December 2003

Harbinger of a Dilemma: an Evaluation of the Digital Divide and E-Government Strategies on the Isle Of Man

George Ryder
IKew Ltd.

Walter Slok
Kingston University

Harbinger of a Dilemma: an Evaluation of the Digital Divide and e-Government Strategies on the Isle of Man

George Ryder[a] and Walter Skok [b]

[a] IKew, Ltd
Tilers Way, Barnet Rd, Arkley,Herts,EN5 3HA, United Kingdom
gryder440@aol.com

[b] Business School, Kingston University
Kingston Hill, Kingston upon Thames, KT2 7LB, United Kingdom
wskok@kingston.ac.uk

Abstract

The 'digital divide', which is defined as the gap that exists between those with and those without access to the Internet, (i.e. the digital 'haves' and 'have nots') has been widely debated. The main protagonists are split broadly into two groups, the technology 'optimists' and the technology 'pessimists'. Conventional wisdom is represented by the optimists' view that the divide is caused by societal barriers to Internet connectivity such as low levels of education, income and proliferation of technology. The pessimists disagree that these barriers cause the divide or that they are important enough to justify significant expenditure by governments in addressing them, e.g. through e-Government programmes. This paper reports on a study to evaluate the validity of the optimistic position.

The Isle of Man (IOM) was selected for this evaluation because of its size, social stability, high levels of education and income, and established e-Government programme. The premise of the research was that if the optimistic view is correct, lower or similar barriers to those found in the UK should result in higher or similar levels of Internet access in the IOM.

A review of the IOM's historical and economic background provided a general context for the evaluation process. Members of the IOM Government were surveyed to determine the quality of their e-Government programme. Quality was tested through comparison with a similar survey of the US Federal e-Government programme, which is a recognised benchmark. The result was that the IOM programme compared favourably with the US one and, by implication, that of the UK, and was additionally expected by the interviewees to be a key variable in materially narrowing the digital divide on the Island.

The remaining research activity was based on establishing the relative levels of age, education, and income between the IOM and the UK. These prime causal factors of the digital divide, as purported by the optimists, were found to marginally favour the IOM. However, the test of Internet access revealed that the IOM trailed the UK connectivity level by between 12% to 14%; a diametrically opposite result to that expected based on the optimistic viewpoint. This unexpected outcome could constitute a dilemma for the IOM Government and those with similar e-Government and digital divide challenges.

A key question for governments arising from limited Internet usage is that legacy systems and processes may have to be perpetuated indefinitely. This will, at best, delay many of the benefits and savings often associated with e-Government and lead to incremental stakeholder costs and possible inconvenience for the foreseeable future.

Further investigation should shed still more light on this result and in time definitively confirm if the significant monies being spent on e-Government and the challenge of the digital divide qualifies as wise investment or optimistic folly.

Keywords: Digital divide, e-Government, Internet connectivity, IOM, UK

Introduction

The advent of universal access to the Internet, especially over the last decade, has generated widespread prosperity and growth, as well as giving rise to a number of accompanying issues. One issue in particular, that of the 'digital divide', has been the subject of controversy and debate from varying perspectives, geographies and contexts by some of the world's leading academics. The debate about this 'divide', which is generally described as the gap that exists between those with and without Internet access, (the information 'haves' and 'have nots'), is dominated by two opposing groups, known collectively as the 'optimists' and the 'pessimists'. The naming of the protagonists in the debate is credited to Lentz, (2000, pp 359 and 366), when he quoted Katz and Aspen, who said that 'in addition to technology optimists, there are also technology pessimists, who believe that at best cyberspace can only create a useless pseudo-community'. A typical technology pessimist is Powell (2002), who maintained that the position of the 'optimists' applied in the mid-nineties, when the Internet was only a few years old as a popular medium and personal computers cost thousands of dollars. Today however, 'with dirt-cheap Internet access and computers approaching the cost of television sets, assertions of a digital divide or racial ravine are as correct as identifying Joe Namath as football's current MVP, or pinning last week's Dow at 1000. Misled by stereotypes, misinformed about survey techniques and misdirected by interest groups, the media have treated the digital divide as a crisis requiring Government intervention. *As a result, billions of dollars might be spent to address needs that no longer exist'.*

A more conventional wisdom is professed by the 'optimists' who maintain that the digital divide is a real and addressable societal problem, especially for Government, because it results from barriers to Internet connectivity such as low levels of education, income and access to technology. Examples of the optimistic side of the debate, to extend Lentz's analogy, include James (2000, p 385) who said that: 'the single most pervasive theme of the twenty-first century has already been decided. It is the digital divide and whether it can be bridged'. In a similar vein, Techeschlok (2001), quotes the Gartner Group CEO, Michael Fleischer's statement that 'the Internet is so pervasive that not having access to the technology or not knowing how to use it will be the equivalent of not knowing how to read or write'.

The divide is a high priority for many Governments, given the importance of making the Internet accessible to allow communities full participation in communication systems, education, employment and other economic opportunities, regardless of their physical capacity. (Cullen, 2001, p314). Judging by their statements and actions, policy makers, i.e. Governments and their leadership, possibly responding to these and similar optimistic opinions held by leading academics and experts in the field, mostly reflect the view that the digital divide is indeed a fundamental problem in society which can and must be addressed.

The importance which resolving this issue has for national leadership is highlighted, again by Lentz, (p 368), who described how in 1999 President Clinton issued an executive memorandum making closing the digital divide a primary goal of Federal Government. He also announced the 'Digital Opportunity' programme with accompanying budget requests of

$2 billion in tax incentives to encourage the private sector to make computer donations and $380 million for public private partnerships.

European leadership has been no less committed to resolving the problem as evidenced by the EU initiative *e-Europe*, the implementation of which would represent an information society for all, including a social vision where there is place for users and Government online. (Cullen, 2001). This initiative formally set the scene for Europe in common with the US for the enactment of enabling legislation and the allocation of funds by Government in order to fulfil a common vision. One of the most evident results of these initiatives, which constitutes a central theme for contemporary governmental activities in most post-industrial societies such as the UK, is the role of the existent and ongoing implementation of e-Government programmes and policies.

The role of e-Government generally refers to the delivery and administration of Government products and services over an IT infrastructure, such as the provision of information electronically using Internet portals, online tax assessment and electronic voting. The use of e-Government as part of the approach to governance incorporates many benefits especially:

- Citizen empowerment through the provision of convenient and direct communication channels which facilitate greater public participation and interaction with the Government

- The delivery of more effective and efficient Government information and services such as increased speed of transaction, greater convenience and better organization and access to information (Detlor and Finn, 2002, p 101)

The considerable effort and resource invested generally by Governments and in particular their e-Government programmes, is either fully justified or a potential waste, depending on which side of the debate about the digital divide proves to be closer to the truth. Evaluating which side of the debate applies in the specific case of the Isle of Man, is the subject of this paper.

The choice of the Isle of Man (IOM) for this evaluation was mainly due to the characteristics of its society and economy and the fact that it facilitated the assessment of information at the level of a population while retaining the dimensions of a large representative sample. Its cultural and historical similarities render it almost a perfect microcosm of the UK as evidenced by the number of research and pilot projects undertaken there by UK organisations (Ratner, 2002). In his article in the Economist about Singapore, the 'Internet island site', Symomds (2000), could have been describing the IOM when he said, 'small and rich, with a well rewarded, entrepreneurial civil service and a political leadership with a liking for big strategies, it is an e-Government natural'

A 'pessimist' result from this research could have serious or indeed potentially damming implications for some Governments. Because of this, in addition to choosing an ideal research location, care has been taken not only to collect a broad spectrum of representative data, but also to establish its quality and the international pedigree of the IOM e-Government programme generally, by comparing it with a recognised benchmark.

Paper structure

The remainder of this paper is structured as follows:

A description of the IOM economy, demographics and e-Government programme establishes a general *context* for the subject under investigation.

The approach used for *collecting data* commences with a review of literature which is split into two sections: literature to do with e-Government and that produced by a selection of academics on the subject of the digital divide. It is followed by a chapter on 'Methodology' defining the research paradigm and the IOM survey characteristics.

A 'Results' section describes the outcome from the survey of e-Government on the IOM and its quality testing through comparison with a similar benchmark carried out in the US Federal Government. A comparison of national level macro data, including Internet connectivity levels, for the IOM and UK reveals the paper's key *result*.

An 'Analysis and Discussion', section is followed by a concluding chapter which sums up the overall result and its implications.

The following diagram illustrates the structure and sequence of the main components of this paper, prior to the chapters covering analysis and conclusion:
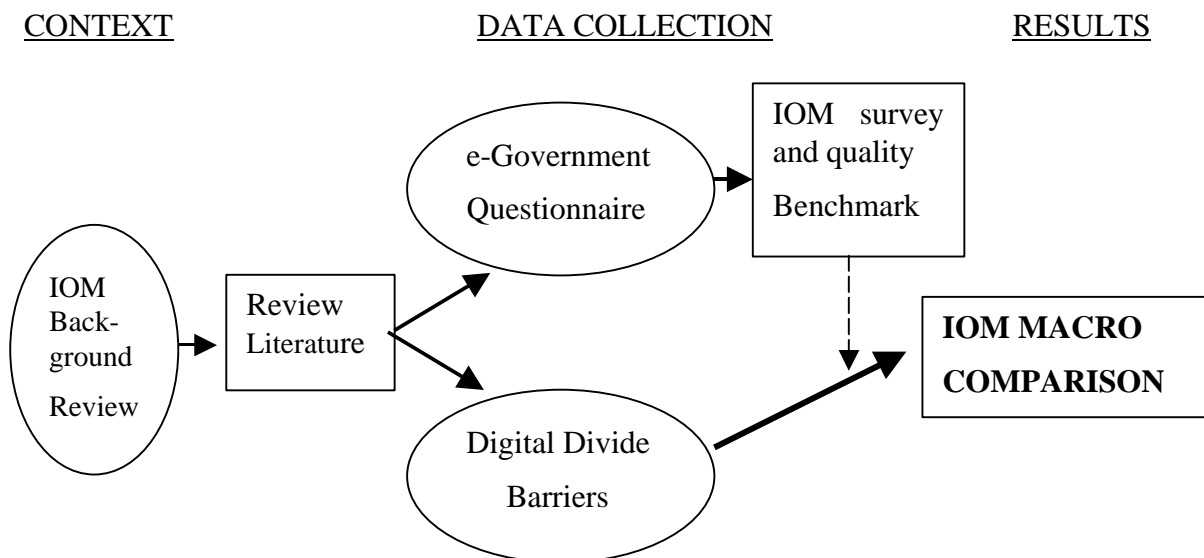
CONTEXT   DATA COLLECTION   RESULTS

Figure 1. Paper Structure

.

The Isle of Man: An Overview

Background

The IOM, situated in the centre of the British Isles, is an internally self-governing dependent territory of the Crown, with a population of just over 76,000 residents, which is not part of the United Kingdom

Tynwald, the Island's Parliament, which has claims to be the longest continuous parliamentary assembly in the World, makes its own laws and oversees all internal administration, fiscal and social policies. The Island has a special economic relationship with

the European Union which facilitates free trade, but is neither a member or associate member of it.

Demographic Overview

The IOM published a census of its 76,315 residents in 2001, which reports on the population under a series of categories, including connectivity to the Internet. This census reported the overall population as having males roughly equal to females, while 22% are aged over 60.The Island's economic progress, especially in recent years, has been the key driver for a rapidly rising National Income and sustaining low levels of unemployment.

The IOM Economy

The IOM is a politically democratic and socially stable environment, with a prosperous economy. GDP which for 2001 totalled £973 million, breaks down as follows:
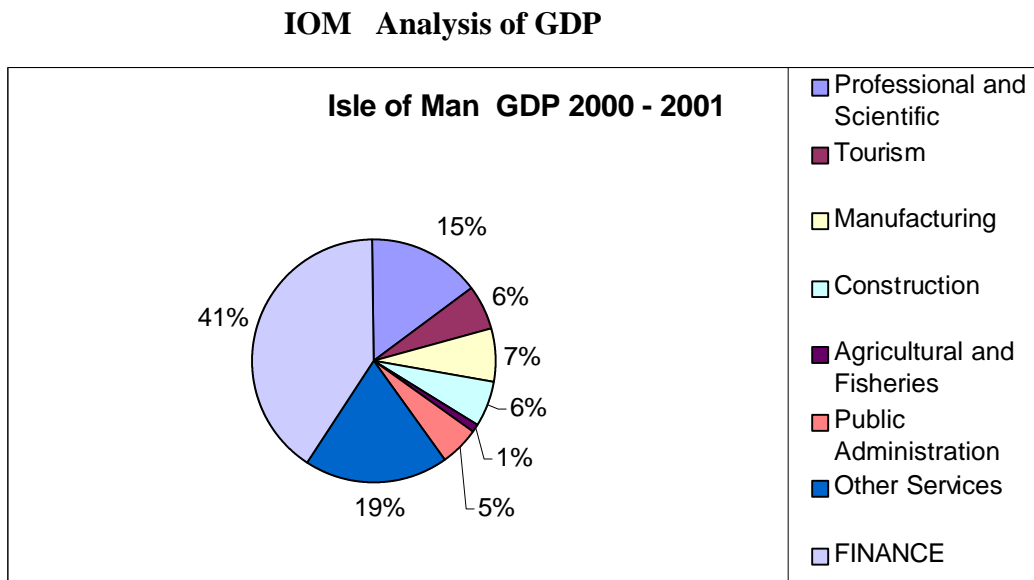
IOM   Analysis of GDP

Figure 2 Source: IOM Treasury (www.treasury.gov.im), Ratner (2002)

This chart illustrates the distribution of business in the economy and that financial services, for which the Island offers favourable conditions, accounts for a significant part of the total at 41%. GDP per capita is reported at £13,022, or the equivalent of $(US) 20,184, based on an average dollar rate for 2001 of $1,55 to the £ (stg.).

As an externally focussed, services based economy, the IOM depends on both the business environment in its immediate vicinity and the wider world. This dependency is reflected in the Government's shaping of policies and programmes including that of e-Government.

e-Government on the IOM

The importance to the IOM of facilitating the growth of additional businesses sectors to finance, is reflected in an aggressive e-Government strategy.

The Island's Legislature enacted the 'Electronic Transactions Act', (Electronic Transaction Act, 2000), which put electronic and paper based transactions on the same footing, as well as removing any legal impediments to the use of electronic communications with public authorities. This Act provides the legal endorsement which is essential to help electronic commerce and governance to flourish. A modern telecommunications infrastructure has facilitated the implementation of Europe's first mobile telephony 3G pilot. (Ratner, 2002).

An added spur to the need to proactively modernise and diversify their business activities exists in the form a threat of possible EU regulation of their banking sector. These factors should combine to render the IOM ideal as an environment for the implementation of

e-Government and facilitating the reduction of the digital divide.

e-Government and the Digital Divide: Literature Review

Introduction

Literature on e-Government covers a wide range of related topics such as funding, drivers and the role of Government portals. In contrast a much greater body of literature on the subject of the digital divide has a more singular focus on the causes of it and suggested remedies for them.

e-Government – Background

From the mid-90s onwards, literature records an increased emphasis on the need for a more strategic approach to e-Government and also on the external, constituent serving, aspects and associated benefits, of it. Providing ever increasing online services to the general public is a 'holy grail' for many governments.

e-Government , according to Gronlund, (2002, pp 1-2) is about changes in two related but distinct fields: 'First, it is about changes in the *internal* Government operations that come about as IT is used for automation, co-operation, integration among Government agencies and as tools assisting in decision processes. Second, while such IT use has been going on for a couple of decades, the current spark of interest in the field is most of all due to the fact that now also *external* operations are transformed, as information and services increasingly become available on the Internet'.

The benefits which e-Government and e-Governance can bring are mentioned by Norriis (2000, pp112-113), who relates that the main potential for e-Governance lies in strengthening policy effectiveness, political accountability and to a lesser extent, public participation. This growing external bias and the benefits which can be derived from e-Government is causing Governments to take a more strategic approach to it

e-Government - Drivers

A recurrent theme in literature about e-Government is the importance of technology as a key driver to facilitating its proliferation in society.

Gronlund (2002, p 19), puts technology within a wider context in stating that it takes place within a changing governance context where technology itself may be only one driver and Government must redefine itself for a world of e-Governance, as this world is being shaped by a variety of forces. Norris (2000, pp123 – 126), puts a stronger emphasis on the role of technology as a driver for e-Governance, which has developed furthest in long established democratic states. She maintains that technology diffusion has proved the single most significant predictor of the distribution of functions of e-Governance and that much of the impact of socio-economic development comes not from patterns of literacy and education per-se, but with its close association with technological development.

A consensus regarding the main drivers for e-Government based on the work of some of the leading academics on the subject, highlights a number of factors as being the most important ones. These include the role of technology, services to the citizen, cost and efficiency, political/legislative requirements and constituent demand.

e-Government - Barriers

While there is an evident degree of agreement among academics about what the most important drivers are for e-Government, when it comes to the discussion about barriers the debate is somewhat more controversial. The views of Symonds (2000), writing about a survey on Government and the Internet, concerning the role of technology, would appear to contradict those of Norris. His comments also resonate the general debate between the 'optimists' and 'pessimists' about the causes of the digital divide.

Symonds, states that survey after survey have found that the main barriers to access are the fear that technology is too expensive, that computers are too complicated and that somehow the whole thing is not really relevant or useful. The 'optimists' argue that one by one, each of those perfectly legitimate anxieties is being overcome. He points out that on the contrary, PCs can be bought for as little as $(US) 300, access charges are lowering and non-PC devices can now provide access to the Web.

Cullen (2001,pp 312- 314), adds to the debate when she writes that access for the citizen in the 21st century should exist, certainly in the developed world. While this assumption is accepted, it is important to remember two key points:

- Technology does not in itself solve social and economic discrepancies within societies e.g. India

- New technologies do not necessarily replace the old. They may coexist.

There is wide discussion about many of the barriers to e-Government, but literature on the subject appears to have a broad consensus about the issues of cost, limited resources, funding, cultural issues and resistance to change. In addition, trust, security and privacy issues, which are related to trust, are emphasized.

e-Government - Products and services

Literature about the underpinning provided by technology and telecommunications related infrastructure to e-Government also refers to the importance of some technology products. Smart Cards, PINS, and PKI (Public Key Infrastructure) and their usage in conjunction with the Internet in the provision of services to the public are seen as being very important. Timmins (1999), references the planned usage of new technology products and services in the UK in referring to a Government framework of rules that has been established to bring closer, Internet and smart-card payment of taxes, benefits and other dealings with Government including the use of personal identification PIN codes, password and digital signatures to authenticate individuals.

Infrastructure for e-Government is closely related to the Internet and the emerging usage of technologies such as Smart Cards and PINs.

e-Government - Funding

The funding of e-Government is critical to its success and although it can sometimes occur as a function of savings, additional costs are often involved.

Cullen (2001), in her article on solutions within developed nations summarises the extent of funding for e-Government in recounting the Clinton administration proposed seven-point scheme which included:

- Tax incentives for private sector to buy computers

- Funds to train all new teachers

- Funding of new technology centres in low income areas

Funding for e-Government whether derived through savings and/or direct expenditure, is directed typically at specific programmes or through some form of cross-functionality as is the case in co-operation between the public and private sectors

e-Government - The role of Government Portals

The current most overt manifestation of G2C e-Government is the Government portal.

Symonds (2000), lists as follows, the four stages involved in establishing an e-Government portal:

- The first stage, which is where most Governments have got to, involves departments posting one way information about themselves via a Government portal.

- The second stage allows two-way communication where the citizen can provide information about themselves, such as change of address.

- The third stage usually supports functions such as licence renewal or paying a fine.

- The fourth stage is a portal that integrates a complete range of Government services based on need and function and not Government department, for example Singapore's e-Citizen Centre.

Literature on the subject of e-Government portals stress two key elements in making them successful: knowledge management and branding. Knowledge management tools facilitate

the provision of consistent and up to date information and branding the effective portrayal of the public image of a Government and the services it offers.

Again, Symonds (2000), in his article on Singapore, summarises much of the opinion on portals as follows: ' one-stop, non-stop e-Government portals will revolutionise not just the way public services are delivered, but Government as well. The trouble with revolutions is that they rarely go according to plan. They also have a nasty habit of eating their own young'.

Some of the key issues stressed by literature concerning portals are content, which involves knowledge management, branding, availability and support services, including 'help-desks'.

e-Government - Projects and Implementations

There is a very wide range of projects involved in the process of e-Government but the implementation of support infrastructure and effective Government portals are seen as priorities for most post-industrial modern administrations.

Harvey (2002), in discussing the UK e-Envoy's pledges, references the concern of many in Government leadership positions, about the money being spent on e-Government generally and more specifically on related individual projects. He relates that though more than half of Government services can already be accessed over the Internet, most of these services consist of simple information presented on Web sites, commonly referred to as 'brochure-ware'.

The NOA report 'Better Public Services through Government' noted that only 3% of the services available allow users to apply for grants or benefits online. The report also focussed on the poor uptake of online Government and *warned that public money would be wasted unless people were encouraged to use the online route.*

Ari-Veikko (2002, pp 272-273), relates the background to the type of projects envisaged by the British Government for their e-Government programme. based on a 10 points list what they consider to be vital in terms of products and services for electronic Government (quoted from Modernising Government, 1999) especially :

(1) Household access to electronic services through developments such as interactive TV.

(2) Much more user friendly, inexpensive and multi-functional technology such as TV, telephones and broadcasting coverage.

(3) Less dependence on keyboard skills.

(4) Continuing dramatic increases in computing power.

(5) Wide-scale take up of multi-purpose smart-cards.

The above list is similar to that in many countries like the UK, but the existence of appropriate infrastructure and an effective portal for their e-Government programmes appears to be pre-eminent in the priorities of most of them.

e-Government- Impact on digital divide and Summary

An important difference between Government and business is that e-Government is not just e-business on a larger scale. Representing the public, they have reason to be concerned about

the digital divide because unlike businesses, who can, by and large, choose their customers, Governments cannot.

e-Government is central to the debate about the digital divide and is the subject of continuing controversy among academics about its role in narrowing it. Cane (2002), argues that broadband access is the essential prerequisite to enabling Governments, through e-Government, to bridge the divide and that Britain is lagging behind its European neighbours in this regard.

A wide spectrum of factors which characterise e-Government were identified in literature. The following list shows them arranged into a series of clusters based on the foregoing review:

CLUSTER	KEY COMPONENTS
Drivers	Required by legislation
	Efficiency and Cost
	Technology
	Service to constituents
	Constituent demand
Obstacles/barriers	Limited resources/funding
	Trust
	Security and privacy
	Cultural resistance to change
Products and Services	Telecommunications/Internet
	Smart-cards
	PKI/PINS
Funding	By specific program
	By savings
	Cross functionality EG Public/Private sector
Portal	Content
	Branding
	Functionality/availability

Knowledge Management

Projects and Implementations   Infrastructure

Portal

Branding

e-Government impact of digital divide   Impact from e-Government

Impact on traditional barriers

Future expectations

These factors provided the theoretical foundation for the questionnaire used to survey e-Government on the IOM.

The digital divide – Background

In contrast with e-Government, there is an important body of literature and associated research about the digital divide, its global scope and the underlying causes of it.

Norris, (2001,p 4), defines the scope of the digital divide in the following way:

(a) The Global divide: divergence of Internet access between industrialised and developing countries

(b) The Social divide: the gap between information rich and poor in each nation.

(c) The Democratic Divide: the difference between those who do and do not use digital resources to participate in public life.

World-wide, 400 million users, including more than 50% of Americans, will use the Internet by mid 2000 with many of the existing barriers will be broken down by a combination of:

• Technological breakthrough e.g. PDA, WAP and iTV.

• Market Competition.

• State Intervention.

The debate is thrown wide open with her comment that 'genre scrambling technologies, converging broadband access, the Internet, telephony and TV promise to alter conventional forms of content delivery. Even if the basic digital divide should gradually narrow over time it is naï ve to believe that this can overturn fundamental inequalities of social stratification that are endemic throughout post industrial societies, any more than it is likely to overcome world poverty. The issue of the underlying causes of the digital divide has given rise to debate and disagreement in terms of those causes which are important, or the order of their importance *or indeed if some of them are causes at all'*.

The digital divide – Causes

A selection of the work of some of the leading academics who have written about the digital divide and its causes, which constitute the barriers to Internet connectivity, illustrates the intensity of debate and disagreement which exists between them. Several authors attribute the digital divide to factors such as the degree of proliferation of technology, while others emphasize social causes such as ethnic background and education.

Bonfadelli (2002), for example, writing about Switzerland, stresses education, or the lack of it, as a leading factor in the way the Internet is accessed and used. In contrast, Compaine (2002), in the preface to his book highlights communications for which perhaps over 25 years, new ways will become mainstream and prevalent. 'What is today the Internet, that is, a packet-switched multi-mode network utilising both wired and wireless components, will likely become a, if not the, primary carrier. So access to that network will be critical and the skill level to use intelligent devices keeps getting lower'.

James, (2000, pp 387-388), continuing on the theme of technology points to the obsolescence of PCs as contributing factors in the digital divide debate. In particular, he says that the practice of software companies to issue constant new versions of proprietary software is causing an epidemic of functionally obsolete computers.

Social causes of the divide such as race and income are in Kennard's (2001,pp 196-197) view key factors to be addressed in terms of the digital divide and the investment and progress being made in the US through the E-rate program to address them. He cites the National Telecommunications and Information Administration (NTIA) at the department of commerce who issued a report entitled 'Falling through the NET II', which found that there is 'still a disparity by race and income',

The ongoing debate about the divide is also revealed by Lentz (2000,pp 376–377), commenting about literacy and access to technology. He considers that the framing of the digital divide problem is a product of a research agenda that is aligned with a national e-Commerce initiative that promotes the future promise of a high technology economy, which supposedly requires a high skilled workforce with digital literacy. However, 'there is growing dispute however about the real promise of the so-called high-tech economy for every day working Americans'.

Schement (2002, p 304) and Powell (2002, p 309), provide more contemporary insights into the debate as to the causes of the digital divide. They also question the importance of cost and assumptions about ethnic minorities as factors to explain it and further suggest *that the basis of Government expenditure on it may be misplaced*.

Schement maintains that at first glance, there appears to be a bewilderment of groups lagging behind the majority when it comes to access. 'Yes, many researchers and policy makers see these gaps more simply, most of the groups affected can be classified into a simple category – women and minorities – while the cause *appears to be quite simply income*. This picture, simple, familiar and comfortable is also *wrong'*.

A fundamental and intractable dilemma for Governments underlying many the above examples of the debate is highlighted by McConnaughey (1999,p 4), namely, that those who most need Government services are also those who are most likely to be classified as likely to be the least connected to the Internet, 'the have nots'.

In order to determine a consensus among the authors reviewed as to the causes of the digital divide and the barriers to Internet connectivity they represent, thirteen of them were selected for analysis from a panel of thirty one. The basis for selection was the definitive nature of each author's arguments and their ordering of the relative importance of the barriers discussed.

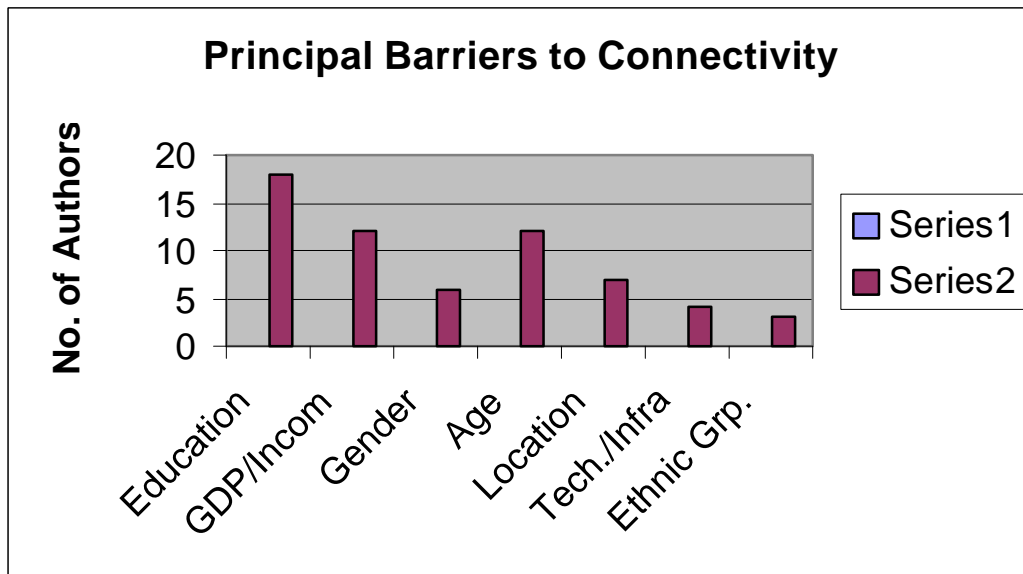The outcome of this analysis graphically is as follows

:

Figure 3. Principal Barriers to Internet Connectivity

This graph shows that based on an analysis of the work of some of the leading academics in the field, a consensus emerges indicating Education, followed by GDP per Capita/Income and Age as being the three principal factors which cause the digital divide

Methodology

The aim of this research was to evaluate if having a strong economic and stable social environment coupled with investing in a world-class e-Government programme narrows the digital divide in the Isle of Man and by inference other similar societies, to a measurable degree.

The hypothesis is that in the IOM, connectivity levels to the Internet which determines the extent of a society's digital divide are *not* increased by reduced barriers to it through having for example, relatively high levels of education and income in addition to a modern e-Government programme.

The methodology used was based on a positivist paradigm, with a quantitative analytical approach to the research undertaken. The IOM background, demographics and economy were reviewed in order to establish a general context for the evaluation of the hypothesis. A review

of literature on e-Government and the digital divide provided a theoretical foundation for the data collection approach used.

The data used for the evaluation came from two sources

- A survey of e-Government carried out on the IOM

- Macro level statistical data used for comparing the IOM to the UK

In order to measure the quality of the IOM e-Government programme, its survey data was compared to similar US secondary data which exists in the form of a quantitative survey carried out in the US. The Meta (2000) research is based on the US Federal Government who are said to have a 'best of breed' programme.

The second source of information was based on macro national level statistical Government and related survey data. The data used facilitated comparisons of the levels of Internet connectivity which obtain between the IOM and the UK as well factors such as population, age and income levels.

Sampling Procedure and Research Instruments

IOM e-Government Programme Data

The source for data on the IOM e-Government programme was a highly representative sample of eight units made up of Government department heads who, collectively, have a direct interest and overall responsibility for e-Government and its implementation on the Island. The questionnaire used in face to face interviews with them, carried out in June 2002, was derived from the review of literature on e-Government. The survey process was greatly facilitated by the quantitative sampling method used for interpreting and recording responses, which in addition to enabling interviews of one hour duration or less, permitted a relatively large number of questions to be asked and a broad spectrum of data to be collected. As over 75% of the questions arising from the literature review used for the IOM survey corresponded exactly with those in the US survey (Meta, 2000), comparison to test quality became a straightforward exercise.

This correspondence, apart from being a research implement which facilitated effective benchmarking of the IOM data, also served to validate the selection of literature reviewed and analyzed on the subject.

Macro Level Statistical Data used for IOM and UK Comparison

The benchmarking of the survey data on e-Government tested the quality of the IOM e-Government programme and indirectly validated its standing in terms of other programmes. It also indirectly provided underpinning for the comparison of their national level statistics, with similar data in the UK.

The national level IOM data is recent, reflects the total population and is available electronically from Government sources. The principal source used was the IOM 2001 Census, which includes demographic and Internet connectivity information.

Census data on the independent variables represented by the barriers of education, GDP per Capita/income and age was compared with similar Government data from the UK. The independent variable representing IOM Internet connectivity levels was compared to

triangulated research instruments containing similar UK data, such as the Kitchen, (2000) survey and the NSO report (Cooper-Green, 2002) which incorporates the UK Expenditure and Food Survey (EFS) and the National Statistics Omnibus survey.

Results

Because of the close correspondence and identical structure of its survey questions with those of Meta (2000), the bulk of the IOM results were assessed and reported in terms of how they compared to the US benchmark The outcome of this comparison is signified by an ' ' in one of three columns in the following table, depending on whether the IOM result quality tested as better (I.>M), equal (I=M) or less (I<M)) than the Meta (2000) benchmark

Cluster	**Questions**	**Comparison IOM (I) to META (M)**		
		I > M	*I = M*	*I < M*
Drivers	Required by legislation		●	
	Efficiency and Cost		●	
	Technology		●	
	Service to constituents			
	Constituent demand		●	
Obstacles/barriers	Limited resources/funding	●		
	Trust			
	Security and privacy		●	
	Cultural resistance to change			
Products and Services	Telecommunications/Internet		●	
	Smart-cards			●
	PKI/PINS			
	Technical Infrastructure			●
	e-Government readiness			●
Funding	By specific program	●		
	By savings			
	Cross functionality Pub./Priv. Sector			
Portal	Content		●	
	Branding	●		
	Functionality/availability		●	
	Knowledge Management			●
Projects and Implementations	Infrastructure			●

	Portal		●	
	Branding	●		
IOM e-Gov. impact -digital divide	Impact from e-Government	-	-	-
(No META Comparison)	Impact on traditional barriers	-	-	-
	Future expectations	-	-	-
TOTAL COMPARISONS (18) ,,,,,,,		<u>4</u>	<u>9</u>	<u>5</u>

Table 1. Comparison of the Key Factors affecting e-Government

The above table shows that out of a total of 24 questions, there was a coincidence between the IOM and Meta surveys of 75%, representing a broad equivalence between them.

A weakness of the IOM programme was their inadequate technical infrastructure and general readiness for e-Government while they scored well in terms of the use of branding techniques for their portal and sufficiency of funds.

The overall result from the benchmark was that the IOM has an e-Government programme that is comparable with and in some respects, better positioned for e-Government e.g. the Electronic Transactions Act (2000), than the US and therefore by inference, the UK.

The final cluster of questions were specific to the IOM i.e. no comparison to the Meta survey. They focussed on the impact on Internet connectivity that the department heads expected their e-Government activities to achieve. Their expectations are illustrated in the following graphs. A rating of '5' signifies maximum impact.
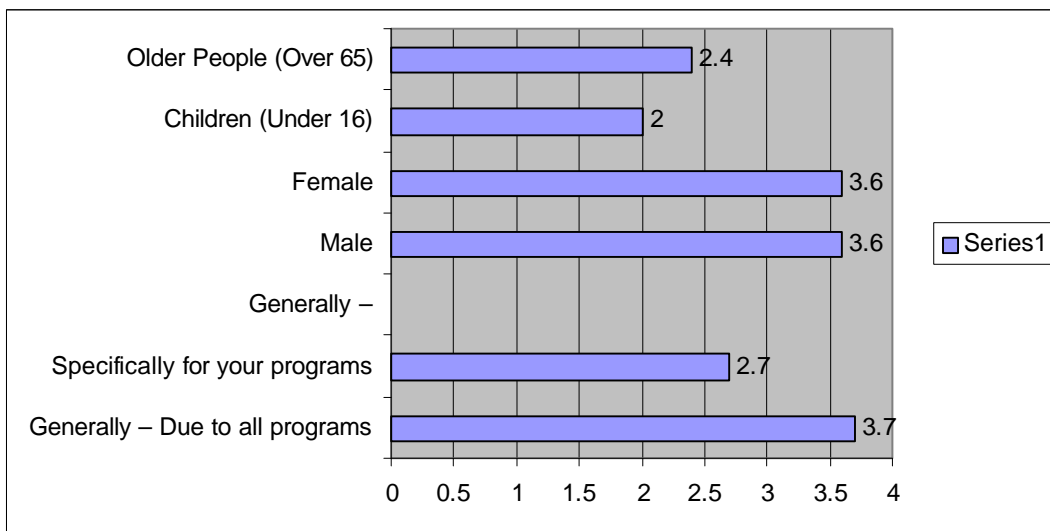

Figure 4. IOM e-Government impact on Internet Connectivity

This result confirms a marked *positive* overall expectation, in terms of the effectiveness of the IOM e-Government programmes in addressing Internet connectivity. Although it reveals a greater level of confidence in the Governments' general approach being taken than for

individual programmes, the result reflects the prevalence of an optimistic mindset within the IOM Government as to the nature of their 'digital divide'.

An additional series of questions concerning the specific barriers which are expected to impact Internet connectivity on the IOM gave results which are graphically as follows*:*
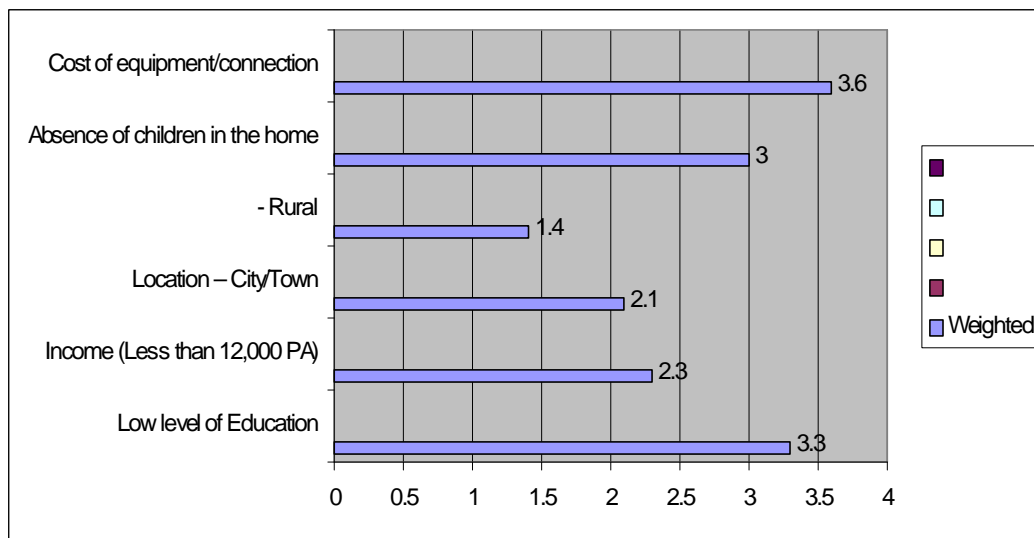

Figure 5. Effect of Barriers to Internet Connectivity on the IOM

The 'optimist' mindset is also evident in the result on barriers, with cost of equipment as the most important barrier, followed closely by low levels of education. Income levels in an environment with 0.6% unemployment is predictably seen as less of a barrier.
Summarized, the main results of the interviews and the comparison with the Meta (2000) survey, used to benchmark them are:

- The IOM Government has a well established e-Government strategy and implementation plan.

- The IOM Government has the necessary structural and legislative e-Government enabling factors in place.

- Comparison with the Meta (2000) survey benchmark revealed some weaknesses in the IOM e-Government programme in the areas of infrastructure, general readiness for e-Government and the approach to the usage of knowledge management tools

- The IOM Government expects its e-Government programme to achieve a material level of narrowing of the digital divide on the Island.

With a well established e-Government programme, a stable, educated society and strong economy, the IOM ought to compare well in terms of Internet connectivity levels with most post industrial modern societies including the UK, with which is has so much in common. In order to test if this was the case, the macro-level data which impacts these levels was reviewed in conjunction with that of the UK.

Macro level data for the IOM and UK

IOM macro level factors identified in literature were compared to corresponding data for the UK, in order to determine the relative degree of similarity or advantage in terms of barriers to Internet connectivity, which obtains between the two entities:

The AGE factor

The following table contrasts the age structures of the populations of the UK and the IOM for 2001:

AGE	0–14	15–29	30–44	45–59	60–74	> 74	TOTAL
IOM Total %	18	17	23	20	14	8	100
UK Total %	19	19	23	19	13	7	100

Table 2. IOM and UK Population age distribution 2001 (percentages) Sources: IOM Census, (2001), Volume 2,Table 7. UK, Ramona (2002), Digest no. 676

The above table shows a close correspondence in age patterns between the IOM and the UK, including for those over 60 years of age, who represent 22% of the population in the IOM, compared to 20% in the case of the UK.

The GDP/income factor

GDP per capita in the IOM is reported at £13,022, or the equivalent of $20,184, based on an average dollar rate for 2001 of $1,55 to the £ (stg).

The corresponding level of GDP per capita in the UK is $21,316 (International Finance Centre, 2002), which is 5% higher than the IOM.

The current level of IOM unemployment, which at 0.6%, (Ratner, 2002), is a fraction of the corresponding level in the UK, should however dilute this small difference. This is because it signifies that a greater proportion of the IOM population are in employment and therefore have secure income, than in the UK.

The Education factor

The level of education of the general population is relatively high, with 63% having academic qualifications at the GCE/GCSE level or higher per the IOM 2001 Census.

The corresponding level in the UK at 55% represents an advantage in this regard for the IOM. (www.dfes.gov.ukstatistics/db/vol/v0302/index.html)

Internet Connectivity

The proportion of the total population which is connected to the Internet per the IOM Census (2001), Volume 2, Table 50, is **50%**, representing 37,376 individuals, while connectivity of households (IOM Census, p 11) is 40.8 %.

The corresponding level of connectivity in the UK for the general population is **64%** (Kitchen, 2000) and **62%** per the NSO report (Cooper-Green, 2002) which incorporates the UK Expenditure and Food Survey (EFS) and the National Statistics Omnibus survey.

For households in the UK, the level is 46% (Cooper-Green, 2002) and 40.8% in the IOM. Average household occupancy rates may partially account for the 5.2% connectivity disparity which for the IOM is 2 occupants per household (IOM Census, Table 48) and 2.8 occupants per household in the case of the UK (e-Envoy 2002, Table 3, p11).

The following summary of the comparison between the IOM and the UK, has the relative advantage of factors for one entity over the other highlighted in bold:

Factor	Favours the IOM	Comparison outcome	Favours the UK
Age	No	Similar	No
GDP/income	No	Similar	No
Education	**Yes**	IOM higher level	No
Employment	**Yes**	IOM higher level	No
Social/political factors	**Yes**	IOM less challenges	No

This summary shows an overall *advantage* for the IOM in terms of the barriers underlying the digital divide, coupled with a significant *shortfall* of 12% to 14% for Internet connectivity on the Island, compared to the UK.

The implications of so definitive a result, which favours the viewpoint of the pessimistic body of literature on the digital divide, require further discussion.

Analysis and Discussion

The question researched in this study was: does a strong economic and stable social environment coupled with investing in a world-class e-Government programme, influence narrowing the digital divide in the Isle of Man and by inference other similar societies, to a measurable degree.

The IOM, as a small relatively affluent, modern society, has some particular advantages over societies like the UK, which favour the implementation of e-Government programmes and promoting the general proliferation of connectivity to the Internet.

These advantages help to explain why their e-Government programme compared favourably with that of the Federal Government of the US. Speed of execution due to the operational proximity of Central and Local Government further facilitates progress.

A supportive environment, a 'best of breed' e-Government programme and high levels of education should, if the 'optimists' are correct, lead to similar or higher levels of Internet connectivity there than in the UK.

A gap of 12% to 14% less Internet connectivity than in the UK however confirms the 'pessimists' view about the digital divide as obtaining in the IOM. The significance of this connectivity disparity is not appreciably mitigated by factors such as sampling errors, which for surveys like Kitchen (2000), are typically between 1% and 2%.

This overall result does not auger well for the expectation of the IOM Government that their modern and proactive approach to e-Government has an identifiable and material positive mitigating impact on this divide. If this was the case, and the optimistic argument was correct resulting in similar levels of connectivity for both entities, e-Government activity could have manifested itself as the expected identifiable, if marginal, increment in connectivity levels over the UK.

Although the impact of barrier levels and e-Government have not individually been assessed in this research, the significant overall connectivity gap between the IOM and the UK would indicate the hypothesis of this paper as being sustained.

One of the key implications of the 'pessimist' position in the digital divide debate, is that misjudgement of its causes can end up costing significant amounts of public funds. It may be significant also that this pessimistic implication is stressed by more contemporary contributors to the debate, such as Powell (2002), Harvey (2002) and Schement (2002), who have the benefit of being able to observe Government efforts in general and more specifically e-Government programmes, at a more mature stage in their development. The 'pessimists' maintain that one of the principal causes of the digital divide is that the inequalities and complexities that exist in society cannot be addressed by technology, as claimed by the 'optimists'. Their position would appear to be vindicated by recent examples in both the G2C and G2B areas in the UK. Notable among these is the disappointing public usage of on-line income tax and value added tax (VAT) returns, despite relatively high levels of government investment and promotion. (Harvey 2002).

The pessimistic argument has a possible shortcoming in that having dismissed the position of the 'optimists', they do not appear to propose alternative solutions. In addition, there does not yet appear to be academic research or empirical data in sufficient locations and volume to definitively vindicate their position. This may explain why Governments generally and the IOM in particular continue to reflect the optimistic position in their approach to the digital divide, since it implies that their programmes can be based on clear problems and solutions to them.

While this shortcoming does not invalidate this research, its 'pessimist' result may however be viewed as indicative, because it is based on the particular case of the IOM and at a particular moment in time. The microscopic reasons which contribute to the relatively low levels of Internet connectivity in a society like the IOM may be viable candidates for further investigation. This would be justified, not out of academic interest alone, but more importantly in order to determine if the significant sums of stakeholder money which the IOM Government in common with many others spend yearly on their e-Government programmes, is well directed and invested. That such research has not as yet been undertaken

may be due to this expenditure being viewed as socially justifiable in terms of digitally enfranchising the 'have nots'. Less altruistic motives such as savings and efficiency are however not necessarily incompatible with such considerations for governments like the IOM who rely on scarce investment resources to achieve their goals.

Pending such investigation, this result can add to the limited body of research examining the factors underlying the phenomenon of e-Government and the digital divide and suggest a model for undertaking it. This model is akin to that of a laboratory where small island environments like the IOM facilitate discovery through allowing research at the level of a total population while having the dimensions and characteristics of a large sample.

Summary and Conclusions

The principal objective of this study was to evaluate the IOM e-Government strategy and implementation and test a 'pessimist' hypothesis about the digital divide through comparison with the UK. A 'pessimist' result from the research undertaken could have serious or indeed potentially damming implications for some Governments.

The comparison involved was based principally on the main barriers to Internet connectivity of education, age and GDP/income, in line with the 'optimists' position on the causes of the digital divide. The outcome was that while the IOM population had a similar age structure and GPD/income to the UK, the IOM level of secondary education and general social conditions are better. This, together with the quality of the IOM e-Government programme, from the standpoint of the optimistic view of the digital divide, should have resulted in a similar or greater level of Internet connectivity there, than in the UK.

The test of Internet access however posed something of a dilemma in that the IOM trailed the UK connectivity level by between 12% to 14%; a diametrically opposite result to that expected based on the optimistic view point. This outcome points to some fundamental questions for the IOM Government and those with similar e-Government and Digital Divide challenges:

The similarities in terms of barriers with the UK points to e-Government as one identifiable variable which could and is expected to account for connectivity improvements in the IOM. This outcome of this research however would render that expectation as being in need of reassessment.

Current connectivity levels mean that legacy systems and processes may have to be perpetuated indefinitely. This will at best delay many of the benefits and savings associated with e-Government, leading to potentially increased stakeholder costs and inconvenience.

A societal saturation point may underlie this result, whereby once Internet connectivity has reached a certain level in particular environments or social structural mixes, diminishing returns on incremental investment to increase it may apply.

Governments who have taken a minimalist approach, providing for example 'brochureware' via their portals; stage one and two as identified by Symonds (2000), are likely to ignore the findings of this research. Those with more ambitious plans for e-Government and narrowing the digital divide, involving potentially the investment of significant public funds, might be unwise to do so. Further investigation and experience, to be undertaken hopefully sooner rather than later, should confirm if such investment is indeed money well spent or more in the realm of optimistic folly.

References

Ari-Veikko, A (2002) Strategic *Knowledge Management in Local Government*, Idea Publishing Group

Bonfadelli, H (2002*) '*'The Internet and knowledge gaps European Journal of Communication', Vol. 17,No 1, pp 65 – 84

Cane, A (2002) 'Viewpoint on broadband access', The Financial Times, 23/1 2002, p II.

Cooper-Green, E (2002) 'Internet Access', *NSO*, 11 Dec.

Compaine, M (2001) *The digital divide. facing a crisis or creating a myth*?, MIT Press Sourcebooks.

Cullen, R (2001) 'Addressing the digital divide', *Online Information Review,* vol. 25 no. 5 pp 311-320.

Detlor, B, & Finn, K (2002) *Towards a Framework for Government Portal Design,* Idea Publishing Group.

e-Envoy (2002) 'Mapping e-Commerce', <http://www.e-envoy.gov.uk/estatmap/estatmap.htm>.

Gronlund, A (2002) *Electronic Government: Design, Applications and Management*, Idea Group Publishing.

Harvey, F (2002) 'E-envoys pledge', *The Financial Times*, 5 April, p. 4.

Isle of Man (2000) Electronic Transactions Act.

Isle of Man Census (2001) WWW address: <http://www.gov.im/census>.

International Finance Center (2002) 'Country Fact Sheet – UK, WWW address: <http://www.statistics.gov.uk/international finance centre/archive.asp>.

James, J (2000) 'Low cost computing and related ways of overcoming the global digital divide', Tilburg University The Netherlands.

Katz, J, & Aspden, P (1997) 'Motivations for and barriers to Internet usage: results of a national Public opinion survey', *Internet Research*, vol. 7 no. 3, pp 170-188

Kennard,W (2002) *Equality in the Information Age,* MIT Press Sourcebooks

Kitchen, P (2000) Can't surf, won't surf the digital divide, Which Online in association with MORI.

Lentz, R (2000) 'The e-volution of the digital divide in the US a Mayhem of computing metrics', *Inf,*; vol. 2. no. 4, pp 355-377

McConnaughey, J (1997) 'The digital divide a survey of information haves and have-nots in 1997. Falling through the New II New Data on the digital divide', National Telecommunications and Information Administration

META Group, (2000) E-Government Multi-Client Study Findings , META Group Inc, Federal Sources Inc.

Norris, P, (2001) *Digital Divide*, Cambridge University Press.

Powell, A, (2002) *Falling through the Gap, whatever happened to the Digital Divide*, The MIT Press.

Ramona, I (2002) 'UK National Statistics Monthly: Monthly Digest of Statistics', No. 676.

Rattner, J (2002) '3G Pilot proves a revealing example', *The Financial Times*, 28 March, p. 21

Schement, J, (2002) *Of Gaps by which Democracy we Measure*, The MIT Press

Symonds, M (2000) 'A survey of Government and the Internet Island site' *The Economist*, 24 June, p.16.

Timmins, N (1999) 'e-Government guide launched', The Financial Times, 18/12/1999

Techeschlok, C (2001) 'Rising to meet the digital Challenge in Rural Communities, a growing divide', *Rural Research Report*, Illinois Inst. of Rural Affairs, vol. 12, no. 4.