Economic benefits of digital inclusion:
building the evidence
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1. Foreword

Digital inclusion has long been on the peripheries of industrial and political thinking, but never a central theme. The fact is the impact of digital inclusion is often very difficult to isolate or to quantify. It cannot be counted in easily measured units, nor does it lend itself to financial analysis. But whether we like it or not, money talks. This research sets out to make it talk about digital inclusion.

We can be fairly certain that, on the whole, technology has added value to our lives and to the economy. How much value it adds is the focus of this report, which attempts to break down the benefits and associated savings of digital inclusion for five core groups – individual people, private sector organisations, the government, society and the wider economy.

The flipside of our increasing reliance on ICT – in public, economic and social life – is that the digitally excluded, by default, also become excluded from public services, modern working life and society itself. This research is a continuation of UK online centres work in this area, and stems from a previous report which examined the links between digital and social exclusion in more depth. Significantly, it found 75% of those counted as being socially excluded were also digitally excluded. That means those already at a social or financial disadvantage are three times more likely to be offline, and missing out on the potential benefits, conveniences, opportunities and savings computers and the internet can provide.

The Observer newspaper recently calculated the cost of dealing with the 1.3 million most disadvantaged people at a staggering £44,538 per person. That’s £57.9 billion a year. The need to cost out the impact of exclusion in general is gaining momentum, and I firmly believe digital inclusion must be a part of the equation. Connecting people to ICT skills can connect them to new or better jobs, to new forms of communication and social interaction, to community infrastructures and government services, to new information, consumer power and convenience. Indeed, a recent report from the EU E-Inclusion Team estimates the benefits of digital inclusion across the EU might be in the order of between €35-85 billion over five years.

The problem is that the benefits of digital inclusion are so intangible. The cause and effect relationship between digital and social inclusion is often portrayed through project-level, qualitative case studies. At this level, the myriad benefits of digital inclusion are indisputable. Take Liz, in her 80s, and a regular at a UK online centre in the South West. She now keeps in touch with family, friends and community services by email, maintains her independence by getting groceries and prescriptions delivered to her door, and finds pension, health and price comparison information at the click of an adapted mouse. But how far can digital inclusion be said to have contributed to Liz’s well-being, how much has it saved the state in her care or in face-to-face transactions, and what has it ultimately added to society or the economy? Most importantly, how can we possibly extrapolate Liz’s experiences? The calculations remain at best indefinable, at worst impossible.
Make no mistake – the digital ‘divide’ is not an easy sum. But just because the maths is difficult doesn’t mean we should throw down our calculators and retreat. This research does not try to establish cause and effect, but where possible aims to gather measurable data to establish a financial value for some of the soft or intangible impacts of digital inclusion. There is in fact a wealth of quantifiable data demonstrating the varied benefits of digital inclusion across the five main impact groups. For example:

- Digitally included individuals are likely to perform better academically (increase of ¼ GCSE grade per subject).
- Computer/internet use commands salary premiums (3-10%).
- Government services can make significant savings through mediated interactions. For instance, one of the NHS Direct online initiatives is predicted to save it £68 million in 2008.
- Companies can increase customer base and sales volumes (online spend is on average 20% higher than offline).
- There is a positive impact on GDP to the economy (upwards of 1.54% over three years).

While the research results are both encouraging and interesting, this report is necessarily limited by gaps and inconsistencies in evidence. Its findings are therefore based on the collation of existing material and assumption-based calculations. It is not intended as a comprehensive review, nor a systematic cost-benefit analysis, but rather an initial piece aiming to establish effective framework models and stimulate further debate.

What we can be sure of is that this summary gathers together hard evidence showing where and how digital inclusion is capable of enhancing opportunity, cutting costs, and ultimately improving society. The sum total of the cost-savings calculated across our five core groups tops £2.6 billion, a conservative estimate based only on the examples explored. The ‘e’ in e-government, e-commerce, e-mail and e-retail traditionally stands for ‘electronic’ – but it could equally stand for ‘economic’. Financially, digital inclusion pays dividends – and this is just the tip of the iceberg.

I hope this can be the beginning of more comprehensive data collection and analysis, and I’d encourage stakeholders and partners to take up the mantel and take on the challenge of building the business case for digital inclusion. If we can show its true worth, we can secure its due recognition and investment.

Helen Milner
Managing Director
UK online centres
2. Introduction and research approach

2.1 The approach
This research aims to build on our understanding of digital inclusion by exploring the impact of exclusion/inclusion in measurable terms. Specifically, it endeavours to attribute a monetary value for the benefits digital inclusion can bring to five core groups: individual people, private sector organisations, the Government, the wider economy and society as a whole.

FreshMinds designed an approach to tackle the task, using a mixture of secondary literature, desk research and original, assumption-based calculations. The diagram below illustrates our approach, which was replicated for each impact area.

- Initial background research provides us with concepts and terminology and a range of different benefits, while the case studies will provide us with the bottom-up data for subsequent extrapolations.
- We will focus on the benefits which are best documented and for which there is most robust data.
- This process was repeated for each impact area.
Data gaps and inconsistencies in the available evidence make research into this area complex. This approach allowed us to identify and map out a wide list of digital inclusion benefits, and focus on particular case studies exemplifying those benefits in order to provide quantifiable data for calculations and further scaling up. Where possible, we try to determine the marginal impact of an additional citizen gaining regular access to the internet.

Each section of this report contains the mapping of benefits offered by digital inclusion. This is done in a standard format shown below:

By its very nature, this research is not intended to be a detailed cost-benefit analysis of digital inclusion. Rather it is intended as a starting point for future modelling, and future debate.
2.2 Putting this research into context

Our goal throughout this work was to review the current evidence to identify quantitative data supporting the contention that digital inclusion generates myriad benefits. As this report shows, there are a number of interesting studies which are pioneering our understanding of those benefits. Here we use cautious, assumptions-based modelling to help draw attention to the potential impact of these initiatives across the UK as a whole.

However, as we point out in the conclusion of this report, much more integrated data is required before the total impact of digital inclusion can be properly understood. This will allow us to account for externalities, changes in behaviour, the capacity to integrate and deploy systems and countless other factors determining the success of any one endeavour.

For example, as we attempt to ‘scale up’ case study findings, we assume that non-internet users will exhibit the same behaviour as current internet users. Given previous work by FreshMinds, we know many non-internet users can also be classified as socially excluded. This calls into question whether they would have the opportunity to take full advantage of the e-retail savings to be found online. Furthermore, internet behaviour may be contingent on the level of sophistication of functional internet use. More research is needed to establish how people’s online spending behaviour changes according to their level of functional usage, income, age and gender to name but a few variables.

Nevertheless, this report seeks to source and aggregate the discernable benefits of the internet across a broad range of impact areas. It shows that, as developing internet technologies become further ingrained into mainstream life, there are considerable benefits – and considerable savings – to be gained from expanding digital inclusion.
3. Individuals

For individuals, the internet has changed how we work, find information, buy products and interact with each other and public or private sector services. Existing research suggests the benefits of internet usage could be split into four main categories:

1. **Time and monetary savings stemming from the use of web-based technologies** – through increased consumer choice and better access to information.
2. **Improved educational attainment** – through more effective learning, and stimulated motivation.
3. **Improved salary prospects** – through e-learning and computer literacy.
4. **Increased satisfaction with public services** – through increased flexibility, convenience of access and overall higher standards of service.

### 3.1 Time and monetary savings stemming from the use of technologies

The internet enables quick and convenient access to an enormous wealth of information across almost every subject imaginable. In particular, for example, consumers have access to a global network of suppliers. From the largest household names, such as Tesco or Debenhams, to the smallest niche retailers, the internet as a whole expands the degree of consumer choice. Search engines and price comparison sites can also reduce the time and cost spent finding goods and services. The enhanced capacity for consumers to find and compare products not only increases efficiency of matching buyers and sellers, but also drives up price competition. According to price comparison site uSwitch.com, the average saving generated using price comparison websites is 13% for groceries, 15% for travel and 21% for services.

Figure 1, on the next page, illustrates the mechanism through which the improved access to information can reduce search costs and increase consumer product choice. Increased market efficiency facilitated by internet search engines and greater price competition can often lead to significant monetary savings.
3.1 Improved access to information

Assuming a saving of 13% on the average internet shopping basket (£606, Verdict 2007), FreshMinds estimates this might save consumers £90.55 per year in monetary terms alone. Calculating for the benefits derived through greater choice and a reduction in search time and cost, a recent survey by Demos/Post Office Ltd found the total per consumer benefit of shopping online to be worth approximately £283 per year.

3.2 Improved educational attainment

The breadth of information available and the increasingly ‘rich’ forms of internet based technologies (such as podcasts, ‘user-generated content’ and RSS data feeds, for example) mean the internet can offer a stimulating, engaging medium for teaching and learning. International research shows students are often more motivated by e-learning and encouraged to conduct greater independent study. As shown in Figure 2, this mechanism can in turn improve the level of individual educational attainment. Indeed, the Fischer Family Trust calculated that the effect of over 10 hours of e-learning amounted to a value added equivalent of one quarter of a GCSE grade per subject (see case study example).
As discussed later in the section on the Wider economy, raising educational attainment has a multiplier effect upon the wider economy as the workforce is more skilled and more productive. This multiplier effect is highlighted by the red box in Figure 2. The figure also shows that e-learning and the ICT skills people can develop by engaging in e-learning can increase individuals' employability and salary prospects.
3.3 Improved salary prospects

Improving educational attainment can increase the employability and salary prospects of individuals in the world of work. This is particularly important as the global economy becomes more competitive. Individuals need to demonstrate that they have (increasingly higher level) skills to partake in the labour market.

In 2007, the Centre for the Economics of Education found those able to use computers benefited from a wage premium of between 3-10% when individual, occupation and industry effects are taken into account. This is illustrated in Figure 2.

The benefits to the individual from enhanced employability and salary prospects could include greater self-sufficiency from the state, improved financial security and greater quality of life. These can have long-lasting, intergenerational effects, which determine the life chances of individuals and their children.

Case study example: E-learning

What is it about and what does it show?
Since 2001 the Fischer Family Trust has conducted an annual study into the impact of e-learning upon the results of GCSE students. In 2004 the survey covered one in six GCSE students. By capturing such a high proportion of GCSE students and focusing on online revision and exam practice specifically, it is a very useful indication of the effect of internet based learning on a large scale.

What data does it yield?
The main findings of its report suggest that students with over 10 hours of e-learning in total, achieved 4.7% more 5+ A* – C GCSE grades than expected, based on prior attainment. The Fischer Family Trust calculated that this amounted to the equivalent of one quarter of a GCSE grade per subject value added.

The greatest improvement was found among students in the middle and lower prior attainment groups. E-learning for 10 hours or more gave rise to gains of nearly half a grade.

How can we scale up what we have found?
Recent research conducted by Walker and Zhu (2007) into the labour market effects of qualifications, found that, relative to no qualifications, an academic NVQ Level 2 (equivalent to 5+ A* – C GCSE grades) increased wages by between 30% and just over 40%, depending upon UK region and gender (and controlling for ethnicity, disability, union membership, and private/public sector). Similarly, NVQ Level 2 increased wages by about 10% relative to NVQ Level 1.

Walker and Zhu (2007) also found that, as with wages, the probability of being in employment increases in the level of vocational and academic NVQ Level 2 qualifications, particularly for women.

Unfortunately, extrapolating for the effects of internet based learning from this wage differential data is not possible. However, if online revision and exam practice can have a significant impact upon attainment of academic NVQ Level 2, and higher attaining students have an increased probability of being employed at a higher average wage, then we could suggest that e-learning might contribute to raising employability and wage prospects.
3.4 Increased satisfaction with public services

The internet is not just a source of information, or a marketplace for buyers and sellers. It can also act as a channel of interaction between organisations and their consumers and/or governments and their citizens. As a result, local authorities and central government departments are increasingly using the internet as a way of delivering public services. The convenience of access, instant availability of information and links to transaction services such as online bill payment, can significantly improve the public service user experience.

For example, the NHS has developed an online appointment booking service that increases patient choice of date, time and place of specialist treatment. This reduces the likelihood of patients missing appointments as they can arrange face-to-face visits when most convenient.

Figure 3 illustrates the benefits of internet based public service delivery for the case of the NHS 'Choose and Book' system. One Primary Care Trust (PCT) reported reduced per-patient waiting time by up to nine days between referral and treatment. Instant confirmation of appointment details and waiting time manages better patient expectations, thus improving the quality of service provided for each individual user.

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Example</th>
<th>Outcome</th>
<th>Quantified benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased patient choice of appointment times</td>
<td>Online hospital appointment booking</td>
<td>Increased service satisfaction</td>
<td>Waiting lists cut by up to 9 working days</td>
</tr>
<tr>
<td>Increased patient choice of hospitals</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Increases quality of service</td>
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Figure 3: Improved public services through flexible appointment booking
3.5 Conclusion

Internet technologies are an established, often essential part of modern life for many people. Those digitally excluded miss out on the benefits that these technologies can bring. There is evidence that benefits to the individual from digital inclusion include:

- Increased educational attainment
- Increased employability and salary prospects
- Increased access to information, saving time, hassle and money
- Increased quality of public services.

In particular, the quantified benefits include:

- `¾ GCSE grade`: value added per learner, per subject through e-learning
- `3-10% wage premium`: for jobs involving computer/internet use
- `£283`: per consumer through greater choice, time and money saved by e-retail (Demos/Post Office)
For the Government, ICT has been a catalyst for a transformation in the way public services are delivered. The main benefit of delivering services online is financial:

- **Cost savings and increased efficiency and productivity** – stemming from increasing use of online public services.

4.1 Cost savings and increased efficiency and productivity

As discussed in Chapter 3, *Individuals*, the internet is increasingly used as a main channel of interaction between citizens and local or central government. By hosting information and frequently used official forms online, the Government can save money and time in dealing with basic requests. Whilst the individual benefits from more convenient access to common public services, the Government can benefit from increased efficiency and productivity savings.

According to Eurostat data for 2007, 89% of UK public services are online and 27% of the UK population access information from public authority websites. UK Government efficiency savings can be loosely identified at Departmental and local authority level. The benefits of digital inclusion can be realised by both the provision of online information and the provision of online transactions.

4.1.1 Online information

Several studies have shown the significant impact on efficiency by simply providing information electronically. Clear presentation of the right information can considerably reduce the need for face-to-face and phone contact and manual processing of forms and information. Figure 4 shows that the savings from health information online is likely to save the NHS £80.87 million in 2008.

**Figure 4: Cost savings through online information**

<table>
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<tr>
<th>Mechanism</th>
<th>Example</th>
<th>Outcome</th>
<th>Quantified benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online health information</td>
<td>NHS Direct Online</td>
<td>NHS and service user productivity savings</td>
<td>£80.87 million net NHS productivity gain (2008)</td>
</tr>
</tbody>
</table>

- **Time saving for service users and NHS**
- **Reduces service user and NHS costs**
- **Empowers patients to make informed, health self-help choices**
A further benefit to the government is increased choice for patients, and the capacity for patient ‘self-management’. The Department of Health, NHS and Stanford University are currently running a pilot ‘Expert Patient Programme (EPP) Online’ – a course for people with long-term health conditions. In a survey of the 30,000 participants who have attended the EPP course face-to-face, GP consultations decreased by 7%, outpatient visits decreased by 10% and A&E attendances decreased by 18%. The service delivery cost saving is clear. An online version of the course might add even more benefits, and initial tests have shown internet based chronic disease self-management to be a ‘viable alternative’ to the face-to-face group set up.

Case study example: NHS Choose and Book

What is it about and what does it show?
In 2004 the government launched the first phase of its online Choose and Book system. This enables patients to choose from at least four hospitals and choose the date and time of their appointments. The Choose and Book facility is a large scale project that relies upon extensive collaboration across the entire healthcare system. Although the successes and challenges it meets might be peculiar to the size and nature of this vast project, it provides a good illustration of the potential benefits of digital inclusion, not only at a system efficiency level, but for individuals in a critical public service. Where once hospital waiting lists were the scourge of the NHS, the Choose and Book system is helping to reduce missed appointments, shorten referral waiting times and increase internal efficiency.

What data does it yield?
- One in ten appointments are missed, so 6.8 million missed appointments translates to 68 million appointments in total, assuming that Choose and Book patients are not arranging any more appointments than those patients currently not using the system.
- It is not clear whether the total number of appointments refers to referrals. We can make a conservative estimation of total saving if we assume that 45% of appointments already go through the Choose and Book system.
- Therefore, of approximately 68 million appointments, 30.6 million will be booked through Choose and Book and 37.4 million are booked through the traditional postal means.

Using the fact that Choose and Book can increase non-attendance by 35%, we first need to identify the proportion of the 6.8 million appointments missed were by Choose and Book patients. We find that:

Choose and Book patients are 7.7% likely to miss an appointment and non-Choose and Book patients are 11.9% likely to miss an appointment.

Therefore, if non-Choose and Book patients were to use the online system and we assume that they exhibit the same behaviour as existing users, the number of missed appointments falls to 5.2 million. This represents a 23% reduction from 6.8 million.

How can we scale up what we have found?
If 6.8 million missed hospital appointments cost the NHS £614 million per year, this translates to a cost of £90 per appointment. This scales up to a potential saving of:

\[ £90 \times (6.8-5.2 \text{ million}) = £140 \text{ million per year}. \]
4.1.2 Online public service transactions

Government and government agencies can save staff time and money by hosting frequent transaction services, such as bill or tax payments, online.

Figure 5 shows the potential cost savings for the Driver and Vehicle Licensing Agency’s (DVLA) Vehicle Tax Payment scheme. Renewal of vehicle tax is an annual or biannual obligation for the owners of the 33 million active vehicles in the UK. Before the introduction of the online tax renewal system, vehicle owners had to make a face-to-face visit to a service delivery provider (typically the Post Office) and remember to bring with them paper copies of insurance and MOT documentation. Beyond the time saving potential and convenience of 24 hour access for the individual service user, unit delivery costs of processing transactions have fallen significantly for the DVLA.

**Figure 5: Online public service transactions**

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Example</th>
<th>Outcome</th>
<th>Quantified benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online service transaction ‘super sites’</td>
<td>Online local public service delivery: DVLA</td>
<td>Reduces service user and departmental/council costs</td>
<td>Free resources for frontline delivery/re-investment</td>
</tr>
<tr>
<td>Time saving for users and government</td>
<td>Increases government productivity</td>
<td>£11.29 saving per online transaction</td>
<td>£90.32 million 2005-06</td>
</tr>
</tbody>
</table>

15
What is it about and what does it show?
The estimated 33 million active vehicles in the UK must all exhibit a valid tax disc. In October 2006, the government launched an electronic tax renewal system, enabling drivers to purchase their tax disc online or via telephone, 24 hours a day, seven days a week. Customers using the new system do not need to provide paper copies of their MOT certificate or their insurance documentation, as these are checked electronically.

The DVLA Annual Accounts and Report 2006-07 shows decreased unit costs and increased transactions, with a unit cost saving of approximately 13% forecast between 2006-07 and 2007-08. How much this can be attributed to the online service alone is not clear, but the DVLA expect electronic based payments will reduce the cost of transactions ‘significantly’ as economies of scale set in. By October 2008 it is hoped that 98.1% of customers should be eligible to use the online service with a target of 60% of renewals made electronically.

The DVLA online vehicle tax renewal system is an example of a government agency providing its service online highly successfully. Indeed, it has almost been the victim of its own take up rate, which considerably outstripped initial expectations. As a result, other online services have been put on hold whilst the DVLA expands its ICT infrastructure to cope. In terms of other government/private sector online services, a 2005 YouGov survey revealed that 64% of UK drivers wished they could complete all such household transactions or bill paying online.

What data does it yield?
In July 2007, the DVLA announced it was the leading electronic retailer, generating an average of £4.2 million tax revenue per day by customers using the electronic tax facility (25% more than Tesco’s £3.36 million per day). The DVLA also tops the e-retailing charts with an average of 273,500 UK motorists buying their tax discs electronically every week (compared to Tesco’s 250,000 weekly online orders).

- Of these, 75% are conducted online, amounting to 8 million average online sales per year.
- An online or telephone payment can be made in an average of 4 minutes.
- 68% of motorists prefer to carry out such transactions online because it’s quicker and more convenient.
- 98% of all tax disc purchases were conducted face-to-face prior to the launch of the electronic system.
- The DVLA estimates a saving of £21 million between 2007-08 and 2010-11 when fixed investment in IT infrastructure is taken into account.

The DVLA credits convenience as the reason for this success, as an online or telephone application and payment can be made in an average of just four minutes. Data on the average time of face-to-face tax disc purchase is not available, but DVLA research compiled at the time of the service’s launch revealed that nearly 70% of UK motorists had delayed paying their car tax on time because they’d lost the relevant paperwork or just couldn’t find the time to do it in the busy working week. The flexibility of the electronic service also enabled 40% of users to purchase their tax disc outside of working hours.
4.2 Conclusion

Government can clearly use the internet as a cost effective way of reaching citizens. Whether by providing information online or making the internet a more interactive channel of service delivery, government stands to make significant gains from expanding digital inclusion.

FreshMinds has calculated that potential government savings could include:

- £140m per year potential saving through fewer missed hospital appointments with NHS Choose and Book
- £90m per year saved by DVLA’s online tax renewal system (rather than face-to-face interaction)
- £80m estimated net saving, in 2008 through basic health information provision on NHS Direct Online

However, usability of internet services will need to be central to maximise the benefits of digital inclusion, particularly in healthcare and among the elderly, disabled, or those who don’t speak English. A possible avenue for further research might be a closer look at the benefits of digital inclusion in light of the degree of usability of internet services and type of platform (mobile phone, desktop computer or portable device, for example).

To estimate the DVLA cost efficiency saving we refer to data from a pilot run by Tameside Borough Council, which encouraged public service users to carry out transactions online:

- A £14.40 saving can be obtained from transactions conducted online rather than face-to-face.
- 80% of all attempted online transactions are completed online.

\[
1 \times 0.80 \times 0.98 \times £14.40 = £11.29 \text{ per user}
\]

How can we scale up what we have found?

This translates to:

\[
£11.29 \times 8 \text{ million user transactions} = £90.32 \text{ million saving per annum}
\]

Note that the DVLA’s estimation of saving includes the cost of fixed investment. This figure shows the potential for saving once economies of scale have been fully realised.

£80m estimated net saving, in 2008 through basic health information provision on NHS Direct Online

£140m per year potential saving through fewer missed hospital appointments with NHS Choose and Book

£90m per year saved by DVLA’s online tax renewal system (rather than face-to-face interaction)

Up to 60% decline in missed hospital appointments per year with NHS Choose and Book
5. Private sector organisations

The ease with which individuals can shop online and search for information represents a significant opportunity for the private sector. For example, developments in technology and internet habits (such as social networking) mean that firms can very accurately target consumers using advertising online. According to media communications agency, GroupM, online advertising accounted for 18% of total advertising spending in 2007 and shows signs of strong growth into 2008.

The internet can therefore represent a significant sales opportunity for businesses, as well as increasing efficiency and productivity by lowering the cost of administering consumer transactions.

Finally, increasing use of internet technologies in retail or consumer relations generates demand for ICT products and services, driving revenue directly within this sector of industry. The benefits to private sector organisations can be summarised as:

1. **Increased efficiency and productivity** – in terms of employees using internet based applications to process work more efficiently.
2. **Increased sales opportunities** – stemming from the application of technologies to reach customers.
3. **Increased demand for ICT products and services** – more access and use of the internet will lead to greater demand.

5.1 Increased sales opportunities

As discussed in Chapter 3, Individuals, the internet can reduce the search time and costs associated with buying goods and services. Not only does this benefit the consumer, but it also benefits the seller by increasing sales opportunities.

In periods of poor consumer spending on the high street, online retail sales have been shown to continue to attract consumers. Many of the large retailers reported poor Christmas sales, but on Christmas Day 2007, 4.4 million shoppers ordered online, spending an average £19.09 each. For example, whilst overall Marks and Spencer sales decreased by 2.2% in the third quarter, online sales had increased 60% by November 2007.
5.2 Increased efficiency and productivity

Research by Goodridge and Clayton (2004) has shown that internet use by employees (and electronic business procurement) can have a positive impact upon productivity. Farooqui (2005) and others find that such productivity gains vary across sectors, but are greatest in the services industry.

5.3 Increased demand for ICT products and services

Increasing internet access and functional use will also fuel demand for computing hardware. Currently, spending by households on computers, printers and calculators totals £40 million per week. This in turn bolsters demand for ICT goods and services and we should expect a further stimulation of innovation, investment and economies of scale. All else being equal, this should lead to greater productivity, higher wages within the industry and a positive impact on GDP growth.
Case study example: Domino’s Pizza

What is it about and what does it show?
As well as telephone and face-to-face orders, UK customers can now select their menu and pay online. Following a determined effort to improve the firm’s internet operations, Domino’s Pizza online orders comprise 15% of total sales.

What data does it yield?
Total internet trading for 2007 reached £32.2 million and the average spend of customers is 20% higher online than for telephone orders.

- If £32.2 million is 15% of total sales, total sales = £32.2/0.15 = £214.67 million.
- We estimate the average telephone order to be approximately £15 and we know that the average online spend is 20% more than this. Therefore, the average online spend per customer is estimated to be £18.
- This gives a per customer online sales ‘premium’ of £3.
- Using average consumer order prices, the number of non-internet orders was approximately 14.3 million and the number of internet orders was 1.78 million.

The value of additional spending to this private enterprise from internet sales increased total sales by:

\[(£18 \times 1.789 \text{ million}) - (£15 \times 1.789 \text{ million}) = £5.7 \text{ million}\]

How can we scale up what we have found?
If the average annual online spend per consumer is £606, 20% may be said to represent the additional internet ‘premium’.

If non-internet consumers purchased online, we might then estimate that they would spend an additional:

\[£606 \times 20\% = £121.2\]

Scaling this up for the 19.1 million UK individuals not digitally included this premium would be worth to private sector an additional:

\[£121.2 \times 19.1 \text{ m} = £2.3 \text{ billion}\]
5.4 Conclusion

The internet is a powerful retail channel, both business-to-business and business-to-consumer. Not only can it decrease the cost of consumer acquisition, but research suggests that people are prone to purchasing up to 20% more online than they would offline. Internet based transactions (including online payment and delivery tracking) might also enhance internal business productivity.

The overall impact of e-retail upon private UK enterprises will depend on:

- the volume of online sales (in light of the increasing propensity to spend)
- the value of online sales (in light of increased price competition)
- the number of sales lost to offshore firms.

£2.3bn per year from up to 20% additional online spending
6. Society

The wider society is the most complex of the impact areas explored in this report. For instance, if a large number of individuals benefit from digital inclusion by gaining qualifications, there is potential for that to translate to a better qualified labour force, lower unemployment and improved life chances. But it is very difficult to attribute a monetary value to improved life chances, or to measure the effect of ‘softer’ impacts. Arguably, there is a significant benefit for society in getting an isolated or vulnerable person to use computers and the internet to reconnect with their community, but the inherent value – and indeed the cause and effect relationship – is largely intangible.

However, there is in fact a wealth of project and micro-level information demonstrating the indirect societal benefits of digital inclusion. These can be split roughly into the following categories:

1. **Decreased social exclusion** – through involving members of marginalised groups in mainstream society activities.
2. **Increased civic participation** – through providing wider opportunities for self expression for citizens.
3. **Enhanced working and natural environment** – through fostering a more stimulating working environment as well as flexible and remote working practices.

### 6.1 Decreased social exclusion

The available body of evidence illustrates that digital technology can reduce social exclusion or marginalisation in two ways. The first can be described as top-down, whereby disadvantaged groups are connected to better services and support via new technologies (see Figure 8). A good illustration is ‘Significant’, a company which offers a remote, web-based signing service for deaf people. Such online services reduce the degree of social marginalisation experienced by typically disadvantaged groups.

The degree of marginalisation experienced by different groups within a community can also be reduced by technology on a grass-roots level, whereby individuals within and between communities gain opportunities for better expression, exchange and communication. This has been shown to increase understanding between groups and ultimately improve communities and community relations. Some studies in this area have measured the frequency of interactions between people (both mediated and face-to-face) and neighbour recognition, and found that connection to the internet had a clear impact. The online community members were significantly more socially proactive than the offline control group.

Other studies have measured proactive job-searching, sense of community spirit, and general improvements in quality of life. There have also been some initiatives demonstrating the impact of internet technologies in stimulating the uptake of local services, including domestic violence and drugs counselling.
Underpinning both the top-down and grassroots approaches is the relatively new phenomenon of user-generated content. Taking the example illustrated in Figure 9, the British Heart Foundation operates an online forum for people seeking support and motivation in stopping smoking. But this is not just a top-down resource. Users can sign up for email hints and tips, post advice to others on a message board and keep a blog of their progress. Stopping smoking obviously has public health benefits, but further social impact arises from the online support network. Communicating with people with similar worries, problems or difficulties can reduce feelings of marginalisation and foster social inclusion.

**Figure 8: Reducing social exclusion through online services for marginalised groups**

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Example</th>
<th>Outcome</th>
<th>Quantified benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online services for disadvantaged groups</td>
<td>Increased access for marginalised groups</td>
<td>Decreased social exclusion</td>
<td>At present value un-quantifiable</td>
</tr>
<tr>
<td></td>
<td>Increased quality of life for individual service users</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 9: Reducing social exclusion through user-generated content**

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Example</th>
<th>Outcome</th>
<th>Quantified benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>User generated content</td>
<td>Online forums (e.g., British Heart Foundation)</td>
<td>Decreased social exclusion</td>
<td>At present value un-quantifiable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Underpinning both the top-down and grassroots approaches is the relatively new phenomenon of user-generated content. Taking the example illustrated in Figure 9, the British Heart Foundation operates an online forum for people seeking support and motivation in stopping smoking. But this is not just a top-down resource. Users can sign up for email hints and tips, post advice to others on a message board and keep a blog of their progress. Stopping smoking obviously has public health benefits, but further social impact arises from the online support network. Communicating with people with similar worries, problems or difficulties can reduce feelings of marginalisation and foster social inclusion.
6.2 Increased civic participation
Digital technology has undoubtedly made communication quicker and easier. As well as allowing people to talk to each other, it has allowed them to talk to their political representatives far more readily. One of the best examples is the e-petitioning site petitions.pm.gov.uk, which allows people to express their views directly to Number 10, Downing Street (see Figure 10 below). People can create, sign or view petitions online for free, whereas a manual petition might cost upwards of £1,600 to run. Ten months after its launch the site has nearly 5.5 million signatures from nearly 3.7 million different email addresses. In this case, technology has effectively narrowed the gap between citizen and state, though the full impact of increased access to local and national government representatives and services is yet to be fully realised or quantified.

6.3 Enhanced working and natural environment
There is a plausible argument that applications of digital technologies in the workplace can have a positive impact on work-life balance. Evidence suggests that they can stimulate efficiency, enable flexible working and enhance motivation. They also have the potential to reduce carbon costs through reduced travel and paper usage. For example, Lewisham Borough Council utilised wireless internet technology to increase the efficiency of its building maintenance and service provision. By transferring information on jobs using the internet, remote workers were able to reduce the number of journeys they made to the central depots and halve their level of paper work. This allowed the Borough save 18.2 tonnes of carbon a year.
Personal well-being and environmental factors may seem peripheral to this agenda, but once again their cumulative impact on society is significant. Nicer places to live and happier people living in them are beneficial to all, and the role of technology in making this happen could and should be further explored.

Case study example: BT Internet Rangers

Research conducted in 2006 found nearly a third of parents and grandparents had been taught or encouraged to surf the internet by a young person aged between 13 to 16 years. In 2007 BT launched its Internet Ranger programme to build upon this trend and increase digital inclusion among older people, typically one of the groups in society most ‘at risk’ of exclusion. At a societal level, it is also a vehicle for increasing cross-generational collaboration and understanding.

In association with Age Concern, Microsoft, learndirect and other high profile sponsors, BT also supports the Silver Surfer campaign. An evaluation of the 2006 Silver Surfer Week shows that 17,000 older people (80% of which were between 60 and 79 years) joined in events across the country. A promising 84% of the participants indicated that they wanted to continue their learning of internet skills, although a notable 20% of these did not have access to a computer.

Although the results of the campaign show that well-publicised events can encourage digital inclusion among typically marginalised groups, there is little research as to the direct or indirect impact this might have upon society.
6.4 Conclusions
Impact on society is the area where most work needs to be done in order to quantify the value of digital inclusion. The body of project-level evidence is considerable, but no attempt has been made to scale things up to arrive at an estimation or extrapolation of societal-level value.

For example, the boom in the use of social networking sites arguably has benefits for all discernible impact areas – ranging from enhanced social capital of users to companies’ savings in recruitment costs. However, research to date has typically stopped short of producing quantitative, systematic studies measuring the impact of grassroots web technologies on communities. We know that web 2.0 applications of the blogging and networking types are generally good, but how do we measure their real value?

Future research in this area should consider building a list of standardised, measurable indices that can be used in evaluations across the spectrum of digital inclusion projects, and therefore yield comparable and scalable results.
7. Wider economy

For the wider economy, ultimately the main benefit of digital inclusion is an increase in national gross domestic product, the primary indicator of a country’s economic well-being. The underlying driver of increased GDP is increased productivity, with the main benefits for the economy including:

1. **Increased demand for the ICT industry** – driving yet further innovation and efficiency gains.
2. **Increased UK competitiveness** – attracting inward investment.
3. **Increased GDP growth rate** – enabling further investment in research and development, which will feed back into a virtuous circle of GDP growth and technological development.

**Figure 12: Increased digital inclusion drives increased GDP growth**

- Increased digital inclusion
- Increased demand for online public services (e.g., Council Tax payment)
- Increased demand for online private sector services (e.g., e-retail)
- Increases ICT skills in workplace
- Increases efficiency of service delivery (increases productivity)
- Increases aggregate demand for ICT industry
- Increased ICT industry innovation, investment and productivity
- Higher return to ICT sector skills (increased wages)
- Increased GDP growth
- (Short run) increase in consumption?
- Increases productivity
- Increases foreign and direct inward investment
- Increases online public sector services (e.g., Council Tax payment)
- Increases online private sector services (e.g., e-retail)
Utilisation of internet based technologies by digitally included citizens can impact on productivity in three main ways:

1. Efficiencies are generated through private and public sector internet based processes such as online sales ordering, transactions and enquiries. Research indicates firms with higher investment in ICT, higher use of computers, telecom services and e-commerce exhibit higher productivity rates.

2. Investment in ICT and skills enhances the physical and human capital of workers, raising their productivity and boosting GDP growth – particularly when economies of scale and network effects come into play.

3. Increased private and public sector use of ICT drives demand for ICT goods and services, boosting investment and innovation in the industry. The launch of new technologies in the long term drives productivity gains and, in turn, GDP growth.

In Chapter 3, Individuals, we discussed the benefits derived from increased employability and salary prospects through internet and computing skills. There we highlighted the significant wage premium – 3-10% (Centre for Economics of Education, 2007) – that computer use in the workplace demands. At an aggregate level, a more highly skilled labour force serves to attract inward investment and bolsters UK competitiveness. Overall, productivity improvements in the ICT industry and wider economy contribute to greater GDP growth.

However, Forth and Mason (2006) find that ICT skills shortages currently act as a constraint on UK companies’ ability to absorb new technologies. Public provision of ICT skills training should alleviate some of the burden of training on private firms, which have less incentive to train an increasingly mobile workforce with highly valuable, transferable skills. If an enterprise makes the investment in training a new worker, they run the risk that he/she moves to a different firm taking their new skills with them, and resulting in the return on productivity being lost.

The following case study shows training undertaken at UK online centres can save private sector employers £33 per digitally engaged citizen. We then scale this figure up in terms of the Leitch Review findings.

**Case study example: UK online centres internet training**

**What is it about and what does it show?**
There are 6,000 UK online centres nationwide, providing internet access and training in basic ICT skills. Previous research has found an estimated 39% of the adult population remain digitally excluded, with those at a social or financial disadvantage three times more likely to be offline. Public investment in widening access and enhancing skills is still vital in expanding digital inclusion, especially as ever-developing new technologies become adopted by the mainstream and the most excluded fall further out of reach.
What data does it yield?

- The cost to employers of the training provided by UK online centres would have been £100. (In fact, economies of scale achieved by the UK online centres national network allow it to provide training at a considerably lower cost).
- One third of the new digitally engaged people served by UK online centres are employed or go on to find a job. (This figure is in line with surveys of UK online centres’ users).

We make the following assumptions:

- All UK online centre customers who either already have a job or who go on to find a job will apply their ICT skills at work. While understanding that not all jobs involve ICT, and that the ‘basic skills’ learned of using the internet may not be the skills that are required for work (Carey 2007), it is not unreasonable to assume that most of those who learn these basic skills will find some application (in the broadest sense) in the workplace.
- Digitally engaged people who are in employment would either have had to have been trained by their employers in basic ICT skills – or their employers would consequently have suffered from reduced productivity.

Therefore, the benefit to business from training provided to their employees at UK online centres is estimated to be, on average:

\[
£100 \times 33.33\% = £33 \text{ per digitally engaged citizen.}
\]

How can we scale up what we have found?

The Leitch Review of Skills (2006) stresses the need for the UK to upgrade to a ‘world class skills base’. Essentially, every new digitally engaged citizen who is also an actual or potential employee (in general, all those below retirement age) represents a positive contribution to the UK’s ICT skills base.

Leitch projects that achieving the UK’s optimal level of skills would result in a net benefit of £80 billion over 30 years – an annual average of £2.5 billion.

We will make an assumption that becoming digitally engaged contributes, on average, 10% of the upgrade which is needed for any individual to reach the skills level optimal for the macroeconomy. This is based on new digitally engaged citizens having achieved not only ICT skills, but also the soft skills (Wyatt et al. 2003; Goodison et al. 2004) which employers say they need (Newton et al. 2005; LSC 2006). That we estimate the contribution of digital inclusion through UK online centres to be only 10% is a recognition that acquiring basic ICT skills is far from the whole requirement for employment (Carey 2007).

Further assuming that 75% of centre users are of working age, and based on the ONS statistics that (as of mid-2005) there are currently 36.6 million people of working age in the UK (ONS 2006b), we calculate that each new digitally engaged citizen makes a contribution to the UK’s economy in terms of competitiveness and productivity:

\[
£80 \text{ billion } \times 10\% \times 75\% \times 36.6 \text{ million } \div 30 \text{ years } = £5 \text{ per year.}
\]

For the economy as a whole, this increase in skills amounts to:

\[
= £200 \text{ million per year.}
\]
According to the European Commission’s e-Government Economics Project, UK public spending on ICT skills training and e-government is estimated to increase GDP by between 1.14% and 1.54% by 2010. Although no quantitative data exists on the macro-economic effects of increased private sector ICT spend, Clayton (2006), Atkinson and McKay (2007) highlight the broadly accepted view that the impact is positive.

It is clear that the internet is therefore not only an expanding channel for household and business spending, but also a driver for sector-wide productivity growth, especially in the services industry.

7.1 Conclusion

The benefits to the wider economy are essentially driven by increases in productivity. Combined with investment in skills, a virtuous circle of increasing GDP growth and use of technology can enhance the UK’s economic competitiveness.

FreshMinds calculated the benefits to the wider economy to include:

- £200m to the economy each year until 2020 if we raise ICT skills sufficiently
- 1.14% - 1.54% increase in GDP 2008-10 due to public spending on e-government and digital literacy programmes
8. Key findings

This research report highlights some of the quantifiable benefits which can be deduced from the data currently available. In summary:

1. On the individual level, digital inclusion means:
   - Time and monetary savings stemming from the use of web-based technologies – through increased consumer choice and better access to information.
   - Improved educational attainment – through more effective learning, and stimulated motivation.
   - Improved salary prospects – through e-learning and computer literacy.
   - Increased satisfaction with public services – through increased flexibility, convenience of access and overall higher standards of service.

2. For the Government, digital inclusion means:
   - Cost savings and increased efficiency and productivity – stemming from increasing use of online public services.

3. The private sector can benefit from digital inclusion in terms of:
   - Increased efficiency and productivity – in terms of employees using internet based applications to process work more efficiently.
   - Increased sales opportunities – stemming from the application of technologies to reach customers.
   - Increased demand for ICT products and services – more access and use of the internet will lead to greater demand.

4. The wider society benefits from:
   - Decreased social exclusion – through involving members of marginalised groups in mainstream society activities.
   - Increased civic participation – through providing wider opportunities for self expression for citizens.
   - Enhanced working and natural environment – through fostering a more stimulating working environment as well as flexible and remote working practices.

5. The wider economy can benefit in terms of:
   - Increased demand for the ICT industry – driving yet further innovation and efficiency gains.
   - Increased UK competitiveness – attracting inward investment.
   - Increased GDP growth rate – enabling further investment in research and development, which will feed back into a virtuous circle of GDP growth and technological development.
8.1 Headlines

Internet technologies are increasingly a part of mainstream everyday life. As previous FreshMinds research has shown, this means the digital divide will deepen unless we can give everyone the skills and opportunity to access the internet and related technologies. Motivating people to become digitally included will involve making them aware of the benefits they might expect from using computers and the internet.

There are of course also costs associated with digital inclusion – developing infrastructures and connectivity, building usability and preventing misuse, for example. However, there are also significant benefits, summarised at the beginning of this chapter. In determining the nature and size of these benefits, we called upon the considerable body of evidence available. However, the majority of evidence is characterised by some often considerable shortcomings:

- **Scale** – data pertinent to assessing the impact of digital inclusion is often collected in isolation, for the evaluation of particular programmes or projects.
- **Nature** – the wealth of information out there is often very descriptive, and stops short of allowing causal links with tangible outcomes. Furthermore, while the body of qualitative evidence is extensive, there is a shortage of quantifiable indicators.
- **Complexity** – there is a considerable degree of interconnectedness in the field, which means it is often challenging to disentangle the true effects of digital inclusion in isolation from other factors.

Nevertheless, a scan of the evidence draws out some key non-monetary headline findings. These include:

- **¼ GCSE grade**
  - value added per learner, per subject through e-learning

- **3-10% wage premium**
  - for jobs involving computer/internet use

- **Up to 60%**
  - decline in missed hospital appointments per year with NHS Choose and Book

- **1.14% -1.54%**
  - increase in GDP 2008-10 due to public spending on e-government and digital literacy programmes
8.2 Financial benefits table

The patchy nature of the available evidence makes quantifying the potential benefits of digital inclusion in monetary terms particularly challenging. The Office for National Statistics does not include internet based expenditure or income in its final accounts because ‘it cannot always be identified as a separate component’. The internet is such an integrated part of modern life that extrapolating its precise financial impact is extremely difficult.

However, based on the data available and scaling-up where possible, we hope to further the debate by bringing together some of the specific monetary benefits of digital inclusion identified in this report:

<table>
<thead>
<tr>
<th>Financial Benefits</th>
<th>Per Year (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Individuals</strong></td>
<td></td>
</tr>
<tr>
<td>NHS Direct Online (0.38 x 28 million users)</td>
<td>10,513,100</td>
</tr>
<tr>
<td>E-retail (per user)</td>
<td>283</td>
</tr>
<tr>
<td><strong>Private sector organisations</strong></td>
<td></td>
</tr>
<tr>
<td>Total 20% extra online spend</td>
<td>2,100,000,000</td>
</tr>
<tr>
<td><strong>Government</strong></td>
<td></td>
</tr>
<tr>
<td>DVLA</td>
<td>90,320,000</td>
</tr>
<tr>
<td>NHS Direct Online</td>
<td>70,356,900</td>
</tr>
<tr>
<td>NHS Choose and Book</td>
<td>140,000,000</td>
</tr>
<tr>
<td><strong>Wider economy</strong></td>
<td></td>
</tr>
<tr>
<td>Economy wide total derived from skills</td>
<td>200,000,000</td>
</tr>
<tr>
<td><strong>Total (excl e-retail per user)</strong></td>
<td>2,611,190,000</td>
</tr>
</tbody>
</table>

Care must be taken when considering this table, which is a very simple aggregation, and doesn’t take into account any other environmental factors. What it does do is to provide an indicator of what financial benefits could be achieved. Indeed, these sums are taken only from the specific examples explored in our case studies, so the cumulative benefits of digital inclusion are likely to be considerably wider at an individual, social and economic level.

As a final example, the total UK e-retail market in 2006 was estimated to be worth £10.9 billion. Given that 40% of all retail is expected to be conducted online by 2020, the economic impact of the internet is, and will be, enormous. This table is intended as an example of how the benefits of digital inclusion can add-up. Further research – and more detailed and comprehensive analysis – will hinge on the availability and nature of data collected in the future.
9. Conclusions and recommendations

As this report has demonstrated, digital inclusion has three broad categories of benefits, which are summarised in the diagram below.

1. Digital inclusion is capable of **enhancing opportunity** for both individuals and organisations. ICT-assisted learning has been shown not only to stimulate learning but can also be demonstrably related to academic achievement at GCSE level. The available research has also shown a very tangible salary premium for computer and internet skills. Customer choice is also greatly enhanced through digital inclusion, which secures better deals for users while stimulating competition in the market. Commercial organisations also benefit hugely from digital inclusion in reaching out to more customers and attracting higher spend, in addition to the obvious internal benefits related to higher efficiencies.

**Research recommendations:**
Future research should focus on analysing patterns of consumer internet-related behaviours in order to understand their evolution, particularly among the newly or ‘freshly’ digitally included.
2. Digital inclusion has immense potential in **cutting the cost** of public service delivery. Examples of such savings include efficiencies stemming from new electronic processes replacing traditional services, which make customer interactions a lot cheaper. Such schemes are increasingly rolled out across different public sector services, ranging from health to vehicle licensing, and their full potential is likely to be much wider. In addition, there are potentially significant impacts for the wider economy—the Government anticipates public spending on e-government and digital literacy programmes to yield returns of between 1.1 and 1.5% of GDP increase in 2008-10. Despite all these clear benefits, there is currently a lack of co-ordination in appraising the benefits of digital inclusion across the entire public sector.

**Research recommendations:**
Future research in this area would benefit from a coherent research strategy across all relevant stakeholders which could result in an agreement on a standardised and systematic framework for analysis.

3. Despite vigorous debates surrounding this area, there are multiple indications of digital inclusion’s ability to **improve society**. Expanding access to ICT for marginalised groups is likely to reduce their social exclusion simply through facilitating access and participation, while the potential of the internet as a vehicle for expression and easier communication often translates to individuals who are more involved and communities that are more integrated. In addition, extended digital inclusion can mean a more flexible workforce, lower paper consumption, and reduced travel to work, all of which have the potential to foster happier workforces and a better natural environment.

**Research recommendations:**
More work is needed to understand the societal impact of digital inclusion. Future research should focus on tackling the indirect nature of evidence in this area and on rigorous mapping of the relationships between societal-level and micro-level impacts. This would also be useful in determining the wider economic impacts of digital inclusion.
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