarms, and there was a substantial number of cynical, satirical or offensive video responses from other sources.

One could wonder about the relevance to the youth of Australia of a funding policy for a small hospital in Tasmania. However, this particular policy announcement was a clever approach to media management. The video announcement was posted to YouTube during the night and was followed by an extensive distribution of e-mails to the mainstream media outlets, saying that the PM would be making an Internet policy announcement at 5:00 am. The novelty of this approach, its immediate availability to all of the media, and the availability of video material for television news, meant that this was the dominant story of the day (Wright, 2007).

The electoral laws in Australia include a ban on all paid political advertising on the electronic media for three days before an election. This ban also applies to paid advertising on the Internet. This ban purports to provide citizens with some relief from radio, television and Internet election advertisements, although they can

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14 Anybody with a digital video camera can make a video clip and load it to a hosting service such as YouTube, for anyone with Internet access to see.
still receive television and print media news and political commentary. Note the ban applies to *paid* advertising, which means that advertising material posted free on YouTube and the social network sites, and political messages sent in mass mail-outs of e-mails and recorded phone messages, are not included. However, there is nothing to prevent the news channels from reporting this Internet material, the result being that politicians and their staff can now by-pass the requirements of the electoral laws (Wright, 2007).

The use of Web based services for these purposes are often promoted because they are new and available, without considering any of the democratic, technical and social implications of their proposal. Technology can be used to support democracy, but the systems should be developed to meet a particular purpose or solve a specific problem.

**5.7.2. The Senator On-Line (SOL) party – initiative c)**

The SOL Party ran candidates for the Senate in a number of states in the 2007 federal election. No candidates were elected, but the party received a national vote of over 8000, a result better than four other parties (SOL, 2008). The aim of this party is to provide a way for citizens to vote for individual items of legislation through their senator. If and when SOL candidates are elected their votes for or against legislation will be governed by citizens in their state. Any citizen can register on-line with the party, without cost, provided that they are on the electoral roll. This enables citizens to cast their votes for an item of legislation via the Internet to the party website. An SOL senator will only vote for the legislation if over 100,000 votes are received from registered citizens in his or her state, and at least 70% vote in favour. Otherwise the senator abstains from voting. (Grose, 2007)

The SOL Party might be considered as an example of Internet based on-line participatory democracy. One of its aims is to reduce the effect that minor parties with the balance of power have on legislation, when they trade their votes for amendments favouring their minority policies. However, SOL senators are only likely to be elected after an extensive distribution of preferences, so they too become minor party representatives. The chances of any SOL senator receiving 100,000 citizens votes for each piece of legislation from his or her state is unlikely, therefore these senators will probably abstain from voting every time. In addition, there are
often individual amendments to legislation which require separate votes, which would probably make the proposed SOL citizens voting process unworkable.

The electoral rolls are public documents and this provides the opportunity for identity theft, where a person could register as several people and vote multiple times. Also, the security of the SOL website is not known, but it may be possible for the votes submitted to be corrupted by malevolent access to the site. Chapter 7 includes more information on the problems of on-line voting via the Internet.

These points against the SOL Party are not to argue against the idea of citizens voting for legislation, or providing their formal consent to it. Other proposals to achieve these aims are provided in chapter 8.

5.7.3. National Library on-line archive – initiative d)

Perhaps the main contribution to democracy from the initiatives listed above is the National Library of Australia’s new political archive. The Australian National Archive, Parliamentary libraries and the NLA are institutions which can have an important role in any future deliberative and participatory democratic models because of their role as the permanent repositories of national information. The Internet can have a role in making this information readily and easily available to citizens.

The overall conclusion from section 5.7 is that many of these new uses of the Internet are not particularly beneficial to improving democratic processes. However, they do indicate interesting experiments of how the Internet might be used in the future.

5.8. Other Internet issues

In section 5.3 some of the early visions of the use of computers and other technology to enhance democratic activities were described. The development of the Internet and World Wide Web made some of these ideas redundant, and at the same time offered other opportunities.

Earlier types of communications technology had also provided opportunities for democracy, as well as having educational and social aspects. For politics, broadcast radio was seen to provide benefits for citizens in two ways, they could receive information which was up to date, and radio could give the appearance of elected representatives speaking directly to their constituents. Subsequently, the same was originally thought to be true for television. Barber and McLean saw the
opportunities for interactive cable television, but this technology never became established; partly because of its high cost, and partly because the Internet arrived before interactive cable networks were widely established. A major impact of the Internet was that it was a low cost, two-way channel, which was relatively easy to access and use. It soon provided citizens with the capability to ask questions of their representatives and to provide feedback to them, for example by e-mail and interactive web-sites, using general purpose computer technology and the telephone network.

In 2003 Barber republished his 1984 book on strong democracy with an updated preface, including additional commentary on the use of the Internet. He notes that the possibilities for participatory democracy through the use of communications technology, that he identified in the 1980s, still remain. However, these possibilities may not be successfully implemented because of the way the Internet has developed and is being used. For example, the speed and instant accessibility of the Internet go against the idea of deliberation for rational decision making, which requires time to consider and discuss the options available. Another concern is that the availability of instant polling across the Internet raises the issue of the tyranny of majority rule, which has always been a concern of thinkers about democracy (Barber, 2003, p xv).

Barber has a vision of strong democracy, in which ICT could play an appropriate part, but his vision of citizens participation in a strong democracy has still to be realised, and the role of ICT in democracy has taken a different course. In some cases this has not been as successful as was hoped, as in the case of electronic voting in the USA described in chapter 6.

However, there have been pockets of success; for example Estonia has used the Internet for a parliamentary election (Trechsel, 2007), Australia has successfully used electronic voting at the federal and territory levels (see chapter 6), and in Europe citizens have used ICT for democratic participation, as mentioned in section 5.5.3 above.

There is a wide range of views about the role of the Internet in modern societies, including its use in democratic activities. As mentioned previously, one commonly held view is that the Internet should be used for democratic purposes because it is new, available and convenient. For example, it has is suggested that since the Internet is used for on-line banking, then it can and should be used for on-line voting. There are strong arguments against on-line voting, as described in
chapter 7. In some instances, the suggestions of widespread use of the Internet ‘because it is available’ reflects a certain infatuation with this technology, a trait amongst cyberlibertarians.

5.8.1. Cyberlibertarianism

Another concern of Barber is the ownership of Internet technology and infrastructure, and its focus on commercialism, turning the Internet into a ‘virtual mall’, swamped by advertising (Barber, 2003, p xv). This concern of ownership is related to an extreme view of the role in the Internet in society, which is held by those known as cyberlibertarians. This view is considered here because libertarian ideas are an extreme of representative democracy, and these ideas could be translated into an extreme form of democracy using the Internet.

Cyberlibertarianism is a development of the libertarian ideas of free markets, individual freedom, and minimum regulation and government involvement, applied to the Internet. It presents an extreme alternative position to the scepticism and concern about the proposed wide use of the Internet in democracy, held in this thesis and by Graham (1999) for example. The term was coined by Langdon Winner, who defines cyberlibertarianism as

a collection of ideas that links ecstatic enthusiasm for electronically mediated forms of living with radical right wing libertarian ideas about the proper definition of freedom, social life, economics and politics in the years to come (Winner, 1997).

The main manifesto of the cyberlibertarian position is *Cyberspace and the American Dream: A Magna Carta for the Knowledge Age*. Its romantic ideas of cyberspace include

More ecosystem than machine, cyberspace is a bioelectronic environment that is literally universal: It exists everywhere there are telephone wires, coaxial cables, fiber-optic lines or electromagnetic waves. The bioelectronic frontier is an appropriate metaphor for what is happening in cyberspace, calling to mind as it does the spirit of invention and discovery that led ancient mariners to explore the world, generations of pioneers to tame the American continent and, more recently, to man's first exploration of outer space. Cyberspace is the latest American frontier. As this and other societies make ever deeper forays into it, the proposition that ownership of this frontier resides first with the people is central to achieving its true potential (Dyson, et al, 1994).

Although the Internet is a global network, the message from this manifesto is that cyberspace will be ‘conquered’ and owned by the American people. However,
Winner (1997) correctly points out that ownership of this frontier is less likely to reside ‘first with the people’ than with the large multinational corporations which develop and own the software and content of cyberspace. As Ginsborg notes,

[b]y 2001 four internet services providers controlled half of all user minutes of US citizens. AOL-Time Warner alone controlled almost a third. Rupert Murdoch’s giant News Corps media corporation bought the social networking site MySpace for $580 million (Ginsborg, 2008, p104).

The suggestion that ownership of cyberspace resides with the people implies that, to cyberlibertarians, this is a democratic space, thus raising several questions about its democratic nature, which are addressed in the next section.

5.8.2. The Internet and democracy

An alternative extreme view to cyberlibertarianism, which might be called cybercommunitarianism, does not exist. However, there is a range of views expressing concern about the use of the Internet, and the way it is developed, which generally oppose the cyberlibertarian view, and also express concern about some of the ideas in the middle of the spectrum, those commonly held views mentioned previously. Some of these different views can be drawn out by using some questions raised in Deborah Johnson’s essay, Democratic Values and the Internet, in Langford (2000).

Her first question is the Internet inherently democratic? considers a number of arguments which supposedly answer this question in the affirmative. The arguments are that the Internet:

a) facilitates many-to-many, unmediated communication;

b) promotes the formation of new associations independent of geographic location;

c) provides access to many sources of information; and

d) enables users of this information to have power which they might not normally have (Langford, 2000, p188).

Johnson’s main rebuttal of these arguments is that while the Internet does do these things, and so each argument has some validity, the assertion that these aspects are democratic or do support democracy is not valid. ‘Many-to-many’ is not the same as ’all-to-all’, which would be required for democratic equality; and ‘many-to-many’ can as easily promote anarchy as it can promote democracy. There may be easy access to many sources of information, but the accuracy of this information may be in doubt, and the software used for searching may be biased in favour of
particular sources, for example when information providers pay for their websites to be given priority in search results. Also, while there may be an illusion of power to the people, those with more power, eg. the owners of all types of communications media, can still dominate the Internet. Johnson’s conclusion is that the Internet is not inherently democratic, although it does have the capacity to facilitate democratic relationships and institutions, and must be structured to support these.

Johnson also asks *is the Internet developing democratically?* (Langford, 2000, p195). Her answer, that the Internet’s development is ‘American, ad hoc, and increasingly moving towards private interests and market forces’ (Langford, 2000, p196) is valid, but requires more analysis. This is done in the following paragraphs by considering the democratic nature of the development of communications hardware, compared with the development of Internet software.

**Communications hardware**

The original national, and subsequent international, communications systems were a mix of public and privately owned networks of cables (eg. telephone networks), using communications equipment (eg. exchanges) supplied by private companies. Ownership by the public depended on the particular nation, so Australia and the UK for example had single public telephone networks, while the USA had, and still has, a number of competing private systems. The communications equipment supplied by private companies was often designed to meet the requirements and specifications of public telephone authorities.

In these public networks there was a sense of democratic ownership, in that elected governments budgeted for and funded this development from taxes. As a case in point, using this approach Australia had established a reliable and affordable telephone service available to all citizens across the nation, with access to international services, by the second half of the 20th century.

The standards and conventions which help to ensure the success of the national and international networks were, and continue to be, developed and promulgated within a democratic framework, through the International Telecommunications Union (ITU), a United Nations agency. ‘Democratic’ in that the ITU works with Member States and other Sector Members and Associates from the private and public sectors, including international and regional telecommunication organizations (ITU, 2008). These standards related to what is called the ‘internet’ in this thesis.
This infrastructure now has significant digital components, and many of the publicly owned national networks have now been privatised. This has also resulted in the installation of more networks competing with each other, some providing fixed line services, others providing mobile communications. In Australia the telephone network has been partially privatised in spite of public opposition to this sale, and citizens, through the government, now own just 17% of the company.

Initially established for personal and business voice communications, this infrastructure, through its digital components, is now increasingly being used for additional commercial services, including shopping, entertainment and education. Governments also use these networks to provide public services and for political purposes. This is the ‘Internet’.

**Internet software**

Except for the exception of open-source software, which is a small percentage of the total, the software to provide Internet services is developed by the private sector. Some components of this software are developed to conform with relevant standards, from the ITU and Internet industry organisations. However, the majority of Internet software comprises competitive products, developed by processes without any democratic attributes. Of course this is normal in the commercial market, but it becomes an issue if some of the software is to be used for democratic purposes, particularly elections, and especially on-line voting. Any voting process must be transparent for citizens to trust it. This transparency does not exist if the voting machine software cannot be examined because it is protected as intellectual property.

Open-source software is protected by a public licence, and the source code, the program instructions written in a readable and understandable form, is available for public scrutiny. It could be argued that some open-source software is developed democratically, since the source code of the product is available on-line and programmers can participate in its development by reviewing the program and propose improvements and corrections. This is a deliberative process, and is one option for the development of future software for democratic processes.

Therefore, the answer to Johnson’s question about whether the Internet is developing democratically is in several parts. First, when the national communications infrastructure was in public ownership it had some strong democratic attributes, but privatisation of this infrastructure has reduced its
democratic nature. Second, there is a reasonable democratic framework within which standards for the communications infrastructure are developed. Finally, there are very few democratic attributes in the development of software for the Internet.

To summarise the previous sections, one of the arguments of this thesis is that there are some problems from using the Internet to support democratic processes, because it is an artefact of commerce, entertainment and education. However, the internet, considered as communications infrastructure, has its place in implementations of democracy supported appropriately by ICT.

5.9. **Electronic government**

Electronic government, or more usually e-government, was referred to in some of the definitions of electronic democracy given previously in this chapter. Kellner (2004) identifies these as being separate things, while Watson and Mundy (2001) considers e-government to be a subset of e-democracy. This section considers e-government in more detail, and clarifies these different views. Electronic government, also called *digital government* in the USA, is different from electronic democracy, but may be related to it. It is appropriate to consider the differences between the two fields, to clarify what is being covered in this thesis, and where, if at all, the two fields overlap.

Electronic government relates to the use of ICT for the provision of government information and services, and for other business and commercial activities. E-government is seen to provide more convenient, efficient and cost-effective services; improved access to, and collection of information; and greater accountability. Economic value is expected to accrue from e-government.

Systems for e-government can cover a wide range of applications, for example in the areas of taxation, social and community services, tendering to government, immigration and customs, education, justice, health, and housing. All of these applications would involve information being provided to a government by its citizens and businesses, and/or a government providing information and services to businesses and citizens.

Another area which could be considered as e-government is the use of ICT for national security, and the prevention and investigation of organised crime and terrorism. Consideration of human values, especially those of identity and privacy, in the development of these systems is of paramount importance, to ensure that the applications for profiling and surveillance, for example, do not infringe the basic
human rights and the freedom of the vast majority of innocent citizens. For issues of human rights, the matters covered in chapter 9 (computer ethics, and ethical ICT systems development) are as applicable to systems for government as they are to systems for democracy.

5.9.1. Definitions of e-government

During 2006 and 2007 a project to investigate aspects of electronic government was commissioned by the European Commission (eGOVRTD2020, 2007). The project team included partners from seven European universities, one from the USA, and CAPPE at the ANU, from Australia. I was the Australian team member. The objective of the project was to identify and define a roadmap for the research themes and activities which would be required to enable the European Union to establish strong e-government by the year 2020. This was an ambitious undertaking, given the distant target date, because all of the EU member states are developing e-government systems already. The 2020 date meant that the research would focus on the EU as a federation of member states with many functions and services being provided at the highest level of government. One of the products of this project, a book (Codagnone and Wimmer, 2007, p11) contains eight definitions of e-government used by various agencies, for example

- eGovernment is defined as using the Internet and the world-wide-web for delivering government information and services to citizens (United Nations)

and

- The use if information and communications technologies, and particularly the Internet, as a tool to achieve better government (OECD)

There are several common themes in these definitions, namely:

- a) the provision of government services through the use of ICT;
- b) the Internet as a common component;
- c) improved efficiency and effectiveness of services to citizens; and
- d) improved interchange of information between agencies, sometimes called ‘joined up government’.

Government accountability, democratic processes and public participation are also mentioned as aspects of e-government in some of these definitions. For example, the European Commission’s definition of eGovernment is

The use of information and communication technologies in public administration combined with organisational change and new skills in order to improve public services and democratic processes and to strengthen support to public policies. (Codagnone and Wimmer, 2007, p11-12)
Thus, from the various definitions identified and used by the European project, there is an overlap between what is considered to be e-democracy and e-government, rather than a clear distinction between the two concepts.

5.9.2. **Provision of e-services**

As outlined above, a major purpose of government is to provide a wide range of services to citizens. Thus it is inevitable that if these services are provided by the use of ICT they would be called *e-services*, and, of course, this term has become part of the e-lexicon. As electronic communications technology has progressed and computing power has increased, it has been possible to provide information services from virtually anywhere to anywhere, certainly in the societies being considered in this thesis. This has resulted in the practice of outsourcing, which means contracting another organisation to provide particular services, both for development and operational functions in the business and government fields.

Chapter 4 described how the governments of the established, or old, democracies have become very close to businesses, and have increased the use of the private sector to provide some services, rather than use the public sector for that purpose. Outsourcing is an example of this practice.

It might be argued that the provision of services should be considered as being separate from government, regardless of whether or not ICT is used to provide them, because they are more aligned to commercial applications. Services can be provided by the state, via public service departments and agencies, or by the private sector, by outsourcing those services or by privatising the state-run services and enterprises, as has now happened to many of them. Since these have now become commercial activities, perhaps the need to consider them as government functions should be reviewed.

On the other hand, a strong reason for many of these services to continue to be regarded as government activities, regardless of how they are supplied, is because they are paid for by the public purse. Even though they may be run by private companies, these systems for providing government services must still provide the same accountability and transparency as those of public enterprises, for example through audits or assessments by a national audit authority.

If ICT support is outsourced, the service provided will be limited to that defined in a Service Level Agreement (SLA), as part of the outsourcing contract. Under such a contract, support staff will be constrained to work within the terms of
the SLA, and will be expected to maximise the revenue from the contract and minimise the costs of providing the service. On the other hand, if the support group is an integral part of a particular government department or agency, that group will not have those contractual constraints and expectations, and are likely to provide a better service through identifying with the people, objectives and activities of their particular government organisation. This would also result in an important aspect of many organisations, the growth of corporate knowledge, which is essential to maintain continuity of service and contribute to the development of the organisation, which is unlikely to happen in a company providing outsourced support.

5.9.3. Overview of the growth of ICT in government

First world societies have used various forms of automation for over 100 years to support their governments and public services. The first example of this was probably for the USA population census in the late nineteenth century. The primary purpose of the USA population census is to work out how to apportion the 435 House of Representatives seats amongst the fifty states. In 1880 the processing of this census took eight years to complete manually, just in time to start preparing for the next census in 1890. During this period there had been an influx of millions of immigrants, thus compounding the problem of counting the population in a reasonable time (Howells, 2001).

Herman Hollerith was awarded a contract to develop an automated system to count the census, based on punched cards and mechanical tabulators, the equipment which produced the total population count. This system was so successful that the initial count of the population, over 62 million people, was completed in six weeks, and the final reports were produced in 1892 (Howells, 2001).

Hollerith’s census system was bought by other countries, including the UK and Russia; and he developed accounting systems from the same technology. These accounting systems opened up a market for his business in the private sector. This was the start of the business and office automation industry, and Hollerith’s original company later became the International Business Machines Corporation, or IBM (Howells, 2001). Other companies were established and supplied their products to many governments and businesses, leading to what is now known as the ICT industry.
**Australian e-government**

The Australian national population census, and other statistical collections, followed a similar path. To quote Dennis Trewin, the Australian Statistician in 2005,

> The Population Census provides a good example of how the processing of statistics has changed. Hand processing was largely used in 1911. Four million records were involved. Not surprisingly, it took 3 years and a small army to produce the first results. Hollerith machines for sorting and tabulating were deployed for the following Census, and versions of this equipment used for subsequent censuses up until 1961. This reduced the cost of processing the Census as well as improving the timeliness and accuracy. Mainframe computers were first introduced in 1966 and improved technology has been used in each subsequent Census to improve performance (Trewin, 2005).

These electronic computers were installed in Canberra and the various state offices of the Bureau of Census and Statistics, as it was then called. In addition to their census and statistics work they also provided an automatic data processing service to other Australian government agencies, for example the Treasury, the Taxation Office, the Public Service Board, the Department of Health, and the Superannuation Board. The Department of Defence installed it own mainframe computers at the same time; as did the Commonwealth Scientific and Industrial Research Organisation (CSIRO), which also provided a bureau service to government agencies. At this time there was an increase in the recruitment and training of programming, technical management, and operations staff into the public service.

It could be said that *electronic government* in Australia really started in the mid 1960s, but it was not called that; the preferred terms then were electronic data processing (EDP) in the defence field, and automatic data processing (ADP) in the other departments. By the mid 1970s, many individual government departments had acquired their own staff and computer installations, and then, as telecommunications technology was developed, on-line services were established for remote access by staff, and for inter-computer data exchange. The public did not have access to these systems at this time.

The state and territory governments also implemented ICT applications in the second half of the 20th century in parallel with the federal government, and, as computers became smaller and more available, local governments started to do the

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15 I was one of the programmers of those new mainframe computers for the 1966 Population Census.
same. This development of e-government applications is occurring across Australia, but at different rates and for different functions. The federal government is the driving force for the adoption of ICT, and it has established strategies and plans for the development of e-government at the national level (AGIMO, 2006). This latest strategy is called Responsive Government – A New Service Agenda. It addresses the way to achieve the vision of ‘a connected and responsive government by 2010’, and describes four main areas of activities, namely:

a) meeting users’ needs;

b) establishing connected service delivery;

c) achieving value for money; and

d) enhancing public sector capability.

This strategy will set the direction, principles, and standards of e-government for federal agencies, and most likely for the states and territories, to provide ‘joined up’ government across the nation, while still recognising the different priorities and circumstances of each jurisdiction. This approach is also likely to be the most logical, efficient and effective way to implement e-government in societies where there are multiple jurisdictions.

5.9.4. From e-government to e-democracy?

The messages from the previous sections are:

a) there are no clear definitions of e-government and e-democracy;

b) the two areas may be linked or overlap in some way; and

c) e-government in some form has been in existence for over fifty years, and is ahead of e-democracy in its implementation.

From c) above, it might be said that e-democracy would evolve from e-government; and that the difference in the rate of implementing these two areas is related to the stages in the development of ICT. Fifty years ago, large, expensive mainframe computers and data processing methods lent themselves to centralised government functions. Now that low cost devices such as personal computers, and better on-line communication services such as the internet are widely available, processes for democracy could be automated.

While that may be the case, it does not necessarily mean that e-democracy will automatically follow in societies which have significant e-government. In 2004, Bishop and Anderson considered the work of Darrell West at Brown University (West, 2002), covering a detailed survey of the implementation of electronic
government in 198 different countries. This survey ranked government websites in terms of information availability, service delivery and public access across two dozen criteria. Bishop and Anderson noted that many of the high ranking e-government nations were not high on the Freedom House ranking of the democratic attributes of press freedom, political rights and civil liberties (Bishop and Anderson, 2004).

Table 5.1 shows a repeat of this analysis, using the latest e-government rankings from the work of West (2007), and comparing these rankings with the 2007 Economist Intelligence Unit’s Democratic Index (Kekic, 2007). This Index is produced from a survey ranking 165 independent states and two territories, according to the state of each democracy measured against 60 indicators in the following categories:

- Electoral process and pluralism
- Political participation
- Civil liberties
- Functioning of government
- Democratic political culture

More information on the Economist Intelligence Unit’s Democratic Index is provided in Chapter 3.
<table>
<thead>
<tr>
<th>Full democracy</th>
<th>Top 20 ranked democracies from Economist Intelligence Unit Survey (Kekic, 2007)</th>
<th>e-government rank from West (2007)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>1</td>
<td>60</td>
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<td>Iceland</td>
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<td>Netherlands</td>
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<td>Finland</td>
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<td>Luxembourg</td>
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<tr>
<td>Japan</td>
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<tr>
<td><strong>Flawed democracies</strong></td>
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<td>South Korea</td>
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<td>Taiwan</td>
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<td>3</td>
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<td>14</td>
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<td><strong>Hybrid regimes</strong></td>
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<tr>
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<tr>
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<td>17</td>
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<tr>
<td><strong>Others</strong></td>
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<td>Liechtenstein</td>
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<tr>
<td>Andorra</td>
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<tr>
<td>UK – Full democracy</td>
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<td>5</td>
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<tr>
<td>Italy – Flawed democracy</td>
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<td>34  20</td>
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</tbody>
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Table 5.1 Comparison between e-government implementation and democracies
The conclusions that can be derived from this table are as follows.

a) Of the top 20 ranked democracies, there are only 8 nations ranked in the top 20 for the implementation of e-government.

b) Eight of the nations ranked in the top 20 for e-government, including the top three, are either flawed democracies, hybrid regimes or authoritarian regimes, with democracy rankings falling between 31 and 156.

c) In the top 7 ranked democracies, Finland is ranked the highest for e-government at 23, and four of these top democratic nations are ranked in the 60s for e-government.

d) Canada, ranked 6 for e-government, is the highest ranked full democracy in the top 10 ranked e-governments.

e) Australia is second to Canada, and coincidentally is ranked 8 in both surveys.

f) Of the full democracies, the USA has the highest e-government ranking of 4, but is ranked at 17 for its democracy.

g) The UK, ranked 5 for e-government, is ranked at 23 for democracy.

h) Italy, ranked 20 for e-government, is a flawed democracy ranked at 34.

This comparison of 2007 surveys is consistent with the results of Bishop and Anderson (2004), and bears out their point that there is little evidence in these surveys to support an argument that ICT, and particularly the Internet, will necessarily result in the adoption of more democratic practices. Perhaps this finding is not surprising, since some of the objectives for governments to use ICT are the same as those for commercial organisations, to improve efficiency and effectiveness. As described previously in section 5.8, ICT and especially the Internet are not inherently democratic, and there is no reason to assume that an undemocratic society would become democratic by using this technology.

Bishop and Anderson argue that the technology in West’s study is ‘politically agnostic’, and that e-government can be anti-democratic, as there are ‘potential Orwellian implications of a two-way, interactive medium’. An example of this could be the use of cookies\(^\text{16}\) installed without consent on personal computers by security agencies, to enable them to keep track of websites visited by particular people of interest (Bishop and Anderson, 2004).

\(^{16}\) Cookies are software files installed on the browsers of users’ computers to help speed up information searches on the Internet, but to do this they hold information about users’ browsing habits, such as websites visited, newsgroups read, etc.
From the two surveys examined, it could be concluded that there is not a clear link between those nations which have well established electronic governments and their status as established democracies. These surveys also suggest that there is not a clear path for the transition from e-government to e-democracy.

Any case for a transition from e-government to e-democracy, therefore needs to measure democracy rather than just the success (or failure) of efforts to adopt electronic technology (Bishop and Anderson, 2004).

However, as the rankings of Australia and Canada show, it is possible for full democracies also to have well developed electronic government systems. Systems for government and democracy can be developed in parallel, and some important components of e-government could benefit the introduction of e-democracy.

The motivation for governments to introduce e-government services is mainly for economic efficiency. In some cases there could also be ideological reasons, for example as a way to reduce the number of people working in the public sector, and to outsource government services to the private sector. Regardless of the motivation, the additional benefits to e-democracy from implementing e-government applications could be:

a) the technical problems which will be met and overcome could make the implementation of e-democracy applications easier;

b) some of the networking infrastructure could be used for e-democracy purposes;

c) some software infrastructure, eg. for identity management, security and privacy, could have application in systems for e-democracy.

5.10. **Electronic governance**

There is another term which sometimes occurs in the literature, which, for completeness, should be briefly considered, namely *electronic governance*. The words governance and government are sometimes confused with each other, so to clarify this matter these are the definitions used in this section.

**Govern:** to rule with authority, especially with that of a sovereign; to direct and control the actions and affairs of (a people, etc.) whether despotically or constitutionally; to regulate the affairs of (a body of men).

**Government:** the action of governing; the action of ruling and directing the affairs of a state.

**Governance:** the action or manner of government; method of management, system of regulations. (SOD, 1974)
From these definitions it could be said, for nation states, that the manner of one
government (eg. Australia) might be run under a method of governance described as
democracy; and the manner of another government (eg. Burma) might be run under
a method of governance described as a military dictatorship.

For Australia, the method of governance is defined in its Constitution. The
Constitution specifies the rules for forming a federal Parliament (which includes
elected representatives of the citizens) and how the executive government operates.
The Constitution grants this Parliament the power to make laws in specified areas,
and grants the States power to make other laws. The judicial system is also
specified. Within this constitutional framework, the processes of government and
democracy operate, and there are ways to control the balance of power between the
three arms of government - the parliament, the judiciary, and the executive.

There is nothing in a method of governance which would preclude the use of
ICT, and as the previous section shows, technology has been used to support
government activities for over one hundred years. Therefore, it is not clear why
governance needs to be qualified by the adjective ‘electronic’, or what electronic
governance means exactly. However, the Council of Europe, which has been active
in promoting the adoption of ICT across its member states, especially to support
government processes, has produced the following definition of electronic
governance.

**E-governance**

The concept of electronic governance chosen by the Council of Europe
covers the use of electronic technologies in three areas of public action:

a) relations between the public authorities and civil society

b) functioning of the public authorities at all stages of the democratic
process (electronic democracy)

c) the provision of public services (electronic public services)

This is a broad definition covering the different aspects of relations between
the state and civil society. The Council of Europe is currently considering a
recommendation which will offer a common vision of how digital
technology can be incorporated into exercise of power. Aware of the risks
entailed in these technologies, the Council reaffirms the need to strengthen
democratic institutions and processes and to involve the public in political
choices so that their needs and priorities are respected. In this connection,
governments must ensure that they involve the whole population, in
particular by ensuring that the largest possible number of citizens are
educated in the use of computers (COE, 2007).

This definition makes some important points; for example about the importance of
managing the risks associated with incorporating digital technology into the exercise
of power, and the need to educate the population in the general use of computers.
This would apply particularly to the use of computer systems developed for electronic democracy, for example an e-voting system. These are certainly governance issues, but their importance and relevance would be no less if the definition was for ‘governance’ rather than e-governance.

The challenges for the member states as they come together to form the European Union are many, covering for example; multiple languages, diverse cultures, various economies and systems of government, and from the definition above, the widespread use of ICT in many aspects of the European society. The method of governance will be the way that these challenges are addressed and resolved. However, there is no talk of, and presumably no need for, specific methods of language governance or cultural governance. Therefore there is no further reference to electronic governance in this thesis.

On a final point, governance in organisations, often referred to as corporate governance, has achieved serious attention in the past few years, following the collapse of a number of prominent corporations. The need for strict governance in the organisations developing and operating ICT applications for democratic processes is addressed in chapter 9.

5.11. Summary and conclusions

This chapter includes a wide range of topics related to the development ICT and ideas about the way that this technology might be used in democratic processes. These topics are now summarised to draw out some conclusions to contribute to the answer to the research question – how can the use of ICT in democratic processes provide a society with an improved democracy?

Some of the history of ICT has been provided, to show how its evolution has influenced ideas about its use in democratic activities. This use started early in the 20th century with the broadcast of radio programmes for political purposes; and has continued with television, computers, global telecommunications, and mobile devices. The arrival of computing technology and software as domestic consumer items contributed to the development of the Internet, which has made profound changes to the way that business, entertainment and education is carried out. In this context, the importance of distinguishing between the internet as the basic global communications infrastructure, and the Internet as a commercial, educational and entertainment environment, has been stressed.
ICT has been shown to have a role to play in democracy. The range of applications of ICT identified in this chapter includes:

a) voting in elections for representatives;
b) voting in other ballots such as opinion polling;
c) communication with representatives;
d) the provision of information for electoral and other purposes;
e) political campaigning and other party activities;
f) grass roots political activism; and
g) participation and deliberation.

It cannot be denied that some use of ICT has benefited democratic processes. However, there are also negative aspects to this use, in that this technology can undermine the principles which distinguish democracy from other forms of government. Of particular concern is the use of the Internet for some of these applications.

The use of ICT in democracy is generally referred to as electronic democracy, of which there is a number of definitions, often relating democratic processes to ICT and the Internet. A new definition is proposed, which unlike the common definitions, is independent of any democratic applications and any specific technology. The thesis definition is

*electronic democracy means processes which use ICT to apply democratic principles.*

The specific reference to democratic principles is included to ensure that ICT is used appropriately in democratic processes, and the technology is subservient to these principles. These principles and the appropriate use of technology are described in later chapters, to provide further answers to the research question.

This chapter also includes consideration of electronic government and its relationship and overlap with electronic democracy. The conclusion reached is that:

a) there are no unique definitions of these two ideas;
b) some definitions of e-government include aspects of e-democracy, such as electronic voting;
c) the inclusion of democratic processes in the definition of electronic government is inconsistent; and
d) from the surveys considered, there appears to be no relationship between the level of democracy in a nation, and its stage of implementing electronic government.
From the analysis in section 5.9, e-democracy and e-government are considered as separate topics, and e-government is not considered further in this thesis.

The description of Australia’s use of ICT in democratic processes indicates that, in general, this country is neither leading or lagging other nations in its adoption of this technology. However the Australian Capital Territory has had some success in the area of electronic voting and vote counting, which is the focus of chapters 6 and 7.

Also, the groundwork has been laid in this chapter to consider practical ways to establish processes of participatory democracy, described in chapter 8. The role of ICT in these participatory processes draws on the thesis definition of electronic democracy.
Chapter 6. Electronic voting systems

6.1. Introduction

The previous chapter provides an overview and analysis of the issues and opportunities for the use of ICT in democratic systems. In this chapter, the role of ICT in voting systems is analysed in more detail, through the use of a case study of the experiences and problems arising in the USA during the 2000 presidential elections. The issues related to the provision and operation of reliable and trusted electronic voting systems are identified through the analysis of a report on electronic voting best practices, produced by a team of experts at the Kennedy School of Government, Harvard. In this analysis, electronic voting systems are considered to be an alternative to manual methods of voting at a polling station. Methods of remote voting, including telephone and on-line voting, are described and analysed in chapter 7.

Note In this chapter comparisons are made between US electronic voting practices and those of an Australian electronic voting system called eVACS®. I was involved with the development of the first version of eVACS® in 2001, but am no longer a permanent employee of the company. The comparison is not meant to be a promotion of eVACS®. However, the design features of eVACS® and its successful usage in Australia makes it ideal for comparison with the practices and issues related to electronic voting experiences during the 2000 USA presidential election, and subsequent elections.

6.1.1. Background to electronic voting

An electronic voting booth is the place where voters cast their vote using some form of electronic voting machine, as opposed to a paper ballot. In the USA, touch screens are a common method to capture voter choices in its first-past-the-post method of selecting representatives. A touch screen looks like a computer display monitor, but the screen is an active input device, and can sense the place on the screen that is touched. Therefore, if the screen displays a ballot showing a set of candidates, a citizen can vote for a particular candidate by touching the physical area on the screen where that candidate’s name is displayed. Other voting functions, such as ‘start voting’, ‘undo choice’ and ‘accept vote’ may be programmed onto the screen, or may be provided through an interface such as a keypad or other device. A
touch screen device could also be used for preferential voting with additional software being required to handle this complexity.

Other forms of voter interface are available, for example a simple keypad with a non-active computer screen could be used to perform voting functions, navigate a ballot displayed on the screen, and select candidates.

These electronic devices are known as direct-recording-electronic (DRE) machines where each vote is recorded directly into the computer and stored as an electronic record, until it is ready to be counted. The ballots are then transferred to a vote database (held on a disk drive on another computer), perhaps via a network, or by the use of magnetic media, eg. a CD-ROM (read-only-memory). The vote database may be distributed, so that subsets of a larger database may be held in state or regional centres, where the votes are counted for the region, and then transmitted to a central vote database to provide a national tally.

A feature of an electronic system is that it should not need to use paper records, but some people have serious concern about the reliability and security of DRE machines. There has been extensive debate in the USA about the need to modify voting systems using DRE machines so that they produce a paper record of each vote for voter verification, validation, and auditing purposes (for example, Mercuri, 2002). This issue is described in the case study later in this chapter.

At present non-electronic methods of casting a vote are used side-by-side with electronic voting, including traditional paper ballots, and the voter is free to choose his or her preferred technology. This arrangement is sometimes known as a ‘hybrid system’. These alternative methods could include mechanical or electro-mechanical devices; for example punched cards, or conventional or specially formatted ballot papers, which are marked using a pen or pencil, and read or scanned automatically. A postal ballot could also be produced using one of these methods.

Votes cast on electronic voting machines are counted electronically. To enable votes cast using non-electronic voting methods to be counted electronically, some form of data entry is required, to convert the ballots to electronic records for storing on a vote database. Data entry methods could include mechanical means of reading punched card ballots; optical methods of reading ballot papers; and by a person keying the vote data on traditional ballot papers into an electronic vote database held on a computer.
When a poll is closed and ballots have been added to the vote database, vote counting can take place. This would be done by computer programs which count the records on the vote database, according to the accepted counting rules of the voting system (FPTP, preferential, etc). Counting of ballots can be progressive if the vote database is being regularly updated by votes being submitted from remote polling places, although some systems may require all the votes to be entered before counting can begin.

In a full electronic voting system, manual counting of paper ballots is not used. However, manual counting of paper ballots produced by DRE machines to provide an audit trail has been suggested as a way to validate a counting process which is in dispute (Mercuri, 2002).

In an electoral system making extensive use of ICT, there are many opportunities for equipment and process failure, and for people to corrupt the process and/or pervert the results of an election. These issues are described in the following case study, and in chapter 7. While it is necessary to have reliable, secure systems for all of the components of an electoral system, the requirements for voting and counting should be very much more so, to ensure the integrity and acceptability of the results of the election.

6.2. The ACT electronic voting experience

6.2.1. Introduction

The case study later in this chapter compares some electronic voting experiences in the USA in 2000 with an electronic voting and vote counting system used in Australia in 2001. Therefore it is appropriate to describe the Australian electronic voting system in detail here, to set the scene for the case study.

The use of ICT is well established to support election administration and processing in Australia, but until 2001 very little use had been made of technology for voting and vote counting in Australia. Green, the ACT Electoral Commissioner, identifies a number of principles which all Australian electoral authorities follow, to ensure that elections are free and fair (Green, 2000). These principles are

- Transparency
- Security
- Professionalism
- Accuracy
- Secrecy
- Timeliness
- Accountability
- Equity.
Green (2000) notes that the voting systems in Australia using paper ballots meet these principles, and it is essential that any electronic substitute should also meet them. Green argues against the use of the Internet for electronic voting because, in 2000, he was not convinced that these principles, particularly security and secrecy, could be met. He could also have included transparency and accountability as reasons for not using the Internet. Nine years later these arguments still apply to a large extent, as shown in the analysis of on-line voting, in chapter 7.

Green’s argument was against the use of the Internet for on-line voting, not the use of ICT for electronic voting. Therefore, in 2001, the Australian Capital Territory (ACT) Electoral Commission let an open tender for a fully electronic voting and vote counting system, ultimately known as eVACS®, to be developed and implemented. This was the first time that an Australian election had used an integrated ICT system for both voting and counting.

It was used by 10% - 16% of the electorate to cast their votes in the 2001 and 2004 ACT Legislative Assembly elections respectively; and to count all votes according to the Hare-Clark method. The system was also used in the October 2008 election, and while voting statistics are not available at the time of writing it appears that there was an increase in the use of electronic voting. The vote counting system was also run in 2003 and 2006 to fill the casual vacancy following the resignation of an elected representative.

6.2.2. The ACT system

The ACT has one of the most complex voting systems in the world, with multiple candidate electorates; the Robson Rotation, described previously; and preferential voting using the Hare-Clark system of proportional representation. These components are considered to provide a fairer, more democratic result of an election, but with these components it is difficult to achieve an accurate count of the votes using manual methods. It takes about three weeks to complete the manual count of all votes in the ACT (about 198,000 ballots in 2001 (ACTEC, 2002a)), and if the result is close there may be a request that the count be repeated. Therefore one of the main reasons to develop the electronic voting and counting system was to provide an accurate and reliable counting function.

In the first ‘electronic’ election in 2001 there were four pre-polling places (where votes can be cast before the specified Election Day), each with ten electronic polling booths. On Election Day these places were supplemented with another four
polling places, also with ten electronic polling booths each\textsuperscript{17}. Subsequent elections have varied the number of polling places and electronic polling booths, and for the 2008 election there were five polling places providing access to twenty electronic voting machines, used throughout the pre-polling period and on Election Day.

The increased number of electronic voting machines available throughout the election period, coupled with their general acceptance by citizens, means that a larger proportion of electronic votes are available for counting and preference allocation soon after the close of the poll. This means that a clearer indication of the election result may be available sooner, although the final result will always depend on the final allocation of all preferences from paper ballots.

\textbf{6.2.3. Voting system configuration}

The electronic voting system eVACS\textsuperscript{®} includes a basic personal computer (PC), numeric keypad and barcode reader, physically set up to be tamper-proof, and these units are connected to a server via a secure local network.

The barcode/keypad configuration of the voting system was chosen by the design team because it resembles an automatic teller machine (ATM) set up, with which most citizens in the ACT are familiar. All other votes in each election were cast manually, using paper ballots or by postal voting.

Only the basic election software is installed on the PC, sitting in a very cut down version of the Linux operating system, with no log-on capability. The software code is available for inspection and use under a public licence, as opposed to the intellectual property of the system being protected by a proprietary licence. The original versions of eVACS\textsuperscript{®} are also open source, and are available for inspection by anyone (ACTEC, 2001). The software was audited by an independent third party, and available for inspection by any interested party. The major political parties used their own technical people to perform inspections of the code.

\textbf{6.2.4. Casting a vote}

Barcodes are created prior to the election, as part of a ‘closed’ system, such that only those barcodes created by the system are known to the system. This ensures that barcodes produced by someone attempting to vote illegally, for example to vote more than once, will not be recognised and accepted.

\textsuperscript{17} All eight centres also provided booths for voting with conventional ballot papers.
When voters arrive at a polling place and choose to vote electronically, they receive a unique barcode. To initiate their vote, the citizen swipes this barcode in the reader, which identifies the electorate and polling place, but not the voter. Upon swiping the barcode, the first screen displays a Welcome message and the voter can choose to see the on-screen voting instructions in English or one of eleven other languages. Having chosen a language, a ballot screen is displayed appropriate to the electorate in which the polling place is located. Voters can navigate the ballot screen using the numeric keypad, and select their candidates in their order of preference, preferences being recorded automatically based on the order of selection. Changes can be made to this order at any time, and when the voter is finished they are required to confirm their selection before submitting the vote.

After voting, the barcode cannot be used again. Informal voting (that is not casting a vote) is possible, but this must be a conscious action. It is not possible to cast an informal vote by accident, as can happen with paper ballots. Visually impaired voters, or those with poor reading skills, can vote in secret through the use of an audio function, by listening to the instructions and candidates names through earphones, in conjunction with using the keypad.

6.2.5. Data entry and vote counting

Votes cast on the electronic voting system are securely stored until the close of the polls, when they are transferred on CD-ROMs to a stand-alone vote counting machine. This machine conforms to the same software environment described above for the voting machine; using basic Linux, open source for the counting software, and comprehensive auditing processes. Since elections in the ACT use a mix of electronic and manual voting, a method of converting paper ballots to electronic records is required, so they can be counted by computer.

In the 2001 and 2004 elections, a data entry module was used to key in the voters’ preferences from paper ballots. Batches of 50 papers were independently entered by two different operators, with candidate scrutineers in attendance. The software produced exception reports of any differences between the data entered by the two operators. Batches could not be committed to the database for vote counting until the differences had been resolved and corrected. The counting module was then run, to distribute preferences and declare the successful candidates. Further information on the accuracy and reliability of this approach to electronic voting,
data entry and vote counting can be found in the ACTEC’s report on electronic voting in the 2001 Assembly election (ACTEC, 2002a).

However, in the 2008 election, data entry of paper ballots was replaced by an optical scanning system which creates an image of each ballot. The accuracy of each image is visually checked by an operator, for example to ensure that a valid sequence of preferences have been produced. The image is then read by intelligent character recognition (ICR) software to identify the preferences shown on every formal ballot, which are then interpreted from the Robson rotation version number printed on each paper. Ballots which pass these checks are automatically sent to be counted. Ballot papers which have unclear numbers or do not pass a business rule check (for example, a break in the sequence of preference numbers, or a ballot appearing to be informal) are flagged, and then verified by an Elections ACT officer. Strict rules are followed if an on-screen record of a vote is changed. When ballots which have been queried are corrected and validated, they are sent to be counted. The scanning, validation, verification processes are observed by election scrutineers. (ACTEC, 2008)

6.2.6. Reliability and security

There is a range of back-up and security functions to ensure the reliability and integrity of the eVACS® system. The voting machines and associated server are connected via a secure local network, with no electronic access from outside. The server has two hard disk drives, and the votes are held on two separate databases as a guard against hardware failure. Set-up of the system is automated by the use of auditable write-once CDs, with very limited functionality available to voters and election officials. This ensures that the software cannot be modified during an election. During set-up the hard drives are reformatted, to remove any other operating system or other software. At the end of voting, the stored votes can only be downloaded using password and encryption keys, which are only provided to the election officials after the poll has closed. A record of every keystroke for every vote is kept. The keystrokes and the back up of other data provide a complete audit trail and recovery mechanism in the event of failure. However, there is no way to link a voter to the vote he or she has cast.

The ACT Electoral Commission’s specification of its voting system precluded the use of the Internet and touch screens, and required a detailed, independent audit of the operating system and voting system software. Touch
screens were excluded from the specification because the Commission received advice that blind voters have difficulty using these devices. The audit requirement precluded the use of proprietary software, which included Microsoft’s Windows operating system. Since it would not have been possible to audit Microsoft’s products in Australia, the design team chose a cut down version of the Linux operating system, the source code of which was available under a public licence and auditable.

Apart from the audit aspect, the eVACS® design team felt that the Microsoft software environment would not be reliable enough for the voting and vote counting system, and because it is not possible to remove unnecessary functions in MS Windows software, or those functions which are potentially threatening to the operation of the system. These exclusions are in contrast to the requirements of electronic voting systems in some other countries, which do allow Microsoft software and touch screens (in the USA, for example Bacchus and Kaper, 2004), and Internet use for voting (in Estonia, for example Trechsel, 2007).

6.2.7. ACT system summary

Elections are run in the ACT by an independent Electoral Commission answerable to the elected Legislative Assembly. The success of the ACT electoral system can be largely attributed to the independence and neutrality of the Commission, and the fact that it closely addresses the eight principles of free and fair elections mentioned in section 6.2.1. By following these principles to implement an electronic voting system, used in ACT elections since 2001, this success has been maintained.

The electronic system has demonstrated that it is possible to automate a complicated voting method like the Hare-Clark, and to produce reliable software for voting and vote counting, which is trusted by the citizens who use it. The ACT system has been described in detail in the previous sections as a prelude to the following case study.

6.3. Background to the case study

A feature of the USA electoral system is that elections are always held on a particular day, the first Tuesday in November. Usually elections for representatives to several legislatures are held on the same day, but it is the presidential election which draws the most attention, particularly from overseas observers and commentators. In the following case study examples from the presidential elections
have been cited where necessary, however it should be noted that the issues raised apply to the voting system technology, and not to the particular representative position being elected. Election management is the responsibility of each state, giving rise to many diverse electoral systems. This case study does not consider individual state systems in detail.

6.3.1. The 2000 election

Because of the size of its population, the USA has been using some form of technology to support election processes for over one hundred years (Tokaji, 2004, p8). By contrast, Australia’s relatively small population has not required that level of automation, and eVACS® is the first automated voting system to be used. During the USA presidential election in 2000 a substantial number of problems occurred with some of the technology used by citizens to cast their vote. Many of these problems were with mechanical (lever operated), and electro-mechanical systems, to record votes in various forms of punched cards (for example Jones, 2000). As a result of these problems, the US Congress identified a number of initiatives to modernise and improve the election processes, and, to that end, the Helping America Vote Act was passed in October 2002 to provide federal grants for the purchase of voting machines and other election related purposes (HAVA, 2002). One requirement of this Act is the replacement of old voting technology with electronic voting systems, also known as direct-recording-electronic (DRE) systems, which typically do not produce a paper record of the ballot.

6.3.2. The 2004 election

During 2004 a number of citizen-based organisations were formed in the USA to protest against the proposed use of some models of electronic voting systems in the presidential elections to be held in November of that year, and to take other actions to assure the integrity of that election process.

The "Computer Ate My Vote" Day of Action was held in July 2004 to coincide with the National Academy of Sciences hearing on voting systems. Rallies were held in 18 USA states to draw the public's attention to the issues. During this event, election officials were asked to pledge to count all votes and to adopt voting machines that produce a paper record of the vote.

The rallies were co-ordinated by the Verified Voting Foundation (VVF, 2004a), which also sponsored and organised the TechWatch programme, to enlist
technology professionals to volunteer to observe and document problems with the election process and voting technology which might arise during the November elections. This documentation could then be used to provide evidence to support litigation and policy making with respect to electronic voting. Both events were strongly supported by the Computer Professionals for Social Responsibility (CPSR), and other like-minded organisations. Before November 2004 over 1300 technologists had registered to support this activity (VVF, 2004b). By the end of 2004 over 42,000 election incidents had been reported (VVF, 2004c). Incidents were reported from every state, and cover a range of issues, but not all related to voting technology. In fact the majority of incidents reported were about voter registration problems and difficulties in being able to vote, often because of insufficient polling places and ballot papers to meet the voter turnout.

However, a main area of concern was, and in 2009 still is, the use of electronic voting machines, which have a history of malfunction, resulting in lost votes, or votes cast for a candidate not chosen by the voter (Wired, 2007 for three examples). While it is possible that some of these malfunctions were caused by errors in the set-up procedures, there is a concern that others could have resulted from tampering with the equipment or other corrupt practices.

A solution proposed by Mercuri (2002), and being considered by some state legislatures, is the use of a voter verifiable paper trail (VVPT), where the voter sees a paper record of the vote, confirms that it is correct, and the paper record is kept within, or with the DRE voting machine. An alternative to this is the voter-verified paper ballot (VVPB), where the voting machine prints a paper copy of the voter’s choice, which is then verified by the voter before placing it in a conventional ballot box. In either method the paper records can then be used in a recount or to confirm the vote totals. The use of paper records of voter intentions is addressed in detail in sub-section 6.5.2.

### 6.3.3. The 2008 election

This thesis was being finalised while the November 2008 presidential and other elections were being held. Reports from this election (for example, Montalbano, 2008) are still commenting on faulty e-voting machines. Other reports (for example, Kennedy and Palast, 2008) refer to attempts to disenfranchise citizens in the lead-up to the election in a number of ways, including obstructing voter-registration drives and purging legitimate voters from the rolls.
It was likely that since one of the presidential candidates was an African American there would be a high voter turnout, (for example, Mark, 2008) and this proved to be the case. There were long queues at polling places (for example, MacAskill, and Goldenberg, 2008); some places had insufficient voting machines, and others ran out of ballot papers. It appears that after eight years, there are ongoing problems with the electoral systems of the USA, and the analysis of this case study is still valid.

While this thesis was being completed there was media reporting and commentary about the use of ICT by the Barack Obama presidential campaign. In addition to the websites that all candidates used, Obama made extensive use of social networking sites and mobile communications to organise his campaign and his supporters. His campaign website (Obama, 2008) contained links from which to register e-mail and telephone contact details, and to volunteer for local campaigning and fundraising activities. As a result, the campaign raised about $750 million from just under four million donors (Bradley, 2008). This campaign was a very successful use of ICT for election purposes, and it resulted in many citizens, especially young people, participating in the democratic process of electing their representatives.

The campaign website also had links to 16 social networking sites, which provided the text and video clips of campaign speeches, and the opportunity to provide questions and feedback on policies. The role of this technology, in voting and other forms of participation such as deliberation, is addressed in sections 5.7.1 and 9.6.

6.4. Electronic voting best practices report

As a result of the problems with the electronic voting machines and other voting technology used during the 2000 USA elections described above, several organisations of concerned US citizens were formed to raise public awareness of these problems; and a number of academics and specialists made contributions to the debate about possible solutions.

A substantial contribution was made in June 2004 when a Voting, Vote Capture and Vote Counting Symposium was held at Harvard’s Kennedy School of Government (KSG). This Symposium produced a report entitled Electronic Voting Best Practices. The work was co-ordinated by Professor Jean Camp, with a number of contributors, who are listed in the report (Camp, 2004). The symposium report
made a number of recommendations covering the practices which were considered essential for the acceptable and reliable use of electronic voting technology for future elections in the USA, including the, then, upcoming elections in November 2004.

The following sections contain an analysis of that report and the proposed best practices compared with the experiences in Australia, in terms of electronic voting and the broader context of full electoral systems and processes. The conclusions from this analysis are that:

a) it is possible to meet the best practices recommended by the Symposium;

b) it is essential to have reliable and transparent processes in any electoral system before the widespread use of electronic voting and vote counting technology is adopted; and

c) vote verification using a printed record of the ballot may not be necessary.

6.4.1. Best practices

The term ‘best practice’ came into common use in the 1980s, with the rise of interest in total quality management (TQM), business process improvement, benchmarking and other management techniques. It is a poorly defined term, and frequently misused, particularly in the management and motivation media. ‘Best’ implies that the practices cannot be bettered, which is often a hollow and inaccurate claim. In many cases, where an organisation is performing well, ‘leading practice’ is a better term to use.

It should be noted that not every recommendation in this electronic voting report defines a ‘practice’, meaning a description of a specific activity to contribute to successful electronic voting, in this case. Sometimes the point is a more general statement, and a particular practice has to be gleaned from the supporting discussion.

The Best Practices report is assumed to define and qualify the practices as being the best for the USA. If these really are the best, or leading practices, they could be considered as providing a description of what should be done in any jurisdiction or election, and the catalogue of practices is a valuable contribution to the requirements of an electoral system, including those using ICT. However, and understandably, the document is very much focussed on the beliefs, practices, needs and shortcomings of elections and their systems in the USA. It should be borne in
mind that some of the practices proposed for the USA can already be found in the systems of other countries, including Australia, Brazil and India.

This case study compares these USA election practices with what is done in Australia, both with electronic voting in the Australian Capital Territory and other electoral systems across Australia. It will be seen that although the report addresses electronic voting, many of the identified issues arise from problems in other parts of the USA’s electoral systems.

The requirements of Australia’s electoral laws and compulsory voting means that well established processes and practices must be in place to ensure the smooth running of elections. In addition, while the USA has a simple ‘First-Past-The-Post’ system of voting, Australia has proportional and preferential voting systems, which add complications to the solutions recommended by the Harvard workshop, as described below.

6.5. Themes of the best practices report

The symposium held at the Kennedy School of Government identified six major themes, derived from issues related to voting and vote counting in the USA. The symposium was held in June 2004, the timing of which reflected the growing concern in the wider community of problems with the current state of voting processes, particularly with respect to electronic voting. The recommended practices cover:

a) what needed to be done immediately (that was June 2004) to start to address the problems;

b) aspects of electronic voting and allied technology;

c) aspects of the human element in the election processes;

d) technology design standards;

e) a wide range of processes to be improved and made transparent; and

f) aspects of auditing electronic voting systems.

The attendees at the symposium were a diverse group, and included technologists, election officials, political scientists, policy analysts, press experts, and activists. The report comments that there was not common agreement between the attendees on everything, and therefore not everyone agreed with every defined practice. However, the list of practices provides a good starting point for comparison between voting systems, and for further development of the practices.
Using the terminology of the report, the six themes are shown below. Each theme includes a number of points, describing the ‘best practices’ identified by the symposium. In the report there is further discussion, clarification and justification of the points from the symposium debate. The details of each of these aspects are not reproduced, but reference is made to them as required.

6.5.1. Theme 1

**Certain immediate steps must be taken.**

1.1. Election Assistance Commission and National Institute of Standards and Technology open standards must be developed and implemented.

1.2. Voting experts and technologists can aid in whatever voting process is used by designing guides, working in polls and gathering trustworthy data.

**Discussion**

This theme identified the immediate steps to be taken for the elections to be held in November 2004, and for ongoing improvements.

**Practice 1.1** identifies the need for open standards for voting systems and voting processes, and for testing and certification processes. The report comments that there had been a slow start and a lack of funds for standards development, but by June 2005 progress had been made and a draft version 2 of the Voluntary Voting System Guidelines (VVSG) was publicly available. This document was a development of earlier publications by the Technical Guidelines Development Committee (TGDC), National Institute of Standards and Technology (NIST), and others. The recent situation is that the EAC has adopted the 2005 version of the VVSG (EAC, 2005), and in 2007 published the Testing and Certification Program Manual (EAC, 2007). Participation by states in this testing and certification scheme is voluntary, and voting systems are tested against the 2005 version of the VVSG.

By March 2007, the NIST had rewritten the 2005 version (NIST, 2007a) and sent it to the EAC as a set of recommendations for ‘a new set of requirements intended to make future voting systems more “secure, reliable, and easier for all voters to use”’ (NIST, 2007b).

The symposium saw these standards as an aid to ensure ‘a competitive market and thus responsive vendors’, and as a ‘help with popular perceptions of trust’ (Camp, 2004). Perhaps ensuring a competitive market for voting machines is
part of the problem facing the USA legislatures. Encouraging a proliferation of different types of voting equipment from different vendors in the various states and sub-divisions increases the workload of those specialists who certify products and ensure conformance to the various standards. Standardisation to a limited number of products may help these recommended practices to be achieved.

Currently, no Australian standards exist, or are planned, for electronic voting systems. However, Australia is active in the standards field, and there are national and international standards which would apply to the development of systems; covering accessibility, software development processes, quality assurance, testing, documentation, governance, and others. The importance of open standards is described in section 9.7.

A shortcoming of the KSG Report on Electronic Voting Best Practices is that it is has scant coverage of the processes to develop voting machines and systems, and the practices of the companies that make them. Voting systems are high-integrity and democracy-critical (section 9.1.2 elaborates on this description), indicating that the application, technology and processes are vital to the operation of democracy. If citizens are to have complete confidence in their democracy they must trust the electoral systems, electronic or otherwise, used to elect their representatives. Voting systems need the reliability of aviation systems and the security of secret defence systems to ensure this trust. Therefore the ability of the companies that develop these systems, and the capability of their processes, should be measured and tested against relevant standards, such as a capability maturity model (CMM or CMMI) and the international standard ISO 15504: 2003 for the assessment of software processes. Chapter 9 addresses this point in detail.

Regarding practice 1.2 above, in general it is desirable to involve citizens as a way to strengthen democracy, and the research work of the symposium is a good example of this involvement. The reference to volunteers ‘working in polls and gathering trustworthy data’ is assumed to include the TechWatch programme, organised by the Verified Voting Foundation. This was a scheme to enlist technology professionals to volunteer to observe and document problems which arose with the election process and voting technology during the November 2004 elections. This documentation would be used to provide evidence to support litigation and policy making with respect to electronic voting (VVF, 2004c).

Such a specific surveillance activity is unnecessary in Australia. State and federal elections are well planned and run by trained electoral officials and
temporary support staff at the polling places. The election management processes include the requirement to record incidents that occur at the poll, but there are very few of these. For example, the ACT Electoral Commission report to the Legislative Assembly on the 2001 election (ACTEC 2002a), contains no record of incidents such as those which occurred in the USA.

6.5.2. Theme 2

A hybrid of paper and electronic systems provides an effective voting system

2.1. Electronic interfaces enable customizable ballots by precinct, party or disability.

2.2. Electronic Systems can meet the widest range of accessibility needs.

2.3. Voter verification of a paper ballot allows the greatest degree of confidence that the ballot was cast as intended.

2.4. A paper ballot, when handled properly, allows a robust audit trail for a recount to ensure that the ballot was counted as cast.

2.5. Hybrid systems can be designed to accommodate provisional arrangements and contingencies for equipment failure.

Discussion

Practices 2.1 and 2.2 cover the way election officials and voters could communicate with the electronic voting systems, and how ICT could provide the required level of customisation to meet the functional needs of these two groups. The report cites examples of customising ballots for specific voters, by providing ballots in a required language, or a special print size.

As described above, the design of eVACS® provides a number of useability and accessibility features within the software. Visually impaired voters, or those with poor reading skills, can vote in secret through the use of an audio function. On-screen voting instructions are provided in English or from a choice of eleven other languages. The audio function is available on all versions of the software, not just a special version for blind people. Later versions of the product could expand this function to provide audio, as well as written, instructions in a range of foreign languages.

Practices 2.1 and 2.2 also advocate the use of an electronic method to read a paper ballot, to update a vote database for counting electronically. The symposium
proposed optical character recognition (OCR) for the reading mechanism. This is a
technique used to scan a page to identify the individual characters typed or written
on it. So the X against the chosen name on a FPTP ballot could be recorded, as
could be the numbered preferences on a preferential ballot. Although not
mentioned in the report, optical mark reading (OMR) could also be used to capture
voters’ intentions. In this technique, marks made in particular places on a pre-
printed form are read in a scanner. This technique has been used to collect data for
opinion surveys and multiple-choice answer tests, and could easily be used on a
FPTP ballot. Preferential voting would be more difficult using OMR, but possible.
Another method is the production of a machine-readable paper record of a vote cast
by other electronic means, such as a DRE. Potential issues with OCR and OMR
methods include:

a) errors caused by citizens who do not record their vote in a readable way on
   the ballot paper which is to be read by a machine;
b) errors in machine reading of the ballot papers - rates vary but a typical rate is
   2% (Prime, 2007);
c) the design of OCR or OMR ballot papers to cover the proportional
   representation and preferential voting models, eg. in the case of Australia;
d) the additional design problems and cost to produce multiple versions of the
   ballots papers using the Robson Rotation, described previously;
e) problems in producing a machine-readable paper record from an electronic
   voting machine, including making modifications to add a printer interface if
   one is not already available; and
f) errors in counting ballots by manual means, if that is required for vote
   reconciliation and audit.

These issues are based on my previous experience of investigating optical reading
systems for other applications, and are still valid in general terms. However, as
described in section 6.2.5, recent developments in imaging hardware and software
enabled the ACT voting system to machine-read voting preferences from paper
ballots using the Robson Rotation in the 2008 election18. Practice 2.5 below
includes further analysis of the use of optical reading in a hybrid system.

Practices 2.3 and 2.4 provide arguments that DRE machines should produce
a paper record of each vote cast, for the purposes of voter verification and to provide

18 The error rate and other statistics from the use of this method are not available at the time of
writing.
an audit trail. DRE stands for ‘direct-recording-electronic’ and, by definition, paper does not have a function in this type of system. However, because of the many equipment malfunctions reported in the 2000 elections, the symposium was rightly concerned that a reliable method of vote verification should be available to the voter, before the ballot was finally committed and stored in the system. The argument was presented that a paper ballot can be read by the voter, to verify the voter’s choice, before it is put in the ballot box, and therefore a human-readable ballot should be included as part of all systems. An added advantage of a human-readable ballot, mooted by the symposium, is that a reliable audit trail is then available, if a recount is needed for any reason, say equipment failure or a contested result. Selker (2004) argues against a paper record, and proposes instead an audit trail using an audio record to provide voter verification and a record of the votes. There are a number of problems with these suggestions.

A properly designed module for electronic voting, eg. a DRE, should not need to use a paper ballot. If voters have so little trust in the equipment that they require a paper record of their electronic vote (that could potentially still be different from that stored electronically), then surely the electronic option should not be used in the first place.

In addition, it has been shown that the manual counting of votes is less accurate than electronic counting by proven software (Green, 2000). Thus proponents of paper records seem to be suggesting that they will accept inaccuracies in manual counting, as they have done for years, if this method is used to verify a vote. However, they will not accept inaccuracies in voting machines, which is, of course, the correct position to take.

It has been suggested that some electronic voting machines used in the 2001 and 2004 elections in the USA did not accurately record the voters’ intentions (VVF, 2004d). For this to happen, the machines may have malfunctioned, resulting in lost or altered votes; or may had been corrupted to give a predetermined result. If this is the case, then it would still be technically possible to print a record of the voter’s selection, but still corrupt the vote sent to the database. This is because the electronic voting machines are protected from detailed inspection, as they are proprietary products covered by intellectual property constraints. It would be possible to corrupt the machine certification process, by technical means and/or by bribing the inspector. The issue of the protection of proprietary products is covered further in Theme 5, below.
There is no paper validation of the vote cast using the eVACS® voting module. Prior to the 2004 election in the ACT, the Electoral Commission investigated this matter, in response to some public concerns about the need for a paper audit trail of electronic votes. The analysis above is consistent with that in the discussion paper, *Electronic votes and printed receipts*, which concluded

> A printed receipt would not necessarily be any guarantee that a voter could be assured that their vote was correctly recorded in the computer system. A manual recount of paper receipts would not be an efficient or effective means of recovering from a system failure. A printed receipt is also not necessarily going to be proof that a system had not been tampered with. The ACT Electoral Commission considers that the other measures incorporated in the electronic voting and counting system will give more assurance to voters, candidates and other political participants that the votes recorded and counted are an accurate record of the voters’ intentions. (ACTEC, 2004, Attachment A).

**Practice 2.5** identifies the need for a hybrid system of electronic and paper methods of voting. A hybrid system uses multiple technologies, and the symposium report describes the Massachusetts voting system as an example of this, in which paper ballots are optically scanned to provide an electronic record of the votes, which are then counted by computer. This is one of the many methods of automating the voting process used in the USA, and this plethora of approaches is one of the problems that the electronic voting best practices are trying to address.

This practice also states that it is important to have the ability to vote using a paper ballot as a backup in the event of equipment failure. This is a valid point, and some form of paper ballot will also be needed for postal voting, and mobile voting, eg. for hospital patients, as is done now. However, the Symposium’s approach is that both components of a hybrid voting system, paper ballots and electronic devices, should be used by each voter. The current Australian approach to a hybrid system is to provide both paper ballots and electronic means of voting, but each voter chooses the single method they prefer.

**6.5.3. Theme 3**

**The process is as important as the underlying technology.**

3.1. Poll workers should be well trained to fully understand the interface and contingency plans in case of failure.
3.2. The educational process for given technologies must follow a ‘chain of trust’ where the election workers trust their trainers and are trusted by the public.

3.3. Poll workers should be well-chosen from a motivated pool with appropriate incentives.

3.4. Poll workers should not have to rely solely on the vendors to address observed errors.

3.5. There should be adequate time for determining the official tally.

3.6. Speed and accuracy in the process are both achievable, but not simultaneously possible.

3.7. There should be provisional voting mechanisms, and adequate time to evaluate provisional votes for the final tally.

3.8. There is an inevitable trade-off between authentication of voters and access.

Discussion

This theme is perhaps the most important of the six identified, and some of these points, such as those relating to poll workers, could have been included in Theme 1, as matters of immediate action.

Practices 3.1 to 3.3 cover the choice and training of election officials and poll workers. Three months after the KSG Symposium, former president Jimmy Carter, commented on the work done by a bipartisan commission, led by him and former president Gerald Ford, to recommend changes to the American electoral process. The recommendations resulted in the Help America Vote Act of October 2002 (HAVA, 2002). Carter commented on the need for

A non-partisan electoral commission or a trusted and non-partisan official who will be responsible for organizing and conducting the electoral process before, during and after the actual voting takes place.

He went on to say that

Florida voting officials have proved to be highly partisan, brazenly violating a basic need for an unbiased and universally trusted authority to manage all elements of the electoral process…. Four years ago, the top election official, Florida Secretary of State Katherine Harris, was also the co-chair of the Bush-Cheney state campaign committee. The same strong bias has become evident in her successor, Glenda Hood, who was a highly partisan elector for George W. Bush in 2000 (Carter, 2004).
It is possible that there are examples of this type of partisanship in other states. Miller cites examples of conflicts of interest where senior executives of the four main companies manufacturing electronic voting equipment are major donors to the two main political parties, and some are fund raisers for the Republican Party. There have also been some very close links between senior electoral and other State officials and these companies, described by Miller as ‘This revolving door between elected officials and the voting machine companies...’ (Miller, 2004).

The Election Incident Reporting System (VVF, 2004c) mentioned previously had recorded over 42,000 incidents during and after the elections up to the end of 2004. Many of these incidents related to the operation of polling places. They point to an inadequate voter registration system, problems with absentee and provisional ballots, and issues of voter identification and criminal status problems.

Other incidents indicate a lack of planning for a higher than expected voter turnout, and inadequate practices by untrained or uncommitted polling place officials. These incidents included late opening and/or early closing of polling places; long queues of voters, some not being allowed to vote; an insufficient number of ballot papers; and poor access and support for people with disabilities and those with insufficient English language skills. The symposium’s emphasis on the need for well trained and motivated people to administer elections is well founded.

By way of contrast, since 1902 Australia has had its federal elections run by public officials. It now has independent electoral commissions covering federal, state and territory elections, staffed by public servants, and supported by temporary polling officials and support staff, who are employed and trained to support each election.

**Practice 3.4** covers the poll workers reliance on the representatives of the vendors to solve errors in the voting technology. This is further evidence of the lack of training of poll workers, and it reflects a lack of adequate design and control of voting processes in the USA. Permitting an employee of the vendor to access a voting machine while an election is in progress is a diminution of an electoral system’s principles of transparency, secrecy, security, accountability, and accuracy. If a voting machine fails and an electoral official cannot resolve the problem, then the machine should be taken out of service, and hopefully the votes already on the machine will not be lost.
By contrast, the ACT election processes specifically preclude representatives from the voting system vendors from accessing the system prior to, and during the poll. In the election set up process, data is exported from the ACTEC’s information technology systems directly to eVACS®, without the need for any intervention by vendor staff. The system also automatically produces the polling place set-up disks and disks for printing the barcode images. In this way, the security of the voting system is enhanced, and the certified software for the election is locked and can be opened for changes only by using a password held by the ACTEC. This automated set up is simpler than the previous manual process, and set up time and financial costs have been reduced. Also, it has enabled electronic voting to commence approximately three weeks before Election Day. In 2001, with manual set up, the pre-poll period was only two weeks. (ACTEC, 2004)

Practices 3.5 to 3.8 cover aspects of voter registration, voter verification, provisional voting and the time it takes to provide a final accurate result of the poll. Delays are caused by the need to evaluate provisional ballots, and to conduct audits of the election. A provisional ballot is a method to allow a citizen to vote even if they cannot be identified on an electoral role. The voter may not be shown as registered, or is listed by a slightly different name. Other reasons include a person trying to vote at the wrong precinct, lacking the required identification, or by returning to a previous polling place after changing address. Provisional ballots are kept secure and delivered to electoral officials, who rule on the voters' eligibility before the ballot is either counted or discarded. Practice 3.8 includes the gatekeeper function that poll workers have, in allowing a person to vote, or not. One condition is that the person should not be a felon, and an example is given of people being denied the vote for having outstanding parking tickets. Other parts of the report propose ways to remove this gatekeeper function from the poll worker.

In Australia, since 1924, it has been compulsory for every citizen of voting age to vote at an election. To support this requirement there is an electoral roll for each jurisdiction, and it is compulsory for citizens to enrol to vote when they reach 18 years of age, or when granted citizenship. Therefore, maintaining a roll of registered voters is an ongoing process, and compulsory registration minimises the occurrence of provisional voting on polling day. There are very few reasons why a person is exempt from enrolling to vote in Australia. A person is not qualified to enrol if he or she: is not 18 years of age or over, (although 17 year olds may enrol
provisionally); is not an Australian citizen; is a permanent resident but not an
Australian citizen; is of unsound mind (incapable of understanding the nature and
significance of voting); has been convicted of treason or treachery and has not been
pardoned; or is serving a sentence of imprisonment of three years or longer (AEC,
2007b).

Because voting is compulsory, Australian election systems must have the
capacity to enable every eligible person to vote, usually on an election day, but also
via postal voting, or pre-polling. Generally there are always enough polling places,
supplied with enough ballot papers, and the places are always open for the stipulated
time; although it may not always be possible to meet this standard in remote
locations with small populations.

6.5.4. Theme 4

**Good voting systems require good design standards.**

4.1. There is no single voting interface that can meet everyone’s needs.
4.2. An untrained voter should be able to know when voting equipment fails.
4.3. Access is critical: not to a specific, single technology, but to the ability
to vote in a fashion that provides full civil rights.
4.4. Even with full auditing of each vote, rigorous testing for security,
usability and reliability remains critical.

**Discussion**

The Report makes the point that technology is rarely value neutral, and biases
(identified as direct and persuasive) can be included in voting systems. These biases
are often included unintentionally, perhaps as the result of minimising the costs of
design and manufacture.

Examples of *direct biases* are the use of touch screens, which blind voters
would prefer not to use; or by placing voting machine controls (eg. barcode readers
and keypads) on the right hand side of the equipment, which left-handed people may
find difficult to use.

A *persuasive bias* might relate to the placement of the cursor at the start of
the electronic voting process. When eVACS® was used in the 2001 election, at the
start of voting the cursor was always placed on the party name at the top left hand of
the screen. There was concern that this placement might influence the voter to start
voting for this column of candidates. Although the ACTEC could find no evidence
that this placement did influence voter behaviour, the voting software was amended to randomise the cursor’s starting position in the 2004 election (ACTEC, 2004).

The report does not specifically cover good design standards in any detail, although failure detection and fail-safe processes are included, and the benefits of electronic voting systems to people with disabilities are also stressed. The use of design techniques which specifically address design standards and human values would be a desirable additional practice for inclusion in this theme. Chapter 9 includes a description of methods which address human values in the design of computer systems.

As stated previously, not every point in the report defines a ‘practice’, that is, a description of a specific activity. For example, practice 4.1 above, ‘There is no single voting interface that can meet everyone’s needs’ is not a practice. The discussion covering this point identifies the need for a diverse range of requirements for voting interfaces, to ensure voters of their basic rights of access to the voting system, thus precluding a standardised interface. The Symposium’s conclusion makes a strong democratic statement, that ‘a community should seek to ensure that everyone could cast his or her ballot comfortably, conveniently and with confidence’. This would indeed be a best practice.

This theme stresses the need for a diversity of interfaces. The ACT experience, described in section 6.2 above, has shown that with good design a single electronic voting system, coupled with the option for the voter to use a paper ballot if preferred, can be successful.

6.5.5. Theme 5

Transparency builds public trust and supports legitimate elections.

5.1. If underlying mechanics or software are not in the public domain, they must at least be available for inspection by the larger security community.

5.2. All security issues should be fully disclosed, although allowing vendors a limited, fixed time between notification and public disclosure could foster more public trust.

5.3. The voting technology acquisition process should be open for public scrutiny from constituents.
5.4. The voting technology acquisition process should be open to allow
dependencies to learn from each other. Records of difficulties should be
made available to all election officials.

Discussion

This theme was identified because of the secrecy surrounding the design and
operation of the electronic voting systems, using intellectual property protections.

**Practice 5.1** strongly covers the requirement for the source code of these systems to
be openly available, stating ‘Restrictive intellectual property practices which prevent
code review are unacceptable in the realm of voting.’ and ‘Non-disclosure
agreements have no role in [the] realm of voting.’ These are powerful sentiments,
which sum up this theme.

The original development of eVACS® was an open source project. The ACT
Electoral Commission website contains:

a) the source code for the software used in the 2001 and 2004 elections
   *(practice 5.1)*;

b) the report of a minor error found in the original version, and a patch to fix
   this error *(practice 5.2)*; and

c) a description of the procurement process; an overview of the system; details
   of the testing and auditing activities; and a description of the consultation
   process *(practice 5.3)*. *(ACTEC, 2007b)*.

Later versions of eVACS® have been developed to meet the international market,
and the source code is no longer published, although the system is available for
inspection and audit by customers and potential customers.

Consultation was held in conjunction with a Reference Group, with
representatives from the political parties; elected members of the ACT Legislative
Assembly; the ACT Blind Citizens Australia and the Proportional Representation
Society. There were discussions with, and demonstrations for this group during
development, and some members took copies of the software for inspection by their
own technical advisors.

**Practice 5.4** is established formally through the Electoral Council of
Australia, comprising the Australian, and the eight state and territory Electoral
Commissioners, and for other senior officials; and informally through other joint
activities.
6.5.6. Theme 6

Election systems must have built-in auditing capability.

6.1. The reconciliation process must be clear, precise, authoritative and binding.

6.2. The cast ballot must follow a ‘chain of custody’ from the moment it is cast to the moment the vote is entered into the final official tally.

6.3. If some metric of voting irregularity is exceeded in a given jurisdiction, a court-supervised manual recount should be required.

6.4. Auditing should not be implemented by a vendor affiliated with the original system.

6.5. Equipment testing does not displace the need for outcome auditing.

Discussion

The five practices in this theme cover aspects of auditing the system, technology and the voting process, to provide an assurance to citizens that the vote that is cast is the vote that is counted. Practice 6.1 requires that the reconciliation process must be open and fully understood and accepted by all parties, and any disputes should be about how the process was conducted, rather than the reconciliation process itself. Practice 6.2 requires that there be a verifiable audit trail that covers the life of a vote, from when it is cast to when it is counted, to ensure that votes cannot be added, changed or deleted. Practice 6.3 requires a court supervised manual recount in the event of an identified voting irregularity.

Practice 6.4 requires that the auditing process of an electronic voting system should be conducted by independent parties, and must exclude the involvement of the vendor of the system in the conduct of the audit. Of course the vendor of the system should be available to provide access to the system and the information required by the audit, but it should be standard practice in the audit of any product that the vendor of the product is not part of the audit team.

Practice 6.5 requires two activities. First, the complete system should be fully tested before the election. I would add that if any defects are found in the system, there should be another complete test after these defects have been fixed. Second, there should be a reconciliation audit, which covers the outcome of the ballot, by reconciling the votes cast against the votes counted; including any provisional ballots which were discarded, and informal and disallowed ballots.
In Australia, the rules for these activities are defined in the electoral legislation of each jurisdiction. When the ACT decided to implement its electronic voting system, the Electoral Act was amended to include additional clauses to cover the details and specific conditions of this system.

It could be assumed that any democratic society has similar legislation to cover the way it conducts its elections, and this should be the place to define many of the requirements and practices identified by the symposium.

With eVACS\textsuperscript{®}, there is a range of back up and security functions to ensure the reliability and integrity of the system, including keeping a record of every keystroke. The keystrokes and the back up of other data provide a complete audit trail and recovery mechanism in the event of failure. There is no way to link a voter to the vote they have cast.

Comprehensive testing is conducted by the vendor prior to an election, and then by the electoral officials, to assure the performance of the product, and to provide training for polling place staff. Also, a full reconciliation of the election is produced and made available to the public (ACTEC 2002a, 2004c), to confirm that the election complied with the ACT Electoral Act.

The ACT legislation and wide range of audit and security practices combine to produce a reliable electoral system acceptable to citizens. However, with reference to Practice 3 above, the ACT Supreme Court sits as the Court of Disputed Elections. A candidate, elector or the Electoral Commissioner can dispute the validity of an election through a petition to this court, which has wide powers to resolve the matter.

6.5.7. Summary and conclusions
The KSG Symposium report on electronic voting best practices provides a valuable document which recommends a number of practices to be adopted to provide reliable and trustworthy electronic voting systems. These practices go beyond the use of technology and identify other aspects related to the underlying electoral processes, for example voter registration and election administration. While the practices are largely USA-centric they provide a starting point for any society wishing to consider ways to improve its democratic processes. The practices are revisited in chapter 9, to show their relationship with the four principles for using ICT in democratic processes.
The practices do not present an excessively high standard, and they are what would be expected in any democratic society. They are achievable, as the Australian examples show. Part of the success in Australia can be related to the country’s long history of electoral innovation and reform, especially in the area of independent election management and administration, and transparent and open processes.

An important aspect of any voting system is vote verification by the citizen. The developers of the KSG practices believe that some form of paper trail is essential for vote verification and audit purposes. The experience in the ACT has shown that this need not be the case.
Chapter 7. Shortcomings and benefits of e-voting systems

7.1. Introduction

Since representative models are predominant throughout the democratic world, it is likely that the main use of ICT for democracy will focus on voting systems; with minor use on what could be considered as the peripheral aspects, such as political party activities. Currently voting machines mainly operate in polling places. However, there are regular suggestions that voting methods using the Internet should be available as another form of remote voting, and there have some trials using this approach.

The purpose of this chapter is to describe the shortcomings and the benefits of ICT based voting systems, and to argue against on-line voting.

7.1.1. Hazards, risks and hazard-points

With any system, including voting systems, there are likely to be potential points of weakness and risk. A hazard is defined as ‘a source of potential harm’, and a risk is ‘the chance of something happening that will have an impact on objectives’ (AS/NZS 4360, 2004). For the purpose of this thesis, a hazard-point is defined as ‘a point in any democratic process which has the potential for a malevolent event to occur in the process’. For example, in any voting system this could be a point in the process where a voter’s choice could be changed by misinterpretation, omission or corruption, through the operation of software and/or human intervention. An outcome of such an occurrence could be that the intention of the voter (as recorded by the vote being cast) is disconnected from the vote that is ultimately counted.

Hazard-points create a particular shortcoming of electronic voting and vote counting systems because they can be attacked by malevolent or defective software. Later sections identify and analyse the hazard-points in electronic voting systems and those for on-line voting, for example using the Internet or another communications system.

Hazard-points also occur in manual voting systems, but the physical nature of the paper ballot and the security procedures of the electoral authority would tend to minimise these risks. This is certainly the case in Australia, where citizens have a high level of trust in their voting systems. In order to understand the hazard-points of electronic voting it is useful to describe those for a manual voting system first.
7.1.2. Hazard-points in a manual voting system

In a manual system the basic voting and counting process used in Australia is shown in figure 7.1. Each voter is given an official ballot paper by an election official, who initials the paper. Voters mark their paper ballots to indicate the candidate(s) of their choice and at this time they can verify that their intentions are clear. Written instructions are provided to guide voters in these voting and verification activities. They place their marked papers in ballot boxes. At the end of voting, these boxes are opened by election officials. Officials count the votes, as marks on the ballot paper, according to the voting system used (eg. STV) and authorised scrutineers check the counting process. If there is a dispute over the interpretation of a voter’s intention, a process exists to resolve it, which may result in the vote being declared informal. The ballot boxes may be moved to another place, either in the same building as the polling place, or another building, for recounting if required, and for storage until the election results are announced.

Assuming that voters do verify that the ballot shows their intention, and they place the paper in the ballot box, table 7.1 shows the hazard-points in this process.

<table>
<thead>
<tr>
<th>Hazard-point</th>
<th>Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>The ballot paper</td>
<td>Forged ballot papers are brought into the polling place, for someone to vote more than once. A voter may cast an informal vote unintentionally.</td>
</tr>
<tr>
<td>The ballot box</td>
<td>Illegal ballots are put into the box before voting starts. Ballots are taken from the box before counting starts.</td>
</tr>
<tr>
<td>Transfer of ballot boxes from one place to another</td>
<td>During these events: ballots are removed; illegal ballots are added; ballot boxes are stolen; ballot boxes are destroyed accidentally or on purpose; illegal ballot boxes are added.</td>
</tr>
<tr>
<td>Storage of ballots until the result is announced (a recount may be required)</td>
<td>Ballots are removed; ballots are lost; ballots are misinterpreted on purpose or accidentally; illegal ballots are added.</td>
</tr>
<tr>
<td>Manual vote counting</td>
<td></td>
</tr>
</tbody>
</table>

Table 7.1 Hazard-points in a manual voting system
In most modern democracies it is rare for the manual voting and counting process to be corrupted, and this is certainly the case in Australia. There are procedures to account for, and reconcile, the numbers of voters, the number of ballots issued and the number counted. Strict security procedures are followed, and voters have confidence that once they have lost sight of their ballots their votes will be protected until they are counted, and the result announced.

7.1.3. Hazard-points in an electronic voting system

One of the points made by Moor (1985), on the need for computer ethics, is the invisibility factor of computer software and its operation. A physical device is visible, and there can be physical representations of the input and output of a device, and of the instructions (program) that control the operations of the computer. However, the conversion of a program which is readable by humans into a form usable by a computer is invisible, as is the operation of those instructions.

A simple example of the invisibility factor is the growing use of surveillance methods. Surveillance cameras in public places could be considered to be an invasion of privacy, but if these cameras are obvious, their use could be rationalised in the interests of public safety and crime detection. On the other hand, the use of software to monitor the e-mails sent and received by employees is also an invasion of privacy, but the invisibility factor of this software could mean that the employees are not aware of what is happening, unless they are told and give consent to this practice. Other examples of this factor are invisible programming values, such as bias in decisions made by software; and invisible complex calculations, raising matters of trust, for example in software for collecting and counting votes in electronic voting systems.

The invisibility factor is evident in the main shortcoming of electronic voting, the potential to disconnect the voters’ choices of candidates from the votes that are counted.

If an electronic voting and counting system is compared with a manual system, there are more and different hazard-points, because of the invisibility factor, as can be seen in figure 7.2 and table 7.2.
With any form of mechanised voting and counting (mechanical, mark-
reading, electronic, etc.) there are hazard-points between the voters’ intentions and
what is counted, and the more complicated the system, the greater is the number of
hazard-points. At each point listed in table 7.2, there is a theoretical possibility to
change or lose votes, through the use of malevolent or defective software.

<table>
<thead>
<tr>
<th>Hazard-point</th>
<th>Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer of votes from screen to storage on the voting machine</td>
<td>Even though the voters confirm that the screen displays their intentions, they do not know whether that vote information is stored on the voting machine, or if it is changed in the machine, by malevolent or defective software.</td>
</tr>
<tr>
<td>Storage of votes on the voting machine</td>
<td>Malevolent or defective software could change vote information during transfer to the server, or while it is stored there.</td>
</tr>
<tr>
<td>Transfer of votes from the voting machine to the server</td>
<td>Vote information could be changed during electronic transfer to the counting machine. If a magnetic medium (eg. CD-ROM) is used, the valid vote information could be replaced with alternative votes.</td>
</tr>
<tr>
<td>Storage of votes on the server</td>
<td>Malevolent or defective software could change vote information during data entry, or while it is stored on the data entry machine.</td>
</tr>
<tr>
<td>Transfer of votes from server to the counting machine</td>
<td>Malevolent or defective software could change vote information while it is updating the vote database, stored on the counting machine, or in the counting program.</td>
</tr>
<tr>
<td>Data entry by optical scanning of paper ballots</td>
<td>Malevolent or defective software could change vote information during data entry, or while it is stored on the data entry machine.</td>
</tr>
</tbody>
</table>

Table 7.2 Hazard-points in an electronic voting system
7.1.4. Vote verification

One of the requirements of the Best Practices Report in chapter 6 is that of providing voters in the USA with a paper version of their ballot, for verification by the voter, and for audit and recounting purposes. As Figure 7.3 shows, this just adds another hazard-point in the voting process.

![Figure 7.3 Vote verification with paper record](image)

The printed record may show the voters intentions as they are shown on the screen, but there is no guarantee that the information printed on the paper record is what is sent to the server, and then to the counting machine.

Many of these hazards could be detected by performing software audits conducted by independent and skilled experts. However, an electronic voting system can also be corrupted the people responsible for its development, maintenance and operation, as the following example shows.

7.1.5. Other points of corruption – an example

Chapter 3 includes the description of a method of voting called ‘above the line’, where voters make a single choice for a party or group rather than numbering their preferences in order.

If a legislature uses a ballot which is split to allow above-the-line (ABL) and below-the-line (BTL) voting, the electronic voting and counting system is more complicated. Above the line voting was used in the Australian Senate elections of 2007, and eVACS® was used in a trial of electronic voting for sight impaired citizens. This method is the equivalent of two ballot papers, and the electronic voting system has to provide an additional function for voters to choose the voting method they will use.

When voting ATL the voter selects one box, which means the voter is selecting the preferences previously decided by that party or group. When voting BTL the voter selects their own preference order. BTL votes are presented for counting electronically, but ATL votes require extra processing before being
counted. For each ATL vote, the preference order for the selected party of group has to be unpacked, before these pre-selected preferences are presented to the counting module. This is not a difficult software problem, but it means that, for the Senate election, the electronic voting system had to be provided with the preference lists for each of the parties and groups for each of the States and Territories. This was part of the procedure to produce the set-up disks. Thus there was an opportunity for the election to be corrupted by the software vendor, by introducing bogus preference lists on the set-up disks. This is another reason for conducting software audits of voting systems; and for including superior governance activities in the organisations, as described in chapter 9.

To summarise, a fundamental requirement of any voting system is that citizens have confidence that the votes they cast in secret are those that are counted. Procedures have been devised to minimise the risks of paper based systems being corrupted. In Australia there is a high level of trust in these procedures.

The risks of corruption have been amplified through the use of ICT in voting systems, because of the complexity of these systems and the invisibility factor of software. Electronic voting systems must be high-integrity, their design must be of the highest quality, and additional security procedures are required for their protection. Methods and principles for the specification, design, development, set-up, and operation of electronic and other automated voting systems are described in chapter 9.

7.2. Shortcomings of remote voting systems

7.2.1. Background

The most common way for citizens to cast their vote is to attend an official polling place on Election Day; have their names checked against an electoral roll; receive a ballot paper from an election official; cast their vote in secret in a polling booth; and place the ballot paper in a box, for counting later. This is a simple, secure, reliable and transparent process.

There is also a number of methods for voters to cast a vote when they cannot attend a polling place, called remote voting in the UK and declaration voting in Australia. These methods enable citizens to vote when they are not able to attend a polling place on Election Day, for example if they are in hospital, prison, or overseas, or will not be in their electorate on the day. The methods available
include election officials visiting the citizen, voting at an official polling place before the day, and postal voting. In Australia, with compulsory voting, these methods enable citizens to meet the legal requirement to vote.

The UK does not have compulsory voting, and in recent years there has been concern about a declining voter turnout. It was suggested that wider use of postal voting might halt this decline, and a number of trials were conducted to investigate postal voting ‘on demand’, and to allow all votes to be cast by post. The report of the trials (UK EC, 2004) concluded that various methods of postal voting could increase voter turnout; it pointed out that postal voting provided opportunities for fraudulent and/or coercive voting; and noted that the lower voter turnout was not necessarily due to apathy or the need to attend a polling place, but because of political disconnection by citizens. This last finding reflected the disillusion of citizens in the old democracies, described in chapter 4 (Beetham, 2005), which was also supported by another UK study (POWER, 2006).

The UK postal voting report also included feedback from citizens on methods of voting which they would be more likely to use, including ‘telephone and internet-based voting’ (UK EC, 2004, p23). The term ‘on-line voting’ is used here to describe ICT based methods of remote voting.

### 7.2.2. Telephone voting

The use of the telephone system for voting was raised in the UK postal voting report (UK EC, 2004). In addition, the Royal National Institute of the Blind has provided a range of information on electronic voting systems to support blind and sight impaired citizens, and those with other disabilities (RNBI, 2008), which includes the use of telephones for voting. Telephone systems are not considered to be practical in this thesis, and there are better methods to meet the voting needs of disabled people, in terms of security, transparency, reliability, and usability. However, since telephone voting has been proposed, it should be examined further.

On-line voting using a telephone would seem to be a simple method. In fact this method is used regularly by television viewers, for example to vote for their favourite performers in a talent competition, or to select contestants in reality shows. There are various methods of telephone voting in these contests. For example each contestant could be allocated his or her own telephone number and a vote for that person is cast by ringing the relevant number. Alternatively, a text message could be sent to a single number stating the name of the selected contestant, and there are
variations on these methods. There is no control over who can vote in such an ‘election’, and more importantly there is no limit to how many times a viewer can vote. In fact multiple voting is encouraged, as the cost to cast each vote is much more than the few cents to make the call, the balance of the cost going to the TV programme organisers.

The method of telephone voting used for television shows described above would not be suitable for voting in political elections for a number of reasons, the obvious one being that it would not be a fair election. However, there are also technical issues to resolve, and even a system similar to telephone banking would not resolve these issues, as explained in the following paragraphs.

Speech recognition technology has been used in a number of applications, in recent years. For example it is possible to enter documents in a computer by using dictation, rather than typing. The software is ‘taught’ to understand aspects of the user’s voice, eg. an accent, and in this way errors are reduced in the transcription from voice to a text document. This technology is also accessible via the telephone network, for example to book a taxi, or query an on-line telephone directory. These systems are not as reliable as a dictation system because they cannot be calibrated for the users’ voices. Therefore errors can, and do occur if a speaker has a cold, or a thick accent.

Theoretically, it is possible to cast a vote by telephone in a political election, by speaking the chosen candidate’s name, and it would be difficult, but not impossible, to accept several names for preferential voting. Until recently, because of the possibility of errors in recognising candidates names, current speech recognition technology was unlikely to be reliable enough for use in voting systems. However, recent developments in speech recognition for use in security systems (for example, Edentiti, 2008) suggest that its reliability may be acceptable in the near future.

An alternative to voice recognition communication between the voter and the voting system could be through the use of the telephone keypad to send numerical digits and/or text messages. Any responses from the voting system to the voter would be by using recorded voice messages, and/or text messages displayed on the telephone screen, if it has one. Thus, not every type of telephone could be used for telephone voting.

Each telephone voter would require a unique personal identification number (PIN) to enable him or her to be identified as a valid voter in a particular electorate.
The PIN would be allocated by the electoral authority, and would be suitably secured to ensure it could not be copied or decoded. The voter would use a suitable telephone to call the voting system, enter the PIN to signify that the voter was authorised to vote in that electorate, and cast a vote. The voting system would record that the PIN had been used, and ensure that it was not used again.

With telephone banking there are at least two security stages; a PIN, or other number, to access the banking system, and an account number to access the banking functions for that account. The account holder has the ability to change the PIN, and sometimes there are other methods of protection, for example by using personal questions such as ‘what is your mother’s maiden name?’ A banking system has to link the customers with their accounts, but a voting system must ensure that there is no record to link a voter with the vote he or she cast. Therefore telephone voting systems require different methods of security, to ensure the secrecy of the vote and the anonymity of the voter, in a reliable and transparent manner.

An inexpensive method to provide the PIN would be to post it to each voter, but that would mean that the electoral authority could link a voter, through the name and postal address, to the PIN number, thereby making it technically possible to find out how a particular person voted. Therefore, to decouple the voter from the vote cast, a second access number is required. This should be computer generated, it would only be used once, there would be no permanent record of it, and it would be provided after the voter had used the PIN supplied by the electoral authority to gain initial access to the voting system. The second number would be like the banking account number, and used to access the voting functions, to enable the voter to cast a vote.

Assuming that would be possible to set up a telephone voting system which resolved the issues identified above, other problems would arise if the legislature used anything other than First-Past-The-Post (FPTP) voting. To reiterate, with FPTP, a citizen votes for one candidate, and the election is won by the candidate with the most votes. Using a telephone to select one candidate from a list is feasible, but in other methods of voting citizens can vote for more than one candidate. This would add another level of complexity to telephone voting, and would require additional functionality to allow voters to change their selected candidates, or their order of preference; and to provide a final list of the candidates selected before the vote is confirmed.
In the previous paragraphs a case has been made that telephone voting is not suitable for legislature elections, partly because of restrictions in the functionality of telephone equipment. It may be argued that modern telephones, particularly mobile phones, do have the required functionality, however the case is still strong that the overall telephone system is not suitable for this type of voting. While it may be theoretically possible to develop a telephone voting system, it would be a contrived method to use technology in a manner for which it was not designed.

7.2.3. On-line voting

Some people argue that since commercial services such as on-line banking or on-line gambling use the Internet regularly, then, it is acceptable to implement on-line voting using the Internet. This argument is false because voting systems are not like banking systems. Recovery from failure of these commercial systems is possible because of the availability of records of customer accounts, there is a transaction trail linking the customer with the transactions, and extensive back up and recovery procedures are available. Voting systems do not, and should not keep records of voters with the votes they cast.

On-line voting and electronic voting both use electronic equipment to enable citizens to cast their votes, and both methods use computers to store votes in a database until they are ready to be counted electronically. The significant difference is the method used to transfer the votes from the voting equipment to the vote storage and counting equipment. With on-line voting, the voter’s equipment is connected to the vote storage system via a communications network, and the votes which are cast are directly transferred electronically to be stored for counting.

Electronic voting does not have this on-line connection, and votes are temporarily stored, typically on a computer at a polling place, and then transferred to the vote counting system, usually on a magnetic medium, such as a compact disk (CD).

Figure 7.4 illustrates the basic components of an on-line voting system using the Internet. To cast a vote a voter uses a personal voting machine, which could be any type of digital device with a screen which can access the Internet, including PCs, advanced mobile phones and other mobile digital devices. Votes are sent via the Internet to another computer which collect the votes it receives, and stores them on a vote database. When all votes have been received they can be counted. This
vote collection and counting system (VCCS) would ideally be run by an electoral commission, but it could be outsourced to a private organisation.

![Diagram](image)

**Figure 7.4 Internet on-line voting**

In a simple implementation of this approach, voters would use browser software in a similar manner to that for Internet banking. They would log on to the VCCS, identify themselves with a combination of voter code and password, be checked against the Electoral Roll to confirm they have not already voted, and cast their votes.

In this approach, a wide range of uncontrolled and uncontrollable devices would be used as voting machines, and there would be no guarantee of reliability and performance for this equipment. Voting machines would have a range of proprietary operating system software and browsers. Other options might include addition software on the voting machine to collect the electronic ballot before it is transmitted via the Internet to the VCCS.

Whatever the hardware and software technology used, the same hazard-points as in electronic voting would exist in an on-line voting system, with the addition of hazard-points through the Internet. The risk of a malevolent event occurring would be compounded by the electoral authorities’ lack of control over the overall voting process. On-line voting should not be an option at this time.

On the other hand, an in-principle benefit of on-line voting is that it can meet the convenience, timeliness and security requirements for citizens who are away from their electorate, be they in the same state, or country or even overseas. These benefits would also apply to people who live in remote regions where the expense of setting up polling places is very high.
Previously, a distinction was made between the use of the Internet and the modern telecommunications infrastructure, the internet. An alternative on-line voting system could use this infrastructure to provide a secure private network. In the 2007 Australian federal election some overseas defence force members used a remote electronic voting system, and the ballots were transmitted via the Department of Defence’s secure communications network to the vote counting system (AEC, 2008b).

From this example, an argument might be made that the Defence network could be used anywhere in Australia to transmit all ballots cast, in a secure way, from electronic polling places to a central vote counting centre. From a vote-security viewpoint this would be an attractive suggestion, but there would be technical problems in connecting a wide variety of equipment, at a large number of non-secure sites, to a secure national network. For example, in Australia, primary schools are often used as polling places. Each school (and any other polling place) would require a secure interface and communications link from the voting equipment to the nearest entry point to the defence network. The cost to provide and install/un-install this connection just for the election period, by technicians with the required security clearance, would be high. In addition, each link would be a point of potential breach in the nation’s defence communications infrastructure.

Also there would certainly be civil liberty objections by some citizens to the transmission of their votes across a network designed for, and operated by, the military. Although there may be no way to connect a voter with his or her vote, the fact that the military can have access to vote information would be of concern, and this option certainly does not conform to the principle of transparency. This technical solution is similar to one suggested in the UK in 2000, where it was proposed to protect the medical records of patients transmitted across the national health communications network (NHSnet) by means of an encryption algorithm developed and used by part of the Government Communications Headquarters (GCHQ), a major organisation of the British security services (Pouloudi and Whitley, 2000).

This is an example of the issues which can arise when there is conflict between democratic principles. The security of any electoral system is an important principle, but the transparency of the system is also important; and any link between a society’s security, military and police forces and its processes for democratic purposes should be avoided.
7.3. **Benefits of electronic voting systems**

The previous sections have described a number of shortcomings of the use of ICT in both electronic and on-line voting systems, but this is not to say that there are no benefits from using this technology. The main issue concerns identifying the particular problem to be solved by the use of technology.

Implicit in the case study in chapter 6 is the suggestion that there are benefits to be gained from the use of ICT in a voting system. This section expands on that implicit suggestion by identifying some benefits, some of the problems to be addressed, and some of the democratic principles supported by ICT.

To reiterate the eight principles for free and fair elections described in chapter 6 (Green, 2000):

- Transparency
- Security
- Professionalism
- Accuracy
- Secrecy
- Timeliness
- Accountability
- Equity.

This is a more comprehensive list than that of Tokaji (2004), who identifies four norms of *equality* for voters; covering citizens not being excluded from voting for reasons of race, disability, or language, and that equal weight be given to each person’s vote, and equal dignity be given to each voter. Other democratic values cited in his analysis of the 2000 elections in the USA are *security* and *transparency*. Boughton (2006) adds *secrecy* to these three principles in her description of the eVACS® system.

To recap, any electronic voting system must conform to these principles at least as well as paper ballots do, and improve on them if possible. The principle of equity is one which can be enhanced through the use of ICT. Equity means that the electoral system should not be implemented in a way that results in some citizens being disadvantaged in their ability to cast their vote; perhaps because of a physical handicap, or not being proficient in the national language, or because of where they are on Election Day.

7.3.1. **Benefits for vision-impaired citizens**

In Australia, the usual way for blind or sight impaired people to vote is to relate their choice of candidate(s) to one of the polling place officials, who completes a ballot for each citizen. This is obviously not compliant with the principle of secrecy, and could cause some concern to both sides. From the voters’ point of view, can they be certain that the official has entered their selections correctly, or even at all; or does the official think poorly of a voter because of the candidate(s)
chosen. From the officials’ point of view, they might wonder whether the voters doubt that they mark the ballot correctly, or at all. This method could also apply to people with other physical handicaps, or with reading disabilities. In effect, it is another example of the disconnection between intention, storage and result. Note however, that by introducing an electronic voting system, the electronic disconnection applies to all voters who use it.

A large video screen may be all that is necessary for some sight impaired people to vote in secret. Alternatively an electronic voting system could have an audio module, so that blind people, or those with reading disabilities, can hear instructions for voting, and the names and other information about candidates through earphones. It is important that these devices with large screens are located in an appropriately designed polling booth, so that they cannot be seen by other voters or polling place officials. Other computer technology already exists to enable people with a physical handicap, for example those without fine motor coordination. This technology enables them to communicate, write documents or use a telephone, and thus it could also be used in a voting system to enable these citizens to vote in secret.

Another group which can be assisted with ICT is those whose first language is not English, or the particular national language(s). In the Australian Capital Territory some documents, including information about elections, are provided in English and eleven other commonly used languages. Other support is provided by multilingual assistance services, also covering additional languages. Instructions on the use of a voting system can be displayed on a screen in whatever languages are required, and an audio module could be incorporated to enable blind voters to hear instructions in their preferred language.

An underlying benefit from electronic voting is that ICT can be of assistance to minority groups such as those considered above. This raises the question of whether these benefits should be provided to minority groups, even if it may not be economical to do so. In order to conform to the equity principle, some legislations in Australia, other than the ACT, are conducting trials of electronic voting for blind citizens. These trials could inform the discussion on how economical these services are.

In the Victorian state election of 2006 there were six electronic voting centres available for people who were blind or vision impaired (VEC, 2006a). The budget for the provision of these E-centres and supporting services was $750,000.
A total of 199 citizens cast their votes at these E-centres, which were also equipped with other aids such as closed-circuit television magnifiers, hand-held magnifying sheets, lamps, fat pencils, and an enlarged version of the booklet showing the group voting tickets (VEC, 2006b). There was also a trial of electronic voting for blind citizens in the 2007 election for part of the Tasmanian Legislative Council (the upper house) (TASEC, 2007).

The federal election, held in November 2007 also included a trial of electronic voting in 29 centres across Australia, for the 300,000 blind and sight impaired citizens. The voting machines for this election are later versions of eVACS®, which, for this election, produced an encoded version of each ballot as a printed barcode. This was then used to print a paper ballot later, to be counted with the hand written ballot papers (AEC, 2007c). The use of a machine-readable barcode added a level of secrecy to the ballot, when compared with providing a printout of the voter’s choice. However, the hazard-points and the problem of the disconnect between voter’s intention and storage/result still apply, as described previously. The full report of this trial concluded that it was a success for voters who are blind or have low vision, and ‘is a solid foundation for the future, should the Australian government undertake further electronically assisted voting’ (AEC, 2008a).

The publication of the details about these electronic voting initiatives is consistent with the electoral system principles of transparency and accountability.

### 7.3.2. On-line electoral rolls

Currently it is possible for Australian citizens to check their enrolment details on line, via the Australian Electoral Commission website. In the future, it might be possible for citizens to cast their vote at any electronic polling place, on the conditions that they can provide sufficient and reliable identification, and that an electronic version of the complete electoral roll is available at any polling place. Preferably the roll would be on-line during the election and accessible from every polling place, in order to identify people who might be trying to vote more than once. This facility would help to assure the principles of accuracy and accountability in the electoral system. The recent trials of the use of PDAs in Queensland, Victoria and the ACT, described in section 3.3.4, are a first step in the use of ICT for accessing an electoral roll in a polling place.
On-line access to the electoral roll would still require a high level of security, although not to the same level as would be required for the on-line transmission of ballots. As argued previously, the Internet is not considered suitable as a transmission medium for ballots in an election and, from the points above, neither is a defence network. There are other options to consider, for example a secure leased line network, such as used by some large businesses, could be set up for an electoral system, or for a broader set of democratic functions, including participation. Given the anti-social aspects of the Internet, such as viruses, unsolicited advertisements and e-mails, and denial of service attacks, it is possible that there could be a set of dedicated parallel private communication services, which may be more expensive to use but which would not have the problems arising from the use of the Internet or defence networks.

7.3.3. Data entry of votes

It is likely that, for a long time, voting systems will always be hybrid, with a combination of electronic voting and other methods of casting a vote. Postal voting is an example of this latter method. Therefore a data entry system will be required to convert these ballots into electronic records for storage in the vote database. The functions of the eVACS® data entry system has been described in chapter 6. These should be the minimum functions for such a system, to ensure that all votes are added correctly to the database, and to meet the principles of accuracy, security and transparency.

7.3.4. Vote counting

The need for an accurate count of the votes in the Hare-Clark system was the main reason why the ACT Electoral Commission adopted electronic voting (ACTEC 2002a). Counting votes by computer is another benefit of using an electronic voting system, because votes can be counted very quickly and accurately once they are stored in a vote database. The software of a vote counting system must be reviewed and audited for correctness, security protection, and to provide confidence that the result cannot be corrupted. If these conditions are met, the system will always give the same result for the same set of ballot data. This is an improvement on manual counting which may not always give the same result, especially with a system using preferential voting. Thus the accuracy principle has been enhanced with electronic counting.
The electronic vote counting system can also be used to fill a casual vacancy, for example caused by the resignation of an elected representative. By recounting the votes from the previous election of the relevant electorate (without that candidate or any others who do not wish to stand), a replacement representative can be found very quickly. The principle of timeliness is also enhanced by electronic vote counting, which typically would take minutes, compared with the days or weeks for counting votes by hand.

7.4. Summary and conclusion
Technology has had a growing role in the support of electoral systems for many years. Earlier uses of mechanical and electro-mechanical technology provided ways to enable votes to be cast and counted in a shorter time than using paper ballots and manual counting. The recent developments in electronic voting and counting is the next step in this technological evolution.

When considering the use of ICT in an electoral system (or any other system), it is important to identify the problem that the technology is trying to solve. Many of these problems should be related to improving the application of democratic principles such as political equality, accountability, or timeliness. Care is needed when defining these problems, and the solutions should not diminish democratic principles. For example, as mentioned in section 7.2.1 above, a problem of low voter turnout in the UK was not necessarily about apathy and citizens reluctance to go to a polling place, but also a disconnection from the political process. The trial of full postal voting to address the low turnout did result in more participation, but also resulted in incidents of fraudulent and/or coercive voting.

In that study of electoral reform to improve voter turnout (UK EC, 2004), there were suggestions for voting via the Internet to be established, because ‘the more choices you give people the better’, and ‘the future of polling has to move with the times’. ‘More choices’ and ‘moving with the times’ are not problems of democracy, and the suggestion of Internet voting seems to be more like technology looking for an application, than a problem to be solved.

In the ACT in 2001, the problem to be solved was the inaccuracy of manually counting the paper ballots in an electoral system using the Hare-Clark method of preferential voting. By attempting to solve this problem other benefits were realised, particularly for groups in a minority because they had physical
handicaps or difficulties with the national language. Another benefit was the increased speed of voting and counting.

However, the benefits of using ICT can also be offset by disadvantages, such a potential diminution of transparency of voting and other electoral processes. Also, the disconnection between the voters’ intentions and the actual result, and the opportunities for the corruption of vote data in electronic voting and counting systems, including on-line and Internet voting, have been emphasised several times in this chapter.
Chapter 8. Beyond representation

8.1. Introduction

The contestation between the various ideas and models of democracy described in chapter 2 could be summarised as arriving at two basic positions. The first position includes models of representative democracy, in which elite groups compete for power through regular elections. This representative democracy position is developed in chapter 3, by describing the principles of democratic decision procedures and the broader requirements of electoral systems. Chapter 5 contains an overview of the ideas and evolution of the use of ICT in democracy, followed by a detailed analysis of the role of ICT in electoral systems for representative democracies in chapter 6. A conclusion from these two chapters is that while the application of ICT to electoral systems can provide advantages such as speed and accuracy of vote processing, it can also produce outcomes which may be detrimental to democratic principles.

The second position from chapter 2 includes various models of participatory democracy, which advocate methods to enable greater involvement of citizens in democratic decision procedures. It is this position that is developed further in this chapter, to provide some answers to the research question - How can the use of ICT in democratic processes provide a society with an improved democracy?

An example of ‘improved democracy’ is taken to mean one which would address the disillusion of citizens described in chapter 4, through enabling better accountability of elected representatives and more opportunities for participation. One measure of the success of any improvement would be the enhancement of democratic principles such as political equality, political liberty and transparency. The ‘use of ICT’ in the research question refers both to the way that democratic processes could be improved by using technology, and the technical and business processes of applying ICT in this way.

In his paper Enacting democracy, Saward (2003b) argues that more models of democracy are not needed, but democratic theory should be reconsidered, to take advantage of the range of current ideas about democracy. Particular consideration should be given to those which argue for greater participation by citizens, and those which address issues such as environmental and trans-border matters; because these are particular issues which currently confront many societies.
Saward’s approach, which he calls reflexive proceduralism, is described in the next section. This approach provides a practical way to use the various theories and ideas of democracy to develop and improve democratic decision procedures, in other words to perform democracy. As an example, the approach is used later in the chapter to describe a decision procedure to enable the participation of citizens in the development of legislation.

The final section identifies the role of ICT in that example, in order to perform electronic democracy, as defined in chapter 5 to mean processes which use ICT to apply democratic principles. The reference in this definition to democratic principles, which are explained later, is to ensure that appropriate technology is used in democratic processes. The proposed approach is to identify ways to use ICT to improve democratic processes after a decision procedure has been designed. The aim is to use ICT to help to improve a process, not to dominate it.

8.2. A new approach to democratic decision procedures

The introduction to chapter 1 identified a number of topics which are contested in the ideas about democracy, examples of these being:

a) how a ‘citizen’ is defined;
b) who is allowed to elect the representatives;
c) who can be a representative;
d) what are free and fair election processes;
e) how the needs of minorities are addressed;
f) how citizens can participate in their society, apart from voting; and
g) how citizens can ensure that elected representatives do not misuse their power?

Saward argues that the ongoing contestation about democracy is not producing improved democratic activities. We do not need more models of democracy, but we do need a different view of democratic theory, one which takes advantage of the ideas behind the current wide range of models and theories of democracy. Therefore we need a new approach to how we think about existing models and how they might be used in political decision procedures to address some of the problems in democratic societies. This approach is called reflexive proceduralism, which consists of ‘clusters of (a) principles of, (b) devices for, and (c) phases of democratic decision-making’ (Saward, 2003b).
The focus on *proceduralism* provides a practical approach to solving problems of democracy, for example to address a democratic deficit such as one of those identified in Australia’s democratic audit described in chapter 3. The resulting procedure is designed to resolve such an issue, and in so doing the people *enact* or perform democracy, hence the title of Saward’s paper, *Enacting democracy*.

A reflexive approach to developing a decision procedure recognises that ideas and models of democracy, and the way they are implemented in different places, are constantly changing. There is not a single implementation of ‘democracy’. Therefore, the cluster of principles, devices and phases represents a ‘toolkit’ for the development of democratic decision procedures; the flexible approach gives the opportunity for continuous improvement in these procedures; and the focus on democratic principles provides an ethical dimension to this work.

The next sections explain how the principles, devices, and phases are used to develop a decision procedure. The roles that ICT could play in decision procedures are then covered.

### 8.3. Democratic principles

The reflexive approach to develop a decision procedure is to invoke and enact *democratic principles*. As with many other aspects of democracy, there is no one set of principles of democracy which would not be contested. However, the four principles which Saward nominates are often identified as being fundamental to democracy; namely *political equality, inclusion, expressive freedom*, and *transparency*.

The four principles are not discrete, but intertwined; they relate to each other, and sometimes to other principles as required. There are no precise definitions of these four principles, and they will be interpreted in slightly different ways in different decision procedures and in the use of the different devices, which are described in the next section. The boundaries between these principles are not fixed, and their degree of overlap is not clearly defined.

However, it is the focus on these principles, and the flexibility in their interpretation, which help to resolve the tension and contention between the various theories and models of democracy. As described in chapter 2, the models of democracy which focus on representation generally place emphasis on political freedom, while participatory models emphasise political equality; but both principles are essential in both types of model. Therefore appropriate democratic
devices should be selected which apply all of the relevant principles in the best way for the particular decision procedure.

8.3.1. A simple example

Democratic principles are ‘primarily things that we do, rather than rights or statuses that are conferred’ (Saward 2003b). Therefore, to ‘do’ political equality and inclusion in a democratic decision procedure to vote for parliamentary representatives, the devices chosen for the procedure should be those that ensure all citizens have the right and the opportunity to vote; even if some of them are travelling away from home, live in remote areas or overseas, are in hospital or prison, or the national language is not their first language.

All principles have equally weight, so in applying one principle, the other principles should not be ignored. Therefore, the decision procedure for voting which has been designed to ensure political equality and inclusion, should also apply the transparency principle. This would mean that voting is seen to be free and fair, people vote in secret, and the ballots are protected securely, amongst other things. This is a very simple description of Australia’s current voting procedure.

This example has not mentioned the fourth principle, expressive freedom, and this might be used to address some of the democratic deficits identified in the audit in section 3.4.4. Therefore an improved decision procedure for voting could include a redesigned ballot to give people the freedom to vote ‘none of the above’. It might also apply political equality, inclusion, and expressive freedom to allow permanent residents to vote in Australian elections.

The following subsections address the four principles with respect to democratic representation and participation. Two components of these principles are given particular attention, namely consent and the right to information. These are components of the four main principles, and cross their boundaries. They have been emphasised to support the ICT and participation material in this chapter.

8.3.2. Political equality

Chapter 3 includes the description and analysis of electoral systems in general terms, and for the particular case of Australia through a democratic audit report. The focus of chapter 3 was on the election process, and political equality primarily means that all citizens have an equal right to elect their representatives. However, as described in IDEA’s Handbook on Electoral Systems Design, for full political
equality it should also mean that the elected parliament represents the people, in
terms of gender, age, wealth, religious beliefs, and linguistic and ethnic groups
(Reynolds et al, 2005).

It might be argued that within these categories the professions should also be
represented. For example, in the near future there will be many political debates on
global warming, climate change, water resources and other serious environmental
matters, all of which will require a sound understanding of the science and
engineering issues involved. Yet there are no Australians with science or
engineering qualifications and experience who are currently elected representatives
in the federal parliament, and who can contribute directly to the debates on these
matters.

On the other hand, science and engineering are just two of many professions
and vocations, and it would be impossible to get fair representation of all of these in
a parliament. Therefore, it is argued, the required expertise should be provided from
public service agencies. However, since the 1980s there has been a diminution of
permanent relevant expertise in these agencies, due to the increased use of
outsourced services, as described in chapter 4. This has resulted in a growing focus
on ‘the cult of management’, and ‘… in Australia, after 1983, there was a growing
conviction that expertise might create serious distortions in policy making, and that
generic managers, usually accountants or economists, would provide an overall
detached view’ (Jones, 2006). An ‘overall detached view’ would presumably focus
on the management and financial aspects of any policy, as opposed to the merits of a
range of technical options.

This situation is an example to support the theme in this chapter of the need
to identify other ways for citizens, in this case professional experts, to participate in
decision procedures. For example, these experts could provide advice to elected
representatives, or to citizens in deliberative and other participatory activities. The
democratic principles of political equality and inclusion are supported in this way.

8.3.3. Inclusion

Saward (2003) relates political equality with inclusion by arguing that ‘it is difficult
to see how anything other than an inclusive, involving form of institutionalising
political equality can be acceptable democratically’. Therefore decision procedures
should be designed to maximise the ways for citizens to be equally included, as far
as possible, in their activities.
Arblaster (2002, p76) argues that there is ‘no neat or clear distinction to be drawn between political equality and social and economic equality’. The inequality of wealth and power within society is exemplified by the access and influence that some individuals and groups have to elected representatives, particularly at the ministerial level, to the exclusion of other citizens. This is often referred to as political lobbying, described as ‘the process by which the non-government sector – business, interest groups, representative organisations – seek to influence government. It is an intervention in the policy-making process or in the wider democratic process’ (Warhurst, 2007, p9).

The need for expert advice to be available to elected representatives was stressed in the previous section, and lobbyists, in the broadest sense of the word, are one source of this advice. Some lobbyists work in welfare, human rights, and environmental and similar organisations, while others come from industry and business. These are experts in their particular field, and can play an important role in policy development, for example.

There is another group of professional lobbyists, ‘paid intermediaries or hired guns’, who operate under a variety of names: consultant; commercial or independent lobbyist; communications or public affairs specialist; or event, issue, or reputation manager (Warhurst, 2007, p10). These are the people who are paid to lobby on behalf of the rich and powerful, to influence politicians and public servants on behalf of their clients. It is unlikely that this type of lobbying is conducted to ensure political equality, inclusion, and transparency.

In Australia, as in other places, an attempt has been made to control lobbying by establishing a register of lobbyists and publishing a Lobbying Code of Conduct (DPMC, 2008). There is no doubt that control and regulation of lobbyists is required, because this type of contact will continue. However a preferred approach would be to establish democratic decision procedures which were inclusive of all interests by providing greater opportunities for participation and deliberation.

It could be said that respect for individuals is the underlying component of political and social equality, inclusion, and transparency.

8.3.4. Expressive freedom

This principle is included because ‘the right to make one’s choices in an uncoerced manner does not automatically follow from the previous two principles, and yet arguably is critical to a self-respecting democracy’ (Saward, 2003b). This principle
has been stressed in previous chapters describing electoral systems and the need for citizens to vote in secret and to avoid opportunities for vote buying and voter coercion. The principle also applies to other decision procedures, in which citizens should have the freedom to participate and deliberate on the matters of concern.

In section 5.7.1 there is a description of the use of social networking applications on the Internet being used to post cynical, satirical or offensive video responses following a policy launch on YouTube. The principle of expressive freedom also applies to the basic idea of free speech, and thus includes freedom for satire and comment on politicians and political processes.

**Consent**

Many modern models of democracy include the concept that, for legitimacy, elected representatives hold power with the consent of their citizens. However, the idea of democratic consent is another area of contestation. Taking one meaning of democracy as being government by ‘the consent of the majority’, Crick (1971, p101) suggests that most modern states are democratic. Writing in 1971, he argued that China and the Soviet Union were democratic, because they were as dependent on the consent of the majority of their population as were America or Switzerland, for example.

However, democratic consent should mean something more than acquiescence to the status quo. While governments assume that they have the consent of their citizens to govern, Uhr considers the current situation is more one of assent, just ‘a nod of approval’. Assent is granted to a government by citizens at election time, through the election process. This assent may be withdrawn at the next election. As Uhr states:

> This falls far short of the ideal of democracy as an experiment in ‘people power’, even if it retains some degree of purchase over government through the requirement that those competing for the power of government must earn the assent of the public to their claim to rule (Uhr, 2005, p48).

Arblaster takes this point further, and argues that if genuine, convinced, voluntary consent is being sought, then free and open discussion cannot be avoided, for what genuine consent needs is that people should feel quite free to voice their doubts and opposition, if only to create the possibility of overcoming such doubts and hostility (Arblaster, 2002, p91).
Therefore consent would be a component of the principle of *expressive freedom*, and, as Arblaster continues to argue, ‘free and open discussion’ involves citizens participation beyond voting for representatives.

Providing consent through participation would also provide accountability, a component of the transparency principle.

While outsourcing, corporatisation and privatisation all attempt to reproduce a ‘market’ response, the use of public money requires an additional level of accountability. This promotes the need to establish direct consent from the public to bridge any ‘legitimation gap’. The principal method available to governments and public sector managers is to include participation or consultation with identified ‘stakeholders’ in decision-making, at a project and policy level (Davis and Weller, 2001, p176).

This point is important because it refers to ‘outsourcing, corporatisation and privatisation’. These are some of the points covered in chapter 4 which have resulted in citizens becoming disillusioned with their governments. Davis and Weller are suggesting that public consent is required for particular policies and legislation, for their legitimacy. For some policies, the stakeholders who would participate or be consulted should be citizens.

Formal consent, rather than just a nod of approval, requires that those granting their consent to an action are provided with accurate and sufficient information on the matter in question, before they do so. The same condition applies when the matter of accountability of representatives is being addressed. The right to information, a component of the transparency issue, is covered below.

Even if they wish to, it will not be practical for all citizens to participate in deliberative decision procedures, for example for the development of legislation. Therefore it may be necessary to gain their consent to some legislation by including a referendum in the decision procedure.

**8.3.5. Transparency**

The principle of transparency is included because if the previous three principles are valuable, they must be seen to be done. Previous chapters have stressed the need for transparency in electoral systems, and this principle is no less important in deliberative processes.

The reference in section 2.3.1, on the conditions necessary to prevent representative democracy from degenerating into oligarchy, includes the requirement for citizens to hold representatives continuously to account, and to have full and accurate information about the reasons for decisions taken on their behalf.
In participatory processes, ‘representatives’ would include citizens who have not been elected, but who have been chosen in other ways, or may have volunteered. These selection processes should be transparent to provide the required accountability.

The right to information

It is a general principle that citizens should have the right to know about matters that concern them, and information on these matters should be freely available. This is stated in Article 19 of the International Covenant on Civil and Political Rights (ICCPR, 1976), to which 160 countries, including Australia, are a signatory or have ratified (ICCPR, 2006). Although the right to information is part of the transparency principle, it has been identified separately because of its association with ICT.

There are two main sources of information for democratic activities. The parliament and public service agencies would provide a wide range of official information for advisory and educational purposes covering matters arising during the life of the parliament. Other information could include expert reports, survey results, national audit reports, and background information on commercial transactions made between the government and outside contractors. This type of information could be made available more freely than it is now.

Other sources of information include political parties, all forms of media, and other institutions of the civil society. They would provide election information such as party manifestos and profiles of candidates, and commentaries and opinions on the issues arising during the election campaign and during the life of the parliament.

In modern societies it would not be difficult to provide enough information to citizens. This can be done with the traditional electronic and print media, and the use of ICT, for example using e-mail and web sites. Whatever the source of the information, the challenge to citizens is to filter out the relevant, reliable and accurate material from that which is trivial and/or wrong. However, this is more important with information delivered by ICT, because of the lack of transparency inherent in that technology. Therefore, some form of regulation and/or standards will be required to provide authentication and authority for some of the information provided in this way. These standards should also apply to information provided by a government for public education and advice. Since this information is provided at
taxpayers’ expense it is important to ensure that it is not advertising material for the party in government.

There are those who wish to delve deeper into a particular issue, and investigate documents other than those provided through the usual sources. Freedom of Information (FoI) legislation is critical in a democratic society, although the terms for exclusion of some documents are often detrimental to the spirit of freedom of information. For example, there are situations where the disclosure of how taxpayers’ money is spent should preferably not be prevented by a commercial-in-confidence classification of documents.

8.4. **Democratic devices**

The second component of reflexive proceduralism consists of what Saward calls *devices*, which are inherent in the various models and theories of democracy. A device is ‘a mechanism that plays a part in constituting a more or less formal procedure by which binding collective decisions are reached for a political community’. (Saward, 2003b). These are used in the stages described in section 8.5.

8.4.1. **Types of devices**

Saward gives a number of examples of devices, related to systems of representation and methods of voting, deliberation and other ways for participation, and methods of implementation and review of a decision. Some of these devices are well known and established, such as *elections* and *voting*. Other devices, such as *protected public spaces*, and *delay*, are less familiar or not often considered as relating to democratic decision procedures. The list includes:

1) Elected **parliament** with legislative authority
2) Implementational (and other) public **agencies**
3) **Public hearings, debates** and **enquiries**
4) **Elections** for representatives
5) **Majority rule** as the key to interpreting elections and other votes
6) **Proportionality** as an alternative aggregative device for interpreting elections and other votes
7) Systems of **representation**
8) The **citizens initiative**
9) The **referendum**
10) **Deliberative opinion polls** or citizens juries
11) Protected **public spaces** of civil freedom
12) Delay or pause
13) Judicial review through independent courts overseeing due process
14) Mixed in with various of these, voting itself (optional or compulsory).

Saward describes this as a ‘radically incomplete list’, and suggests that some of the devices could represent families of sub-devices. For example, in 2) electoral authorities could be shown as a device separate from other public agencies; and the institutions of civil society could also be considered as a separate device. However, it seems that any obvious omissions could be included with one of the devices already listed. The non-specific nature of the list is useful because it means that there is flexibility when considering which device to use in a new procedure.

Although there is no mention of technology, it might be argued that the Internet, the computer, and other technology artefacts should be included in this list of devices. Their omission is valid however, because these ICT artefacts do not fit in to the definition of a device as a ‘formal decision mechanism’. This is not to imply that ICT does not have a role to play in new decision procedures, and technology can be used to support democratic devices in a procedure, especially when it can be used to enhance a democratic principle.

8.4.2. Devices for participation

The reflexive proceduralism approach is consistent with Budge’s version of direct democracy, which would keep the representative democracy institutions of political parties, governments and parliaments, but would include a number of participatory devices. As described previously in chapter 5, parliament would be an ‘advisory, investigative and debating committee informing popular discussion and voting, rather than substituting for it’ (Budge, 1996, p181). Although government by political party would continue, by debating and passing legislation, it would seek votes of confidence from the population at large. This device, a referendum, is used in the example in section 8.6.

Table 2.2 in section 2.5.1 shows a number of methods for citizens participation, and these would all be devices which fall into item 10) in the above list, which only includes deliberative opinion polls and citizens juries. The choice of device would depend on the purpose of the decision procedure, and other factors such as the time available; noting that the more time set aside to study an issue and work through conflicting perspectives, a deeper analysis occurs. Thus, a citizens jury, which typically lasts a week, could produce a detailed set of policy
recommendations. A citizens assembly, which uses a larger body of participants over a period of months, could reach consensus on a concise policy position. The plenary session of a deliberative opinion poll is typically a weekend, and this relatively brief time could provide an informed view on a single issue.

8.4.3. Institutions as a device

In the list above, the devices

2) implementational (and other) public agencies,
3) public hearings, debates and enquiries, and
7) systems of representation,

are all associated with institutions.

The typical categories of institutions previously shown in chapter 2 include:

<table>
<thead>
<tr>
<th>academia</th>
<th>professional associations</th>
<th>trade unions</th>
</tr>
</thead>
<tbody>
<tr>
<td>religious organizations</td>
<td>non-profit organizations</td>
<td>charities</td>
</tr>
<tr>
<td>environmental groups</td>
<td>women's groups</td>
<td>cultural groups</td>
</tr>
<tr>
<td>community organizations</td>
<td>consumers/consumer</td>
<td>non-governmental organizations</td>
</tr>
</tbody>
</table>

With the opportunities for life-long education, changes in employment patterns, and mass media communications, many citizens have become more aware and understanding of the local, national and international events and problems that governments are required to address. Some also have ideas about how they might be resolved; and they could be more educated, knowledgeable, and/or experienced in the topic than their elected representatives, political advisers, and government officials. However, in a modern complex society, where elected representatives are the dominant players in political debates, it is often difficult for these informed citizens to participate. Institutions are an important way to address this exclusion, and provide citizens with the opportunity to participate, either as members of the institution, or by being the conduit through which they can access a decision procedure.

An established electoral authority such as the Australian Electoral Commission (AEC) would be the best agency to administer alternative systems of representation, device 7. In a participatory process, citizens would be ‘representatives’ for the period of the decision procedure. They might be chosen randomly for a deliberative opinion poll, by lot for a citizens jury, or they might
volunteer for a citizens assembly. In each case the electoral authority would administer these activities.

**8.4.4. Devices for voting**

In the list above, devices

5) majority rule,
6) proportionality,
8) the citizens initiative,
9) the referendum, and
14) voting

are components of aggregative approaches to decision making, which would be used in both representative and participatory models.

As described in section 2.5.2, ‘direct democracy’ is a term sometimes used to describe three distinct forms of voting within a democratic system:

a) **referendums**, which are votes on a specific single issue or piece of legislation (rather than for a party or candidate);

b) **citizen initiatives**, whereby citizens can propose new legislation or constitutional amendments by gathering enough signatures in a petition to force a vote on the proposal; and

c) **recall**, under which citizens can force a vote on whether to oust an incumbent elected official by collecting enough signatures in a petition.

(ACE, 2008 italics added)

Items a) and b) are identified in the list above as devices. Item c), recall, is not shown separately in the list, but would be included as a citizens initiative if that was part of a society’s democratic processes.

**8.4.5. Other devices**

Models of participatory democracy will still need some form of parliamentary representation to debate and pass legislation. Therefore devices 1) an elected parliament and 4) elections for representatives are included.

However, a criticism of some parliaments in recent times has been the haste with which legislation has been passed with very little time for deliberation and debate. While not good for democracy, this happens because party discipline and voting on party lines usually means that the result of the vote is a foregone conclusion. This practice should not be permitted in participatory activities.
Therefore, it is important to include device 12), delay or pause, in a formal way at relevant points in a decision procedure. This is to provide opportunities for informal debate and discussion in the public sphere, to inform many citizens of the matter and to gauge their responses, as well as for the formal participants to review their position.

The inclusion of device 13), judicial review through independent courts, is important because it provides the way to include the transparency principle formally in a decision procedure.

The remaining device, 11) protected public spaces of civil freedom, is to provide venues for the principle of expressive freedom. The provision of these protected spaces might be considered as the participatory equivalent of parliamentary privilege for elected representatives.

Section 8.6 below gives an example of how some of these devices might be combined to design a decision procedure to enable citizens to give their consent to legislation.

8.5. Stages in a decision process

Saward intermingles the terms process and procedure without clearly defining them. In this thesis I use the following definitions for these terms. A process is defined as ‘the logical organisation of people, materials, energy, equipment and procedures, into work activities designed to produce a specified end result’ (Pall, 1987). This is a useful definition because it identifies the various components of a ‘work activity’, including procedures, which are therefore part of a process.

A procedure is defined as the ‘fact or manner of proceeding with any action, or in any circumstance or situation; the performance of particular actions, esp. considered in regard to method; practice, conduct. Also: the established or prescribed way of doing something’ (OED, 2008).

Therefore, a decision procedure is part of a process to achieve the specified end result of a political decision; for example the selection of a representative, or the production of a piece of legislation. A democratic decision procedure would require that the people were involved in the decision, in some significant way.

The third component of reflexive proceduralism comprises four stages, namely:

Stage 1: Agenda setting;
Stage 2: Debate and discussion;
Stage 3: The moment of decision itself; and
Stage 4: The moment of implementation.

Each stage uses a number of devices to form a decision procedure. In engineering terms this might be called the decision process life cycle. Each stage would include one or more procedures and would be concluded on reaching a milestone, with agreement to continue with the next stage.

For example:

Stage 1 milestone:
The scope and requirements of the decision process are defined, a budget and agenda is agreed for the next stages, and there is a formal decision to proceed.

Stage 2 milestone:
All debate and discussion are complete, and there is agreement on the decision, eg. the scope and general content of a new piece of legislation.

Stage 3 milestone:
The decision has been made, eg. the legislation has been debated and passed by the parliament and has received consent by citizens.

Stage 4 milestone:
The decision has been implemented, eg. public servants have received any required training, public information has been developed and distributed, and the law can be enforced.

Saward notes that while these stages may be rigid within the overall process, there may be phases within the process which are not constrained. For example, there may be a deliberative phase, which takes place throughout the process, using the many different forms of deliberation at different times to ensure that democratic principles are followed and established. If for some reason the legislation is not passed in Stage 3, then further deliberation would be necessary to resolve the matter. Thus phasing is another way to ensure that ‘creative complexity’ is enabled in the reflexive proceduralism approach.

8.6. An example of a collective decision-making process

The Australian Constitution gives the Parliament the power to make and amend laws. These laws include those for the administration and operation of Australia’s democracy, a part being the electoral system. Although the Constitution requires
that changes made to it must be approved by a referendum of all citizens, there are no democratic processes to enable citizens to comment on the electoral laws made by the Parliament, or to give consent to them. This means that elected representatives define the content and administration of the system for their election, and this power could be misused.

The problem statement in chapter 1 cites an example of such misuse of power by the government, which amended the Electoral Act for its electoral advantage (Hughes and Costar, 2006). If the Constitution requires democratic support for changes to its content, then it could be argued that it should also require citizens to have control over the rules for running democratic processes, such as an electoral system.

The following example uses Saward’s approach to develop democratic decision procedures to enable citizens to participate in the development of electoral legislation, and then to provide consent to the legislation via a referendum. The procedure includes deliberation, other forms of participation, voting, and giving consent, and includes the current practice in Australia of compulsory voting in parliamentary elections and for a referendum.

8.6.1. Stage 1: Agenda setting

Political agenda setting is often an amorphous activity, and can be initiated in a number of ways. For example, a government may initiate a decision procedure as part of its reform agenda. The catalyst may be the results of opinion polls on a particular matter prompted by a media campaign, or there could be pressure for change from academia, pressure groups, or democratic audit findings. Alternatively, the Joint Select Committee on Electoral Matters (JSCEM) could initiate the agenda.

Whatever the process, it should result in a recommendation to be accepted by the Australian Parliament, that the new decision procedure be developed. Since this example involves electoral legislation, the involvement of the Australian Electoral Commission (AEC) would be required.

In this example the JSCEM may propose a number of amendments to the Electoral Act, for example:

a) to provide comprehensive information services on the proposed legislation;

b) deliberative opinion polls to be conducted in all states and territories, and their results to be binding;

c) other methods of citizens participation to be provided; and
d) the requirement for a referendum to give public consent to the legislation. This last amendment might make the referendum non-compulsory, and propose other rules for counting the majority\(^{19}\). The Parliament makes the decision to proceed.

### 8.6.2. Stage 2: Debate and discussion

The procedure in this stage exemplifies the idea of participation as organised collectivism. It is to enable as many citizens who wish, to participate in the discussions and debates on the new legislation. Initially there would be wide public discussion on the proposed amendments in the print and electronic media, with the objectives of informing citizens of the issues, and gaining a sense of public opinion on the matter.

Groups of representative citizens would be selected by ballot from the electoral rolls to participate in a number of deliberative opinion polls, on the matters in the new legislation. Experts from a number of civil institutions would advise and guide these participants. Experts and participants would be paid for their time. The advisory material and the results of the deliberative opinion polls would be widely available. The results would be binding on the Parliament.

### 8.6.3. Stage 3: Moment of decision

The moment of decision is in two steps. Legislation would be enacted in the Parliament following the usual process of committee, debate and amendment activities. However, these amendments should not go against the spirit and intentions of the results of the previous participatory activities.

The second step would be a referendum for citizens to provide their consent to the new legislation, perhaps using the amended rules for the conduct of a referendum. There is a high probability that the referendum would pass, because citizens would know that some of their number had participated in preparing the legislation and it had been passed by the elected representatives.

It is a democratic decision if the referendum is not accepted. The purpose of the decision process is to produce a democratic benefit, and this negative result suggests that the overall process should be reviewed. This could be achieved as part of a repeat of stage 2, debate and discussion.

\(^{19}\) Currently, in Australia, a referendum requires a majority of votes in a majority of states to pass.
8.6.4. Stage 4: Moment of implementation

The new legislation means that citizens now ‘own’ the Electoral Act. The new requirements of the legislation would be implemented by the AEC, which may require the provision of additional information and education for citizens.

Further activities could include the development of additional decision procedures requiring citizens participation, and perhaps a judicial review of the procedure, to recommend improvements for the next amendments of the Electoral Act.

8.7. The role of ICT in the process

The previous section has described how a number of devices can be used to implement a simple democratic decision procedure to provide citizens with a number of opportunities for participation. ICT artefacts are not mentioned above, because they are not considered to be devices. However, ICT could be used to support the procedure in a number of areas. These areas, and the institution(s) which could use the technology are as follows:

a) running the ballot to select citizens from the electoral rolls to participate in deliberative opinion polls (carried out by the independent election authorities);

b) preparing the material for the deliberative opinion polls (AEC, civil society institutions, political parties);

c) conducting, and reporting the deliberative opinion polls (by official poll websites);

d) reporting, opinion pieces and debates on the deliberative opinion polls (by the print and electronic media);

e) providing protected public spaces, (on the AEC and other official websites) for:
   i. on-line public debate,
   ii. publicising the deliberative opinion poll material,
   iii. publicising the referendum material,
   iv. reporting the referendum,
   v. providing information and receiving citizens feedback on the new legislation, and during the judicial review;

f) providing, to a wide audience, information, opinion, and debate on the proposed legislation amendments, and publicising the recommended final
version of the legislation, and the referendum question (by the print and electronic media);
g) administering the preparation of the referendum (AEC systems); and
h) electronic voting for the referendum question, in conjunction with other voting methods (AEC and other electoral authorities).

This list shows that there is a wide range of opportunities for ICT to support applications in decision procedures which focus on participation. However, it is beyond the scope of this thesis to describe in detail the various ways that ICT could be used in these applications.

8.8. Summary and conclusion

An underlying theme of this thesis is that democracy can be improved by providing opportunities for citizens to participate in democratic decision procedures, and this reflects the thesis meaning of democracy. Reflexive proceduralism described in this chapter has provided one approach to enable such participation. This approach requires that democratic principles be applied in a decision procedure through the use of a variety of ideas and artefacts of democracy, called devices in this case. The focus on principles means that any contention between the selection of devices is minimised; the most appropriate devices are chosen for the particular procedure. In this approach, ‘participation’ is not identified as a principle of democracy, it is an outcome of the procedure.

The list in section 8.7 above shows that ICT has a number of roles to play in any new decision procedures. However, as argued in previous chapters, ICT should be used to solve particular problems, rather than be adopted because it is in common use, or for spurious political reasons. To provide a starting point for the use of ICT, electronic democracy has been defined in this thesis as the use of ICT to apply democratic principles. In the next chapter the practical aspects of this definition of electronic democracy are described, by considering the ethical development of systems of democracy.
Chapter 9. The ethical development of systems for democracy

9.1. Introduction

To reiterate, the research question *how can the use of ICT in democratic processes provide a society with an improved democracy?* covers two meanings of ‘how’. The first meaning relates to the way that ICT might be used in a democratic system as a ‘product’, and the second meaning relates to the ‘process’ used by developers to implement ICT-based systems.

Answers to the first meaning of this question have been addressed in previous chapters. Chapter 6 describes the role of ICT in voting systems; and chapter 8 concludes by listing possible ways that ICT might be used in decision procedures for participatory models of democracy. A theme in both chapters is that while ICT has the potential to improve democracy, it also can be detrimental, by undermining democratic principles such as political equality and transparency.

This chapter addresses the process aspects of the development of ICT-based systems for democracy, the second meaning of the research question. In this section it is argued that:

a) these systems have special characteristics because of their public nature;

b) they should be developed as ‘high-integrity’ systems, to ensure the full trust of the citizens who use them;

c) voting systems should be considered as ‘democracy-critical’; and

d) systems for democracy should be developed using leading practices.

Leading practices are established by considering computer ethics and Value Sensitive Design (VSD) in the next section; followed by the description of four principles for the use of ICT in systems for democratic processes. These principles describe the need to use appropriate technology, open standards, systematic processes, and superior governance.

This chapter concludes by revisiting the case study in chapter 6 on electronic voting best practices in the USA, and comparing these proposed best practices with the four ICT principles.
9.1.1. Public systems

Government agencies are major users of ICT systems, as briefly described in section 5.9 on electronic government, and these systems are expected to provide a number of benefits, for example:

a) more convenient, efficient and cost-effective services for citizens;
b) improved access to information for both citizens, the government and its agencies;
c) greater accountability of those agencies; and
d) less opportunities for citizens to defraud public services.

Economic value is expected to accrue from the use of ICT by governments in this way. Some of these benefits would also be provided by using ICT in systems for democracy.

For the purpose of this chapter, the term ‘public system’ is used to cover the use of ICT for democracy. These systems can be used by any citizen, and in the case of voting, they are potentially used by all citizens. While the choice of a public system might be made through a competitive process such as a tender, when it has been implemented there is not a competitive alternative system, as there is with banking and other widely used systems. Therefore, a public system must be capable of use by all citizens, regardless of their language, competence with technology, physical and intellectual capability, and location.20

A major feature of a public system is that it is paid for by taxpayers, and there is no fee for its use when it becomes operational. Therefore, minimising the cost to the public purse of these public systems is essential. However, while economic efficiency is important, democratic principles should not be ignored when planning the development and use of ICT in the service of democracy. One reason to focus on democratic and ICT principles is to ensure that citizens can trust their public systems, and the people who develop and operate them.

9.1.2. High-integrity systems

There is a class of systems known as ‘safety-critical’; for example some of those used in aviation, the defence services and the nuclear industry. They are called safety-critical because a failure of the system could result in the death or injury of

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20 This is not to say that banks do not try to provide a high level of service, but a particular banking service may not be provided if it is uneconomical to do so. Alternatively there may be an additional charge for the service, for example if a customer chooses to use a human teller instead of Internet banking or an ATM.
someone. These are also called high-integrity systems. Jonathan Bowen identifies an ethical dimension in the development of such systems.

Ultimately, it is unethical to develop software for safety-related systems without following the best practice available. All software engineers and managers wishing to produce safety-critical systems in a professional manner should ensure they have the right training and skills for the task. They should be able to speak out without fear of undue repercussions if they feel a system is impossible or dangerous to develop. It is important that companies, universities, standards bodies, professional institutions, governments, and all those with an interest in the well-being of society at large ensure that appropriate mechanisms are in place to help achieve this aim (Bowen, 2000).

Democratic decision procedures using ICT are not safety-critical in the sense that a failure of the system could cause physical harm. However, failure of an electronic voting system could produce a result which did not reflect the voters’ choice, and this would not be a democratic result. Therefore, systems for democratic purposes should be of high-integrity, developed to ensure the trust of citizens.

Public systems must be designed to cater for a wide spectrum of citizens with different skills and education. They must also be designed to enable citizens to use a wide range of technology, especially if the application includes on-line participation. A system failure in this environment could result in citizens being disenfranchised, for example because they were not able to vote, their votes were lost, or they were denied the opportunity to participate in some other way. Alternatively, there is always a chance that a system could be corrupted by unscrupulous people for their own ends. Of course this can happen with systems not using ICT, but the invisibility factor of software (described in section 9.2 below) makes the potential for system failure or corruption harder to detect.

This type of high-integrity system might be called democracy-critical, and the methods used to develop safety-critical systems should be applied to these. Likewise, from Bowen (above), it is also unethical to develop public systems for democratic decision procedures without following leading practices. Those practices are identified in this chapter through considering computer ethics, Value Sensitive Design, and four ICT principles.

9.2. Computer ethics

Computer ethics has been defined as ‘the analysis of the nature of and social impact of computer technology and the corresponding formulation and justification of
policies for the ethical use of such technology’ (Moor, 1985). This definition would still be valid if ‘computer’ is replaced by ‘ICT’ or ‘cyber’.

### 9.2.1. Example of an ethical issue

In his seminal essay *What is computer ethics?* Moor (1985) gives an example of an ethical issue arising from the use of computers in a USA presidential election 21. Computers were used by the electoral authorities for counting votes across the country, and by television networks and other commentators for predicting the election result. Exit polls would have supplied data for these predictions, and would have used computers for their processing. With First-Past-The-Post counting it is easier to make a statistical prediction of the result, than it is with preferential voting.

No television station has the authority to declare the election result, as that is the responsibility of the electoral authority. However, in USA elections there is competition between the television networks to be the first to predict the result correctly. In the election mentioned by Moor, a television station announced its prediction of the election result in the eastern states before polling places had closed in over half of the remaining states 22. This raises the issue of whether an election can be fair if the result has been publicly predicted before a substantial number of citizens have voted. The effect of the television station broadcasting the result could mean that people change their voting intentions, or do not bother to vote. Therefore, in addition to the issues raised previously in chapter 6 about the use of electronic voting machines, there is an additional issue about the use of ICT to broadcast the results. In Moor’s example the ICT was television, but the use of the Internet for modern election commentary could compound this issue. This issue would appear to be intractable, since any attempt to regulate any of these activities would been seen as a breach of free speech.

In Australia it is also the usual practice to provide on-going predictions of election results, based on the number of first preference votes as they are counted. It is usual for a party leader to either claim victory or admit defeat based on these first preference votes, but it is the electoral authority which formally declare the result when all votes have been counted. However, the same issue of election

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21 Moor refers to ‘the last presidential election’ which could have been in either 1980 or 1984. His example is relevant to both elections.

22 In the 2008 presidential election in the USA, CNN predicted the win by Barack Obama just after polling closed in California and other western states.
broadcasting on television and the Internet could still arise in Australia, as mentioned in democratic audit area d) in section 3.4.4.

In the context of Moor’s definition above, there has been a social impact from the widespread use of television to report an election, which has revealed the need for a policy to cover this situation, which must be formulated and justified so that other values are not diminished.

9.2.2. Why is ICT different?

Ethical problems can arise because there are aspects of computers which separate them from other types of technology. One of these aspects is the logical malleability of computers, which is possible because every computer device consists of fundamental components of electronic circuits controlled by software to perform logical operations. It is software which make ‘the computer’ a universal tool, with applicability throughout society, for example in government, business, education, transport, health care, defence, and artistic endeavours. The range of examples, in chapters 5 to 8, which show how computers are, and can be used in systems of democracy, is also an instance of this malleability.

The USA election example in the previous section illustrates how computers can sometimes transform human activities and social institutions, another aspect of the difference of ICT from other technologies. This transformation may result in policy and conceptual vacuums about how this technology should be used. Policy vacuums occur because the rate of change in the development and adoption of ICT is much greater than the speed with which relevant policies can be implemented.

While it is possible that policy vacuums can occur with other technologies, these technologies tend not to have the invisibility factors associated with computer technology. These factors include:

a) invisible abuse, such as invasion of privacy and identity theft;

b) invisible programming values, such as bias in decisions made by software; and

c) invisible complex calculation, raising matters of trust, for example in software for controlling aircraft or for counting election votes.

Computer ethics includes the study of these factors and their social impacts, and the identification, formulation and justification of policies to address these impacts.
9.2.3. Policy vacuums

The nub of the problem statement concerning ICT is that this technology has both the ability to enhance democratic systems in ways that have never before been possible; and, by its nature, the ability to corrupt or destroy well established democratic practices. For example, the widespread adoption of the Internet has resulted in proposals for on-line voting systems, as described in chapter 7. The adoption of this technology raises several issues concerning its ability to guarantee free and fair elections, including for example:

a) the reliability of the wide range of computers which would be used in such systems;
b) the reliability and transparency of proprietary software;
c) the problems of certifying hardware and software as being suitable; and
d) the possibility of corrupting election results through the use of a largely unregulated and uncontrolled network with global access.

A conceptual vacuum\textsuperscript{23} exists because frequently there is no clear understanding of ICT and the social impact it can have. This presents difficulties in forming policies to address these issues.

‘Policies are rules of conduct ranging from formal laws to informal, implicit guidelines for action’ (Moor, 1999). This spectrum of options applies to policies for using ICT in democratic systems. An example of a formal law could be that legislation in an electoral act requires that all software used in voting and counting systems must be audited by an authorised independent organisation. For a project team, an informal guideline could be that all developers of voting and counting systems should be full members of a professional body, such as the Australian Computer Society.

Formulating and justifying policies from this range of options is not easy, given the range of technology, and the social and cultural aspects to be considered. To help resolve this difficulty, Moor proposes that an ethical framework be adopted which draws on the core values which are shared by all human beings, such as happiness, ability, freedom, knowledge and security. This framework is called ‘just consequentialism’ (Moor, 1999).

This framework reflects Moor’s definition of computer ethics defined above, and consists of two steps:

\textsuperscript{23} Also perceptively called a conceptual muddle (Moor, 1998).
a) *deliberate* over various policies from an impartial point of view to determine whether they meet the criteria for being ethical policies (for example, they do not cause unnecessary harms, and support individual rights); and

b) *select* the best policy from the set of just policies arrived at in the deliberation stage by ranking ethical policies in terms of benefits and (justifiable) harms.

Point b) requires that good and bad consequences in ethical policies be weighed against each other, and policy makers distinguish between disagreements about facts and disagreements about principles and values. It is the facts of a particular matter which inform the process of selecting the best policy (Tavani, 2004, p60-61).

The just consequentialism framework was developed as a way to consider the policy vacuums associated with the use of ICT, and to produce policies by considering core human values to maximise their ethical content. This framework could also be used with Saward’s reflexive proceduralism as a way to combine the four democratic principles to produce a desired decision procedure.

### 9.2.4. Methods which address human values

In the 1960s it became clear that computers and software had the potential to automate many areas of the workplace. A common theme was that it was possible to improve the quality of life and safety of workers by replacing people with computers in areas which were dangerous, had extreme conditions of heat or cold, and/or were tedious and boring. These people would then have the opportunity to work in more rewarding and intellectually challenging fields, while machines did the drudgery. It was around this time that Mumford was conducting research into the positive and negative effects of automation, especially on those people who had been replaced by information technology. This research identified ethical problems such as:

a) the lack of communication and co-operation between the designers of systems and those who operate them; and

b) poor communications between the designers and senior management, particularly if there are problems in implementing the new system.

(Mumford and Ward, 1968, p72).

These continue to be problems in the development and use of ICT systems.

Many of the people who had been displaced found work in the service industries, such as banking and insurance, and in services provided by the public
sector. Technology continued to advance, and now some of the workers providing these services are also being replaced by ICT. The introduction of electronic government is an example of this. However, since there is now a greater understanding of the impacts of ICT on people, the ethical issues related to the introduction of new technology are receiving more attention. One aspect of this focus on ethics is consideration of the values to be included in the ICT systems being developed.

The ICT industry is not lacking in methods and approaches to software development, as shown in this section. Since the 1970s researchers and others have been devising methods to help developers consider the impact of their systems on humans, and to identify techniques to ameliorate these. These methods included ergonomics, the development of training in the use of computer systems, and providing education in the wider social implications of the adoption of technology.

Early in this period Mumford and Weir published their method for the Effective Technical and Human Implementation of Computer Systems (ETHICS) and, as the name implies, it has an underlying ethical approach. In addition to the usual focus on business objectives, the systems design and development processes also consider the specific job satisfaction needs of employees (Mumford and Weir, 1979).

At about the same time there were several groups in Scandinavia, particularly Sweden, focussing on industrial democracy, computer supported cooperative work (CSCW) and participatory design (for example see CSCW, 1990). Other methods developed in the 1980s include Actor-Network Theory (ANT) (for example see Latour, et al, 1986)

In the 1990s methods such as Multiview from Avison and Wood-Harper (1990), and The Soft Systems Methodology from Checkland and Scholes, (1999) were developed and published. An underlying theme of these methods was the need to consider the wide range of people who may be affected by the introduction of ICT, and these people started to be known as stakeholders.

In this century, Design for All (DfA) methods have been developed as ways to design and implement systems and products which promote inclusion (eg. for people with disabilities) and equality (eg. regardless of their age). By addressing these values DfA methods include an ethical focus. ‘Inclusive design’ and ‘universal design’ are related terms. The European Design For All e-Accessibility Network (EDeAN) covers the UK and much of Europe, and provides education,
training, methods and tools to business and academia. These methods cover products other than those using ICT (EDeAN, 2006).

People continue to develop theories and implement practical applications in this area; in academia, the industry, and in professional and standards’ organisations. However, Friedman et al (2008, p70)\textsuperscript{24} consider that ‘there is a need for an overarching theoretical and methodological framework with which to handle the value dimensions of design work’. They consider Value Sensitive Design (VSD) to be such a method.

9.3. **Description of Value Sensitive Design (VSD)**

Value Sensitive Design is described as a tripartite methodology (Friedman et al, 2008, p71-73) for the design of a system to include human values. ‘Tripartite’ refers to three perspectives, and the ‘methodology’ is to apply conceptual, empirical and technical investigations into the requirements and other aspects of a system, as shown below. These investigations are employed iteratively.

a) **Conceptual** investigations include the identification and consideration of stakeholders, which are classified as direct (those individuals who interact directly with the technology or its output) and indirect (those who are also impacted by the system). The values associated with the system are identified, and it may be necessary to consider the trade-offs amongst competing values in the design, implementation and use of the system.

b) **Empirical** investigations extend the conceptual investigations, particularly in the human context, but also to cover organisational aspects. Potentially, empirical investigations can use the entire range of social science research quantitative and qualitative methods to examine human and group activities and their values. These investigations can occur during the development and the on-going operation and support of the system.

c) **Technical** investigations cover two main areas. Firstly they consider how the existing properties of the various options for the technology being considered will support, or hinder, human values. The second area covers the design of systems to support the identified values, using the chosen technology or its underlying properties.

Friedman et al’s description of the method also includes ten practical suggestions, mainly focussing on aspects of the conceptual investigation. The first six of these

\textsuperscript{24} This reference is the latest publication of a paper which was initially published in 2003.
points could be considered to form an outline procedure on how to use VSD, as follows.

2. Identify direct and indirect stakeholders.
3. Identify benefits and harms for each stakeholder group.
4. Map benefits and harms onto corresponding values.
5. Conduct a Conceptual investigation of key values.
6. Identify potential value conflicts.

The final four points

7. Integrate considerations into one's organisational structure.
8. Human Values (with ethical import) are often implicated in system design.

provide additional background and approaches to using the method.

The conclusion by Friedman et al encourages other researchers and designers to ‘critically examine, use and extend’ the VSD approach. The following section examines how VSD might be applied practically in system development projects. This is followed by two critiques of the method.

9.4. The practical application of VSD

9.4.1. The uses of VSD

There is no single definition of ‘design’ in the context of using ICT. For example, one definition of ‘design and development’ in an ISO quality management standard is a ‘set of processes that transforms requirements into specified characteristics or into the specification of a product, process or system’ (AS/NZS ISO 9000:2006, clause 3.4.4). This entry notes that the terms ‘design’ and ‘development’ are sometimes used synonymously.

In the software engineering life cycle standard, ‘design’ describes activities in the ‘development’ process (AS/NZS:12207, 1997, clause 5.3), such as ‘system architectural design’ and ‘software detailed design’. In a development life cycle, the design activities take place at specific points, or form specific phases.

If VSD is a design methodology, it would be used in the design activities of the development life cycle. However, since the authors state that VSD is an iterative methodology it need not only apply to the design activities, but also to other stages of the development process. The method would also have application in the
feasibility analysis and requirements analysis stages of a project. The findings of the three types of VSD investigation described above could inform a feasibility report, thereby ensuring that specific values for a system could be included in the initial planning activities.

Values could be identified in an operational concept document, or a request for quotation, thereby providing information to assist the estimation of effort and resources to develop the system. Requirements that particular values be addressed in the system would appear in a requirements specification, which would ensure that the values to be provided by the system were identified on a contractual basis. Acceptance test cases would be derived from these requirements, so that the acquirer could be assured that the required values had been included in the system.

If particular values are expressly identified, defined, and described in a specification, then the development team has the opportunity to consider them, and to identify any appropriate implementation issues and techniques. The costs of developing all requirements can then be estimated, and the budget framed to include the delivery of a technical solution to these aspects. This approach also provides the opportunity for a wider impact analysis, for example when the budget is limited or there are constraints on the project schedule.

Since VSD can be used at many stages of the development process, perhaps it should be called Value Sensitive Development.

9.4.2. Is VSD a methodology?

The original meaning of ‘methodology’ referred to the study of methods, but from common usage it now usually means ‘a method or body of methods used in a particular field of study or activity’ (OED, 2008).

From the author’s experience and observation, many system developers who try to use a methodology have an expectation of producing the desired system simply by following a series of documented tasks - step by step; and filling in all of the sections of document templates, sometimes regardless of their relevance or suitability for the work in hand.

Part of their reason for doing this is a) a lack of understanding of what the methodology is about, and b) not knowing how to tailor a ‘standard' methodology to suit their particular organisation, product, or maturity level\(^{25}\). A common example

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\(^{25}\) The maturity level is an indication of the capability of an organisation when measured against a set of defined criteria.
is that of a project plan being prepared because the methodology requires it. To some developers this is regarded as just a chore to complete before going on to the interesting work; rather than the preparation of a useful document (the project plan) for on-going reference, assistance, and management endorsement and support, to ensure a successful project. This attitude by developers of all levels could be through a lack of training, perhaps deeper problems of conceptualisation, and/or perhaps a reluctance to use any proposed method.

The wording of the VSD ten point approach outlined in section 9.3 above implies such a step-wise methodology. ‘Point 1 - Start with a Value, Technology, or Context of Use’ gives a starting point for the work to be done. However, on further analysis, it may be better to start at point 8, by considering a list of the main values implicated in systems design, and then apply the other points, generally in order, but more iteratively than in strict order. Or it may be better to consider stakeholders first (Point 2), or choose another appropriate starting point related to the particular stage in the life cycle.

Friedman et al, have proposed a set of vague tasks to provide an iterative and flexible approach to consider the human values in a system, but I conclude that they have not proposed a methodology in the usual meaning of the word for software and systems development.

9.4.3. VSD and stakeholders

Point 2 of the VSD approach simply states ‘Identify direct and indirect stakeholders’. This is not an easy task, and the VSD description does not provide any information on how to do this, which is another shortcoming in the method. In VSD, stakeholders are classified as direct (those individuals who interact directly with the technology or its output) and indirect (those who are also impacted by the system). The definition below would cover both categories.

Stakeholder identification

In recent years the term stakeholder has become commonplace when referring to people involved in the development and use of computer systems. A range of definitions of stakeholder appear in the national and international standards on software and systems development, and risk, quality, and environmental management. Other definitions given in Sharp et al (1999) come from strategic management research, information systems research, and software engineering.
This recent definition, from an international standard on systems engineering, is typical of those published:

> [an] individual or organisation having a right, share, claim, or interest in a system or in its possession of characteristics that meet their needs and expectations (ISO/IEC 15288:2008, clause 4.29).

While it should be possible to use formal definitions of stakeholders to assist in their identification, Sharp et al (1999) make the point that these definitions are often not particularly useful when trying to identify the stakeholders for a particular project, because they are sometimes vague and may be too general, misleading and/or incomplete.

Pouloudi and Whitley (1997) describe four principles that characterise the behaviour of stakeholders, as follows:

a) stakeholders depend on the specific context and time frame;  
b) stakeholders cannot be viewed in isolation;  
c) the position of each stakeholder may change over time; and  
d) feasible options may differ from the stakeholders’ wishes.

These characteristics recognise the difficulty of identifying stakeholders, and emphasise the need to consider stakeholders throughout a project.

A comprehensive approach to stakeholder identification is in the international standard on systems engineering referred to above, which includes a Stakeholder Requirements Definition Process (ISO/IEC 15288:2008, clause 6.4.1). This process describes activities which elicit, define, analyse and maintain stakeholder requirements, which are then transformed into a technical requirements specification. The guidance for this process also emphasises the need to consider the types of human values identified in the VSD approach.

**SoDIS**

For several years Gotterbarn and Rogerson have been developing a process for software development impact statements (SoDIS) and an associated tool to support stakeholder and risk analysis, with an ethical dimension (Gotterbarn and Rogerson, 2005). The SoDIS process was used by Fairweather and Rogerson (2002) to assess the technical requirements of a UK electronic voting system. The analysis and conclusions of the research in this thesis, particularly the issues raised in chapter 7, are consistent with many of the findings of Fairweather and Rogerson (2002).
**Major stakeholders in public systems**

In public systems, defined above in 9.1.1, there are two major stakeholders, in addition to the usual ones such as project sponsor, development team, and the operations group. The first major stakeholder is the taxpayer, since it is taxpayers who provide the finance for public systems. These stakeholders clearly have an interest in the financial values of the project, especially its cost/benefit. When projects are delivered over budget and/or schedule it is taxpayers who ultimately carry the additional costs.

The taxpayer is also a citizen, the second major stakeholder. The citizen as a stakeholder has an interest in the human values of the public system, in areas such as its legality, social desirability and human rights aspects. In addition, citizens may also be users of the system, and in this case they would be interested in more personal aspects such as privacy, usability, equality of access and transparency.

**9.4.4. Critiques of VSD**

The comments above relate to the practical aspects of VSD and how it might be used in software and systems development projects. In addition, the philosophical underpinnings of the VSD approach have been analysed, in the following two critiques.

The main criticism by Albrechtslund (2006) is that it is difficult to justify the claim that VSD is a principled and comprehensive account of human values in design. This claim relies on the idea that the design of an item of technology will more or less correspond with the use of that technology. He calls this the ‘positivist’ problem, an example of which is that the original design of the internet was to provide the US Department of Defense with a reliable, fail-safe communications network. However, its usage grew as some of the academics doing research started to use the network for their own purposes. Then came widespread commercial usage, resulting in the Internet and WWW that is now in place. As the internet technology has been enhanced with more functionality and opportunities for use, the ethical problems associated with its use have increased. Albrechtslund’s argument is that for sound ethical design the designers should take this change of use into account at the design stage (as far as can be done), but VSD does not enable this to happen.

He argues that any approach to design ethics which does not distinguish between the intentions of the designers and the intended uses, plus other possible or
unimagined uses of the artefact, could give various stakeholders the impression that ‘technology developed under certain guidelines are somehow certified “foolproof” with regards to future ethical problems and dilemmas’ (Albrechtslund 2006). VSD certainly does not make the distinction Albrechtslund requires, but it does not make the ‘certified foolproof’ claim either. He suggests that the focus of VSD should be on anticipating the various contexts for the use of the technology being designed, and the associated ethical scenarios. For this to happen, VSD should be improved by including ways to inform designers of the ways that the uses of technology can change beyond what was intended in the original design; and that VSD be supported by an ethical theory which supports this approach.

In the second critique, by Sollie and Manders-Huits (2007), three shortcomings of VSD are identified. The first is the vagueness of the concept of values used by VSD, and the lack of information about the relationships between them, such as whether some values have priority over others. Thus there is no guidance or frame of reference in VSD to enable designers to identify and resolve conflicts between values. Sollie and Manders-Huits also identify the need for the ethical analysis tasks to be carried out by people who have relevant expertise.

The second shortcoming covers the problems of stakeholder identification, which reinforce the points made in 9.4.3 above on this matter. Also, once stakeholders have been identified, VSD has no guidance on how the information on the values obtained from different stakeholders can be evaluated and prioritised.

This introduces the third shortcoming, that VSD supports the idea that ‘the morally right thing to do from a normative perspective can be derived from public values’. This is an example of the naturalistic fallacy, in which an ‘ought’ is reduced to an ‘is’. Sollie and Manders-Huits argue that when users of VSD ask stakeholders what they think ‘ought’ to be in the design, they run the risk that the response ‘is’ taken as fact and morally important, and then implemented as ethical design. Their conclusion is that VSD lacks an ethical framework, and this lack prevents VSD from doing what it claims.

The arguments in this section on VSD have cast doubt on the claim by Friedman et al (2008, p70) that VSD meets the ‘need for an overarching theoretical and methodological framework with which to handle the value dimensions of design work’. However, VSD continues to be a useful method, as do DfA, participatory design, and other methods which address human values in technical design. As argued above, these methods do not stand alone as ways to develop and implement
systems. They are just a part of a compendium of methods which address the complexity of products using ICT, and the development and support lifecycles of these products.

Electronic democracy has been defined in chapter 5 as meaning processes which use ICT to apply democratic principles. In the next section the reflexive proceduralism approach is extended by proposing that the use of ICT to support any particular decision procedure should follow an additional set of principles, in order to maintain and/or enhance democratic principles.

9.5. Principles for use of ICT in democratic processes

As argued in previous chapters, the use of ICT in decision procedures may not always apply democratic principles such as transparency. Therefore, some additional principles are needed covering the use of ICT in the development and operation of democratic processes and applications. Their main purpose is to ensure that appropriate ICT is used to apply the democratic principles described previously, by definition this being electronic democracy. These ICT principles should be followed by the people responsible for the acquisition, development, implementation and operation of systems for democracy using ICT.

Four principles are proposed; one relates to technology, and three relate to standards, people, and organisations. However, as with the democratic principles described previously, these ICT principles have flexible boundaries and there will be some overlap between them. The principles are:

1. Use appropriate technology
2. Use open standards
3. Follow systematic and rigorous development processes
4. Provide superior governance

As noted in chapter 8, Saward defines principles as things that we do. Likewise, these ICT principles are also things that we do, in this case ‘we’ being the designers, implementers and operators of ICT systems for democratic processes. Unlike Saward, these new principles include a verb in their wording to reinforce the point that these are actions.

9.6. Principle 1 – Use appropriate technology

appropriate technology n. (a) technology considered suitable for a particular application; an instance of this; (b) technology in general, or a particular technology, that is designed to take account of the social,
economic, and environmental circumstances in which it is employed, often aiming to meet a specific practical need, and typically (in developing countries) utilizing locally available resources and cheap or renewable energy sources (OED, 2008).

This definition of appropriate technology is relevant to the use of ICT for democratic purposes, for both developed and developing countries. Taking account of social, economic and environmental circumstances, using local resources, and considering the energy requirements of ICT are fundamental to this principle. This principle also has to support the democratic principles described previously in section 8.3.

Chapter 5 identifies the components of ICT as computers, digital communications equipment, radio and television, including digital radio and television, mobile telephony, and the recent portable consumer devices such as laptop computers, Personal Digital Assistants (PDAs), and digital video cameras. It was noted that its growing functionality, ubiquity and relatively low cost would be attractive to the designers of systems using ICT products to support democratic processes, but this opportunity raises some questions. For example, are these products, and particularly their software, secure and reliable enough to be used for electronic voting; and will the small screens and keypads of mobile devices be a hindrance or risk to their use for voting? It is also important to remember that software is a critical component of this technology, and software is frequently the component that fails in ICT systems.

ICT systems for use in democratic decision procedures are not complex compared with many applications in other fields, and do not need rich functionality. However they do need to be reliable, secure, transparent, and easy to use. Typically their functions include data management, data communications, citizens communications (eg. e-mail), information presentation and retrieval (eg. web sites), voting and vote counting. All functions should to be easy to use, and the last two functions need the highest levels of security, reliability, and transparency. In fact, a main purpose of this first ICT principle could be summarised as being to resolve the shortcomings and enhance the benefits of electronic voting systems, as described in chapter 7. To address these issues, ‘appropriate technology’ in this ICT principle falls into four categories.
9.6.1. Appropriate hardware

To ensure political equality and inclusion, the selection of hardware for public systems, eg. e-voting systems at electronic polling places, should focus on usability, with special consideration of elderly and handicapped people. For example, for an electronic voting system in Australia, touch screens were excluded from the specification because blind voters have trouble using these devices, and an audio module was implemented instead.

For political equality and inclusion, systems which receive on-line input, for example from citizens participating in an on-line petition, should be designed to be hardware vendor independent, and not rely on particular products or versions of a product. Therefore, systems using input from home computers should work with both Apple products and the IBM PC, including clones, and be capable of working with older versions of home computer hardware. This approach would also apply the transparency principle.

9.6.2. Appropriate auditable software

A major requirement of any voting system is that all parts of the process are transparent and open to scrutiny, to engender voters’ trust in the process. This requirement applies equally to both manual and electronic voting systems. Transparency is especially critical in electronic voting and vote counting software, which could be either proprietary products or custom built for a particular electoral authority, or a combination of these.

For political equality, inclusion, and transparency, systems designed for citizens participation should be able to accept input from a number of software products or versions of a software product, and this particularly applies to web browsers.

The great majority of software products are proprietary, and therefore their technical details and source code are kept from public scrutiny. This situation reinforces the invisibility factors described previously, and applies to system software to operate the hardware, as well as the software for running the vast majority of applications. These products are usually referred to as packaged software, and are generally purchased on magnetic media, or on-line by downloading the product from the vendor. Users pay for the right to use this software under some form of commercial licence, usually called the end user licence agreement (EULA).
The EULA problem

When packaged software is being installed on a computer, the first thing the user must do is to agree to the terms of a software licence. This is done by indicating acceptance on the computer at the start of the installation process. If acceptance is not given the software will not be installed, and the user may not be reimbursed for the cost of the software. Therefore, the usual practice is to accept the agreement, regardless of the terms and conditions. Typically these terms include a statement to the effect that the product has no warranty, nor even a guarantee that the software will work on the user’s computer. In fact, the licence disclaims any right to merchantability.

Trade practices legislation requires that a product be of merchantable quality, meaning it is fit for the purpose for which it was bought. If the terms for use of any other product included such statements, it is likely that no one would buy it. If a product has serious fault or failure, there are processes for product recall, and the vendor of the product could possibly be charged under trade practices legislation.

The producer of a proprietary software product can often exert considerable power over its customers, the software users, in terms of insisting that they upgrade to later versions of the software, and/or to pay licence fees in various forms for the life of the product. In addition, the capacity for the software to be improved may be limited by the efforts of the producer. This may cause problems for users, for example if the product is discontinued or the producer goes out of business. In addition, some proprietary software may not be considered reliable enough, and usually will contain functionality which is not required for the system being developed.

The EULA issue is difficult to address because it is such a common practice. The developers of systems for democratic processes should be aware of this issue and make appropriate decisions about the software they choose, particularly for voting and vote counting systems.

Software audits

To ensure transparency of software products the software should be audited by an independent authority. However, this audit requirement may preclude the use of proprietary software; because of intellectual property requirements, and/or if such software is being used in a country different from that of the vendor.
The developers of eVACS\textsuperscript{®} have created an arrangement which allows their proprietary software to be audited, and which also protects their property rights. At the same time, the integrity of the software is maintained and the possibility of election fraud is reduced. Election agencies which purchase this certified product receive the source code for independent inspection, but they will not be able to modify it. Any modifications must be done by the company following strict procedures, and the modified product must be re-certified by an approved body (Boughton and Boughton, 2005).

**Open source software**

For the development of this type of software the source code of the product (the program instructions written in a readable and understandable form) is available online, and any programmer who wishes can participate in its development by reviewing the program and propose improvements and corrections. Open-source software is protected by a public licence, and the source code is available for public scrutiny.

Open source software is generally used in products for operating system and data communications functions. Since the source code for such products is available under a public licence, it provides transparency and the developers have the ability to remove unnecessary functionality if required. Software for voting, vote counting and other specific products for democratic systems could also be developed using the open source method, as was the case with eVACS\textsuperscript{®}.

However, at a certain stage, extra processes would be required to enable an electoral authority to remove a specific version of this software from the development stream, place it under separate strict control, conduct the independent audit and inspection, then keep it locked and available for use as required.

The argument that software for democratic purposes is required to be of high integrity appears in section 9.1.2, and development processes for this software should be similar to those used for critical systems, such as aviation software. ICT principle 3 requires that an ethical engineering approach by qualified professionals be taken. There is no guarantee that those involved in the open source software development movement have the required professional qualifications. There may also be doubt about the qualifications of some of those engaged in the non-open source development environment. In this latter case however, it is easier to check qualifications and take any remedial action.
9.6.3. Appropriate electronic communications

The widespread availability and use of the Internet and World Wide Web has resulted in the suggestion that these technologies herald the start of a new age of democracy, enabling on-line participation, deliberation, and citizens interaction with their representatives. While these democratic activities can be enhanced through the use of ICT, circumspection is needed on how the Internet should be used, because the democratic principles may be undermined through its use.

For example, ensuring transparency when using the Internet is a major issue. That is why it should never be used for on-line voting, as argued in chapter 7. However, the internet, the underlying communications infrastructure, could be used in the future to assist transfer of votes from polling places to the vote counting system, using secure leased lines, or a similar approach.

Likewise, it might be thought that the democratic principle of expressive freedom could be applied on the Internet as an electronic public space, where anyone can freely meet with their representatives to exchange and discuss ideas. What happens however is very different from that which occurs in a physical meeting place. At a public meeting there would be immediate interaction between citizens and their representatives; there would be side discussions to clarify points; and the representatives would be pressed to answer questions and explain their actions at the time.

At an Internet political meeting, any side discussions between participants would be difficult but not impossible. Also it is quite possible that the representatives are not actually ‘attending’ the meeting, and it is their staff who answer questions posted on-line. It could be argued that it is a common practice for politicians just to sign the letters replying to constituents’ enquiries, and it is the staff who write the reply; and there is no real difference for an on-line meeting. If that is the case, there seems to be no point in having an on-line meeting with a representative. Such a meeting is an example of the use of ICT in section 5.5.2, where there is reference to Coleman’s point about the need to avoid the use of ICT as a distraction or a ‘cosmetic substitute’ for real interaction. (Gibson and Ward, 2000, p97).

These Internet social networking systems are not transparent or inclusive, and they appear to be set up more for marketing purposes than any sense of community service. Visitors to these sites are plied with repetitive product advertisements, something that does not happen in open public political meetings.
Beetham, describing digital democracy, states, ‘its basis is a technology of communication, involving the Internet and other computer-based applications, which is market-driven, and not intentionally democratic’ (Beetham, 2005, p 150).

Therefore this ICT principle would be supported by the establishment of an organisation such as a Civic Communications Cooperative (CCC). As noted in chapter 5, Barber proposed such an organisation with the charter to ‘take primary responsibility both for the constructive civic uses of the new telecommunications technology and for protecting individuals against media abuse from the private and public sectors’ (Barber, 1984, p277). This was before the establishment of the Internet, and Barber was particularly referring to commercial cable television in the USA, citing the BBC as a model for this new cooperative.

Barber envisaged the CCC to be an independent and publicly controlled organisation, with the mandate ‘to promote and guarantee civic and democratic uses of telecommunications, which remain a vital public resource’. It would operate alongside existing private media organisations and would not have any regulatory powers over them. Several of the CCC’s aims relate to a responsibility for televising civic events and public activities of civic interest such as debates, hearings and trials. In Australia some of these types of service are provided by the public broadcaster, the ABC, and occasionally by commercial outlets.

Another proposed aim of the CCC is ‘regulating and overseeing all electronic polling, voting, and other forms of public choosing’. In Australia, regulating and overseeing voting are the responsibilities of the Australian and each state and territory electoral commission, and the other aspects could also be handled by these bodies if required.

Barber’s argument is that an organisation separate from the commercial communications media companies is needed because democracy is too important to be considered as just a part of their entertainment offerings. While Australia is not as extreme as the USA in this regard, the privatisation of the national telecommunications authority, the introduction of competition in this area, and the growing dominance of the Internet, suggests that an organisation such as the CCC in Australia and elsewhere is worth further consideration.

This could be a new separate institution, or it could be a part of the Australian Electoral Commission, perhaps renamed as the Australian Democracy Commission. Such an independent organisation could help to establish processes
for citizens participation, including the use of ICT, in the same way that Australia’s electoral systems have been established by its electoral commissions.

To summarise, using ‘appropriate electronic communications’ means that citizens should communicate with their representatives and each other, and participate in other democratic activities, using communications services which are transparent, and are independent of commercial interests.

9.6.4. Appropriate use of technology in democratic devices

The devices described in chapter 8 could use ICT to support their functions. However, a point stressed in this thesis is that ICT should not be used just because it is available.

It is sometimes argued that since commercial services such as on-line banking or on-line gambling are used regularly, then, it is acceptable to implement on-line voting. This argument is false because voting systems are not like banking systems. Recovery from failure of these commercial systems is possible because of the availability of records of customer accounts, there is a transaction trail linking the customer with the transactions, and extensive back up and recovery procedures are available. Voting systems do not and should not keep records of voters with the votes they cast.

Basically, the list of devices shown in section 8.4 will require systems for the following:

a) voting for representatives;
b) voting for decisions, eg. in a referendum;
c) selecting citizens to participate, eg. by ballot;
d) citizens participation, eg. in petitions, debates, deliberative opinion polls, and citizens juries;
e) information management and retrieval; and
f) communication between citizens and representatives.

Representatives in a) above would be the elected members of parliament or assembly. There would also be citizens who have specific participatory roles, as in c) above, for example specialists from institutions, democratic opinion poll participants, and others. Some of these could be volunteers, and others might be selected by ballot.

Some of the systems could use existing ICT-based services, such as e-mail, browsers, and the websites of government agencies and other institutions. Other
systems, such as those for deliberative opinion polls and petitions may already be available, or may have to be custom-built.

The design of any of these systems should address requirements, especially for values, at the lowest practical common denominator. The ICT used by system developers is likely to be reasonably modern, but citizens may still be using late 20th century computers, quite happily and successfully. Design and testing processes need to take this situation into account, to ensure that, within reason, these citizens can use their own technology to participate in their democracy.

Regardless of the care taken and the methods used, it is inevitable that there will be defects and problems with ICT systems developed to support democratic decision procedures. Therefore it will be important to provide reliable problem reporting and feedback mechanisms to enable defect resolution and the implementation of corrections and improvements. This facility should go beyond in-house defect and problem reporting systems, and include functions to enable all citizens to provide feedback on the use of the system.

It will also be important to provide comprehensive instructions on the use of the system to the operations and support staff as well as to users, and since these instructions will probably be on-line, they will present other challenges to incorporate essential values such as accessibility, usability and reliability.

The digital divide

The early chapters of this thesis describe the contention between the ideas of democracy, and between the ways democratic systems might be implemented. Over a period of several hundred years, issues such as how a ‘citizen’ is defined, and who should be allowed to elect parliamentary representatives have mainly been resolved. Section 3.4.4 describes some outstanding issues for Australian citizenship. Certainly, the vast majority of citizens have the rights to vote for their parliamentary representatives and participate in the democratic activities of their society, regardless of their gender and wealth. Often these rights were won against strong opposition, and it would be difficult to take them away. However, in some instances, the use of ICT in democratic systems could have that very effect, because of what is known as the digital divide.

The term ‘digital divide’ refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard to both their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide variety of
activities. The digital divide reflects various differences among and within countries (OECD, 2006).

The ‘various differences among and within countries’ are sometimes referred to as the global digital divide, and the local digital divide, respectively. The local digital divide with respect to electronic democracy is of concern here.

This ICT principle - use appropriate technology – requires that the developers of democratic decision procedures using ICT should recognise that there is wide variation in the computer equipment used by citizens, and make some allowance for it. This would ensure that some people are not disenfranchised because the equipment and software they use is not compatible with the decision procedure. For example, a system to enable citizens to contribute to a discussion on a policy topic should recognise the wide range of browser software in use.

However, some people do not own a computer because of the cost. Others may not have one, elderly people for example, or just because the person chooses not to own such technology. In these instances it would be necessary to develop hybrid systems for some of the democratic devices, in order to ensure that the principles of political equality, inclusion and expressive freedom are applied. These hybrids might include paper-based and other manual systems as backups in case of technology failure, and as alternatives to technology-based systems for citizens who do not have, or choose not to have the appropriate ICT equipment and software.

9.7. ICT principle 2 – Use open standards

9.7.1. The purpose of standards

‘Standard’ is used here as ‘a definite level of excellence, attainment, wealth, or the like, or a definite degree of any quality, viewed as a prescribed object of endeavour or as the measure of what is adequate for some purpose’ (OED, 2008). It is usually a published document, either hard copy or in electronic format.

In the context of ICT, standards have many uses as a ‘prescribed object of endeavour’, covering both the product being made and the processes for making it, such as:

a) providing functional and non-functional requirements of a product;

b) defining the protocols to enable communication and operability between technical products;

c) describing life cycle models to guide the development process;
d) guidance for project management, systems development and implementation;

e) requirements for establishing quality management systems;

f) support and guidance for education and training; and

g) to provide artefacts such document templates and checklists.

As a ‘measure of what is adequate’, the same standards can be used in an audit process, to assess whether the product meets the defined requirements, and/or the defined process has been followed. Other standards exist to define this audit process.

Standards should be used because they reflect the knowledge, wisdom and experience of many people who have worked extensively in the area covered by the standard. The process of writing a standard is democratic to some extent because there is often a voting process before it is published, and this formal acceptance provides the standard with a level of authority which is generally accepted by its readers.

9.7.2. Why use open standards?

In this ICT principle, an ‘open standard’ means one which has been produced by:

a) a national or international body, such as Standards Australia or the International Standards Organisation;

b) an industry consortium, such as the Organization for the Advancement of Structured Information Standards (OASIS); or

c) a professional body such as the Institute of Electrical and Electronic Engineers (IEE).

These organisations have extensive committee and working group structures to manage the content and production of standards, and there is an on-going process of review, improvement, and amendment to their products. These organisations are also well regarded because they are seen as being independent, which adds to the authority of the standards. Because of this authority and independence, a standard from one of these organisations can be invoked in a contract, and both parties will usually accept the requirement that this standard be followed.

The alternative to an open standard is a proprietary standard, that is one which is developed and owned by a private company. Such standards usually only apply to technology products, although process standards need not be excluded.
Current examples for software are the operating system and office products from Microsoft, which have become *de facto* standards because of their market dominance. This market dominance can be so strong that it excludes possibly better alternative products. Proprietary standards are also improved and updated, but these changes may be to maintain market dominance.

This ICT principle does not advocate the use of proprietary standards for ICT, but their use cannot, and should not be completely excluded. The use of a proprietary standard should be governed by its use in the particular decision procedure being developed. Proprietary software products can support the democratic principles of political equality and inclusion in a participatory procedure; but they are most unlikely to support transparency in a voting procedure.

Within ICT principle 2 there is a vast array of open standards to support:

a) the technology and products required in ICT principle 1;

b) the development processes required in ICT principle 3; and

c) the governance requirements of ICT principle 4.

9.8. *ICT principle 3 – Follow systematic and rigorous processes*

This principle enables people to perform the previous ICT principles covering technology and standards, and it provides more of the answer to the ‘how’ of the research question, with respect to processes.

Its basis is the Institute of Electrical and Electronics Engineers definition of software engineering

the application of a systematic, disciplined, quantifiable approach to the development, operation and maintenance of software, that is, the application of engineering to software (IEEE, 1990).

A ‘systematic, disciplined, quantifiable approach’ would equally apply to other aspects of ICT development besides software. However the focus on software is appropriate because this is often the weak link in any ICT system. ICT hardware is generally very reliable because its design, manufacture, and quality management have well established processes which are rigorously followed. Also, there is a competition factor for many of these products, which is not as strong with software, particularly for system software such as the operating system, e-mail, communications and Internet browsers.
9.8.1. The need for systematic and rigorous development processes

Generally, the broad aims of software and systems development projects are to deliver the product on-time, on-budget, with acceptable quality. ‘Acceptable quality’ means the system meets its requirements and other specifications and standards, and has a minimum or acceptable number of defects. These are obviously worthy aims, but there is, or should be, more to be delivered. Delivering the product to schedule and budget could just be considered as part of the requirements, and may not be relevant or of interest to all stakeholders. Some stakeholders might expect certain values to be incorporated in the system, for example:

a) *accessibility* for people with special needs;

b) enhanced *useability* through comprehensive error messages and ‘help’ functions;

c) *portability* to enable the system to operate across a range of hardware.

To include these values in the final system, they must be translated into specific technical requirements, and included with all of the other requirements in a specification, in the early phases of a project. The cost and time required to deliver each requirement must be estimated, and identified in the budget and schedule. The project team must follow established development and project management processes. A wide range of standards are available for these processes, but they are not always followed for a number of reasons, perhaps related to a lack of education, training and good management.

Adopting poor and/or unethical practices to cut costs so as to be first to get a product to market, or to meet a deadline, can result in poor quality products and services, and dissatisfied customers. Examples of poor practices are producing an inadequate or incomplete design; cutting corners in the development process such as not conducting reviews and incomplete testing; and ignoring proper estimates and then setting a low development budget.

A recent survey in Australia asked ICT professionals what they thought were the most important ethical problems facing the ICT industry. The percentage of respondents who identified the following issues is:

- Compromising quality to meet deadlines: 54.9%
- Unprofessional Behaviour: 49.7%
- False Promises: 44.8%
Conflict of Interest 42.2%
Compromising user requirements to meet deadlines 29.9%
Compromising functionality to meet deadlines 29.6%

(Lucas and Weckert, 2008)

These issues reflect what is often called the ‘software problem’, resulting from straightforward software development methods being ignored, and a minimum focus on the basic financial values of schedule and budget.

Not all software is produced by teams which ignore reliable development methods; if it were, people would not use air travel for example. One of the reasons for the success of aviation software is that it is built by qualified and experienced teams using engineering principles.

The introduction to this chapter described aviation software as safety-critical, and it was argued that software for decision procedures could be called democracy-critical, and both types of software must be of high integrity. Therefore the development processes for both types are similar, in that they must be built following the application of a systematic, disciplined, quantifiable approach to the development, operation and maintenance of software, that is the application of engineering to software, to repeat the IEEE (1990) definition. Since engineering is a profession, systems for democracy should be developed by professionals.

9.8.2. Professionalism

Many of the people in the ICT industry would consider themselves to be ‘professionals’. One definition of a ‘profession’ is:

A profession is a disciplined group of individuals who adhere to ethical standards and hold themselves out as, and are accepted by the public as possessing special knowledge and skills in a widely recognised body of learning derived from research, education and training at a high level, and who are prepared to apply this knowledge and exercise these skills in the interest of others.

It is inherent in the definition of a profession that a code of ethics governs the activities of each profession. Such codes require behaviour and practice beyond the personal moral obligations of an individual. They define and demand high standards of behaviour in respect to the services provided to the public and in dealing with professional colleagues. Further, these codes are enforced by the profession and are acknowledged and accepted by the community.

(Professions Australia, 1997)

Using a detailed definition of ‘profession’ avoids the confusion of ‘professional’ being used as an adjective as well as a noun and, more importantly, identifies a
number of special conditions which help to distinguish a ‘profession’ from an ‘occupation’. From the definition above, a professional is a member of a disciplined group of individuals.

The Australian Computer Society is one such group, which represents the people working in the ICT industry, and the ACS is a member of Professions Australia. However, unlike doctors and lawyers for example, Australia does not require ACS members to be registered or licensed, and membership of the ACS is voluntary. Many of the people in the ICT industry do not belong to the ACS, but would still consider themselves as professionals.

The definition above is for a profession, and ‘professional society’ is not mentioned. The requirement is ‘a disciplined group of individuals who adhere to ethical standards’ and so on. Therefore, a group of individuals working in the ICT field in the same company, government agency or consulting/contracting organisation, and who fulfil the other requirements in the definition, could consider themselves as professionals in the sense being considered.

The definition states that training and education are required to enable people to gain special knowledge and skills. This informs the recruitment policies of the group. Guidance for the application of the groups’ skills and knowledge, and for its work behaviour and culture can be found in codes of ethics, and standards of professional conduct and practice, which are readily available. These could be adopted by the organisation, which could also devise and enforce its own disciplinary process.

Such an approach would be considered as part of the governance system of the organisation, and standards and guidance are available for organisations to establish such a system.

9.9. **ICT principle 4 – Provide superior governance**

While ICT principle 3 defines the responsibilities of systems developers, principle 4 is mainly the responsibility of the directors and managers of the organisations which develop decision procedures, and the organisations, such as the electoral authorities, which operate them. Its prime purpose is to support transparency by ensuring that accountability can be ensured throughout the life of any democratic decision procedure.

In 2003, Standards Australia published the AS 8000 series of standards on Corporate Governance, covering:
a) good governance principles;
b) fraud and corruption control;
c) codes of conduct for the organisation;
d) corporate social responsibility; and
e) whistleblower protection.

This series was followed by the publication of AS 8015, covering the governance of ICT in an organisation (AS8015, 2005); and a draft of a standard focusing on governance of ICT projects was released for public comment in July 2008 (AS 8016, 2008). All of these standards would provide extensive support and guidance to this ICT principle 4.

In these standards, governance for corporations is defined as ‘the system by which entities are directed and controlled’, and an entity can be a ‘company, government department, government body or not-for-profit organization’ (AS 8000, 2003). Therefore, an electoral authority is an entity, and relevant governance requirements from these standards would apply, including the governance of the ICT it uses.

The corporate governance of ICT ‘involves evaluating and directing the plans for the use of ICT to support the organization and monitoring this use to achieve plans. It includes the strategy and policies for using ICT within an organisation’ (AS 8015, 2005). In the case of an electoral authority, ‘using ICT within an organisation’ would cover all electoral systems, for example voting and vote counting systems as well as the systems for election management. The organisations responsible for developing the ICT systems would also follow these governance standards.

The objective of this fourth ICT principle is to provide another level of trust and accountability to these systems, and to their application to democracy.

9.10. The relevance of these principles

It might be said that these principles are stating the obvious, and surely all significant software and systems development should follow them. That is true, but research by the Standish Group has shown that in 2006 the success rate for projects being completed on time, on budget, and meeting user requirements was only 35% (2006 Chaos Report, cited in Rubinstein, 2007). This statistic mainly reflects the low success rate of ICT principle 3 being followed.
Other sources propose combinations of the four principles. For example, the World Summit on the Information Society conference made a Declaration of Principles for building the information society (WSIS, 2003). These principles have a number of objectives, including to ‘address the ethical dimensions of the Information Society’ (clause 19). Good governance and democracy are recognised with other attributes, at all levels, as being interdependent and mutually reinforcing (clause 3); and the need for governance of the Internet is specifically identified (clause 50). The use of ‘open, interoperable, non-discriminatory and demand-driven standards’ is stressed (clause 44). The possibilities offered by ‘different software models, including proprietary, open-source and free software’ should also be considered (clause 27). However, no other sets of ICT principles for the development of democratic processes, which included all of those proposed in this chapter, could be found.

**9.11. Revisiting the case study**

The case study in chapter 6 on electronic voting in the USA, described a number of problems with the use of technology to conduct elections, and a number of best practices which had been identified to address these problems. The material revealed that the technology aspects were, in some respects, symptoms of deeper problems in the planning, acquisition, development and operation of the election systems in the USA at that time.

It is appropriate to compare the four ICT principles with the KSG best practices, to confirm that these principles would cover all of the best practices. This section relates the principles described above to the electronic voting best practices described in chapter 6. To reiterate, the four principles are:

1. Use appropriate technology
2. Use open standards
3. Follow systematic and rigorous development processes
4. Provide superior governance

### 9.11.1. Theme 1

**Certain immediate steps must be taken.**

1.1. Election Assistance Commission and National Institute of Standards and Technology open standards must be developed and implemented.
1.2. Voting experts and technologists can aid in whatever voting process is used by designing guides, working in polls and gathering trustworthy data.
Principle 2, on open standards, applies directly to practice 1.1. Principle 3 is applicable to practice 1.2 because the production of training material is part of the development process; and some of the data gathered could be used for process improvement and other quality management activities.

9.11.2. Theme 2
A hybrid of paper and electronic systems provides an effective voting system

| 2.1. Electronic interfaces enable customizable ballots by precinct, party or disability. |
| 2.2. Electronic Systems can meet the widest range of accessibility needs. |
| 2.3. Voter verification of a paper ballot allows the greatest degree of confidence that the ballot was cast as intended. |
| 2.4. A paper ballot, when handled properly, allows a robust audit trail for a recount to ensure that the ballot was counted as cast. |
| 2.5. Hybrid systems can be designed to accommodate provisional arrangements and contingencies for equipment failure. |

Principles 1 and 3 would apply to all five practices, since they refer to systems design using appropriate technology.

9.11.3. Theme 3
The process is as important as the underlying technology.

| 3.1. Poll workers should be well trained to fully understand the interface and contingency plans in case of failure. |
| 3.2. The educational process for given technologies must follow a ‘chain of trust’ where the election workers trust their trainers and are trusted by the public. |
| 3.3. Poll workers should be well-chosen from a motivated pool with appropriate incentives. |
| 3.4. Poll workers should not have to rely solely on the vendors to address observed errors. |
| 3.5. There should be adequate time for determining the official tally. |
| 3.6. Speed and accuracy in the process are both achievable, but not simultaneously possible. |
| 3.7. There should be provisional voting mechanisms, and adequate time to evaluate provisional votes for the final tally. |
| 3.8. There is an inevitable trade-off between authentication of voters and access. |

Principle 3 directly applies to all of these practices, because they address the design of the voting system, including its operation on Election Day and the training of the poll workers.

Principle 4 is also applicable, because there is a component of governance in three of the practices. The selection of staff (3.3), the role of vendors 3.4), and responsibility for the authentication of voters (3.8) are the responsibility of the electoral authorities, and therefore are governance functions.

9.11.4. Theme 4
Good voting systems require good design standards.
Principles 1 and 3 directly apply to all of these practices, because they refer to appropriate technology; and the design, development, testing and quality attributes of the system.

Principle 2 is applicable to practice 4.4, because testing and security would include the use of open standards.

**9.11.5. Theme 5**

*Transparency builds public trust and supports legitimate elections.*

5.1. If underlying mechanics or software are not in the public domain, they must at least be available for inspection by the larger security community.
5.2. All security issues should be fully disclosed, although allowing vendors a limited, fixed time between notification and public disclosure could foster more public trust.
5.3. The voting technology acquisition process should be open for public scrutiny from constituents.
5.4. The voting technology acquisition process should be open to allow jurisdictions to learn from each other. Records of difficulties should be made available to all election officials.

Principle 4, on governance, applies directly to all of these practices.

Principle 1, covering appropriate auditable software, is applicable to practice 5.1.

Principles 1, 2, and, 3 apply in the acquisition practices (5.3 and 5.4), because these three principles would be used in the evaluation of the vendors and/or the products being considered.

**9.11.6. Theme 6**

*Election systems must have built-in auditing capability.*

6.1. The reconciliation process must be clear, precise, authoritative and binding.
6.2. The cast ballot must follow a “chain of custody” from the moment it is cast to the moment the vote is entered into the final official tally.
6.3. If some metric of voting irregularity is exceeded in a given jurisdiction, a court-supervised manual recount should be required.
6.4. Auditing should not be implemented by a vendor affiliated with the original system.
6.5. Equipment testing does not displace the need for outcome auditing.

Principle 4, covering governance, applies to all of these practices.

Principle 3, applies to practices 6.1, 6.2, and 6.5, because they include aspects of design, development and testing.

This simple comparison indicates that the twenty-eight best practices identified in the USA are covered by the four ICT principles developed in this
thesis. A further point to note is that the focus of the best practices is on electronic voting and counting, while the four principles address the use of ICT in any system for electronic democracy.

9.12. eVACS® and the ICT principles

The design, development, implementation and operation of the ACT system called eVACS® are described in various sections of chapter 6. This system development took place before the ICT principles had been formulated. However, to conclude this section on the relevance of the ICT principles, these activities are summarised below, to indicate how the four ICT principles were applied in this development project.

1. Use appropriate technology

The interface for citizens to cast their votes was a simple keypad and barcode reader, modelled on the ATM interface which many citizens use. Touch screens were excluded, because of advice from the blind community. Blind voters used an audio module with the keypad/barcode combination. Those with partial sight had access to a large screen display. On-line instructions to use the system were in English and eleven other languages. The voting system at each polling place was a closed network, without access from external networks. For reliability and security, the system required minimum interaction with polling place staff for set-up, operation, and shut down at the end of polling. Reliability was provided by using redundant hardware. Security of barcodes and vote information is provided by encryption and passwords, and the storage and transport of magnetic media containing vote information was at least as good as that provided for paper ballots.

2. Use open standards

The operating system was a cut down version of Linux, with no log-on capability. The IEEE documentation standards for software engineering were used for project and quality planning, configuration management, risk management, requirements and testing. The Electoral Commission requirements included an independent audit of the final system, and thus the use of proprietary software was precluded from the design of the system.
3. **Follow systematic and rigorous development processes**

The development processes followed the documented plans mentioned above. The project plan required that all requirements be fully understood and documented, before starting programming. This was achieved through extensive discussions with the electoral office staff, who signed off the documents. Each software module and its test program were written at the same time, which resulted in the more efficient integration of modules and a comprehensive test suite for system testing. As the project neared completion, the development team met frequently to check progress, raise problems and allocate resources as necessary.

4. **Provide superior governance**

The Electoral Commission processes had ensured transparency in previous paper based elections, and they extended this practice to the development of the electronic system. The amendments to the Electoral Act to cover electronic voting and counting provided a framework in which the technical and operational requirements would fit. The Electoral Commission established a Reference Group with representatives from the political parties and community groups. This group received progress reports and demonstrations on the electronic system, and members could take copies of the software for inspection by their technical advisors. The final version of the system was inspected by independent auditors. The Commission, the system developers, and other contractors worked closely together to ensure progress and address any problems. The directors of the system development company provided extensive oversight to the development team, including contract staff. A clause in the company’s Quality Policy states ‘to perform all of our activities ethically’.

9.13. **Summary and conclusion**

The purpose of this chapter is to answer the second meaning of ‘how’ in the research question, referring to the processes used by developers to implement ICT-based systems.

The reasons for considering the systems for democratic processes as being public systems of high-integrity led to the conclusion that these systems should be developed in an ethical way, and include human values. The description of computer ethics includes the need to recognise that the rapid change of much technological innovation is often ahead of the development of policies for the ethical
use of that technology, resulting in a policy vacuum. These policy vacuums occur regularly with ICT, particularly because of the invisibility factors of software.

The developers of ICT systems have a responsibility to minimise the effects of policy vacuums, and there is a number of techniques that can be used to assist them to do this.

In chapter 8, the approach of reflexive proceduralism is used to define decision procedures which focus on democratic principles, as a way to resolve the differences and contestation between models and ideas of democracy. That approach has been extended in this chapter to consider how the use of ICT in decision procedures could support and enhance those democratic principles. It is argued that ICT should be adopted with care, to ensure that democratic principles are not diminished. Four principles for developing ICT in systems for democracy are described, which advocate a professional approach to the development of systems which use of appropriate technology following open standards, within a strong governance framework.

It might be argued that these four ICT principles put unfair and excessive restrictions on the developers and vendors of software, systems and technology. However, the developers of safety-critical systems accept this discipline, and the developers of other high-integrity systems should do the same. If technology is to be used to apply democracy then democratic principles should continue to be followed, and the primary purpose of ICT should be to enhance these principles.
Chapter 10. Summary and conclusions

In this chapter I summarise the various threads of the thesis, and provide an answer to the research question asked in Chapter 1 - how can the use of ICT in democratic processes provide a society with an improved democracy?

The chapter finishes with a summary of my original contributions to the body of knowledge; a statement on the limitations of the research; and some suggestions for further research work.

10.1. Summary

It is generally agreed that the fundamental meaning of democracy relates to the people being sovereign in some way, that is they rule themselves. Chapter 1 includes a meaning of democracy for the purpose of the thesis which recognises the importance of representative government, and stresses the need for on-going participation and deliberation by the people.

There is contention about democracy in two ways: a) about democracy as an idea; and b) the political reality of democracy - how a democratic society actually operates, compared with a norm of how it ought to operate. The focus of the thesis is the latter area of contention, using the thesis meaning of democracy to describe how a society ought to act.

The first presupposition of the research question, that democracy needs to be improved, is addressed in chapters 2, 3, and 4.

Examples of the historical development and modern versions of democracy are given in chapter 2, which describes the two main groups of democratic ideas. These groups cover the ways that decisions are made either by the people gathered together, or by a small group of elected people’s representatives - briefly democracy by full participation, or by representation. Some democratic societies combine aspects of both positions, as reflected in the thesis meaning of democracy.

Modern democratic societies predominantly follow representative models, and chapter 3 includes details of voting methods and election requirements, to provide understanding of the issues related to electoral systems.

Democracy evolves as societies change. Over about the last thirty years the dominance of market economics and globalisation has impacted on the established representative democracies. This dominance has resulted in a decline of government autonomy, through the influence of business on government decision making;
government capacity because of the influence of global markets and international corporations; and credibility, resulting in a loss of trust by citizens in their governments. Chapter 4 includes descriptions of the ways this disillusion has come about, thus supporting the first presupposition, that democracy could be improved.

**The second presupposition** of the research question, that the use of ICT can improve democracy, is addressed in chapters 5, 6, and 7.

The use of ICT in the management and administration of electoral systems is well established, in the same way that this technology is used in other areas of government and business. Uses of ICT in democratic decision procedures is less common but growing, and is commonly referred to as electronic democracy. Chapter 5 includes the development of ideas about electronic democracy, including examples of recent projects using ICT for participation by citizens in local government activities. In this chapter the role that the Internet might play in a democratic society is considered.

The use of ICT to support voting and vote counting processes is being used in several countries, with varying success. A case study of electronic voting systems used in the USA and Australia is provided in Chapter 6, through the analysis of proposed best practices for electronic voting.

Remote voting means that citizens cast their vote in ways other than attending a polling place on election day. The use of ICT has been suggested for remote voting, including voting by telephone, and the Internet. The shortcomings of this use of ICT are described in chapter 7, together with the shortcomings and benefits of other uses of ICT in electoral systems.

*Political equality, inclusion, expressive freedom,* and *transparency* are democratic principles which should be applied in democratic decision procedures. In chapters 5 to 7 it is shown that there are benefits from the use of ICT in electoral systems, for example through the ability of this technology to enable disabled people to achieve political equality and inclusion, by being able to vote in secret. The use of ICT to provide fast and accurate vote counting, particularly in complex election systems, is another advantage. However, there can also be disadvantages with the use of ICT, in that democratic principles can be violated. The invisibility factors of software can give rise to a lack of transparency in electoral systems, thus increasing risks of undetected election manipulation and fraud. Using ICT could also result in a conflict between democratic principles. The use of Internet might be
advocated as a way to apply political equality and expressive freedom, but the Internet violates the principle of transparency, by its very nature.

The Internet has a profound impact on the way that business, entertainment and education are conducted, and there are many benefits from its use in these areas. However, its successful use for on-line banking or gambling does not guarantee that the Internet can be successfully used for on-line voting, and arguments against the use of the Internet for this purpose are provided in chapter 7.

ICT can be used in a decision procedure for any model of democracy, but care must be taken to ensure that this use does not violate democratic principles. Therefore, the definition of electronic democracy used in the thesis is the use of ICT to apply democratic principles. The ICT industry is always looking for new applications for its technology, and it is not surprising that its use in democracy is advocated. However, the design of a new decision procedure should come first, and the use of ICT, if any, should then be identified. Therefore, the second presupposition, that ICT can contribute to improvements in democracy, is supported, but with qualifications.

There are two aspects to the research question asking how ICT could be used to improve democracy. The first meaning of ‘how’ relates to which components of ICT could be used to support a democratic decision procedure, when considered as a product. The second meaning of ‘how’ relates to the design, development and operation of a democratic decision procedure using ICT, that is what process should be followed.

Chapters 8 and 9 provide the analysis and answers to the research question, leading to the conclusions of this thesis.

10.2. Conclusions

A focus on the four democratic principles identified above can provide an ethical framework within which to design a new decision procedure, or improve an existing one. This approach is called reflexive proceduralism, and chapter 8 describes the way it could be used to resolve some of the differences and contestation between models and ideas of democracy. An example of a simple decision procedure to enable citizens to participate in the development of their electoral legislation is provided. The procedure provides ways for some citizens to deliberate of the issues involved, and all to provide their consent to the legislation; this is a method in line with the thesis meaning of democracy.
One reason why current ideas about democracy include increased citizens participation is the recognition that ICT can help this to happen. ICT can enable people to receive relevant and up-to-date information; and communicate more easily and quickly with each other and their representatives. The application areas in which ICT has a role in the decision procedure example above are also identified in chapter 8. Detailed descriptions of the applications are considered to be outside the scope of the thesis, but chapter 9 provides further information on how ICT should, and should not, be used appropriately in these applications.

Aviation and similar systems are categorised as being safety-critical, and must be of high-integrity. People would not use air transport if they did not trust the technical people involved, and the aircraft and the processes necessary to build and maintain them. ICT is a major component of this industry, and the development of safety-critical systems is an ethical as well as a technical activity.

In chapter 9 it is argued that democratic processes using ICT must also have high-integrity in their development and operation, in order to engender trust by citizens in these processes. This particularly applies to voting and vote counting systems, which could be categorised as democracy-critical. Citizens must have the confidence that the outcome of any decision procedure is a democratic decision.

ICT should be adopted with care, to ensure that democratic principles are not violated, in line with the definition of electronic democracy stated above. To this end, four principles for using ICT in democratic decision procedures have been proposed, as follows:

a) The procedure, as a product, should use appropriate technology, in terms of the hardware, software that can be audited, and electronic communications; and the people developing and operating the procedure should use

b) open standards, as opposed to proprietary standards;

c) systematic and rigorous development processes; and

d) superior governance of the development organisations and electoral authorities.

This is an ethical approach to the use of ICT.

I started my thesis by using a quotation from Churchill about democracy being the worst form of government except for all of the others. I explained this paradoxical statement by suggesting that we should continue to use this form of government because the alternatives would be much worse, and we can still search
for the best form from the many options available. This thesis is a small contribution to that search for the best form.

The results of the research are relevant and important to the broad ICT community, that is the people who are designers, developers, managers and consultants in the enterprises which make the products using this technology. They are usually not called engineers, but they have the same responsibilities to society that engineers have, in terms of the quality of these products, in the broadest sense of that term. This responsibility is particularly true for software and hardware products which will be used in systems for democracy, currently for voting and vote counting, and to an increasing extent to enable democratic participation.

Democratic systems are slow to evolve, and therefore arranging greater citizens participation is a long-term project, as it will involve significant changes to the culture of societies, and citizens attitudes and education. ICT can assist with this evolutionary process, but care should be taken to ensure that technology does not undermine the principles that make democracy such a desirable idea. The four ICT principles proposed in this thesis can also contribute to this evolutionary process by helping to protect democratic principles. Therefore, ICT can be used to improve a society’s democracy by applying ethical ICT principles which do not detract from democratic principles.

10.3. Summary of the original contributions to the body of knowledge

An initial contribution, in chapter 5, is a new definition of electronic democracy, which recognises that ICT can be used in any model of democracy, and current definitions tended to be circular. The new definition

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\text{electronic democracy means processes which use ICT to apply democratic principles}
\]

relates a specific outcome, the application of democratic principles, to the use of ICT.

In chapter 7 there is extensive analysis of the shortcomings and risks of online voting systems using telephony and the Internet, and the identification of the hazard-points in these systems. These are the points in any voting system where the intention of the voter, as recorded by the vote being cast, has the potential of being disconnected from the vote that is ultimately counted. This analysis has not been done before.
This research has drawn on a number of disciplines, including political science and philosophy, information technology, information systems, and computer ethics. By building on ideas in political science, an approach to the development of democratic decision procedures, called reflexive proceduralism, is extended in chapter 8 to show how ICT could be used in these procedures. This is a different approach from normal, because it requires that the decision procedure is designed in detail first, and then ICT is only used to support democratic principles.

It is argued in chapter 9 that public systems have unique characteristics, which require them to be of high-integrity, in the way that safety-critical systems are; and systems developed for voting and vote counting particularly, should be considered as ‘democracy-critical’. It is argued that these systems should be developed in an ethical way. This leads to my original contribution of the four ICT principles to be applied to the development of systems for democracy. These four principles are:

1. use appropriate technology;
2. use open standards;
3. follow systematic and rigorous development processes; and
4. provide superior governance.

### 10.4. Limitations and further research possibilities

#### 10.4.1. Limitations of the research.

In any research there will be limitations to what can be achieved in the time available and the method used, and the limitations of this thesis are described here. Some of these limitations have been addressed in the following section, covering suggestions for further research.

An initial limitation is that of keeping up to date in a rapidly changing field. Over the time that this research was conducted there were changes in the ideas of practical democracy and politics, not the least being a change of government in Australia. In this case, some of the examples of shortcomings in Australia, such as financial donations to parties, are being considered by the new government.

The main point of the thesis was to use identified problems of democracy, and then consider solutions to these using ICT, rather than to identify new problems using empirical studies. By considering ways to enhance democratic processes using ICT, empirical studies could then be identified. Empirical studies have been included in section 10.4.2, on possibilities for further research.
The development of Internet applications, especially in those for social networking, may have introduced additional opportunities for democratic applications, or ameliorated some of the problems I have identified. Sometimes it was necessary to rely solely only on the print media for reports and commentary for the background of these activities.

The case study material was developed early in the research, and it is likely that other material has been produced to enhance and complement the best practices defined by the KSG report.

Only publications and other research material in English has been included. Given the widespread adoption of ICT and the on-going development of democratic societies, there is likely to be relevant and useful material in other languages, for example from European Union member countries and Brazil, which was an early adopter of electronic voting.

10.4.2. Further research
The solutions to these problems will be related to the particular culture of the society in question. Each society has evolved its democratic processes over many years, and continues to do so. No doubt research will continue into the philosophical meanings of democracy, and political science topics. Research into the products and processes of ICT will also continue. Any further research with respect to this thesis would focus on the overlap between these two major disciplines.

A major limitation of this research, stated above is the lack of empirical studies, including studies into the four ICT principles. Further research could be carried out to examine the practical use of these principles, through the use of focus groups, questionnaires and other surveys in systems development organisations and electoral authorities. This research could also cover the working relationships between these two groups. In addition, further research could cover the practicalities of reflexive proceduralism, and its extension into the use of ICT in decision procedures.

A theme of the thesis has been the use of ICT for democracy related to national or regional governments. However, democratic processes are used for reasons other than electing governments and decision making at any level. For example, forms of democracy are used:

a) for shareholders to elect the directors of their companies;

b) in the workplace, where employees have a role in running their company;

c) when political parties sometimes select their candidates; and
d) in many organizations, from trade unions and professional societies to small associations, to elect their executives and committees.

It could be argued that to be truly democratic, a society would make widespread use of democratic processes in many of its institutions, especially those that overlapped government activities. For example the selection of candidates to stand for political parties, or the election of board members of taxpayer funded national institutions such as the Australian Broadcasting Commission.

The recent global financial crisis supports the arguments about the decline in the democratic standards of western democracies, and reflects the lack of democracy in ‘the market’ and the need for economic democracy. Therefore, future research topics could cover the application of the four democratic principles to a wide range of institutions; and the use of ICT and the ICT principles in these types of democratic activities.

The use of the Internet for voting and other democratic activities has not been favoured in this thesis because of its lack of transparency, and the commercial underpinning of much of its software. Other research topics could cover the development of an economical ICT environment for democratic purposes using the internet infrastructure. This could be used by other democratic organisations such as those mentioned above. It might be called a democratic cyberspace.
Glossary

This glossary defines many of the terms used in the thesis. The number of the section where the term is mainly used is also shown.

*computer ethics* is a discipline which studies the analysis of the nature of and social impact of computer technology and the corresponding formulation and justification of policies for the ethical use of such technology. This definition would still be valid if ‘computer’ is replaced by ‘ICT’ or ‘cyber’ [9.2].

*decision procedure* (thesis definition) is a part of a *process* to achieve the specified end result of a political decision; for example the selection of a representative, or the production of a piece of legislation. The result of a *democratic decision procedure* would reflect the will of the people in some way in the result of the decision [1.3.5].

*democracy* (thesis meaning) as popular power should be seen as a continuous process of interaction between government and society, with a maximum involvement of the people in public decision-making at every level. The substance of democracy is the power of the people to make governments, and make their representatives accede to the popular will and popular demands. The process is participatory and deliberative. Policies are not simply proposed and debated, but are evolved through discussion and by taking into account, as far as possible, the variety of interests and viewpoints expressed by those involved. It is the people, not the government or parliament who are sovereign, and it is the business of government to accept and to implement the popular will [1.2.4].

*democracy-critical* is the description of a system in which a failure of the system could result in a citizen being disenfranchised, or the system is corrupted in some way [9.1.2]. See also *safety-critical*.

*device* a mechanism that plays a part in constituting a more or less formal *procedure* by which binding collective decisions are reached for a political community. Examples of devices relate to systems of representation and methods of voting, deliberation and other ways for participation, and methods of implementation and review of a decision [8.4]. A device is a component of *reflexive proceduralism*. 
digital divide refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard to both their opportunities to access ICT and to their use of the Internet for a wide variety of activities. The digital divide reflects various differences among and within countries [9.6.4].

electronic democracy or e-democracy (thesis definition) means processes which use ICT to apply democratic principles [5.2.1].

electoral system is regularly used either narrowly, to describe various voting methods, or broadly, to describe all the structures and operations that are used to run an election [3.3.1].

hazard, means a source of potential harm, and a risk is the chance of something happening that will have an impact on objectives. For example, in any voting system this could be a point in the process where a voter’s choice could be changed by misinterpretation, omission or corruption, through the operation of software and/or human intervention. An outcome of such an occurrence could be that the intention of the voter (as recorded by the vote being cast) is disconnected from the vote that is ultimately counted [7.1.1]. See also democracy-critical.

hazard-point (thesis definition) is a point in any democratic process which has the potential for a malevolent event to occur in the process [7.1.1].

high-integrity system is a type of system that has been specified, designed, developed and tested by professional people with adequate training and resources, following engineering practices, and its operation can be trusted [9.1.2]. Safety-critical and democracy-critical systems are examples of high-integrity systems.

ICT principles are principles developed in this thesis which should be applied in the development of public systems, especially for electronic democracy [9.5]. The principles are:

1. Use appropriate technology
2. Use open standards
3. Follow systematic and rigorous development processes
4. Provide superior governance
Internet, internet (thesis meanings) The capitalised version, Internet, refers to the World Wide Web and the many software applications for commerce, education, and entertainment that are now so dominant in modern societies. The lower case version, internet refers to the underlying infrastructure which enables national and international telephone and computer communications [1.3.5].

procedure is the fact or manner of proceeding with any action, or in any circumstance or situation; the performance of particular actions, especially considered in regard to method; practice, conduct. Also: the established or prescribed way of doing something [8.5]. Also see process.

process is the logical organisation of people, materials, energy, equipment and procedures, into work activities designed to produce a specified end result. This is a useful definition because it identifies the various components of a ‘work activity’, including procedures, which are therefore part of a process [8.5].

public system is a term derived for this thesis to denote a system which can be used by any citizen, and in the case of voting, is used by all citizens. A public system must be capable of use by all citizens, regardless of their language, competence with technology, physical and intellectual capability, and location. The choice of a public system might be made through a competitive process, but when implemented there is no competitive alternative system. A public system is paid for by taxpayers, and there is no fee for its use. While economic efficiency is important, democratic principles should not be ignored when planning the development and use of a public system; to ensure that citizens can trust the system and the people who develop and operate it [9.1.1]. Also see high-integrity.

reflexive proceduralism is an approach to thinking about models of democracy and how they might be used in political decision procedures to address some of the problems in democratic societies. It consists of ‘clusters of principles of, devices for, and phases of democratic decision-making [8.2].

risk see hazard [7.1.1].

safety-critical is the description of a system in which a failure of the system could result in the injury or death of someone [9.1.2]. See also democracy-critical.
**stakeholder** is an individual or organisation having a right, share, claim, or interest in a system or in its possession of characteristics that meet their needs and expectations [9.4.3].

**voting method** is a way to enable citizens to participate in a democracy, for example by asking them choose a representative for parliament, or to decide a referendum question. The voting method includes a way for citizens to indicate their choices of candidate(s) from a list, and a way to aggregate these choices to reach a democratic decision [3.3.1]. Also see **electoral system**.

**VSD** Value Sensitive Design, is a method with the purpose of including human values in the design of a product [9.3].
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