DIGITAL REPORTING OPTIONS FOR EUROPE:
A STUDY OF INTERACTIVE DATA FROM THE PERSPECTIVE OF NON-PROFESSIONAL INVESTORS
Joanne Locke, Andy Lymer & Alan Lowe
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<tr>
<td>ABRA</td>
<td>Adaptive Business Reporting Automat</td>
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<tr>
<td>AICPA</td>
<td>American Institute of Certified Public Accountants</td>
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<td>AIS</td>
<td>Accounting Information Systems</td>
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<tr>
<td>ANT</td>
<td>Actor Network Theory</td>
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<td>ASCII</td>
<td>American Standard Code for Information Interchange</td>
</tr>
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<td>ASIC</td>
<td>Australian Securities and Investments Commission</td>
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<tr>
<td>CEMA</td>
<td>Committee on Economic and Monetary Affairs (Europe)</td>
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<tr>
<td>CESR</td>
<td>The Committee of European Securities Regulators</td>
</tr>
<tr>
<td>CIFiR</td>
<td>SEC's Advisory Committee on Improvements to Financial Reporting</td>
</tr>
<tr>
<td>COREP</td>
<td>COmmon solvency ratio REPorting framework for European banking</td>
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<tr>
<td>Eb-XML</td>
<td>‘electronic business’ XML a transaction level business reporting standard being developed by UN/CEFACT and OASIS</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>EDGAR</td>
<td>SEC’s electronic filing system initiated in 1993 – Electronic Data Gathering, Analysis, and Retrieval system</td>
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<tr>
<td>EDI</td>
<td>Electronic Data Interchange</td>
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<tr>
<td>EP</td>
<td>European Parliament</td>
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<tr>
<td>ERP</td>
<td>Enterprise Resource Planning (systems)</td>
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<td>ESC</td>
<td>European Securities Committee</td>
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<td>ESME</td>
<td>European Securities Markets Expert Group</td>
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<td>FAF</td>
<td>Financial Accounting Foundation (US)</td>
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<tr>
<td>FASB</td>
<td>Financial Accounting Standards Board (US)</td>
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<tr>
<td>FDIC</td>
<td>Federal Deposit Insurance Commission (US)</td>
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<tr>
<td>FRTA</td>
<td>Financial Reporting Taxonomies Architecture (XII)</td>
</tr>
<tr>
<td>FSA</td>
<td>Financial Services Authority (UK)</td>
</tr>
<tr>
<td>HTML</td>
<td>Hyper Text Mark-up Language</td>
</tr>
<tr>
<td>IASB</td>
<td>International Accounting Standards Board</td>
</tr>
<tr>
<td>IASCF</td>
<td>International Accounting Standards Committee Foundation</td>
</tr>
<tr>
<td>ICAEW</td>
<td>Institute of Chartered Accountants in England and Wales</td>
</tr>
<tr>
<td>ICT</td>
<td>Information communication technology</td>
</tr>
<tr>
<td>IDEA</td>
<td>Interactive Data Electronic Applications – SEC proposed new platform for interactive data</td>
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<tr>
<td>IFRS</td>
<td>International Financial Reporting Standards</td>
</tr>
<tr>
<td>IOSCO</td>
<td>International Organisation of Securities Commissions</td>
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<tr>
<td>IRR</td>
<td>Integrated Regulatory Return (FSA UK)</td>
</tr>
<tr>
<td>IRS</td>
<td>Investor Relations Society (UK)</td>
</tr>
<tr>
<td>ITMM</td>
<td>IFRS Taxonomy Modules Manager</td>
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<td>LSE</td>
<td>London Stock Exchange</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>MER</td>
<td>UK FSA's Mandatory Electronic Reporting system</td>
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<tr>
<td>MiFID</td>
<td>Markets in Financial Instruments Directive (Europe)</td>
</tr>
<tr>
<td>OAM</td>
<td>Officially Appointed Mechanism (Europe)</td>
</tr>
<tr>
<td>OASIS</td>
<td>Organization for the Advancement of Structured Information Standards</td>
</tr>
<tr>
<td>PDF</td>
<td>Portable Document Format (Adobe systems)</td>
</tr>
<tr>
<td>RIXML</td>
<td>Research Information Exchange Markup Language</td>
</tr>
<tr>
<td>RNS</td>
<td>Regulatory News Service</td>
</tr>
<tr>
<td>RSS</td>
<td>Rich Site Summary or Really Simple Syndication</td>
</tr>
<tr>
<td>SEC</td>
<td>Securities and Exchange Commission</td>
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<tr>
<td>SOX</td>
<td>Sarbanes-Oxley Act (US)</td>
</tr>
<tr>
<td>TD</td>
<td>EU Transparency Directive</td>
</tr>
<tr>
<td>UN/CEFACT</td>
<td>United Nations' Centre for Trade Facilitation and Electronic Business</td>
</tr>
<tr>
<td>W3C</td>
<td>World Wide Web Consortium</td>
</tr>
<tr>
<td>Widgets</td>
<td>A widget is anything that can be embedded within a page of HTML, i.e., a web page. A widget adds some content to that page that is not static. Generally, widgets are third-party originated, though they can be home made. Widgets are also known as modules, snippets, and plug-ins (<a href="http://www.wikipedia.org">www.wikipedia.org</a>)</td>
</tr>
<tr>
<td>XBRL</td>
<td>Extensible Business Reporting Language</td>
</tr>
<tr>
<td>XBRL FR or GAAP</td>
<td>XBRL for Financial Reporting or Generally Accepted Accounting Principles or Practices</td>
</tr>
<tr>
<td>XBRL GL</td>
<td>XBRL Global Ledger</td>
</tr>
<tr>
<td>XFRML</td>
<td>Extensible Financial Reporting Mark-up Language</td>
</tr>
<tr>
<td>XII</td>
<td>XBRL International Inc.</td>
</tr>
<tr>
<td>XML</td>
<td>Extensible Mark-up Language</td>
</tr>
<tr>
<td>XSB</td>
<td>XBRL Standards Board (part of XII)</td>
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The scope of this project has required us to ask many people for their input and almost without exception it has been given unstintingly. We are particularly grateful to the ICAEW’s IT faculty, interviewees and software vendors. We acknowledge many of the participants in our research in the report and we thank them for their generous assistance as well as the many unnamed individuals who simply took time to talk to us at conferences or meetings. We would like to thank two anonymous reviewers for their helpful comments. The financial support of the ICAEW’s charitable trusts is gratefully acknowledged.
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Our report considers the potential for Level 2 reporting to be required by capital market regulators in the European Union in the light of the SEC’s interactive data project. We take the perspective of non-professional investors in the analysis because the purpose of the SEC’s interactive data project is framed around the provision of improved data for their investment decision making.

Molina’s (1999) model of socio-technical alignment is used as a framework within which to analyse the issues associated with the development and diffusion of interactive data in Europe. This theoretical approach emphasises the need for a constituency of developers, adopters and complementary technologies to be built up around the target technology. The analysis is organised into six dimensions that Molina argues are important in the ‘alignment required for successful constituency-building’:

- Target problem and market trends
- Target constituents’ perceptions and pursuits
- Constituents’ perceptions, goals, actions and resources
- Interacting and competing technologies (constituencies)
- Intra- and inter-organisational governance
- Nature and maturity of the technology. (Molina, 1999, p9)

The researchers have many years experience with XBRL and collected data by participating in XBRL constituency activities such as conferences and working group meetings. Interviews were conducted with representatives of groups both inside and outside of the XBRL constituency as well as a focus group meeting with accounting experts. We synthesize relevant academic literature and material from the internet. Evidence of how digital reporting formats influence non-professional investors’ use of interactive financial statement data was provided by conducting a pilot experiment.

Some key findings from the report are described below.

The SEC’s interactive data project may provide motivation for similar adoption in Europe. The institutional structures for capital market regulation in Europe are much more complex than in the US and the preference expressed in European committees for a decentralised solution for the collection and dissemination of regulated company reports may mitigate against pan-European adoption of an XBRL data-style project.

The proportion of the US capital market constituted by individual investment is greater than that in the UK. However there is evidence of increasing institutional investment and falling levels of individual participation in both countries. This raises the issue of how regulators should best construct dissemination mechanisms for investor audiences.

There is little research on the data sources or investment evaluation methods used by non-professional investors. Available evidence suggests they prefer to use newspapers, investor websites, and financial advisers. When they do use financial reports traditional print and PDF report formats remain popular. Our experimental research into investment decision making with different data formats suggests that subjects tend not to integrate narrative and financial information regardless of the data format. Further research that explores the full context of investment decision making and the specific functionality offered by Level 2 reporting is needed.
The diffusion of XBRL has been mainly achieved through regulator mandated data tagging. The interactive data constituency in the US was able to achieve alignment in the relatively short period of five years through the strong support of the SEC and its Chairman, Christopher Cox. There is no obvious regulatory authority in the EU likely to fulfil that role for the nascent European constituency, although regulatory restructuring in response to the credit crisis may lead to more centralised control.

Non-professional investor participation in the XBRL and interactive data constituencies is limited. While professional analysts are increasingly involved, their interests are not necessarily the same as non-professional investors.

There are opportunities to work with the constituencies of competing and complementary technologies to increase convergence, interoperability and the provision of applications that operationalise the functionality of XBRL tagged data.

XBRL is characterised as a network grammar used and as constituting a component of other applications or infrastructures in Molina's (1999) technology genotype framework. It is identified as being at the adolescent stage of development on Foster's (1987) S-Curve. This suggests that improvements in the XBRL technology are still required to achieve the functionality that is important to non-professional investors (and other users). These improvements include the automated linking of narrative text to financials, the ability to retain tags downloaded to compatible software, user friendly software for automated search and download into customisable analysis templates and a reliable rendering for visual presentation in statement format.

A summary of the 12 recommendations made based on the analysis in the report follows.

Funding should be explicitly made available to encourage research to be undertaken to develop our understanding of how non-professional investors engage with the capital markets, and what role the different functionality of data formats plays in their investment decision making. This is very poorly understood at present.

The XBRL consortium and regulators considering interactive data implementations should increase the level of dialogue and engagement with non-professional investors. The XBRL consortium should reconsider its governance and organisational structure to permit full participation without membership fees.

The economic crisis stimulates demand for improved regulation. Standardised digital reporting can provide a basis for improved surveillance but only in conjunction with appropriate regulatory resourcing and systems for audit, analysis and review.

The consideration of an interactive-style corporate reporting regime in Europe should balance the perceived benefits of decentralisation with the pressure for centralisation and requires the support of a regulatory body with the power to impose a standard for reporting purposes.

Opportunities to increase interoperability between data standards and increase convergence between XML-based standards in the accounting and reporting domains should be actively pursued.

If mandatory filing of tagged company reports was to be instituted in Europe authoritative IFRS taxonomies at the industry level must be made available so that restrictions can be placed on company level extensions to facilitate comparability and reduce the potential for manipulation of tagging.

Accountants who are authorised to give financial services advice and accounting educators should take a role in educating non-professional investors and software designers in appropriate analysis techniques using tagged data.
1. INTRODUCTION

The promise of digital formats to deliver transparency and improved outcomes for preparers and users of financial reports has been explored by academics and professionals (Allam & Lymer, 2003; Beattie & Pratt, 2003; Di Piazza et al., 2006; Lymer et al., 1999; Shin, 2003). ICAEW has traced the development of digital reporting and analysed its potential (ICAEW, 2003, 2004, 2006). This report analyses a specific development in digital reporting from a perspective that has received little attention. Our focus is the recent decision by the Securities and Exchange Commission (SEC) in the United States to mandate the submission of files tagged using eXtensible Business Reporting Language (XBRL) in its ‘interactive data’ programme. We consider in particular the potential impact of this decision from the point of view of non-professional (retail) investors in the United Kingdom and Europe. The interactive data project is a significant application of what ICAEW has called Level 2 Digital Reporting (ICAEW, 2004).

The financial markets and accounting regulators claim to have the interests of the ‘average’ investor in mind when formulating the rules that shape minimum requirements for the information that is to be made publicly available for decision making. For example, in Europe the Transparency Directive states:

‘The disclosure of accurate, comprehensive and timely information about security issuers builds sustained investor confidence and allows an informed assessment of their business performance and assets. This enhances both investor protection and market efficiency.’ (Directive 2004/109/EC, 2004, para 1).

Similarly:

‘The mission of the US Securities and Exchange Commission is to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation.

As more and more first-time investors turn to the markets to help secure their futures, pay for homes, and send children to college, our investor protection mission is more compelling than ever.’ (www.sec.gov/about/whatwedo.shtml, downloaded 5 September 2008).

Our purpose is not to evaluate the effectiveness with which these aims have been pursued, but recent decades have furnished sufficient reporting debacles and concerns to ensure that regulators and investors alike share a common interest in improved transparency and reliability (DiPiazza & Eccles, 2002; Unerman & O’Dwyer, 2004). Financial and non-financial reporting by listed companies to current and potential investors is part of an infrastructure designed to support capital investment for production and the provision of services (Charkham & Simpson, 1999; Villiers, 2006). Infrastructures need to remain stable in order to form a strong foundation for the activities they facilitate (Bowker & Star, 1999; Hanseth & Monteiro, 1997). So the options available to actors to improve conditions in the market are on the one hand limited since major restructuring will not be welcomed, but on the other hand numerous as there are many complex interrelated elements that may be ‘adjusted’.

One response in the US was the Sarbanes-Oxley Act which has received mixed reviews (Edison, 2006). Since then Christopher Cox, the Chairman of the SEC, has instigated change specifically related to reporting in three areas. First, the ‘interactive data’ programme for the receipt, storage and dissemination of submissions, replacing the existing EDGAR system. Second, the establishment of the Advisory Committee on Improvements to Financial Reporting and its subsequent report (CIFiR, 2008). Third, and most recently, a recommendation to adopt IFRS as the basis of reporting by listed companies in the US by 2014 (SEC, 2008b). While the SEC has substantial power to dictate requirements to companies in the US all these changes require the
alignment of technologies (both accounting and computer based) and people (commissioners, committee members, companies, software vendors, etc.). The effort to achieve these changes, the size of the US capital market and the linkages among international markets means that any shift in infrastructure in the US is likely to have implications for developments in Europe. Our focus is on digital reporting using ‘interactive data’ that goes beyond the static provision of PDF files or linked HTML documents. It is our view that the impact of a change in the data delivery mechanism cannot be isolated from the broader institutional and environmental context of company reporting.

A theoretical framework that is capable of supporting analysis at a meta-institutional level as well as at the detailed level of user interaction with technology is required to provide an analysis of the impacts of a shift in reporting format in the US on developments in Europe. A strong literature based on Actor Network Theory (Latour, 1987) has developed in accounting (eg, Briers & Chua, 2001; Quattrone & Hopper, 2005; Robson, 1991, 1992). Latour’s approach is to give equal emphasis to the technology objects and the people as actants in the creation of socio-technical networks. He encourages researchers to ‘follow the objects’ (Latour, 2005) and capture events as they unfold, before they become ‘black boxed’. We are in the situation to report on the events as they are unfolding for the international adoption of Level 2 digital reporting or ‘interactive data’. We have adopted Molina’s (1995) diamond of socio-technical alignment as a framework that provides more direction than Latour’s approach alone. The researchers have been actively involved in observing the development of XBRL for a number of years. This report integrates the authors’ experience and research using multiple methods within Molina’s overarching framework.

Our work builds on the ICAEW’s research in the Information for Better Markets thought leadership initiative (ICAEW, 2003, 2004, 2006) and updates it with recent developments using the particular perspective of non-professional investors. The 2004 ICAEW report on the progress of digital reporting defines three levels of digital reporting. At Level 1 the reports are provided electronically, but there is no significant increase in functionality. Portable document format (PDF) and HTML are examples. This type of reporting has been observed extensively (Allam & Lymer, 2003; Brennan & Hourigan, 2000; Deller et al., 1999; FASB, 2000; Lodhia et al., 2004; Lymer et al., 1999; Trites, 1999).

Level 2 involves standardising ‘the framework within which information is stored, processed and presented for reporting purposes’ (p8). If there is an openly available agreement on a standardised data format then the exchange of data between disparate systems (interoperability) is facilitated. It also means that the search for, and processing of, data for analysis may be automated (Debrenceny & Gray, 2001). For example, templates in Excel may be automatically populated by software that searches for the standardised information for selected companies. In the same way the presentation of the data may be customised to suit the individual user. These characteristics of Level 2 digital reporting are the basis for the SEC’s characterisation of it as ‘interactive data’. Note that while Level 2 reporting suggests greater functionality, flexibility and ease-of-use of data provided in this format, it is not ‘interactive’ in the accepted dictionary sense of ‘reciprocally active’ (Oxford English Dictionary) or ‘pertaining to a two-way system of electronic communications’ (dictionary.reference.com). It does not provide the user with a communication channel to the supplier of the data nor can they amend the actual data supplied or draw down more information than provided to the website or data store. There is a set of data from which the user may more flexibly select and process and that is the extent of the ‘interaction’ currently proposed.

The ICAEW (2004) report identifies the potential for Level 3 reporting that ‘would integrate all aspects of financial and management accounting and reporting and enable full drill-down by external users of an organisation’s reports to the underlying detail’ (p8). The report concludes that while this type of digital reporting may be technically feasible it is unlikely that any entity would see a cost/benefit gain in allowing such detailed and real-time access for external users (Hunton et al., 2003; cf; Wallman, 1997).

Our report is primarily concerned with the potential impact in the UK and Europe of the SEC’s adoption of a standardised reporting format for the collection and dissemination of corporate submissions. There are many participants in the ‘financial reporting supply chain’ (IFAC, 2008) and many of them are affected by changes in the format and nature of reporting requirements.¹

¹ The IFAC (2008) survey includes the following categories of participants in their research: regulators, standard setters, academics, external auditors, preparers, users and ‘others’. These groups are also relevant to research on digital reporting. However we would also include software vendors and the developers of the data format. See also Di Piazza et al (2006, p16).
They may also have competing or at least different interests in developments (Beattie & Pratt, 2003). To concentrate our analysis, therefore, we have chosen investors as the participant group that is a key focus of the regulators and the beginning and end of the financial reporting cycle (Di Piazza et al., 2006, p17; IFAC, 2008, p1). They are also crucially used as the focus for standard setters in conceptual frameworks on financial reporting (IASB, 2006; cf Young, 2006). Non-professional investors are of particular interest because so little of the literature about digital reporting and XBRL in particular has been concerned with how they will be affected. Nonetheless Chairman Cox has been quoted directly on his motivation for the Interactive data project as follows:

‘The SEC is concerned with making disclosure more useful for investors. That’s the whole point of our focus on using interactive data for financial reporting. Enlisting the power of new technology in our efforts to improve the usability of financial reporting is natural.’ (Headliner Q&A, 2007, p30)

‘This is a giant leap for America’s 90 million investors toward tapping the full potential of the Internet to provide customized financial information.’ (www.fsn.co.uk)

We report on the SEC’s mandatory ‘interactive data’ requirement and discuss the likely implications for regulators in Europe from the perspective of the impact on non-professional investors. The next chapter describes the theoretical framework that underpins the academic approach to the research. The chapters following that are based on each of the aspects of socio-technical alignment described in the theory. Chapter 3 defines the target problem and market trends and provides a background setting. The target problem is defined as the provision of digital data with Level 2 functionality in a way that is appropriate for non-professional investors. XBRL has been adopted by the SEC as the technical standard to achieve this. A brief non-technical introduction to XBRL and the SEC’s interactive data project is provided in Appendix 1. Chapter 4 focuses on non-professional investors and their perspectives and describes how they may be affected by Level 2 reporting. The following two chapters provide a current assessment of constituency formation and governance for the interactive data project and for the European context. The participants in the project, their resources, perspectives and coordination with other groups are considered from the perspective of non-professional investors. Chapter 7 discusses the domain of XBRL and the technology infrastructure for the interactive data project, identifying relationships with other technologies. This is important to consider as the technology of digital reporting cannot stand alone – it is dependent on, and provides support for, other standards and technologies. This in turn affects the ability of its proponents to cooperate and build support among a broader audience which is vital to provide a stable basis for digital reporting. The penultimate chapter analyses XBRL from the perspective of a technology genotype and examines the strategic implications of its key features. The report ends with a summary and overview of conclusions, limitations and recommendations that emerge from the study.
The purpose of this report requires us to consider changes that are occurring at the highest level of regulation of corporate reporting, such as changes to US and European legislative requirements. It is also prefaced on an interest in the detailed development and acceptance of technology objects (eg, XBRL) that currently a very small minority of participants in the capital markets are interested in or even aware of (CFA Institute, 2008). The purpose of this chapter is to describe the theoretical framework we have selected as appropriate to allow the analysis to span such a wide range of different and possibly competing interests. We then relate the framework to our particular interest in the adoption of Level 2 digital reporting from the perspective of non-professional investors and discuss the specific methodological issues involved in conducting the research.

2.1 THEORETICAL FRAMEWORK

Molina (1995, 1997, 1999a & 1999b) provides an approach to analysing the alignment of socio-technical constituencies necessary to achieve the development and acceptance of new technologies.

’Sociotechnical constituencies are defined as dynamic ensembles of technical constituents … and social constituents … that interact and shape each other in the course of creating, producing, and diffusing specific technologies.’ (Molina, 1999b, p8)

The analysis recognises that the successful development of technology innovations ‘is a process inseparable from society at large … society and technology reciprocally influence each other’s development’ (Molina, 1995, Fn 7, p407). Constituencies are formed through a process of alignment. Molina (1999b, p8) emphasises that this process is an ill-defined one that may be undertaken consciously or unconsciously by those developing the technology. Molina includes the technical as well as social factors and ‘actors’ as part of the constituency. This characterisation of the process of bringing a technology object to a point of acceptance and adoption is very similar to Latour’s (1999) translation of the interests of a network of actors (material and social) to fabricate a technology. Molina differentiates his socio-technical constituencies from Latour’s networks by his emphasis on agency being attributed to social actors, while the technology is given only an ‘intrinsic role’ (see Garud & Kamæ, 2003; Molina, 1995, 1999b). There is an interesting philosophical debate about whether or not technology objects may have an active role in determining how a project develops. It is not appropriate to recall that debate here. We have chosen Molina’s approach not because we agree with his view on this distinction. The purpose of the report is best served by working with a framework that provides an initial structure within which to organise the ideas and material available. We have also found that the philosophical distinction has not impeded our inclusion of the role the different technologies play in the interactive data project. Where the nature of the technology object is important in determining how events have unfolded we have included it in the discussion.

The diamond of socio-technical alignment shown in Figure 1 (Molina, 1995, 1997, 1999b) reflects the need to achieve at least sufficient alignment among diverse parties and technologies to enable them to act as constituent partners in the process of bringing the new technology to the point of a critical mass of acceptance (see also, Locke & Lowe, 2007b; Shapiro & Varian, 1999). The concept of alignment is based in organisational behaviour theory’s description of the formation of coalitions (Cyert & March, 1963; Simon, 1957). It is not synonymous with consensus or agreement on objectives (Cyert & March, 1963; Molina, 1997). Alignment may be achieved by imposing a technology either by legislative or contractual power for example. Neither is the process limited to the social actors. The technology may be aligned to the social constituents by being designed with features that they find useful. The social constituents or actors may need to be aligned to the technology through training in its use. The process of multi-directional alignment is ongoing and organic, difficult to manage or predict.
The diamond of alignment is a summary device to indicate the dimensions of constituency building that may be important in large-scale technology developments that involve more than one institution (Molina, 1997, p605). The diamond has six segments that are all linked to the target technology in the centre. The segments at the top and bottom together make up the constituency of the technology. That is, the characteristics of the technology and the social groups together form the ‘socio-technical’ dynamic of the constituency. The four remaining segments represent dimensions that are influential in terms of the success or failure of the constituency’s efforts to develop and disseminate the technology.

Each of the segments is briefly outlined below:

**Constituents’ perceptions, goals, actions and resources.** These are the members of the constituency formed to support the target technology’s development. They may not always share the same goals and perceptions and how the differences play out may be very significant for the future of the technology.

**Intra- and inter-organisational governance.** The social structures created to mediate interactions within the participating constituencies and with other institutions ‘outside’ shape the success of attracting others and the processes of development used. The goals and perceptions of members will shape how they form governance structures and reciprocally enhance or possibly undermine the achievement of the goals.

**Interacting, collaborating/competing technologies (constituencies).** Other technologies may be on development paths that compete with or complement the technology of interest. These technologies will have formed their own constituencies which may come into conflict with the target technology or its development or may be important for their joint success. The governance structures of the constituencies may enhance their ability to identify complementary prospects and bring them into alignment or it may impede cooperation.

**Nature and maturity of the technology.** One of the particular contributions of Molina (1999) is to highlight the impact of the types and stages of development of the technology on the process of achieving socio-technical alignment. The nature of technology itself is an important factor in its successful diffusion.

**Nature of target problem, market and industry trends.** This segment of the diamond emphasises the context in which the technology is to be implemented. Some technologies are developed before there is actually a demand or market for them and, linked to their nature and maturity, this may have a significant impact on how constituencies form around them and their ultimate diffusion. Other technologies create their own markets or meet an existing need.

**Target constituents’ perceptions and pursuits.** The target constituents are the intended users of the technology. In order that their needs are met appropriately, it is preferable that they should be part of the initial constituency for the creation of the technology but this is not always the case. It is important that their views and needs are understood and it may be necessary to change their attitudes to favour the technology. Achieving alignment of this group is ultimately vital for success.
The diamond of alignment is not designed to capture all the elements that are important for a particular technology nor does it normatively outline ways of ensuring success. It reflects a dynamic process that may include not only alignment, but also misalignment, the need for re-alignment or even non-alignment. In this latter case relevant groups or technologies are not ‘aware’ of each other (Molina, 1997, p605). It shows that an extensive network may be required to successfully diffuse a new technology.

The socio-technical diamond of alignment provides a useful framework for the study of the potential impact of the SEC’s interactive data project on the adoption of ‘interactive data’ in the UK and Europe. The diamond’s dimensions direct attention to issues that span contextual and institutional factors as well as individual stakeholder and technical considerations. In our case the technology of interest is Level 2 digital reporting, dubbed ‘interactive data’ in the US and Standard Business Reporting (Australian Treasury, 2006). It is possible to achieve Level 2 reporting with technologies other than XBRL. This is an issue we will discuss further in Chapter 7. However, the SEC project has adopted XBRL as the enabling technology for its project, so for our purposes it is the ‘target’ technology around which the interactive data constituency is being built.

The clearly identifiable constituency for XBRL is XBRL International Inc. (XII). This consortium was initially formed under the auspices of the American Institute of Certified Public Accountants (AICPA) but has since grown and become an independent, non-profit organisation. XII has been successful in engaging with other organisations and technologies, but has failed to enlist others as allies. These constituency building activities, organisational barriers and relationships with other technologies will be considered in Chapters 5 to 8. We begin the report with an analysis of the target problem and market and the emerging trends. This provides the broad economic and institutional setting against which the needs and perceptions of the target constituents’ (in our case non-professional investors) perceptions can be set. The infrastructures that define the provision of corporate reports become accessible to the target technology because the problem the technology seeks to solve is perceived as important to the effectiveness of that infrastructure. The changing economic, institutional and regulatory conditions are thus significant determinants in the adoption of new technologies (Di Piazza et al., 2006).

2.2 METHODOLOGY

Molina’s framework provides a structure within which a broad range of perspectives can be analysed. It also presents the researchers with a challenge to gather data and evidence from both a range of perspectives and using different methodological approaches in order to answer the questions raised by the dimensions of the diamond.

In order to approach this task we have used a range of research techniques broadly characterised as qualitative and quantitative (Collins, 2004). We have participated in XII constituency activities such as conferences and working group meetings, we have interviewed representatives of groups both inside and outside of the XBRL constituency and conducted a focus group meeting with accounting experts. Appendix 2 acknowledges the participants who gave us permission to include their names in our report. We synthesize relevant academic literature and draw on material from the internet. An area of concern was the lack of evidence about how digital reporting formats influence non-professional investors’ use of the financial statement data. We have conducted a pilot experiment to explore this issue using students as proxies for investors. The results of the experiment are included in Chapter 4 with additional detail provided in Appendix 4.

We do not seek to suggest that we have achieved a full triangulation of methods (Modell, 2005); rather we have applied methods appropriate to the broad range of research issues that emerge out of the question addressed in this report. We identify areas for further research where our analysis suggests gaps in knowledge.

2.3 SUMMARY

Molina’s (1995 & 1999a) framework is adopted as providing a useful approach to analysing the potential impact of the SEC’s adoption of interactive reporting on the UK and European financial markets and institutions from the perspective of non-professional investors. A variety of methods are adopted as appropriate to address the issues that arise within the dimensions of Molina’s diamond of socio-technical alignment.

The next chapter explores the ‘target problem and market trends’ dimension of the diamond. This provides a context for the study as a whole by considering a broad span of relevant institutional and technical influences.
This chapter explores the key factors in the environment in Europe, the UK and the US that are relevant in the diffusion of the interactive data programme instigated by the SEC. The chapter proceeds by first defining the ‘target problem’ and the motivation for its becoming central to the efforts of the constituency. Following this, these issues are located in the broader landscape of the institutional, regulatory and economic environment that are also likely to influence acceptance of the SEC’s approach in Europe and the UK.

3.1 NATURE OF THE TARGET PROBLEM
In building support for a new technology, it is important that the adopting community believe they have a worthwhile solution to their problems. To persuade others that they should support and adopt the technology it is often necessary to re-invent or reorient the problem for which the solution is applicable (Callon, 1986; Chua, 1995). This has been the case for XBRL. Initially named eXtensible Financial Reporting Mark-up Language, it was quickly identified that this may not be inclusive enough. Moves were made to re-brand as a business reporting language within a year (Cover Pages, 2000; Lymer et al., 1999; Waters, 1999). 2 The early predictions of the XBRL constituency about the demand for tagged or interactive data were over-ambitious. The speed of adoption was overestimated (see for example, Hannon, 2001) and the drivers of adoption were poorly specified (Hucklesby & Macdonald, 2000). In terms of problem definition it was not businesses recognising the value added by ‘straight-through’ reporting and it was not investor demand for information with ‘interactive’ functionality that has underpinned the slower than expected growth of XBRL adoptions (Boulton, 2005).

Yudkowsky (2003) suggests that one of the reasons XBRL has had a ‘hard time taking off’ is difficulty with the question:

‘Who is the customer? The adoption message associated with XBRL value is convoluted. For whom will the value be increased? Is it the information creator’s (an individual or the company) or the processor of that information (analyst, CPA, SEC)? Not understanding who the real customer is [is] complicating the marketing pitch.’ (p2)

The initial explanation of the solution that XBRL offered was too complicated and the problem to which it was directed was unclear.

As it has turned out, to date, it is regulators who have driven adoption (Locke & Lowe, 2007b). The decision by Christopher Cox, when he became Chairman of the SEC in mid 2005, to support the ‘interactive data’ programme was a momentous one for the constituents of the project, especially in the light of the UK Financial Services Authority’s decision not to adopt (Hadfield, 2006). The target problem identified by Christopher Cox is to make information less complex and easily available for investors to use for decision making. He is described in his biography as having:

‘…championed transforming the SEC’s system of mandated disclosure from a static, form-based approach to one that taps the power of interactive data to give investors qualitatively better information about companies, mutual funds, and investments of all kinds.’ (http://www.sec.gov/about/commissioner/cox.htm; see also Knight, 2007)

2 XBRL is not actually one homogenous data standard. XBRL for reporting to external parties has developed differently to XBRL for internal reporting. The internal reporting taxonomy and techniques surrounding it are known as XBRL GL. In a similar re-branding exercise the GL was initially treated as short for ‘general ledger’, but has since been changed to ‘global ledger’ (Anonymous, 2001; http://www.xbrl.org/GLTaxonomy/).
Chairman Cox outlined the particular need to focus on the ‘ordinary’, individual investor in his keynote address to the 2007 US-EU Corporate Governance conference:

‘Just as disclosure and transparency is a key element of good corporate governance, the cost of obtaining and processing information about the corporation presents a barrier to shareholders that is a systemic problem in corporate governance. The traditional answer to this problem – that the shareholder can rely upon an efficient market to judge the information for him or her – carries with it profoundly unsatisfying implications for the individual investor.

That’s why at the SEC, we are focusing so much attention on improving the quality of financial reporting through interactive data, which will let ordinary investors obtain information much more quickly, inexpensively, and usefully.’ (Cox, 2007, emphasis added)

The target problem from the point of view of the SEC is to collect and disseminate interactive (XBRL tagged) data in the belief that it will improve the quality of financial reporting to individual (non-professional) investors. Next we review the broader conditions within which this target problem has become important and how they may affect the potential for a similar target problem to emerge in Europe and the UK.

3.2 MARKET TRENDS AND CONDITIONS

Our research question requires us to examine conditions in the market for corporate information for investment decision making in the US, Europe and the UK. Initially we focus on the broad market conditions, institutions and regulations. Following that we specifically consider the digital provision of corporate information and its particular effects on the market and non-professional investors.

3.2.1 Corporate information and capital markets in the US

Identifying market trends in the US and conjecturing about possible effects in other jurisdictions is fraught with difficulty. Often it is assumed that the ‘Anglo-American’ model for capital market operation and regulation are similar. However, Bush (2005) persuasively argues that there are fundamental differences. Nonetheless as the effects of the US initiated sub-prime mortgage crisis, commonly referred to as the ‘credit crunch’, unfolds worldwide there is little doubt about the strength of the influence of the US financial markets on global capital market sentiment. Similarly the response to the earlier crashes of large US companies and the frauds underlying them stimulated a number of regulations in the US including the Sarbanes-Oxley Act (SOX) (Ribstein, 2003). SOX immediately impacted companies with cross-listings in the US and international subsidiaries of US-based companies. It arguably set a new international standard for compliance and executive responsibility for internal control and reporting (Edison, 2006; Ribstein, 2003).

Table 1: Interactive data timeline

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early 2004</td>
<td>SEC task force</td>
</tr>
<tr>
<td>March 2005</td>
<td>Voluntary filing programme</td>
</tr>
<tr>
<td>August 2005</td>
<td>Christopher Cox sworn in as SEC Chairman</td>
</tr>
<tr>
<td>Early 2006</td>
<td>Incentives for ‘test group’ – 10 companies</td>
</tr>
<tr>
<td>September 2006</td>
<td>SEC announces contracts of $54m for interactive data system</td>
</tr>
<tr>
<td>July 2007</td>
<td>SEC Advisory Committee on Improvements to Financial Reporting (CIFiR) established</td>
</tr>
<tr>
<td>September 2007</td>
<td>US GAAP Taxonomy completed, 40 companies in voluntary test group</td>
</tr>
<tr>
<td>October 2007</td>
<td>SEC Office for Interactive Disclosure announced</td>
</tr>
<tr>
<td>January 2008</td>
<td>SEC ACiFR interim report recommends phase in of mandatory interactive data</td>
</tr>
<tr>
<td>May 2008</td>
<td>Commissioners vote in favour of proposed rule to phase in mandatory XBRL filing (initially as an exhibit)</td>
</tr>
<tr>
<td>June 2008</td>
<td>Dr Lutz announced as leader of 21st Century Disclosure Internal Inquiry</td>
</tr>
<tr>
<td>19 August 2008</td>
<td>SEC’s new IDEA platform announced</td>
</tr>
<tr>
<td>28 August 2008</td>
<td>SEC announced vote to move to IFRS by domestic companies</td>
</tr>
<tr>
<td>17 December 2008</td>
<td>A vote by the Commissioners made final an Interactive Data rule</td>
</tr>
</tbody>
</table>

Chairman Cox also mentions in various speeches the reduction in time, effort and cost that will accrue to preparers of submissions (see http://www.sec.gov/spotlight/xbrl.shtml). This is an essential element of constituency building to encourage preparers to embrace the new technology despite the obvious additional initial costs.
These prominent instances of corporate failure, financial instability and crisis have in common the tendency to stimulate regulatory changes that have worldwide impact. The cycle of capital market crisis and regulation has been documented in the literature (Eaton, 2005; see also Klein, 2002). With the Enron debacle still fresh, Christopher Cox's tenure as head of the SEC began with demands for better regulation and reporting and an emerging debate over the efficacy of SOX requirements. In mid November 2007 the consequences of the sub-prime mortgage problems were still unclear, but by early 2008 the credit crunch crystallised and a series of shocks to international financial institutions reverberated through capital markets. At the same time the plan to make interactive reporting mandatory was imminent. The roll call of major events in the financial services sector include the ‘nationalisation’ of Northern Rock in the UK, the mergers among banks in the UK and US, the instability of and Fannie, Freddie and AIG in the US and the multi-billion dollar bailout plans adopted first by the US and then by other countries around the world. The financial services sector globally is undergoing a very significant restructuring. As the fall out continues, criticisms that regulatory agencies failed to adequately police banks and investment houses have emerged. In particular, Christopher Cox has admitted that ‘failures in a voluntary supervision program for Wall Street’s largest investment banks had contributed to the global financial crisis, and he abruptly shut the program down’ (Labaton, 26 September 2008).

The SEC Inspector General’s report on the SEC’s performance was very critical. Among other issues:

‘The report found that the S.E.C. division that oversees trading and markets had failed to update the rules of the program and was “not fulfilling its obligations.” It said that nearly one-third of the firms under supervision had failed to file the required documents. And it found that the division had not adequately reviewed many of the filings made by other firms.’ (Labaton, 26 September 2008)

Fair-value accounting has also been criticised for potentially exacerbating the banks’ problems as the sub-prime mortgage derivatives’ revaluation created losses and wiped out their reported asset backing. To add to the spiral:

‘Bankers say that in a downturn fair-value accounting forces them all to recognise losses at the same time, impairing their capital and triggering firesales of assets, which in turn drives prices and valuations down even more.’

(The Economist, 18 September 2008)

The debate over the use of fair value, especially for banks, has been lively for some time (AAA Committee’s Financial Accounting Standards Committee, 2000; Allen & Carletti, 2008; Barth, 1994; Hirst et al., 2004; Hitz, 2007; IASB Expert Advisory Panel, 2008). It is relevant here in that the argument for fair value has been linked to transparency by the Financial Accounting Standards Board, and the SEC’s Advisory Committee on Improvements to Financial Reporting (CIfIR) recommended cautious expansion of its use as well as supporting the interactive data reporting programme (CIFIR, 2008).

In an upheaval of the scale of the current credit crisis, it is important not to overstate the potential role of interactive data in preventing a similar crisis in the future. However, since it is our focus, the question is whether or not the links between CIFIR, fair value reporting and interactive data will act to derail the momentum surrounding interactive data tagging. If there is a perception that too much rapid, transparent reporting actually damaged the ability of the financial sector to ride out the wave of crises created by the bursting of the sub-prime mortgage bubble, it may be that the ongoing support for the mandatory roll out and ultimately the switch over to interactive data is undermined (Roberts, 2009). On the other hand, the crisis may provide interactive data further impetus as a tool to ‘streamline[d] collection, aggregation and validation of information’ (Nimmons, 2005) and so facilitate regulatory surveillance and improve the SEC’s performance in that regard. Transparency, tighter regulation, and new technology may be convincingly presented as ways to boost investor confidence in reporting and emerge as part of the crisis-prompted ‘solution’ for the future and give the interactive data project a boost (Gunn, 2007). In the immediate future while it would seem likely that the SEC’s and other constituents’ attention would be diverted away from interactive data, the interactive timeline (Table 1) shows that at least Christopher Cox’s mission to have the proposed rule finalised by the end of the 2008 has been achieved.

Even supporters of XBRL vary in their views of whether or not the technology can solve the problem of identifying market-wide problems and individual frauds. Some argue that it is not a ‘magic pill’ but is helpful, while others claim much more for the strengthening of regulatory oversight (Cuban, 2008; Moyer, 2008; Nagesh, 2008).
The unfolding of the US-based financial market crisis will certainly cast a shadow over the interactive data programme. The next section focuses on how that programme has developed and the specific conditions in the US regulatory environment that have sustained it to date.

3.2.2 The development of the interactive data programme

A task force in the SEC to consider XBRL and interactive data was formed in early 2004 (Booth, 2006). This led in April 2005 to the voluntary filing programme which was seen as a 'real-world' test of the concept (Booth, 2006). Filers were required to continue to file their information in HTML or ASCII and so it placed an additional burden on them with no immediate benefits. Initial interest in voluntarily filing was, perhaps unsurprisingly low, so early in 2006 an incentive was offered for companies who joined a 'test group'. These companies agreed to submit four interactive data filings in a 12-month period. They agreed to provide feedback on 'manpower', costs, and benefits or deficiencies involved with submitting the filings. The incentive offered was that the SEC staff would provide expedited reviews of registration statements or Form 10-Ks from test group participants (http://www.sec.gov/news/press/2007/2007-191.htm). The test group programme was slow to take off, with only 10 companies making 27 filings in the first year (Booth, 2006). In the context of the 15,000 publicly traded companies registered with the SEC – this was a disappointing response. However, by September 2007, 17 months into the voluntary programme and with the incentive in place, more than 40 companies with a combined market capitalisation of $US2tn were part of the test group (http://www.sec.gov/news/press/2007/2007-191.htm).

Christopher Cox was sworn in as Chairman of the SEC on 3 August 2005 – soon after the beginning of the voluntary filing programme (http://www.sec.gov/about/commissioner/cox.htm). This was a critical time for the interactive data project since the low number of participants may have meant that he would not view the project favourably. As it turned out Christopher Cox has become one of its most vociferous supporters, speaking at many conferences and being actively involved in a series of ‘interactive data roundtables’ and even doing a hands-on demonstration for an on-line news conference (http://www.sec.gov/news/press/2008/2008-179.htm). The support of the SEC Chairman meant that resources have been made available to hasten the development of the standards and technology required before interactive data can be made mandatory. These resources included $US54m for contracts to support the development of software and the required taxonomies. A key organisation in this process is XBRL US Inc., which was formerly the US jurisdiction run under the auspices of the AICPA as part of its initial support for the XBRL consortium (now XII). The completion of all required taxonomies (including one for mutual funds) was announced on 25 September 2007. The Financial Accounting Foundation and stakeholder groups such as analysts, filers, and software vendors provided initial feedback on the taxonomies. They were then opened up for public comment (http://usgaap.xbrl.us). The taxonomies are a vital part of the technology and require the cooperation of accountants and IT specialists. We will discuss their development in more detail in Chapter 8 when we focus on the technology itself.

The SEC’s institutional commitment to the programme was demonstrated by the creation of the Office for Interactive Disclosure and the appointment of David Blaszkowsky as its Director. His role is described as being to:

‘… coordinate the agency-wide disclosure modernization program, and … work with investor groups, analysts, journalists, and preparers of financial statements as well as other key public and private sector stakeholders in the United States and around the world to advance the use of interactive data in financial reporting.’ (http://www.sec.gov/news/press/2007/2007-213.htm)

‘David’s combination of capital markets and technology development experience will be a tremendous asset to the Commission as we transform disclosure to make it easier for filers and more useful for investors,’ said Chairman Cox (http://www.sec.gov/news/press/2007/2007-213.htm).

For the interactive data project 2008 has been a pivotal year. The work of the previous three years in the voluntary pilot programme and the development of the technological and institutional elements of the network to support the final steps required to put the programme into action was well advanced by the end of 2007. In 2008, many of the threads of the
underlying structure needed to introduce the revamped EDGAR were in place, so events unfolded quite quickly against the devastating background of the credit crunch.

The draft recommendations of the SEC Advisory Committee on Improvements to Financial Reporting (CIFiR), established in July 2007, were published in January 2008 and its final report on 1 August 2008. CIFiR did not only address interactive reporting, its purview included ‘examining the US financial reporting system with the goals of reducing unnecessary complexity and making information more useful and understandable for investors’ (http://www.sec.gov/about/offices/oca/acifr.shtml). The interactive data project was thus located in the broader setting of better financial reporting. This is a way of gaining support and allies not just from those who are attracted by technologically advanced systems but also on the basis that it was part of a wider programme of improvement, simplification and increased clarity in reporting for investors. The report supports the adoption of interactive data and a phased approach to it becoming a mandatory filing mechanism as part of a package of improvements to the delivery of information to investors.

The text of the interactive data recommendation is:10

‘Recommendation 4.1: The SEC should, over the long-term, mandate the filing of interactive data-tagged financial statements after the satisfaction of certain preconditions relating to: (1) successful XBRL U.S. GAAP Taxonomy testing, (2) the capacity of reporting companies to file interactive data-tagged financial statements using the new XBRL U.S. GAAP Taxonomy on the SEC’s EDGAR system, and (3) the ability of the EDGAR system to provide an accurately rendered version of all such tagged information. The SEC should phase-in interactive data tagged financial statements as follows:

- The largest 500 domestic public reporting companies based on unaffiliated market capitalization (public float) should be required to furnish to the SEC, as is the case in the voluntary program today, a document prepared separately from the reporting companies’ financial statements that are filed as part of their periodic Exchange Act reports. This document would contain the following:
  - Interactive data-tagged face of the financial statements.
  - Block-tagged footnotes to the financial statements.
- Domestic large accelerated filers (as defined in SEC rules, which would include the initial 500 domestic public reporting companies) should be added to the category of companies, beginning one year after the start of the first phase, required to furnish interactive data-tagged financial statements to the SEC.

Once the preconditions noted above have been satisfied and the second phase-in period has been implemented, the SEC should evaluate whether and when to move from furnishing to the SEC interactive data-tagged financial statements to the official filing of such financial statements with the SEC for the domestic large accelerated filers, as well as the inclusion of all other reporting companies, as part of a company’s Exchange Act periodic reports.’ (CIFiR, 2008, pp14–15)

While the recommendation did not go as far as some proponents would have liked, the clear indication that interactive data would become mandatory was an important signal to public companies, software vendors and data aggregators.

Much of the early hype surrounding XBRL was based on a diffusion of the data standard arising out of its ability to enhance the functionality of the data and the business case for adoption by companies (Berkely et al., 2002; Hucklesby & Macdonald, 2000; Strand et al., 2001; Zarowin & Harding, 2000). There was an expectation that the SEC’s encouragement through the voluntary programme would create the ‘peer pressure and investor demand … lead(ing) to its widespread use’ (Di Piazza et al., 2006, p16). In common with many other jurisdictions, however, the momentum needed to get companies and software vendors to

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9  EDGAR, the Electronic Data Gathering, Analysis, and Retrieval system, ‘performs automated collection, validation, indexing, acceptance, and forwarding of submissions by companies and others who are required by law to file forms with the U.S. Securities and Exchange Commission (SEC). Its primary purpose is to increase the efficiency and fairness of the securities market for the benefit of investors, corporations, and the economy by accelerating the receipt, acceptance, dissemination, and analysis of time-sensitive corporate information filed with the agency.’ (http://www.sec.gov/edgar/aboutedgar.htm)

10 Peter Wallison dissented from this recommendation. Given his support for the adoption of XBRL (http://www.aei.org/publications/pubID.24046/pub_detail.asp; note also his keynote presentation to the XBRL conference in Vancouver, 2007) it was not the adoption he was concerned about but the recommended approach to phasing it in (Johnson, 2008). The technical details of the SEC phased-in requirements will be discussed in Chapter 6.
invest in the new technology requires more certainty about market size and demand (Keeling, 2006a). The pattern has been that a mandatory requirement has been needed to create the market demand, and indeed the predicted diffusion to wider uses has not been evidenced even though mandatory requirements for filing in the US by the Federal Deposit Insurance Corporation (FDIC) overseeing about 9,000 banks have been in place since late 2005\footnote{Ironically, Gruenberg, FDIC vice chairman concluded his 2006 remarks to the XBRL conference with the statement; ‘...the FDIC’s implementation of XBRL has improved the safety and soundness of the U.S. banking system and its transparency to the public’.} (Covaleski, 2002; Gruenberg, 2006).

The mandatory requirement will also avoid the difficulty that despite the claimed success of the voluntary programme, there still is evidence that corporate preparers of submissions in the US are not embracing interactive data (Chung, 2008). Indeed there is the obvious retort to the need to mandate it, quoted here from an accountant; ‘if it was really that great, it wouldn’t have to be mandated …It’s being pushed by the people who have an interest in pushing it’ (Rappeport, 2008).

Since the vote on the proposed rule which largely followed the CIfiR report recommendations, the developments have been rolled out rapidly (SEC, 2008a). In June 2008 Dr Bill Lutz was announced as the leader of an internal inquiry into the SEC’s ‘21st Century Disclosure’ (http://www.sec.gov/disclosureinitiative). The inquiry reported in January 2009 and has lead to the creation of an investor advisory committee (3 June 2009) which met for the first time on 27 July 2009 (SEC, 2009b; SEC staff, 2009). As described by Dr Lutz in August, the role of interactive technology in bringing financial reporting into the internet era will be central to the inquiry’s ‘blank slate’ approach to the SEC’s collection and dissemination of company data (http://www.sec.gov/news/press/2008/2008-179.htm), or colloquially as Dr Lutz put it; ‘financial disclosure meets The Matrix’. The final report, unsurprisingly therefore, supports the use of interactive data concluding that: ‘A disclosure system using modern technology and based on interactive data would improve transparency for all users’ (21st Century Disclosure Initiative staff, 2009, p23).

The Interactive Data Electronic Applications (IDEA) platform was announced in August at a ‘live’ and webcasted news conference hosted by Christopher Cox.\footnote{Since the announcement of the IDEA platform and the initial writing of this report, CaseWare filed a suit against the SEC for trademark infringement (Cohn, 2009). The SEC settled the case on 27 May 2009, agreeing to ‘permanently discontinue’ its use of the trademark and has yet to announce a replacement name for the system (Cohn, 2009). In the absence of a replacement name we have left IDEA in the text of this report, but in quote marks, to refer to the replacement for the EDGAR system.} ‘IDEA’ is to run parallel with EDGAR for an estimated three years after which it will replace the older platform which will be retained as an archive (http://www.sec.gov/news/press/2008/2008-179.htm). The ‘IDEA’ concept is coordinated with the ‘21st Century Disclosure Initiative’. The proposed changes in the basis of collection and dissemination of company data in the Disclosure Initiative are to be realised through a flexible platform based on interactive data and a company-centred, rather than form-centred, model of data storage and retrieval. The metaphors used at the press conference related to the evaluation and purchase of consumer goods and services on the internet. The aim of ‘IDEA’ is to make the company submissions to the SEC searchable and open to comparison and customisation in the same way. In Chapters 7 and 8 we will discuss some barriers and technical issues associated with achieving this goal. It is evident that Chairman Cox’s commitment to the completion of the framework for mandatory reporting to an interactive data platform before his tenure at the SEC ended in June 2009 remains steadfast. Indeed, in the face of the criticisms and moves to significantly downgrade the role of the SEC, some writers have argued that it may be his only legacy:

‘“Cox just hasn’t done anything except for XBRL,” says Peter Wallison, who supervised the SEC chairman when he worked in the White House counsel’s office under President Ronald Reagan.’ (Westbrook & Schmidt, 2008, p1)

While the commitment to an XBRL-based system for interactive data seems solid – it is interesting to note that in the roundtable on modernising the SEC’s disclosure system (8 October 2008) one of the questions for discussion is: ‘Data tagging using XBRL, or eXtensible Business Reporting Language, is one way, but we understand there are other ways to structure data. What alternative ways could be used by companies to submit structured data to the Commission?’ (p7). This is an issue we take up in Chapter 7.

The market trend in the US for interactive data seems undiminished by arguably the worst crisis to hit capital markets since the 1930s depression. The timeline ends as anticipated with the rule for interactive data being finalised on 17 December 2008. The capital market that is currently the largest in the world will have taken the most significant step in diffusing the use of XBRL to date. There are two key structural reasons why the SEC’s project is so significant in the market for corporate information.

12 Target problem and market trends
First, the SEC’s investor protection mandate has been interpreted as involving the provision of information to capital markets. This is in contrast to other jurisdictions (such as the UK) in which the dissemination of information is largely the prerogative of third-party data aggregators and distributors (Mantos Associates, 2004). The impact of this is that while some projects (such as for banking regulation and by Companies House in the UK) emphasise data collection using XBRL tags, the SEC’s project provides a platform for the free dissemination of the data to everyone. The non-professional investor and analyst in any country have the potential to benefit just as much as the regulator. This size and the SEC’s financial investment in value-added data for investment decision making make the project unique.

A second structural feature of the interactive data project is that the SEC is a single regulatory agency in control of reporting requirements for the largest capital market in the world. The European Union market overall may rival the size of the US market—but the regulation is divided between the member states and progress towards a co-ordinating mechanism has been slow. Chinese, Japanese and other securities regulatory agencies have adopted (and in some cases mandated) XBR-tagged reporting schemes, but none of them have the capital market impact of the US. The next section discusses the relevant market trends in the UK and Europe.

3.2.3 Corporate information and capital markets in Europe

The market for corporate information for investment decision making in Europe is not dominated by a single standard-setter and it is not a homogeneous market. In this section we briefly outline the regulatory developments in Europe that are aimed at building an infrastructure for a corporate reporting dissemination system for a single European capital market.


The Directorate General for Internal Markets and Services has overall responsibility for making the European single market for capital and services work effectively (http://ec.europa.eu/dgs/internal_market/mission_en.htm). Broadly the creation of the single market works by cooperation between the supra-national bodies such as the European Commission and the legislature and regulators of the 27 individual member states. The complexity and coordination needed to achieve a single market is reflected in the long timelines. The 1999 plan sought to achieve an integrated capital market by April 2004. Progress is charted based on the achievement (transposition) of the Directives by the member states. League tables of progress of each state are used as a motivation device for lagging jurisdictions. Despite later target dates being set (for example, January 2007 for all member states to have transposed the Transparency Directive), the EU has failed to achieve them (Woolfe, 2008). The 2008 Directorate Management Plan reports that despite the lengthy period that has passed only 18 of the member states have transposed all of the relevant Directives. In addition, some centralised elements necessary to support a single market are still in the early stages of implementation; for example the single euro payment area (McCreevy, 2008).

The credit crunch has required significant responses by European Governments, with many acting to guarantee bank deposits and provide liquidity into the credit market. The UK announced an ‘historic’ ‘rescue package’ for its banks on 8 October 2008 that includes a £50bn capital injection to stabilise their capital backing (through the government of purchase preference shares); £200bn to be made available through the ‘special liquidity scheme’; and £250bn in guarantees for short to medium-term debt issued by banks (The Economist, 2008c). In common with concerns in the US there has been a call for greater regulation, with the Director General of DG Internal Markets and Services (Jörgen Holmquist) commenting in the 2008 annual management plan that:

‘The DG will need to continue to respond effectively to the recent financial market turmoil in order to maintain investors’ confidence. Even before the current turbulence concerns were expressed that financial market supervisory

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13. Statistics published by The U.S. Central Intelligence Agency estimate the market value of publicly traded shares in the U.S. to be $17tr in 2005 (no 2006 figures available), while for the European Union in 2006 it was reported as $11.64tr https://www.cia.gov/library/publications/the-world-factbook/geos/ee.html#Econ.

14. Under the Lamfalussy approach there are two levels of directives. Level 1 sets out framework principles and Level 2 that specify the implementing measures for putting the principles into practice.
structures in the EU need to be strengthened. Work will continue, in partnership with Member States, to identify precise causes for concern and propose relevant action. We will also pursue enhanced cooperation between national supervisors in the so-called Lamfalussy “level 3” Committees. At the same time, the Commission is considering amendments to the Capital Requirements Directive that should help provide a sound basis for cross-border supervisory cooperation and will continue negotiations on the “Solvency II” Directive to provide a solid risk-based capital regime for insurance and reinsurance undertakings.’

(Directorate General for Internal Markets and Services, 2008, p3)

The much more complex institutional structures in the European Union mean that unlike the situation in the US, a single, powerful champion such as the chairman of the SEC may not be sufficient to form a constituency and energise a project. The complexity also has implications for pan-European companies. Michael Diekmann, chief executive officer of Allianz called for a single European financial services authority … similar to the US Securities and Exchange Commission’ (Gow, 2006). The argument is that it would increase transparency and decrease compliance costs for regulated entities. The barrier to this type of solution is that it would require the national governments and their regulatory agencies to cede authority to a central ‘European Financial Services Authority’ and not even Mr Diekmann could see that happening at the time. The current economic situation may have an impact on attitudes to a centralised regulatory body once the immediate crisis has passed. A central body would speed up regulatory changes and possibly support the introduction of tagged data delivery. Even without a centralised regulator, the calls for greater regulation may provide a boost for the argument that national regulators should adopt a consistent, electronically efficient, pan-European method of carrying out market surveillance – a bill which XBRL tagging could fit.

A relevant factor for the effectiveness of this argument in Europe is that the banking regulators are already using XBRL tagging in an effort to coordinate regulation for banks operating in different member states through the COREP (COnmon solvency ratio REPorting) and FINREP (Financial Reporting) projects. Despite sound intentions to simplify the compliance and regulatory tasks, concerns have been emerging about how the tagging has actually been implemented resulting in comments such as:

‘COREP and FINREP in EU, good intentions but wrong results... Each regulator has changed the EU base taxonomy ... to fit with its needs, leading to several taxonomies and huge costs for EU global banks ... From a dream to a nightmare ...
’ (Nederlandt, 2008)

COREP, FINREP and the FDIC XBRL projects are different to the SEC’s interactive data programme. COREP, FINREP and the FDIC projects are simpler than the SEC’s situation in that they can specify a taxonomy with tags they define for the collection of data for regulatory reporting. They also do not wish to disseminate the data collected to the public. The SEC’s interactive data project, on the other hand is designed to allow filers discretion to report within a ‘fair presentation’ requirement that incorporates flexibility and requires a taxonomy to cover commonly reported data items. The difference between the European projects and the FDIC project is the greater complexity involved in using tagging to create a centralised data definition for interoperability in an essentially fragmented regulatory environment. This particular characteristic of reporting in Europe that is distinct from the situation in the US underlies the difficulty identified in the quote above. It is possible that the concerns about the current experience in the European banking sector may undermine arguments that XBRL is a ‘solution’ for Europe in the context of the credit crunch.

15 For example Lord Turner, Chairman of the FSA, made clear in the wake of the recent failure of Isave the UK branch of an Icelandic bank, under European rules (even though Iceland is not a member of the EU), is regulated in its ‘home’ jurisdiction (BBC interview, 8 October, 2008). This raises an issue of the quality of regulation in each jurisdiction, but also the possible benefits of extending a common platform for the centralisation of required submissions by regulated entities. In a later development, on 27 May 2009 the European Commission proposed, in a Communication, two new European bodies - the European Systemic Risk Council and the European System of Financial Supervisors. The aim of the re-organisation is to improve cooperation and information exchange and ensure high standards of regulatory supervision that are applied fairly and consistently (Commission of the European Communities, 2009).
The progress towards providing digital corporate reports in a centrally coordinated way in Europe has been slow. The need to create a constituency to support the technology’s progress through the Lamfalussy processes, the many conflicting interests and the lack of a key role from which a strong champion could act creates a very different environment in Europe for the adoption of the ‘interactive data.’ An important issue for the adoption of a standard data format across national jurisdictions is how the Transparency Directive is to be implemented. ‘The Transparency Directive (TD) seeks to provide a framework for the disclosure of accurate, comprehensive and timely information about security issuers in order to keep the public informed’ (ESME, 2007, p1). ‘The TD also sets out the mechanisms for disclosure to the market such as publication channels, requirement to post information on the issuer’s web site and storage of historically published information in an officially appointed mechanism (OAM)’ (Lépicier, 2008, p7). Under the TD each member state is required to create an OAM:

‘... for the central storage of regulated information. These mechanisms should comply with minimum quality standards of security, certainty as to the information source, time recording and easy access by end users and shall be aligned with the filing procedure under Article 19(1).’

(XBRL’s progress towards potential adoption in Europe may be charted by focusing on actions and outcomes triggered by these requirements. These include the recommendations of the Committee of European Securities Regulators (CESR; see Appendix 3) and the reactions of the European Commission and Parliament (see the timeline in Table 2).

In July 2005 the European Commission gave CESR the task of providing:

- An opinion on two preliminary issues, how agreements of interoperability of Officially Appointed Mechanisms (OAMs) could be obtained and an analysis of cost and funding implications for Member States at the initial stages of the creation of a EU-wide network;

- Secondly, CESR shall provide advice on a number of technical issues regarding the role of the officially appointed mechanism for the central storage of central storage of information (Article 21(2)) for the Transparency Directive, in this regard CESR shall also provide technical advice on the role of the Competent Authority in supervising the OAM and provide an assessment of the costs of setting up an OAM that meet the standards.

- Thirdly, CESR shall provide technical advice on the filing of regulated information by electronic means with the competent authorities (Article 19(1)), and alignment of this procedure with that of the filing with the OAM. (CESR, 2005)

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Table 2: EU Interoperability Timeline

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 1999</td>
<td>European Commission’s Financial Services Action Plan</td>
</tr>
<tr>
<td>July 2005</td>
<td>Mandate to CESR for technical advice on storage and filing of regulated information</td>
</tr>
<tr>
<td>June 2006</td>
<td>CESR’s final technical advice on implementing measures for the Transparency Directive</td>
</tr>
<tr>
<td>October 2007</td>
<td>European Commission recommendation on electronic … central storage of regulated information</td>
</tr>
<tr>
<td>December 2007</td>
<td>ESME First report on the Transparency Directive</td>
</tr>
<tr>
<td>January 2008</td>
<td>Opinion of Committee on Economic and Monetary Affairs to Committee of Legal Affairs on a simplified business environment for companies in the areas of company law, accounting and auditing</td>
</tr>
<tr>
<td>February 2008</td>
<td>McCreevy and Cox joint statement on EU-US mutual recognition arrangement for securities</td>
</tr>
<tr>
<td>February 2008</td>
<td>CESR call for evidence on Transparency Directive</td>
</tr>
<tr>
<td>April 2008</td>
<td>Motion for a European Parliament Resolution: on a simplified business environment for companies in the areas of company law, accounting and auditing</td>
</tr>
<tr>
<td>30 May 2008</td>
<td>European Parliament adopts report containing motion</td>
</tr>
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14 Article 19(1) specifies that the issuer should file information with the Competent Authority in its home state. It also specifies that ‘implementing measures’ will be put in place and that procedures to enable electronic filing in the home state will be specified (as per the CESR mandate, following).
CESR circulated a call for evidence, set up an expert group and a consultative working group of stakeholders. The difficulty with co-ordinating and centralising the regulated information, such as annual reports, is reflected in the many layers of responsibility emerging. Competent authorities in each state are responsible for setting up and monitoring the OAMs and there is also a need for a central co-ordinating mechanism as well. Yet all these relationships are unknown and need to be constructed and supported with an information system.

CESR delivered its final technical advice on this (Level 2) mandate in June 2006. One of the early points it raises is to note that discussions held at the European Securities Committee (ESC) ‘have shown that member states prefer a network model to a centralised system for the storage of regulated information’ (point 6). The multi-layered, overlapping committees and other groups diffuse the focus on even relatively small issues such as storage mechanisms. It is hard to estimate the weight given to the ESC’s views on the matter; however, CESR also concludes that a distributed network is to be preferred to a centralised system. The decision-making framework adopted by CESR was that the selection of an appropriate model should be based on the needs of ‘end users’ and to better fulfil the objectives of the Directive (point 11). End users are defined by CESR as ‘anyone with an interest in having access to the stored information, including retail investors, institutional investors or professional users of the information stored’ (point 46, p15).

CESR’s conclusion in relation to storage is that the OAMs in each state must have a system to receive, store and make available the filings electronically over the internet (CESR, 2006). The important factor in relation to any role for XBRL was the refusal to specify that the filings should be in a single data format (eg, XBRL). CESR preferred a ‘flexible’ approach that allowed OAMs to specify formats that are acceptable, but that they must accept:

– file formats and transmission protocols that are non proprietary and that obviate single vendor software applications;
– commonly used and generally accepted proprietary formats (CESR, 2006, p8).

The first requirement favours XBRL-based software solutions since, as it is an open standard, it does not create the lock-in to a single vendor’s product that CESR is concerned to prevent. It also allows other open standards that may compete with XBRL, too. For example, HTML or XML-based filings. The second requirement does not strengthen XBRL’s case as Excel and PDF formats would fall into this category and are already widely used by companies to disseminate their annual reports (Allam & Lymer, 2003; FASB, 2000).

CESR also made recommendations regarding the need for the integrity of the stored information; that is that it must be complete and unaltered. Further automatic validation of the filing should be part of the system, so that the documents can be checked for ‘technical adherence’ to the required standard. This is an area where XBRL would claim a technical advantage over other filing mechanisms, since it is able to facilitate the validation of submissions in relation to the ‘internal logic’ of financial statements as set up by the OAM. XML has a similar feature, but some of the structures that would have to be created by the OAM on a one-off basis are already ‘standard’ in XBRL.

Another recommendation made by CESR that is relevant to the data format for filing, is the issue of language. Where an issuer is disseminating filings in more than one language, the requirement is that the OAM must receive all the translations and make search facilities available for all the languages. Once again the XBRL IFRS taxonomies have an advantage over other data formats in this regard because the IASC Foundation has made a commitment to provide free translation of the IFRS tags and to make the IFRS openly available in ‘multiple languages from the centralised location of this website’ (http://www.iiasb.org/xbrl/ifrs_taxonomy/translations/translations.html). The CESR requirements also include that the OAM must provide filings in a format that enables end users to: view, download, print, search, order and interrogate the documents. Many data formats provide this type of functionality, with XBRL and XML able to claim that they facilitate the ‘interrogation’ of the document at an individual data item level whereas PDF for example, allows searching but not a ‘deeper’ analysis.

The other area of significance on which CESR made a recommendation was the structure of the interoperability arrangement between member state OAMs. Four models were proposed for consultation purposes. Model A is a centralised collection, storage and dissemination system similar to the SEC’s EDGAR structure. Model B is a fully decentralised system and Model C is a hybrid that has a central application server and database of all issuers, but for each issuer links to the OAM’s system that holds the filings for that issuer (see Figure 2). Model D simply required a list of OAMs on each competent authority website (and so left it to users to navigate to the home state OAM for the issuer).

17 Note that there are technical issues that mean it is not simply a question of allowing filers to submit in XML. The tagging system needs to be agreed between the sender and receiver – so the OAM would need to provide a taxonomy for the filings. This is one of the areas in which XBRL claims to have an advantage as there are existing taxonomies for International Financial Reporting Standards. Note that although XBRL is based on XML they are sufficiently different to be considered competing technologies. For example, the FSA in the UK selected XML in preference to XBRL (see Figure 4). See also Chapter 7.
Model C was preferred. The implication of this model is that the OAMs may retain authority over the data format of submissions to their sites and only need to achieve interoperability at the point of providing the list of issuers and links to their sites (CESR, 2006, pp40, 46). There is no trigger in the CESR recommendations to require a decision on a single data format and so no centralised opportunity to mandate XBRL tagging as happened in the United States. The recommendation explicitly allows for individual OAMs to make decisions about how to provide information differentiated for different types of users (eg, professional analysts versus retail investors), different formatting, levels of aggregation, language translation and analysis over and above a minimum level of harmonised data (points 49–51). This suggests an almost competitive model where Competent authorities and OAMs may seek to attract issuers and investors through the provision of differentiated services. This ‘market for information’ was perceived by the Investor Relations Society in the UK as ‘a major success in improving ease of use, and limiting excessive costs’ (IRS, 2005, p3). It may lead to an investment in what are considered to be ‘best practice’ tools and models by OAMs, but it does not provide an obvious foundation for cooperation and standardisation.

Figure 2: European Interoperability Structure – Model C

It is interesting to note that the European Commission’s mandate to CESR included a reference to XBRL in asking the Committee to consider whether or not to ‘require issuers to use input standards (such as XBRL or similar formats).’ Clearly the recommendation did not support a standard submission in XBRL or any other format, preferring to maintain the flexibility of the OAMs to choose within some constraints their own data formats. References to XBRL in later documents are also tangential – none directly recommending its systematic adoption. The European Commission Recommendation in October 2007 closely tracks the CESR report, but also provides a sense of the more ponderous nature of expected progress. It states at introductory paragraph 10 that: ‘A gradual approach appears necessary in order to ensure that the electronic network of storage mechanisms will be able to meet the expectations of issuers and investors…’. The recommended guidelines for future development at paragraph 21 suggests the member states are to ‘encourage’ their competent authorities to draw up appropriate guidelines for the network by 30 September 2010; that is in three years from the recommendation. They are further ‘invited’ to inform the EC of the steps taken in relation to the recommendation by 31 December 2008.

The European Securities Markets Expert (ESME) group’s report on the transparency directive was completed on 5 December 2007. It dealt with some issues associated with the notification of major shareholdings and the consequences of securities lending. It also indicates that methods of dissemination and storage of regulated information is an emerging issue and expressed support for the approach adopted by CESR, in particular the concept of a pan-European system (ESME, 2007, section 2.2, p9).
Meanwhile, another European Committee had been working on a related area – ‘a simplified business environment for companies in the areas of company law, accounting and auditing’. The Committee on Economic and Monetary Affairs (CEMA) reported their draft opinion to the Committee of Legal Affairs on the 21 January 2008. CEMA ‘called for’ the inclusion, inter alia, of a statement ‘strongly promoting’ the use of new technologies such as XBRL as part of a motion for a resolution regarding the creation of an interoperable Business Register (paragraph 6). This is the first mention of XBRL as part of a possible ‘solution’ in the context of the EU single market network for information storage. It is still slightly tangential in that it does not directly recommend XBRL, but gives it as an example of ‘new technologies’. However, in the context of the style of recommendations, opinions, invitations and suggestions in the EU documents, it is relatively strong support for XBRL. Woolfe (2008) identifies leke van den Burg, a member of the Committee on Economic and Monetary affairs and the draftswoman of the Opinion, as one who is promoting the adoption of XBRL. The report to the European Parliament (EP) on a motion for a EP resolution from the Committee on Legal Affairs in April 2008 also includes the reference to XBRL as an example of new technology, and adds the idea that the new electronic reporting formats ‘should make it possible to meet disclosure requirements economically, efficiently and swiftly’ (para 12, p5). The report containing the motion was adopted by the EP in May 2008.

In 2008 CESR’s work was to consult and report on its Level 3 work on implementing measures for the Transparency Directive. The July call for evidence received 21st responses. The area of particular interest for this research is the potential role of CESR in the EU network of national storage mechanisms described earlier. The respondents had very diverse views, but CESR concluded that it should have a role in facilitating and providing support to member states and decided to ‘set up the network of national storage mechanism using the CESR MiFId database … already running at its website’ (paragraph 15). While recognising share issuers only are included in the database under this approach, CESR stated that ‘the advantage of this solution is that it will allow the implementation in the short term of the CESR consensus about the design of the network (Model C), at least for shares’ (paragraph 17). The CESR website is very simple in design and not particularly appealing for users. It has a large amount of small print text defining terms and when the user scrolls down there is a database controlled by drop down filters (see Figure 3). The website development is in its early days and it is to be expected that since most of the flexibility and innovation has been anticipated to exist at the OAM end that the future developments in user-friendly interfaces and added value information will be developed there. It remains to be seen how much diversity and competition actually emerges from this structure.

The European timeline in comparison to the SEC’s shows a detailed process of many small steps with a much larger agenda than XBRL adoption. XBRL is cited in the documents as an example of technology that could encourage simplicity and efficiency. Some writers describe the recent events as a ‘push by the European Parliament to embrace the language’ (eg, Woolfe, 2008), but arguably the wording in the documents themselves is not strong enough to support this. There are individuals emerging as champions, but the complex committee and regulatory structures make it difficult for individuals to have an effect.

XBRL International Inc. (XII), the consortium of organisations developing XBRL, supported the creation of an ‘affiliate organisation’ – XBRL Europe – headed by Gilles Maguet19 in mid-2008. The body has a range of purposes focussed on supporting the development of XBRL in Europe. They include: ‘to promote and support the standardisation of electronic financial and business information within Europe’ (www.xbrl.org/eu). There is a clear need for a focus for action and lobbying in the European institutional setting and this development is the sort of response needed for constituency building. The lack of a clear mandate emerging for XBRL and the long timeframes set out by the European Commission for the OAMs to set up their databases, suggests that the pressure for a unified approach to standardised data format will need to come from outside of the European setting. We will discuss the international pressures later, but for now we turn to the particular case of the regulatory setting in the United Kingdom.

18 ICAEW was the only professional accountancy body, and also the only accounting industry representative, to make a submission to CESR on the call for evidence.

19 An entity described as the XBRL in Europe Consortium and an affiliate of XBRL International was awarded a £1m contract by the European Commission in 2004 (Edgar Online, 2004; Hannon, 2004). The purpose of the contract was to support the development of European jurisdictions of XBRL and to create greater awareness of XBRL. The current entity is not directly related to the previous one in that the contract was completed and ‘XBRL in Europe’ did not exist for a period of time. The new body was announced at the XBRL conference in Eindhoven in May 2008 and its Bylaws are dated June 2008 (www.xbrl.org/eu). The founding members were XBRL France, XBRL Spain, XBRL Ireland, XBRL Belgium, XBRL International. It is interesting that despite having a representative on the XBRL International Working Group that established the jurisdiction, XBRL UK was not one of the inaugural members.
3.2.4 Corporate information and capital markets in the United Kingdom

Developments in Europe are very significant to trends in the market for corporate reporting in the UK. The Financial Services Authority regulates securities issuers in the UK and is particularly interesting in the context of our study because of its history with XBRL adoption.

In September 2003 the FSA document CP198 set out proposals for an integrated and updated electronic reporting approach. A March 2004 policy statement was based on the views of respondents to the initial proposals. A Mandatory Electronic Reporting (MER) system was created to be phased in over three years, although there have been subsequent delays.21

Included in the next steps was a project for Integrated Regulatory Return (IRR) to remove duplication and integrate reporting to the FSA. In the 2004 document there is a stated intention to use XBRL in the MER system:

'We decided that the XBRL standard is the appropriate language to use for electronic submission. We will continue our discussions on implementing this with firms and their software suppliers. We do not intend to undertake further formal public consultation on this subject.' (FSA, 2004, section 2.12)

The FSA created XBRL taxonomies by the end of 2004, but on 18 May 2005 David Kenmir was forced to ‘disappoint’ his audience by announcing that it would be far from certain XBRL would be used (Kenmir, 2005). In a December 2005 ‘Integrated Regulatory Reporting Update’ the position is explained:

‘Our original intention was to build a single system to enable firms to report electronically, using eXtensible Business Reporting Language (XBRL). A formal review of this approach was undertaken involving discussions with a number of firms. The review concluded that this was not the most cost effective route at this time for either firms or for the FSA, so we will not at this stage develop reporting systems using XBRL.

... The review team noted that XBRL activity is on the increase and it is possible that it may well become a major data exchange format in the future. So, while XML will be used in the development of regulatory reporting for the time being, we will continue to monitor the evolution and usage of XBRL.’ (FSA, 2005)

20 It is the UK’s competent authority under the Financial Services and Markets Act 2000.

Documents made public under a Freedom of Information Act request in 2006 shows the range of material and issues that were considered by the FSA (FSA, 2006a). The conclusion reported in an Internal Discussion Document dated July 2005 includes a concern about cost, but overall identified the adoption of XBRL as too risky. The analysis included consideration of the contemporaneous implementations of XBRL by HMRC and Companies House and the possibility that the FSA may be involved in the technical implementation of COREP (using XBRL). Feedback from filers was also sought, but with mixed results. Three data formats were considered; Comma Separated Values, XML and XBRL. The conclusion includes comments regarding the potential future of XBRL, but finds that the risks outweighed the benefits. In particular there were concerns over the stability of the format, the lack of supporting software, the cost of programming, the lack of successful implementations and its immaturity as a technology (p40; see also Figure 4). The ‘generic’ XML option was seen as a more widely used and supported technology (of which XBRL is a business application) and which gave the FSA a platform from which it could move to XBRL later. The internal report is also interesting in that it shows concern for the attitudes of not only its stakeholders, but also other broader constituency members – such as other European supervisors (p34) and the XBRL lobby (p51; see Figure 4).

Figure 4: Extract from FSA Internal Discussion Document 2005

There is the potential for XBRL to gain critical mass and become the industry standard in data over the next few years but there are serious concerns over the adoption of a new technology and the associated risks: Will a new version of the standard be introduced forcing FSA to upgrade its systems? Is the supporting technology sufficiently robust? Are sufficient resources available in the marketplace for FSA and regulated firms? One of the key questions would therefore appear to be what the FSA’s appetite for risk is in terms of new technology? Given that the FSA is paid for by the firms that it regulates, the FSA needs to ensure that the costs it imposes both directly (as a result of requires changes to firms systems) and indirectly (being the costs that we incur in amending our own systems) are proportionate to the benefits that the electronic reporting system will provide. The risks involved in implementing XBRL do appear to be greater than those associated with XML. To keep the FSA’s technological options open it may be appropriate for FSA to include XBRL within its longer term strategy, to be phased in once FSA data requirements are harmonised. This message would clearly help to mitigate any negative PR from the pro-XBRL lobby. It would also keep the FSA within touching distance of the CEBS COREP initiative if there was a big push to shift towards XBRL based reporting in Europe.

[9 The size of this task should not be underestimated. It is reported that it took the FFIEC well over 10 years to harmonise its data requirements before it was in a position to be able to implement an XBRL based reporting system.]

Source: FSA (2006 pp49–50, 51)

A structural factor that also affected the FSA’s decision (and is mirrored in other EU member states) is that it is not the FSA which is responsible for the dissemination of regulated information to investors. The responsibility is delegated to primary information providers in the UK. The Regulatory News Service (RNS), which is based at the London stock Exchange, is one of these. In a statement reported on-line in November 2006, the FSA further states that:

‘XBRL is a technology that allows listed companies and mutual funds to make their financial and regulatory information publicly available. However, unlike other regulators, the FSA is not required to provide or facilitate access to such corporate disclosures. Therefore, one of the main benefits of XBRL as a “firm-oriented” technology would not be realised by the FSA.’ (FSA, 2006b)

Companies House in the UK acts as company registrar, maintaining a register of limited liability company details, annual reports and accounts which it makes publicly available. It is a self-funding organisation that charges users for the administrative cost of the information it makes available. Companies House has programme for electronic filing that uses XBRL tagging. The project started with the simplest reports that could be completed in an electronic form and is working towards full account filing in coordination with the HMRC project. There are two key reasons why this project will not have the same impact on the UK capital market as the SEC ‘interactive data’ project may have in the US. First, Companies House is not disseminating the data in XBRL format. Images of the rendered documents are provided electronically – removing all of the tagging functionality. Currently there is no policy to provide ‘interactive’ data to the public. Part of the reason for this may be that Companies House also provides data-to-data...
aggregators for a fee. They seek to add value to the data for re-selling. If Companies House provides the tagged data direct to the public, it will effectively be in competition with its data aggregator clients. The second reason that the Companies House project is unlikely to generate a significant impact is the need to charge for the data. The large quantities of tagged data the SEC is providing free are viable for a wide range of users because there is no cost for undertaking the multi-company downloads of data for comparison that tagging facilitates.

In the UK the mechanisms for disseminating company accounts is fragmented with the FSA, Stock Exchange and Companies House having responsibilities and the use of third-party entities as primary information providers. This is not an unusual situation in Europe. A report commissioned by European Commission Directorate General Enterprise titled the ‘Feasibility of a Pan-European Enterprise Data Repository on Intangible Assets’ (Mantos Associates, 2004), observes that:

‘[An]… independent network of enterprise data repositories is run by the EU securities regulators and the market operators (i.e. stock exchanges). The field of securities regulation is again fragmented …. However, at the country level, securities information is often widely scattered along the regulatory information supply chain – i.e. the securities regulator, the stock exchange itself and private distribution channels. The legal and administrative infrastructure, and rules governing transaction disclosure, filings and investor access channels are all governed by national regulations. Community regulations call only for publication of the national filings.’ (Mantos Associates, 2004, p27)

Not only is the provision of information to investors being channelled through different entities, but as observed by the FSA, this removes one of the key motivators for adopting XBRL that the SEC is charged to ensure; that is effective dissemination. As mentioned earlier, the use of multiple channels received praise in terms of its perceived benefits from the IRS in the UK. The London Stock Exchange has adopted a ‘wait and see’ approach to XBRL as reflected in its submission to the CESR call for evidence in 2005, which stated:

‘In addition it is important that flexibility is built-in to Level 2, for example, we believe it is inappropriate at the current point in time to require filers to use input standards such as XBRL, though we recognise that this may be beneficial in the longer term.’ (LSE, 2005, p1)

CESR, as a group of securities regulators is therefore not motivated by the same demands as the SEC and this may underlie the preference for maintaining the autonomy of individual member states over the data format rather than seeking consensus on a standard. A factor that may influence CESR’s view is global developments and the need to compete for capital (especially as the capital markets plunge and confidence reaches almost unprecedented lows). In the next section we explore the possibility that a global trend could provide the push needed to create the pressure for the adoption of XBRL as a standard reporting format for securities regulators in Europe.

3.2.5 Global trends in corporate reporting regulation

In this section we explore evidence about the attitudes of regulators to globalisation and the possible impacts on the diffusion of XBRL. The rapid spread of the sub-prime mortgage credit freeze and subsequent ‘black Friday’ (10 October 2008) capital market crash echoes earlier global capital market crashes and the highs that preceded them. The evidence of the interconnectedness of the world’s major capital markets is painfully clear. A report on the EU regulatory and supervisory framework by two key regulators in the UK, HMRC and FSA (2007) observe that the benefits are accompanied by challenges:

‘In response to globalisation and with the benefits of new technology, financial markets and institutions are increasingly integrating across borders and sectors, providing savers and investors with increased choice, greater access to capital and more sophisticated products. These developments can bring significant benefits and advantages for the global economy. Nevertheless, they also make the regulation and supervision of financial markets more complex.’ (p5)

22 In this report we are focusing on the provision of information for investment decision making and so have not discussed developments in relation to the UK and European taxation offices, banking regulators, statistics collectors, and even whole-of-government platforms (e.g. the Netherlands). There are XBRL projects emerging in all these areas. As we have mentioned, participants are influenced by the level of adoption in related areas – but within the specific scope of the report, however, it is not feasible to discuss them all in detail. The XBRL International Inc. website makes an effort to track a report on progress of ‘XBRL in Action’ (www.xbrl.org).
One of the most remarkable developments in the last few years is the success of the International Accounting Standards Committee Foundation (IASCF) and its Board (IASB) in achieving the wide adoption of International Financial Reporting Standards (IFRS) (Martínez-Díaz, 2003; Tweedie & Seidenstein, 2005). Perhaps the single most significant step was taken by the SEC on 27 August 2008 when the Commissioners voted to permit US companies to report using IFRS voluntarily by 2010. A further vote is to be taken at that time on whether to adopt IFRS on a mandatory basis by 2014 (SEC, 2008b; The Economist, 2008b). This is the outcome of a process of convergence officially signalled in 2002 with the issue of the ‘Norwalk agreement’ between the FASB and the IASB (IASB & FASB, 2006).

As part of his vision to simplify and modernise regulatory supervision processes Chairman Cox ‘has assumed leadership of the international effort to more closely integrate U.S. and overseas regulation in an era of global capital markets and international securities exchanges’ (http://www.sec.gov/about/commissioner/cox.htm). He has been involved in a number of bi-lateral discussions and has signed mutual recognition agreements with international counterparts, most recently Australia’s ASIC23 (August, 2008) and the EU (February, 2008) as part of a programme of selective mutual recognition announced in 2007:

"The US capital markets are a vital part of the larger global marketplace", said SEC Chairman Christopher Cox. “Innovations in technology have eliminated many barriers to cross-border access between U.S. and foreign markets. Consequently, it is imperative that the Commission consider the implications of increased U.S. investor demand for foreign investment opportunities. At the same time, we are seeing the international coalescence of a group of securities regulators who share many of the same concerns about investor protection and market efficiency that we at the SEC have – a development that I believe could greatly improve investor protection world-wide.” http://www.sec.gov/news/press/2007/2007-105.htm

The consistent theme in Christopher Cox’s speeches and statements is the link between globalisation, simplification, increased transparency, improved reporting – and technology. So it is not surprising that as part of this global outreach, Cox has sought to promote the ‘interactive data’ programme for adoption elsewhere. ‘On 9th November [2007] the SEC Chairman, Christopher Cox, concluded a week of bilateral discussions with securities regulators from Australia, Canada, China, Japan and Korea, and focused on, among other things, timetables for implementing interactive data initiatives for financial reporting’ (http://sec.gov/news/press/2007/2007-227.htm). China and Japan are already receiving submissions tagged in XBRL, Australia has started work on its Standard Business Reporting (SBR) Programme (http://www.sbr.gov.au/content/default.htm) and Canada is working towards a submission project (Regulator Panel, 2008). A roundtable on Interactive Data for Public Financial Reporting held in June 2008 hosted by Chairman Cox at the SEC boasted representatives from Canada, China, Israel, Japan and Mexico and appearances from representatives of the Netherlands whole of government project, the Bombay and Shanghai stock exchanges and the IASCF XBRL team (www.sec.gov).

The impetus for cooperation may not just be the altruistic desire to improve markets for investors worldwide. The securities regulators are aware that they are operating markets that are competing among themselves to attract capital. The Chairman of CESR – Eddy Weermesch in his speech to the 17th XBRL International Conference in Eindhoven expressed his view that the decentralised approach favoured by CESR was superior to the centralised database approach of the SEC. He gave examples of XML and XBRL making useful contributions to the issues that regulators worldwide face. He described the SEC’s adoption of XBRL as a useful ‘pilot study’.

However, the point he finished on and made very strongly was that in a global capital market Europe may lose capital investment if it did not provide technological support for decision making that is the equivalent of their competitors:

‘The final point is of interest … if the Americans have a very [well] performing XBRL system on their financial information and all the financial analysts and all investors who access this information … and that we in Europe are not able to offer this same service. I think it will have a negative impact on the interest that is taken by institutional investors and others in our European shares. So this is the macro dimension of all this. Don’t forget. There is a large competition going on between the US and Europe and for market share, for financial market share. We should not weaken ourselves deliberately by not having the necessary tools and that’s the message you can bring to the European Commission, the European Parliament and to our political masters.’ (Wymeersch, 2008)

23 Australian Securities and Investments Commission.
Similarly the US sees that it is also in a competitive market – comments by Professor Lutz and Christopher Cox at the 19 August launch of ‘IDEA’ reflect very similar sentiments (http://www.sec.gov/news/press/2008/2008-179.htm).

An interesting question from the point of view of the UK, is whether or not the international pressure is having an effect on the FSA’s stance on XBRL. There has been no public announcement of a move to migrate the IRR system from XML to XBRL. There was no-one from the FSA present at the June International Roundtable (http://www.connectlive.com/events/secroundtable061008/). Indeed, there appears to be a lack of interest from most EU securities regulators. This would be consistent with the ‘competitive’ model for information disclosure if each regulator believed that they had a means of offering a superior system to their competitors in the open, distributed approach favoured by CESR. Or it may reflect a lack of focus on the distribution of information to investors and a greater interest in simplifying filing to attract companies to make their ‘home’ in the OAM’s jurisdiction. Under questioning at a webcast news conference to announce ‘IDEA’ (http://www.sec.gov/news/press/2008/2008-179.htm) on 19 August 2008, Christopher Cox replied in answer to a question about the international adoption of XBRL:

‘… I know that the FSA (UK) is looking at this in the context of IOSCO, which is the International Organisation of Securities Commissions. I am currently the Chairman of the technical committee at IOSCO; XBRL and data tagging is very much a focus of that international body’s work and all the regulators that are a part of it, some of them have already mandated XBRL use in their own countries.’

It is interesting that Mr Cox chose to talk about the UK, since the FSA has not been proactive in adoption, has not participated in discussions and could be identified as one of the regulators ‘hanging back’ on XBRL. Naturally the FSA has been somewhat preoccupied by the difficulties created by its perceived failure to prevent the collapse of some financial institutions. In response to the internal audit of its performance after the nationalisation of Northern Rock, the FSA announced a package of changes titled the ‘Supervisory Enhancement Programme’ (Sants, 2008). The final point in the announcement is that: ‘The intended enhancements to our technology platform supporting our supervisory and regulatory process will be accelerated’ (ibid). It is possible that the external pressure to conform to the approach a growing number of securities regulators of large capital markets have adopted combined with the pressure to demonstrate technological changes that can be presented as improving regulatory surveillance may create a ‘perfect storm’ of pressure for change. However, inquiries at the FSA revealed that XBRL is not part of the Supervisory Enhancement Programme and is not currently under active consideration.24

3.3 SUMMARY AND CONCLUSION
If, as Christopher Cox identified, relying on the efficiency of the capital markets has ‘profoundly unsatisfying implications’ for individual investors, then how much worse is it when those markets continue to fall through one government ‘bail out’ after the next? The overriding trend of 2007 and 2008 has been the loss of confidence in the banking sector and the consequent global capital market free fall in the face of fears of a recession. Against this backdrop and in the face of severe criticism, Christopher Cox and the SEC have commenced a major re-engineering project for corporate reporting with worldwide implications. The move to allow the adoption of IFRS in the US despite criticism over the impact of fair value accounting that is part and parcel of the convergence process was a very courageous decision. It provided a clear timeline for not only for convergence but also for a switch to one set of accounting standards for all the major capital markets. The recommendation to require a phased in approach to mandatory ‘interactive data’ filing adopted in December 2008 is very significant for the XBRL community. The gradual replacement of EDGAR with ‘IDEA’ will be an overdue revamping of a platform for providing information for decision making in an environment in which the capital markets will hopefully be rebuilding the value lost over the latter part of 2008.

Europe is facing the same economic crisis but is in the throes of a slow, complex, and painstaking approach to the regulatory reform of corporate information dissemination. Co-ordinating 27 member states, with almost as many official languages, cultures and regulatory idiosyncrasies, requires the navigation of a labyrinth of committees and consultative bodies through to the European Commission and Parliament. The autonomy of the member states must be balanced against the need for standardisation and interoperability to achieve a pan-European corporate reporting hub to support the emerging single market. The disparity between the states creates a need for careful consideration and cumbersome administrative structures, but there is also pressure to compete for capital on a global market in which large players with centralised regulatory systems such as the US can move more effectively.

24 Phone and email correspondence 27 October 2008.
Eddy Wyneersch’s (2008) observation that decisions are needed and that political pressure is required to stimulate action at the level of the European Commission and Parliament, echoes Mantos Associates’ (2004) conclusion that ‘what is lacking is the muscle or the brief to “demand” data in a harmonised or harmonisable format’ (p52). It is possible that the capital market crisis will galvanise the European Commission into action to pursue technology options that promise greater surveillance and competitive advantage in the market for investors’ capital. The key body that is likely to be authorised to roll out a more standardised system is CESR. The written advice from CESR has been very cool on XBRL. The chairperson was careful in his speech to the XBRL conference to point out the uses of XML as well as XBRL as (related) data formats for communication over the internet. At this point the shift needed seems too great to be achieved within the next two or three years. Perhaps with a longer time frame, and if the SEC’s ‘pilot’ programme does generate demand from investors and preparers, then the member states perhaps could be persuaded to harmonise. The shift required is not more significant than the acceptance of fair value and the adoption of IFRS in the US – so it must be possible, but we have identified significant structural barriers.

The focus of this research and an important factor in the success of the interactive data project is whether or not the intended audience – retail investors – perceive that it is useful and adds value to them. In the next chapter we analyse extant research on investment decision making and report the results of an experiment to explore ‘investor’ reactions to tagged data.
The previous chapter outlined the regulatory infrastructure and market trends that are created with the avowed purpose of protecting investors and providing them with transparent and useful information for decision making. In this chapter we focus on the non-professional investor as the target constituent for the new technology – ‘interactive data’. First we review the size and nature of the participation of non-professional investors in the UK and US capital markets. The UK is used as a comparison because of its significant size relative to combined European markets. However, the structure of financial markets across Europe varies and individual investors may play more or less significant roles in each. We also reflect on the difficulties of engaging with retail investors as a stakeholder group in digital reporting. Next we review the previous research on investor decision making to identify findings that may provide insights for the development of decision support technology such as interactive data. We add to this research by reporting the results of an experiment we conducted using students as proxies for non-professional investors. The attitude of investors to the implications of the new technology is discussed in the next section. Finally we draw together the evidence to form conclusions about the needs and perceptions of the target constituents and particularly outline the need for further research.

4.1 NON-PROFESSIONAL INVESTORS IN THE CAPITAL MARKET

The creation of the corporate form was designed to permit the accumulation of capital from disparate sources to facilitate the larger manufacturing businesses of the industrial revolution. It created a separation between ownership and management and enabled anyone with money to invest to share in ‘the prosperity achieved by competent management and direction’ (Charkham & Simpson, 1999, p61). Investors also share the risks. As well as the regulatory and technological changes discussed in the previous chapter, capital markets have been changing in terms of the role of individual investors.

‘There have been profound shifts in the pattern of ownership in the UK as elsewhere. ... The pattern of shareholdings and the economic landscape has dramatically altered. In the space of thirty years, the ownership of companies has been transformed from dominance by private investors to institutional shareholdings formed from the public’s savings. ... No longer are listed companies owned by fragmented individual holdings or family stakes; the collective saving vehicles of the nation’s pension funds, insurance savings, and unit trusts are the new owners of companies.’ (Charkham & Simpson, 1999, p2)

The growth of institutional investment through pension funds has led to individuals’ savings being invested in the market indirectly – such that many individuals do not actively manage a portfolio, but their retirement income may depend on the vicissitudes of the capital market. Charkham and Simpson (1999, p4) observe that ‘thirty years ago private investors owned two-thirds of the stock market; today they hold less than one-fifth.’

Figure 5 shows time series share ownership data collected by the Office for National Statistics in the UK. It confirms the trend to relatively low levels of identifiable individual investor share ownership in the market. An interesting feature of the UK market is the high proportion in the ‘other’ category. Almost this entire segment of the market is made up of foreign ownership.

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25 Statistics published by The U.S. Central Intelligence Agency estimate the market value of publicly traded shares in the UK to be $3.058tr in 2005 (no 2006 figures available), while for the European Union in 2006 it was reported as $11.64tr https://www.cia.gov/library/publications/the-world-factbook/geos/ee.html#Econ.

26 The data has been categorised to group individuals and charities (to be comparable with the US data in Figure 6). The other category included public sector and ‘rest of the world’. During the period represented in the graph the ‘rest of the world’ constituted over 99% of the value of the category. Note that we have included unit trusts in the UK and mutual funds in the US as institutional because the investor is not evaluating companies for investment – but rather a managed portfolio. The focus of this research is on individual investors making decisions to invest in companies based on reported financial data. The SEC has a separate reporting programme for mutual funds based on the interactive data approach.
To some extent the actual participation of individual investors is masked in the UK by the development of the CREST settlement system introduced in 1996 to replace the paper-based system for settlements (Buckle & Thompson, 2004).

‘There has been a massive increase in day trading and there has been a massive increase in the use of internet trading by retail investors but we’ve also seen a commensurate shift from investors holding on their own account in their own name on registers to private client stockbroker nominees.’ (Interview Investor Relations Representative)

Everyone who buys through the CREST system has to pay an annual fee to be on the share register. Stockbrokers have offered investors investment through pooled nominee’s accounts to avoid this cost and so the actual number of investors and their direct relationship with the companies in which they invest is obscured because their names are not on the share register (interview Investor Relations Representative). There is also a shift from clients holding shares in their own name to mediated investment vehicles such as unit and investment trusts and many investors do not actively follow the companies they invest in and manage their portfolios themselves (interviews investor relations and non-professional investor representatives). In the UK the shift to using corporate forms and Individual Savings Accounts for investment is also motivated by the tax structure. There is however, still a ‘large’ retail investor market in the UK:

‘… and many smaller stockbrokers specialise in serving retail investors’ needs, By number of trades, private clients have a significant share of the market. In 2004, 40.8 million agency bargains were traded on the London Stock Exchange (LSE) on all markets, according to Compeer, Private clients trading through members of the LSE accounted for 10.5 million agency bargains, 26 per cent of the total, with institutions accounting for the remaining 74 per cent. But in terms of sums invested, private clients only have a small percentage of the total, although they also put cash into pooled investment schemes, which are used to invest across asset classes including the stock market.’ (Davidson, 2008, p151; emphasis in original)

Figure 5: Investment in equity by type of investor – United Kingdom

*No data was available for 2005 – the trend has been estimated

Our informant indicated that the fee is currently £25, but it will vary over time.
The US census data in Figure 6 shows that household investment (including charities) is falling as a percentage of the net investment in equity. Increases in institutional investors and ‘rest of the world’ in the ‘other’ category make up the difference and reduce the household sector to 26.6% of the value of net equity investment. The trend lines show a distinct change in 2002 and a continuing increase in institutional investment. This trend is echoed in this comment from William Lutz, head of the SEC’s Disclosure for the 21st Century initiative:

“If anything the movement of the individual investor running his or her own account has been dying off. I think my son is one of the last ones on the planet to manage his own 401K.” (Lutz, 2008, transcription; at 54th minute)
Figures 5 and 6 show that while both the UK and the US share a pattern of increasing institutional investment, the UK market has a much more significant level of foreign investment (included in the ‘other’ category\(^{28}\)). The size of the individual investment segment as a proportion of the market has also been consistently lower over the last nine years. While this is necessarily a broad brush comparison because of the potential differences in data collection methods between the two countries, it does suggest that the markets are very different.

The greater proportion of the US market made up of individual investors suggests one of the reasons why their protection as a large and potentially vulnerable group in the capital market is prominent (see Chapter 3). The relatively low level of foreign investment in the US equity market is interesting in the context of the emerging global competition for investment funds discussed in Chapter 3. The UK, through the London Stock Exchange, has been very successful in attracting foreign investment.

The LSE has taken a measured response in contrast to the SEC’s move to promote and adopt XBRL, preferring to argue for retaining flexibility when presenting its response to the European Commission’s request for input on how to structure a network for sharing regulatory information on listed companies (see Chapter 3). It may be that the competitive model of information dissemination is perceived to be more effective for the LSE than a globally standardised system given that it has a significant proportion of foreign investors. A global system would put countries on closer to a ‘level playing field’ in terms of the accessibility of company reports and financial information and perhaps displace the currently high proportion of investment (Gunn, 2007). Of the foreign investment in both countries, it is not possible to tell how much of that is individual investors. Given the additional barriers to cross border investment, such as the need to work in foreign currency, it seems likely that it is mainly institutional investors. However, as the SEC and other regulators move to create a more seamless global capital market, it may be that increasing numbers of individual investors will expand their horizons. The most likely outcome is that they will remain at least for the foreseeable future a relatively small proportion of the value of the capital market in the UK.

\(^{28}\) The international investment for the US starts as 8% of the total market in 1998 and rises to 13.7% by 2006. In the UK virtually all of the ‘other’ category is made of international holdings. It starts the same period at 31% and stays relatively steady but significant at 36% by 2006.
Despite the relatively lower proportion of equity investment undertaken by individual investors, regulators emphasise the importance of protecting them and they are consistently regarded as one of the key stakeholders for general purpose financial reporting (see the conceptual frameworks of both the IASB and FASB). Given this, there is surprisingly little systematic research on who they are and what information sources they use. Our informants both in the UK and the US knew of no such research and did not know of any demand for it to underpin the design of financial reporting. The approaches adopted are based on marketing type strategies and client demand for different presentation styles. One of the problems with trying to characterise non-professional investors is that they are a very heterogeneous group (Charkham & Simpson, 1999, p2).

The Australian Securities and Investments Commission (ASIC) regulates the Australian securities market and recently created a ‘Retail Investor Taskforce.’ A series of focus groups and a survey of over 1,200 investors during 2006 and 2007 were commissioned. The purpose of the research was to:

- ‘help ASIC communicate more effectively with investors about issues that affect them
- inform ASIC policy and other core business activities relating to investors
- give context to ASIC research about people who have invested in financial frauds and scams.’ (ASIC, 2008)

It is interesting that despite the major changes being promoted in the US and the significant budget for technology development, there is no similar systematic approach to research. The Australian argument for the need to understand and support non-professional investors is that the introduction of compulsory superannuation in Australia means that the ‘vast majority’ are investors even if they ‘don’t think about it much’ (Cooper, 2008). The key findings are summarised in Table 3.

**Table 3: ASIC Retail Investor Task Force: Key findings (ASIC, 2008)**

<table>
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<th>Finding</th>
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<tr>
<td><strong>Most investors do not see themselves as investors</strong></td>
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<td><strong>49% of investors had only one type of investment (eg, shares only)</strong></td>
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<tr>
<td><strong>12% of investors never review the performance of their investments</strong></td>
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<tr>
<td><strong>36% of investors consult a professional as the first step in deciding about an investment</strong></td>
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<tr>
<td><strong>Daily newspapers were the main source of investment information for investors with shares (33%) and debentures and bonds (22%)</strong></td>
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<tr>
<td><strong>16% of investors relied solely on their own judgement the last time they invested</strong></td>
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<tr>
<td><strong>37% of investors don’t have a long-term financial goal or a plan to reach it</strong></td>
</tr>
<tr>
<td><strong>Only 12% of investors have ever paid for investing seminars, training courses, or software</strong></td>
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</table>

Many of the points raised in the Australian study are consistent with our interviews with investor relations representatives in the UK, US software designers and non-professional investors. Many non-professional investors don’t hold shares themselves and give their brokers authority to manage their portfolios. Some may select shares, but do it on the basis of familiarity with the company. For example, in the UK Marks & Spencer is well known and many people shop there and utility companies that investors use domestically may be preferred (IR representatives).

Many of the points raised in the Australian study are consistent with our interviews with investor relations representatives in the UK, US software designers and non-professional investors. Many non-professional investors don’t hold shares themselves and give their brokers authority to manage their portfolios. Some may select shares, but do it on the basis of familiarity with the company. For example, in the UK Marks & Spencer is well known and many people shop there and utility companies that investors use domestically may be preferred (IR representatives). Having a relationship with customers as investors can also be productive for the right sort of company – but some companies prefer to encourage larger holdings by institutional investors to reduce the cost of ‘engagement’ with shareholders (IR representatives).

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29 We will review the research into how investors make decisions in the following chapter.
30 A number of roundtables have been held, some with investor representatives. There is mention of an investor survey undertaken by the SEC’s Office of Investor Education and Advocacy in the SEC’s 21st Century Disclosure report. No detail is provided regarding method or numbers of respondents and no other references to this survey have been identified. The report itself was released after the SEC’s decision to mandate interactive data, so it is unclear what role ‘the survey’ may have taken.
31 Jeremy Cooper is the Deputy Chairman of the Australian Securities & Investments Commission.
Of the retail investors who do review their share portfolio, they use newspapers and websites such as Motley Fool and Yahoo Finance and still may not undertake financial analysis themselves. They are also very price-sensitive when it comes to accessing information. Even a Companies House charge of £1 for statements can put investors off (investor interview). There is a perception by all the people we spoke to that despite the documented growth of digital forms of company reporting (ICAEW, 2004, pp9–10; Rovbottom et al., 2005) and the use of websites to find out about companies, many investors still prefer a glossy hard-copy annual report they can browse through ‘while soaking in the bath.’ This is in contrast to other research that examined the likely future of digital reporting and concluded that it was a preferred medium for corporate disclosure by both preparers and users (Beattie & Pratt, 2003; Xiao et al., 2002).

Beattie and Pratt’s (2003) survey conducted in 2000 received 235 responses from ‘private shareholders’ to their ‘primarily closed-form’ questionnaire. At that time, 27% of their respondents never used the internet and this category had the lowest percentage of daily use out of all the groups surveyed (p168). This was a significant difference between this group and the others (p167). Despite this distinct difference in internet usage, the attitude of the private shareholder group to internet reporting was similar to the expert user group. One area of difference was the experts’ preference for Excel format information that facilitates further analysis, while private shareholders had a closely clustered preference for HTML, word processed and Excel. What isn’t clear is how those private shareholders who never use the internet responded to the questions in Beattie and Pratt’s study. The problem is that it is difficult to obtain a meaningful overall view of the needs and perspectives of such a disparate group. A lot depends on how the questions are asked. ASIC’s 2006/07 survey paints a picture of investors who may say that HTML is a useful format if asked, but in practice may rarely use it to do any analysis based on the percentage responses in these categories. Our interviews suggest that there is only a very small group of ‘day traders’ who have models for analysing annual report type data while other investors either choose not to manage their own investments or to rely on newspapers, familiarity with the company or websites for investment ideas.

This characterisation of non-professional investors and the analysis of the proportion of the capital market that they comprise, raises a fundamental question about the relevance of the non-professional investor as an iconic stereotype which regulation, accounting standards and the ‘interactive data project’ are purported to serve (see also, Young, 2006). As a disparate group it is hard for any actor to argue that they have superior knowledge of them, so anyone may speak for them. In addition, because of their nature, it is most likely that they will have very few ‘real’ representatives. Because of this, champions such as Christopher Cox and William Lutz, and committees such as CIFIR can easily argue that they speak on behalf of ‘all’ retail investors. What is not clearly questioned is the SEC’s original policy of individual investor protection. Charkham and Simpson (1999) for example argue for a regulatory emphasis on shifting responsibility to institutional investors to monitor the performance of companies and raise issues to improve their management, thus improving the protection for individual investors as well.

A contrary argument is that the provision of information on the basis that a level playing field is to be created for all investors means that a larger pool of (possibly not as skilled) analysis is undertaken which may be important to the efficiency of capital markets (Libby et al., 2002). In the internet age the viral spread of information means that perhaps only one investor is needed to spot a risk or an anomaly for it to quickly become widely known. These are not the arguments that are widely presented, however. The emotive stance of ‘protecting the little guy’ is a politically strong one – since it is much more acceptable with the electorate to let big corporations fail than it is to let individual’s lose their homes and savings deposits. In terms of garnering support from constituents and muting potential arguments to the contrary, the amorphous mass of ‘little guys’ are a powerful ally.

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34  The project also included expert users (investment analysts, fund managers, corporate leaders), finance directors and audit partners.
33  The possibilities for democratisation through the internet have been widely discussed on the internet and in the academic literature (Poster, 2001; Unerman & Bennett, 2004, http://www.nytimes.com/2007/01/03/opinion/03wed1.html). However the success of viral detective work has been mixed. Some well-known people predicted the housing crash and credit crunch but were ignored (see for example, Lord Oakeshott and Vince Cable (http://www.telegraph.co.uk/news/newstopics/politics/liberaldemocrats/3179555/Vince-Cable-Sage-of-the-credit-crunch-but-this-Liberal-Democrat-is-not-for-gloating.html). Although Roth (2009) has confidence in the individual’s ability to provide supervision of markets, we do not expect that markets may be made efficient by greater numbers of individual investors conducting analysis. The irrational responses of capital markets are well known (Hirschleifer & Teoh, 2003, Lee, 2001). It is possible that isolated cases of problems may be brought to light faster or good investments in smaller companies, not normally analysed by professionals, may receive more attention.
32  See for example (http://www.wsj.com/articles/SB119688330763768288) in relation to the bank bailout in the US ‘In this sense, the overwhelming hostility of ordinary working people toward this massive transfer of public resources to the super-rich found its expression, highly distorted as it was, in the measure’s temporary demise.’ Similarly, ‘But when Kanjorski returns home to his blue-collar, Northeast Pennsylvania district with a possible deal in place, he may get a hostile reaction from his constituents, who have been skeptical about offering billions of dollars to help Wall Street firms during a time of economic struggles on Main Street’ (http://www.politico.com/news/stories/0908/13954.html).

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One aspect of the stereotypical non-professional investor that may not have been fully addressed by regulators acting as their spokespersons in the interactive data project, is that they have a vested interest in the profitability of companies. During an interview with a United Kingdom Shareholders’ Association (UKSA) representative who was familiar with XML tagging, the issue of the cost to the companies was raised. When the US figures of in the tens of thousands ($US), then falling off rapidly in following years, were quoted from SEC webcasts the interviewee felt that was perhaps ok for large US firms, but was not convinced that smaller UK companies could as easily absorb the additional cost. ‘It is nice to have marked-up digital annual reports, but one has to think about whether the extra benefit justifies the cost’ (non-professional investor). The investor perspective is not just concerned with more information in easy-to-use formats, but also with the effect of increased compliance costs on profits, capital growth and dividends. If a significant number of individual investors do not actively manage their portfolios and are happy with a simple PDF which they can print, an important element of the case for the benefits of ‘interactive data’ is lost. The case is perhaps clearer for institutional investors who make use of data aggregators as a source of normalised data or have bespoke data gathering systems for their analytical models. If ‘interactive data’ reduces the market for pre-processed data35 and the cost of purchasing it, the net effect is a transfer of benefits between the investor groups. The benefit to the institutional investor may come at the cost of reduced profitability, and therefore capital growth or dividends, which affects individual investors who will not directly benefit from the additional compliance cost.36

The difficulty of obtaining views from a disparate group such as individual investors is not a sufficient reason in itself for not pursuing it actively. The SEC’s Advisory Committee on Improvements to Financial Reporting (CIfiR) explicitly included the need for greater consultation with investors in its recommendations:37

‘Most importantly, we believe that the financial reporting system would be best served by recognizing the pre-eminence of the perspective of investors because they are the primary users of financial reports. To promote this perspective, we support increased investor representation on the FASB and the Financial Accounting Foundation (FAF). Increasing their direct and indirect representation in the process is the best way to assure that financial reports will be useful to investors.’ (CIfiR, 2008, p4; see also, Di Piazza et al., 2006)

In Europe and elsewhere there are groups that represent shareholders who may usefully be consulted. These include: Euroshareholders, the World Federation of Investors Corporations, and UKSA (also see Table 9 in Chapter 6). UKSA is consulted by government departments on particular issues, but the representative interviewed as part of this research felt that there was a lack of consultation about accounting and reporting issues generally and they would welcome greater interaction with the accounting profession and regulators.

In the current setting where competing groups incur different costs and benefits, it is easy for regulators and other powerful participants to act as spokespeople for non-professional investors and invoke their best interests (see for example, Di Piazza et al., 2006). To the extent that this is accepted as an important argument, there is a role for academics to provide independent research on non-professional investors’ views using large scale surveys and focus groups to build on existing research; eg, Beattie and Pratt (2003) and ASIC (2008). From the point of view of the ‘interactive data’ project this research should focus on the sources of information, how they are accessed and the nature and extent of the analysis undertaken, if any. Another key question is whether or not a change in the way company information is provided will impact on individuals’ decisions to invest in the capital market as suggested by William Lutz:

‘That [trend away from individual investors] can be reversed because now investors will be given the same power of sophisticated data analysis and access as any money manager. And if you so choose to do it, you can do it.’ (2008; transcription at about 54 minutes)

35 It is not clear that this market will be impacted as heavily as might initially be expected. The lack of complete standardisation of reporting elements means that there is still room for a third party to take the interactive data and standardise it for institutional investors’ use (see for example the IMetrix product).

36 Note that proponents of XBRL argue that once companies are required to tag their submissions to the SEC, they will realise further benefits by applying XBRL to other external reporting requirements and by incorporating the tags deeper in their internal systems. The argument is that these additional benefits will generate a return on the investment involved through reduced costs (Anonymous, 2003; Jones & Willis, 2003). The difficulty with this argument is that it is only regulatory filing to the SEC that is being mandated, so the ‘cascading effect’ is not guaranteed (Covaleski, 2002). Secondly the cost and technical difficulty of integrating XBRL in companies’ internal systems is significantly beyond the figures quoted for the ‘bolt on’ solutions being discussed for regulatory filing. The technical issues surrounding this will be discussed further in Chapters 7 and 8.

37 In Chapter 5, Table 7 we analyse the representation at the SEC roundtables and find that the number of professional analysts is twice the number of non-professional investors. The temptation seems to be to satisfy the call for greater input by using professionals.
This is a much more difficult research question. If the policy objective is to encourage more individuals to invest in shares, then the population includes everyone who is not currently an investor. Finding a way to elicit from this wider group ideas about what would stimulate their interest and facilitate their active evaluation of companies – is a great challenge. In a setting where the mid-term outlook is for bear markets the possibility for engagement on this issue seems low.

The broader survey work described above and the assertion that consultation is the best way to make sure financial reports are useful forms a context for the more specific research into the processes an individual decision maker goes through in making an assessment. In the next section we review the extant literature on individual decision making with a view to identifying key lessons for the data delivery formats such as interactive data.

4.2 Review of Literature on Investor Decision Making

This section first reviews the investor decision making literature and then considers the more recent studies of issues that arise particularly in a computerised environment such as information overload and preferences for different data formats.

The early research that focused on investment decision making largely grew out of seminal work by Robert Libby. This work is formalised in the 1981 book *Accounting and Human Information Processing: Theory and Applications*. Libby draws together the streams of research in the area and highlights their potential complementary contributions. Brunswick’s (1952) lens model and Newell and Simon’s (1972) and Simon’s (1955) work on the use of heuristics arising from the bounded rationality of decision makers are identified as important elements in the broad area of behavioural decision theory. This early work already identifies important aspects of interest. While digital reporting formats were not imagined at the time, the input-processing/output classification of information-processing variables (Libby, 1981, p8) identifies the presentation format and its level of disaggregation as variables in the information set. Researchers also examined the use of cues prior to the decision on decision outcomes (Libby, 1981; Simon, 1979).

The literature that developed out of this early work pursued themes related to individuals’ decision making such as: how information is presented and what data is included (eg, Amer, 1991; Hirst & Hopkins, 1998; eg, Maines & McDaniel, 2000), the use of decision aids (eg, Arnold, 1998; Brown & Jones, 1998; Lewis et al., 1983) the role of heuristics (Wright, 1980) and the different decision strategies used by experts and novices (eg, Hunton & McEwen, 1997).

Table 4 summarises the findings of some relevant studies and extrapolates their implications for interactive data.

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<tr>
<th>Article</th>
<th>Findings</th>
<th>Implications for Interactive Data Reporting</th>
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<tr>
<td>Amer, 1991</td>
<td>Object like presentations (such as the Chernoff face display) did not achieve the expected improvements in decision making with integrative tasks. Non-object displays supported superior decision making performance for selective tasks. (See also Moriarty &amp; Roach, 1977)</td>
<td>Non-professional investors have loosely structured analytical processes for investment decision making (Maines &amp; McDaniel, 2000; SRI International, 1987). The combination of these findings suggest that guidance about when it is appropriate to study data in isolation or when to make use of tables or object displays, should be refined. ‘Best practice’ approaches need to be identified and disseminated to analyst package vendors and investors.</td>
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<tr>
<td>Hirst &amp; Hopkins, 1998</td>
<td>Reporting comprehensive income improves the ability of financial analysts to predict earnings management.</td>
<td>This study reflects only one alternative among the possible reporting options for companies in a digital reporting context. It suggests that regulators such as the SEC need to reconsider what is reported as well as its interactive functionality.</td>
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<tr>
<td>Article</td>
<td>Findings</td>
<td>Implications for Interactive Data Reporting</td>
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<td><strong>Maines &amp; McDaniel, 2000</strong></td>
<td>Using comprehensive income disclosures, the researchers find that non-professional investors weight information in making a decision.</td>
<td>As above.</td>
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<td><strong>Arnold 1998; Brown &amp; Jones 1998</strong></td>
<td>Despite evidence that individuals are poor at making statistical judgements, research also shows that they tend to choose not to use decision aids. Reliance on a decision aid is part of the strategy adopted in making a decision. Difficulties may arise where there is over-reliance on decision aids in situations to which they do not apply (Glover et al, 1995). Previous research also found that increasing the pressure to use a decision aid led subjects to reduce their reliance on it. The level of reliance on decision aids varies with changes in decision aid features, decision maker characteristics and factors that affect the evaluation strategies. We expect that the key to understanding the adaptive behaviour of aided decision makers will be improved understanding of how decision aid reliance is incorporated into decision strategies’ (Brown &amp; Jones 1998, p92).</td>
<td>A single type of decision aid is not appropriate for different decision makers and decisions. Policy makers need to consider ways to provide a match between decision, decision maker and decision aid. The ultimate difficulty may be in assessing what is the ‘correct’ model on which to base a decision aid, however. With so many unknowns in an investment decision model, the creation of a decision tool that is sensitive to all the variables (including the possibility that data may be ambiguous in its reflection of underlying ‘reality’) is likely to be extremely difficult.</td>
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<td><strong>Lewis Shields &amp; Young, 1983</strong></td>
<td>Decision aids must be evaluated according to a cost/benefit trade-off and it is necessary to understand why decisions vary from the normative ‘best’ decision. The study found that a decision aid was not cost/benefit effective in the experimental situation (analysis of variances).</td>
<td>A free market response to providing decision aids may result in investors paying for tools that do not offer any net benefits. In the absence of any basis for advice about how to choose decision aids, it is difficult for policy makers to make recommendations supporting the use of decision aids, despite other evidence that indicates that they are necessary in the face of poor decision maker evaluation of information.</td>
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<td><strong>Wright, 1980</strong></td>
<td>Individuals use simplifying heuristics that cause systematic biases in decision making. Individuals are not good intuitive statisticians and need formal judgement decision aids.</td>
<td>More information without supporting structures and aids may not enhance decision making.</td>
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Table 4: Findings and implications of investor decision literature (continued)

<table>
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<th>Article</th>
<th>Findings</th>
<th>Implications for Interactive Data Reporting</th>
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<td>Hunton &amp; McEwen, 1997</td>
<td>This study uses retinal imaging technology to distinguish directive from sequential search strategies used by 60 professional analysts. The findings indicate that analysts using a directive search strategy take less time and make more accurate forecasts. The search strategy may be linked to experience which allows individuals to structure and search for specific items of information.</td>
<td>One of the claimed benefits of interactive data is that it allows users to extract exactly the required items and format them into a template (or decision aid) according to their specifications (or as provided by a software/data vendor). This study suggests that an appropriate search mechanism can improve forecasting accuracy. A key factor will be the model used by the investor and their level of reliance on it.</td>
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A number of key issues are identified in the table. These concern the desirability of decision aids, the problems of achieving effective data format and presentation and the difficulties of processing large amounts of data. Though we indicated earlier in the section that the development of interactive data postdates much of the research on decision making the concerns identified are still relevant. Next we focus attention on analysing the literature that has explored how digital reporting may impact investment decision making.

While Sutton (2005, p2) argues that ‘we know very little about what formats are most useful for reporting, how users will value more continuous information dissemination, and how financial information users will use this information’ we review the evidence that is available. It falls broadly into the areas of information overload and the claims associated with the added functionality of digital data formats.

Eppler and Mengis (2004) review the literature on information overload in three disciplines. They define information overload in the simplest terms as ‘receiving too much information’ (p326). The elements of the experience that there is ‘too much information’ have been explored ‘objectively’ by trying to conceptualise information overload and measure it and ‘subjectively’ by using surveys and interviews to elicit subject responses (Eppler & Mengis, 2004). The authors suggest a conceptual framework as a basis for classifying the research on information overload (p330). One of the key features of their framework is that countermeasures adopted to reduce overload should not be considered in isolation, and may have ‘significant side effects on other causes’ (p330). A corollary is that information technology developments’ impact on the quality of information, the motivation of the individual and task parameters should be carefully studied since there may be unintended side effects. Eppler and Mengis (2004) comment on the scarcity of such research (p330). The information technology causes of information overload that have been identified in research include; push systems, email, internet, and various distribution channels for the same content (Bawden, 2001; Edmunds & Morris, 2000; Eppler & Mengis, 2004).

Interactive data allows users to extract the information they want in a pull system and so apparently reduces two of the identified information technology causes of information overload. It does, however, open the prospect of increasing further the distribution channels for company data on the internet. Data aggregators, newswire services, company data portals as well as the Edgar system and companies’ own websites are all sources of online company data. The SEC project has also encouraged the creation of additional portals specifically providing outlets for interactive data (eg, IMetrix provides current and archival interactive data, the SEC site provides Financial Explorer and Interactive Financial Reports; see also SAVAnet and IA). These sources provide additional functionality over traditional on-line channels, however, the investor needs to make a choice not only about what data is required, but the level of functionality (interactive or PDF for example) as well as the source to be used. Ways to simplify these choices and ensure that investors are educated about the implications of interactive data are needed – but research into how best to provide this additional information without simply further adding to the information overload is lacking. This may be particularly important in the UK and European environment where there may be multiple outlets for regulated information in a national jurisdiction under the ‘competition model’ (see Chapter 3).

The added functionality that interactive data provides results from the data format used. XBRL is an XML-based data standard for adding tags to data so that they can be searched and processed without human intervention (see Appendix 1). This provides a significant increase in the ability to locate specific items of data from a financial statement and to automatically download it into a particular cell in a spreadsheet (for example). There is very limited published
research on the implications of this functionality for decision making. Hodge, Kennedy and Maines (2004) investigate whether using an XBRL-enhanced search engine helps non-professional financial statement users acquire and integrate related information when making an investment decision' (p687). The research was conducted using an experiment in which students were given the choice of whether to use the enhanced search engine (based on an XML structure similar to XBRL) or a PDF format with no search capability. The findings indicate that the search capability improved the students' ability to integrate information effectively, but that a surprisingly high percentage of the students chose not to use it. This is remarkably in line with the earlier research cited that suggested that decision aids are not always used, even where they are appropriate.

A weakness of the Hodge et al study, from the point of view of providing insights about interactive data is that the data delivery formats were created artificially to test only the effect of a search capability within the statements. This does not reflect the full functionality of either interactive data (which will also permit for example, automated processing) or PDF which does allow searching (and more recently hyper-linking within documents). Extensions of this type of research are needed to better understand the effects of interactive data on investor decision making and information overload.

Once the SEC's programme is fully operational, research into perceived barriers to use, rates of adoption among investors and the use of decision aids will be important. To contribute to research in the area of non-professional investors' decision making using digital reporting formats we conducted a pilot study on students using an experimental design.

4.3 PILOT STUDY OF INVESTOR DECISION MAKING USING DIGITAL FORMATS

Our analysis of the literature and our interviews with investor relations and software designers suggests that there is little research that directly addresses the interaction between digital data format and investor decision making. Given the recent speed of development of the interactive data project, it is important that research is undertaken soon to help inform the development of the tools and address the issue of whether or not the benefits asserted to follow from adoption can be observed to exist in controlled settings.

We suggested earlier that engaging with non-professional investors is the most appropriate way to proceed. At this stage in the development of interactive data it is not feasible to survey investors about their experience with the technology as virtually all of them will not have experienced it. In these circumstances it is appropriate to conduct an experiment that would involve recruiting non-professional investors to first undergo some training in a software package that allows them to exploit the full range of functionality available through tagged data. After the training they would be asked to undertake investment analysis exercises to see how they performed and what their impression of the data format is.

4.3.1 Pilot experiment sample

As an interim step to achieving a study of this nature, we undertook a pilot experiment using students in an Accounting Information Systems (AIS) class at Waikato University, New Zealand. It is very common in experimental studies in accounting for researchers to use students as surrogates for a range of professional and non-professional populations (e.g., Frederickson & Miller, 2004; eg, Kumar & Krishnan, 2008; Lewis et al., 1983; Maines & McDaniel, 2000; Tuttle et al., 2002). Libby et al (2002) argue that:

‘Other experiments focus on the judgments of general or novice investors, and so require subjects who possess only basic familiarity with accounting and investing. Student populations that have such basic familiarity are appropriate here as well.’ (p803)

Because of the tendency to use students as surrogates and the lack of other research directed at understanding the 'profile' of non-professional investors, it is very difficult to establish that student-based studies of investment analysis have the external validity to be useful for policy or software design guidance. With this caveat in mind and an awareness of the necessary restrictions of the experimental format we believe, nevertheless, that some useful insights were gained from the research.

38 Ghani et al (2007) provide an early report of the findings of an experiment conducted on 62 accountants using three data formats (HTML, PDF and XBRL tagged). The study finds that users have no statistically significant preference for any of the formats. In fact even though participants using PDF perceived XBRL format data to be more useful, a greater percentage still stated a preference for PDF (p18). The difficulty may be that users are more confident with the technology they know. The authors recommend a programme to increase the awareness of the benefits of the new digital reporting format.

39 Currently there is no software that allows a user to do this without a reasonable understanding of XBRL (including schemas and taxonomies). A survey of software products available is provided in Appendix 4. The technical aspects of the functionality of interactive (tagged) data are discussed in Appendix 1 and in more detail in Chapter 8.

40 There is an issue with training experimental subjects and then asking them to use the software, since they would have a more superficial knowledge of the new techniques there is likely to be a bias against them compared to methods with which they are very familiar (Ghani et al., 2007; Libby et al., 2002, pp802–803).
The use of students from an AIS class has the advantage that they had already learned about XBRL and tagged data before the exercise was conducted in class. Students were motivated to do their best in the investment analysis task because it was worth 5% of their final grade in the course.\(^\text{40}\)

### 4.3.2 Structure of the experiment

There were three phases in the experimental exercise. First the students were asked to complete an electronic form with demographic information about their stage of completion in the degree, previous experience in investment decision making, whether or not they consider themselves risk takers and what four factors they believe are important in investment analysis. They were then asked to conduct an investment analysis that required them to choose which out of two companies to invest in using PDF-formatted data and also for a further two companies in XBRL-tagged data presented in a spreadsheet. As part of this process students were asked to write a comment on how they made the investment decision and their perceptions of the data format. So each student used both formats.\(^\text{42}\) The order of analysis of the formats was randomised among the subjects – half used the PDF first and the other half used the tagged data first. Because the aim was not to test the students’ knowledge of investment analysis, a sheet of commonly used ratios was provided. Despite the increased level of control over the setting and ‘noise factors’ in an experimental setting, understanding how investors use data formats to process accounting information for investment decision making is a complex research question. It involves the observation of a decision which is the joint product of the subjects’ skill and knowledge in investment analysis as well as the possible effects of the data formats. Our design allows us to analyse the prior knowledge and other relevant characteristics of the subjects. We are also able to check the statistical analysis of the decision by analysing the reasons they provided for their choice. This reduces the potential for a spurious conclusion that the data format drove the investment decision. The two key elements that the experiment setting manipulates are the presentation of the information and the data format. The aim is to try to isolate whether or not the data format affects the subjects’ ability to locate and integrate the information necessary to make the ‘correct’ decision (Hodge et al., 2004).

### 4.3.3 Financial statements

We chose to provide statements in a similar format to annual financial statements; including a chairman’s report, consolidated income statement and balance sheet, notes to the accounts and (clean) audit reports. It was necessary to balance the length of the reports (around 10 pages) with making them somewhat realistic. The time constraint for completing the two investment analyses was two hours – so the information provided needed to be limited to what could be viably considered within that time frame. The time constraint is in some ways not representative of the situation of a non-professional investor, who may choose to spend considerably longer on his/her analysis. However, our interviews suggest that investors are usually not willing or able to spend much time on such analysis, so in that sense it may not be that unrealistic. The experiment design also does not mirror the tendency for non-professional investors to seek other analysis to identify investment opportunities, however, we are focusing on just the effect of the data formats, so this abstraction reduces the ‘noise’ surrounding the investment decisions of the subjects.

In common with Hodge et al (2004) we were interested in testing the ability of the subjects to integrate information from the narrative footnotes with the quantitative information on the face of the accounts using the different data formats. In order to gain insight into whether or not they had done this the financial statements were created so that one company appeared more profitable and with a similar risk compared to the other when only the financial information is taken into account. Information in a footnote to the accounts about the treatment of intangibles should alert the subjects to the fact that there are unrecorded assets in that company that if included in the analysis (to make the companies’ statements comparable) reduce the return on investment and make it comparatively less attractive than the alternative company. Hodge et al (2004) refer to this as a manipulation of the placement of information since in one annual report the information is contained in a disclosure in a footnote and in the other it is recognised

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\(^{40}\) The experimental exercise was assessed for ethical conduct by the Ethics Committee of the Waikato Management School and approved. Students were permitted to opt out of the exercise and earn the grade in an alternative way. No students opted out, although some were unable to attend on the day and so completed the exercise in their own time. Students were told in writing that their preference for one or other data format would not affect their grade.

\(^{42}\) More technically, this is expressed as a 2 X 2 within subjects, repeated measures experiment design. That is the subjects (students) were tested on two conditions (PDF and tagged) of the factor (digital data format). The advantage of this design is that it reduces the effect of differences between the students on the results (since all students do all formats) and it also means that fewer subjects are required to obtain statistically significant results. The disadvantage is that the students may learn something during the first part of the exercise that affects their performance in the second part. The randomisation of the order of the PDF and tagged data analysis among the subjects helps to reduce the impact of any learning during the exercise on the outcomes.
on the face of the accounts. The students were also asked to report after the analysis what influenced their choice. This tells us whether they had identified this information but incorrectly conducted the calculation or if they had chosen the ‘correct’ company, but for a different reason.

4.3.4 Data formats

Previous research shows that HTML and PDF are the data formats most widely provided for users on company investor relations sites, with Excel less frequently made available (Allam & Lymer, 2003; FASB, 2000). The two hour time limit imposed by the class setting, and the statistical benefits of having each student complete each data format, constrained the number of data formats that could be included in the experiment to two. We chose to use PDF as the alternative to the XBRL tagged format for two reasons. First it is very extensively used, not just for financial reporting, but for the delivery of all types of documents (including academic articles), so the students would be very familiar with it. Also, unlike Hodge et al (2004), we presented PDF files that were searchable and included hyperlinks between the note numbers in the financial statements and the footnote disclosures (but not back again), and between the index and the statements. This more accurately reflects the current state of the PDF functionality – even if it is not yet commonly used by companies when posting their financial statements. It also includes the type of functionality available in HTML format, but combines it with a more reliable presentation rendering, offering an alternative to XBRL with the common features that are available.

It is important to choose an appropriate level and type of functionality for each data format being presented in the experimental setting. Given that interactive data is not widely used, it seemed most appropriate to compare the two formats using their greatest functionality rather than limiting them to what is their current common use. Hodge et al (2004) in their study reduce PDF to a non-searchable presentation format and create an XML-based search engine to do little more than what can currently be done in PDF and HTML. We felt that it is important to identify what functionality it is reasonable to expect XBRL-tagged data to be able to deliver to non-professional investors and incorporate as much of that as possible in the experimental setting. The features that proponents of XBRL and the SEC interactive data programme claim that can be delivered include:

- automatic search and download at individual data item level. For example, Revenue, first quarter 2008 for Microsoft and Adobe downloaded;
- automatic load into software for analysis (either graphical or numeric) in a pre-specified format (ie, no rekeying of data);
- validation of instance document to ensure its internal integrity;
- links to narrative explanation (footnotes, and possibly management discussion);
- display of meta-data tags that show among other things the reference to relevant accounting standards for the tag.

There are a number of technical issues with how these features of interactive data are described and the current state of the technology for their delivery that will be discussed in Chapter 8. We will accept the features at face value for the time being and build on them to suggest ways that this functionality would most appropriately be delivered for non-professional investors:

- The software for downloading the data should interface with Excel as the dominant standard in spreadsheets and be flexible for interoperability with future standards or competing open source options. The download capacity should enable loading data tagged a specific way into predesigned templates that can be used for multiple companies and many times over (eg, the revenue item for the first company in sheet1, cell 11C). The software should also specifically allow for the download of complete statements.
- The software design should provide flexible functionality to suit a range of user skill levels:
  - standard templates for viewing and analysis; and
  - ability to create customised formats and analysis models without needing to understand the elements of XBRL and its terminology.
- Automatic location and display of footnotes related to numeric items displayed (and vice versa).

The lack of extant software that delivers this functionality created a problem for ‘operationalising’ the interactive data format in the experiment. A survey of the software available revealed that only one package was capable of providing a significant proportion of the functionality of interactive data (see Appendix 4). This package required more than a basic understanding of XBRL, so it was considered not appropriate for non-professional investors. In the set-up...

43 In Hodge et al (2004), the accounting item manipulated was the recognition or disclosure of employee stock option information. We chose intangibles because it is not such a recent controversy, applies to a wide range of industries now, and the students would have had exposure to it as an accounting issue.
for the experiment, it was not possible to simulate a web search for specific data items for downloading into a spreadsheet and include the other functionality. Internet users, and certainly students are generally very aware of web-searching, so this aspect was abandoned in favour of including the linking of footnotes to the financial statements, the automatic population of data into a ratio analysis template and being able to see the meta data (such as references to accounting standards) in the tags.\textsuperscript{44} This was achieved by preparing the financial statements in Excel with a Dragon Tag\textsuperscript{45} add-in. The students viewed the statements in Excel with the Dragon Tag add-in and so were able to refer to the underlying taxonomy with a right mouse button click.\textsuperscript{46} The students were provided with the full statements in both cases and the additional `automatic' ratio calculation in the interactive data format on another sheet in the workbook.\textsuperscript{47}

Two sets of two financial statements were presented to the students in the data formats for them to analyse. Of the 55 students enrolled in the course, 49 completed the experimental exercise, but there were only 44 usable responses since some students did not complete both the PDF and `interactive' investment analysis. The class was 93% undergraduate students, with 73% of the class majoring in accounting. Most students were in their third year of a four year degree. 20% of the students were from overseas – mainly Chinese. The gender distribution was slightly weighted towards females (53%).

4.3.5 Results

The data was analysed using t-tests to identify if there was any significant differences between the samples. Because each individual used both data formats and was comparing statements with each of the presentation styles, the potential variance caused by the different experience and abilities of the students is removed, however there is a chance that they will learn in the process of undertaking the first round of analysis and that will affect their decision in the second analysis. Table 5 shows the descriptive statistics and results of the t tests for the choice between the two companies and the percentage invested broken down by data format and order of use.

The descriptive statistics highlight the remarkable consistency between the two groups of students (in columns A and B). It appears from the raw percentages of correct choices that the students perform better using XBRL regardless of whether they use it first or second (59% overall using PDF and 66% using XBRL). However, Chi-square and Fisher’s Exact Test show that there is no significant difference between the two formats (see Appendix 4, Tables 3 and 4). This is further explained by looking at the individual responses of participants. Nine make a different decision using the different data formats. Six swap to the correct company, but three swap to the incorrect company, leaving only three additional participants with the correct company. We asked students to describe the basis for their decision, so we can compare for the nine `switching' students what changed between the two formats. None of them mention the accounting policy difference between the two companies and the need to adjust the ratio calculation for the difference in the recognised asset base. Five were focusing on profitability and returns to shareholders, but of those the switch in decision with XBRL went the `wrong' way.

We also asked the students to indicate what percentage of their funds they would choose to invest in each of the companies, given that they already had a diversified portfolio. Table 5 shows that the students very consistently chose to divide their funds between the two companies, with only one student committing 100% of their funds to their `first' choice. Again the result of t statistics show no significant difference between the groups or between the investments made using the two data formats (see Appendix 4). Many of the students reported that they had trouble choosing and so put some money in each company. It may be that the idea of diversification as a way of reducing risk has been so firmly ingrained as an investment strategy that it is applied to each investment decision rather than to the state of the portfolio as a whole.\textsuperscript{48}

\textsuperscript{44} One vendor kindly offered the use of tagged data on their server, however, the other functionalities could not be implemented.

\textsuperscript{45} Rivet Software.

\textsuperscript{46} Unfortunately it was necessary to create a taxonomy extension for the US GAAP taxonomy in order to include accounts the New Zealand students would be familiar with and incorporate the intangible asset classes required.

\textsuperscript{47} This is in contrast to Ghani et al’s (2007) approach which only provided abstracted data for the interactive format. We felt that because users will have the option to receive full statement information or extracted data items when software for investment analysis is fully designed – that we should provide our experimental subjects with the choice rather than limit them to smaller data sets.

\textsuperscript{48} It may also suggest that in future experiments of investment decisions the nature of the portfolio needs to be described and given greater emphasis.
Our review of the basis for investment decision making provided by the participants showed that they considered the decision to be more complex than seeking the highest return. They were concerned with the risk factor associated with solvency and leverage. Some students reported making their decision almost solely on this basis. The experiment was conducted in October 2007. In New Zealand there had been a spate of finance company collapses over the preceding nine month period. The students seemed to have absorbed this concern and adjusted their investment analysis accordingly. This is not an irrational reaction and investment advisers are arguing that in the wake of the stock market crash and credit crisis, cash reserves and lower levels of gearing should be key factors in decision making. Some students gave significant weight to the chairman’s report and the company’s professed (but not evidenced) social and environmental policies. What this does suggest is that investment decision making is a complex task that is likely to be affected by individual preferences and concerns as well as economic conditions. Our sense is that giving the students an almost full-scale investment analysis setting as opposed to the calculation of four ratios (used by Hodge et al, 2004 and Ghani, 2007) reveals that the complexity of the setting outweighs any difference that the data format may offer.

Table 5: Pilot experiment results

<table>
<thead>
<tr>
<th></th>
<th>Group A Used PDF first</th>
<th>Group B Used XBRL first</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results using PDF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number who chose disclosure company ('correct' choice)</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Number who chose recognition company</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Percentage 'correct'</td>
<td>59</td>
<td>59</td>
</tr>
<tr>
<td>Average percentage of funds invested in disclosure company</td>
<td>53</td>
<td>51</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>18.6</td>
<td>16</td>
</tr>
<tr>
<td>Results using XBRL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number who chose disclosure company ('correct' choice)</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>Number who chose recognition company</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Percentage 'correct'</td>
<td>64</td>
<td>68</td>
</tr>
<tr>
<td>Average percentage of funds invested in disclosure company</td>
<td>54</td>
<td>55</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>18.9</td>
<td>16.1</td>
</tr>
</tbody>
</table>

While the data format appears not to have made any significant difference to the participants’ investment decisions, they did have strong views about the relative ease-of-use of the tagged format. The majority of the students stated a preference for the automatic calculation of ratios (see Table 6 for summary results). A surprising minority, however, preferred the look and ‘feel’ of the PDF statements because they more closely resembled the familiar form of hard copy financial statements (6 students, 13%). To place this outcome in context, this was an optional course for all but 7% of the students and as undergraduate students, their average age was about 22. This suggests that they should be favourably disposed to technology developments (having selected a course in AIS and being of the ‘computer’ generation) and as a group they do not have long experience with hard copy reports to be wedded to them through familiarity. Our subsequent interviews with investor relations and non-professional investor representatives suggest that in the retail investor population this preference may be more widely held. 28 participants (62%) reported only negative perceptions of the PDF format while 11 (24%) stated that they preferred the look and feel of the PDF, but found the format not useful for comparative financial analysis.

Comments about PDF included:

‘It is more convenient to get what financial information I want.’

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49 Two students chose the correct company but chose to invest 60 or 70% of their funds in the other company. They did this consistently between the two data formats, so we have adjusted the percentage figures for what they intended to do based on their company choice. The change makes no difference to the overall outcome in terms of the statistical significance of the t-tests.
‘I feel comfortable. I also can get necessary information, but it is time consuming’.
‘I disliked having to manually work through the PDF, as well as it being a read only file. This limited its capability for manipulation in terms of analysis. Although after spending many years at university I am quite used to the PDF format and its uses (or lack thereof).’
‘I like PDF as it reads like you have a hard copy in your hand (can also be printed easily). It thus takes the form of a real financial report, because of this each section flows.’ (emphasis added)

Table 6: Preferences for data format

<table>
<thead>
<tr>
<th>Perception</th>
<th>PDF format</th>
<th>Interactive data format</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>%</td>
</tr>
<tr>
<td>Negative</td>
<td>28</td>
<td>62</td>
</tr>
<tr>
<td>Negative about analysis but positive presentation</td>
<td>11</td>
<td>25</td>
</tr>
<tr>
<td>Positive about analysis but negative about presentation (confusing)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Total**</td>
<td>45</td>
<td>100</td>
</tr>
</tbody>
</table>

The perception of the interactive data was overwhelmingly positive. This mainly had to do with the decision aid built into the presentation that showed a common set of ratios automatically calculated. The participants identified this as saving time. Significantly, however, they also identified this as providing ‘accurate’ analysis and relieving the user of the need to search through financial statements. The difficulty here is whether or not it is appropriate to always rely on such a decision aid. Calculations taken directly from figures in the financial statements do not allow for the differences in the bases of calculation that may be used in principle-based statements. In this case the difference in accounting policies for intangibles has a significant impact on the way the asset base is reported between the two companies. There is no reason to expect that users of automatically calculated ratios would be more likely to seek out and integrate information to adjust those figures. The tendency is to rely on them as ‘correct’. Some indicative comments include:

‘It was much much easier to compare ratios as already done for you, takes away any chance of error on users behalf when calculating.’

‘This information made it easier when evaluating ratios as they were already calculated. This also leaves out room for my error in using wrong information when calculating the information!’

‘The important information, was highlighted for me.’

The students expressed negative perceptions about the need to get used to the format the interactive data was presented in, that it was not as clear and attractive as PDF and their initial confusion using the tool. It was also unclear to them what the meta-data tags offered to help them in their analysis. They showed little interest in whether or not the labels and the tags from the two companies indicated that the underlying meaning of the items were the same. Similarly when it was suggested they could look up the meaning of an element in reference material such as the relevant accounting standard – the interest in doing so was minimal.

A key goal of interactive data is to allow investors to search for particular pieces of data across companies and automate their analysis. Some non-professional investors may make use of the decision models (perhaps in the form of ratio analysis) of consultants/vendors packaged as a service in conjunction with interactive data provision. The investor decision-making literature reviewed at the beginning of this chapter suggests that individual decision makers are not good at making statistical assessments based on financial information. The research on decision aids is mixed, however, there is reason to believe that their appropriate use can improve decision making.

The participants’ perceptions of interactive data raise some additional concerns about how to best ‘package’ the improved functionality with decision aids. Hodge et al’s (2004) study

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**This analysis includes the responses of two participants who completed the experiment outside of the controlled setting. Their investment decision data was not included for analysis, but their views of the data formats were judged not to be affected by their later submission. One participant’s response was not usable since it only contained a view on PDF.**
Target constituents’ perceptions and pursuits

4.3.6 Implications for the constituency

The findings of our experiment combined with the previous research suggests that there are important issues for constituency members who are seeking to support the interactive data project and extend the adoption of XBRL by regulators disseminating data to retail investors.

The Hodge et al (2004) study found that search facilitating technology could enhance the integration of data among users who choose to apply it. This facility is available in PDF format and so it is important that the additional functionality of interactive data brings benefits for retail investors. The experiment reported here suggests that inexperienced investors are not likely to improve their decision making where the user is required to select links to integrate footnote information. The constituency needs to consider how to develop technology to create and maintain a link between numerical data and related footnotes. This runs counter to the ‘atomising’ functionality of XBRL, but is essential to preserve the full meaning of the financial data.

This is particularly important in the light of the reported belief that the numbers calculated by the software tool using interactive data were more accurate and reliable. This may be an incorrect perception where interactive data is not audited, tagging is not accurate or important narrative data is not integrated. The constituency should develop a requirement that users are informed of the extent to which the data and tagging have been audited whenever data is being used (perhaps through clearly displayed context information).

The results also support the argument (see also Chapter 8) that the functionality of interactive data should be supported by clear regulatory requirements for appropriate tagging and standardisation so that the reliance users may place on the automated download and calculation is not misplaced because of the ability of filing companies to create potentially unhelpful extension taxonomies.

Finally there is a need for constituency members to play an active role in supporting initiatives to educate retail investors about the impact of atomised data on their analysis and understanding of companies’ financial performance and position.

4.4 NEEDS AND PERCEPTIONS OF NON-PROFESSIONAL INVESTORS – SUMMARY

This chapter has explored literature and evidence about non-professional investors; their role in capital markets, their decision making characteristics and how they may interact with XBRL tagged (Level 2) digital data. A range of evidence from individual interviews to national census figures and experimental research have been reported in an effort to start to map out what is known and point to where more research is needed.

The analysis of the size of the retail investor share of capital markets in the US and the UK (Figures 6 and 7), indicates that while such investors have a bigger share of the US investment market than in the UK, they still only represent about one fifth of the market by value. In both regions the recent growth has been in institutional investment and in the UK, foreign investment is equally important.

Chapter 3 also highlighted the institutional and regulatory differences between the US and UK. In part this is affected by European Union regulation. Christopher Cox, with his zeal for interactive data implied that the FSA was considering XBRL – but confirmation that the FSA’s position has not changed suggests that there is a difference of vision between these key financial regulators in US and the UK. The structural differences between the jurisdictions suggests that while the rhetoric about the need to protect individual investors is difficult to argue against, there is a powerful financial services lobby in Europe (Gow, 2008) and as this chapter suggests, a lack of clear evidence so far that ‘interactive data’ will provide direct benefits to individual investors. They want to know that any increases in compliance costs that mandating reporting using XBRL may cause will generate benefits to them that exceed the impact of the costs on their returns. If they are not interested in financial statement analysis because they source the information on which they make decisions elsewhere, then a second order argument is necessary – such as, that they will benefit because analysts will be able to provide faster and more comprehensive coverage
of companies. As the benefits seem less direct, then any power these arguments about investor benefits may have had to overcome the structural differences and rigidity in the EU is diminished.

This chapter raises some concerns about the potential of Level 2 digital reporting to have a negative impact on the quality of investment decision making by non-professional investors. A differentiating feature between them and professional analysts is that they usually lack a well formulated decision model (Maines & McDaniel, 2000). Like the students in our experiment, they may perceive the ‘sliced and diced’ information and calculated ratios as ‘accurate’ and reliable and not seek to integrate the narrative information from the footnotes that is critical to a full interpretation of the financials. This suggests that a keen understanding of how decision tools should be best designed for this group of investors is important for the development of website presentations of tagged data (such as the SEC’s Financial Explorer) and software packages. Our interviews suggest, however, a lack of engagement with research by designers and even with an intention of producing useful decision tools, they face the difficulty created by the heterogeneous nature of non-professional investors. Further, the research suggests that even when useful tools are available, users may not make good decisions about when to use them. If the policy aim is to engage larger numbers of individual investors in the creation of carefully constructed portfolios, then there is a need for education of existing and potential investors in programmes tailored to their skill level. In the current economic climate efforts to boost confidence in the ability of capital markets to ultimately achieve stable growth in value will also be needed. In this context, tagged data may be argued to provide increased transparency for improved regulation – but this is too abstract, and perhaps tenuous – to inspire the necessary trust. The shift to greater regulation in general and the concerted actions of governments internationally need to be presented in convincing terms to not only retain retail investors but encourage an increase in their share of the market.

4.5 FURTHER RESEARCH

We have raised a policy question and an issue for researchers – is it important to provide financial information specifically for non-professional investors? The normative aspect of this issue has consequences for the formulation of conceptual frameworks for financial reporting and the mechanisms for providing information to the capital market (such as the question of appropriate digital data formats). If it were agreed that the most important investment decisions are taken by institutional investors – then how would financial statements and data delivery mechanisms need to change?

If one accepts the argument that regardless of the size of their share of the capital markets, individual investors have an intrinsic right to be provided financial information they can use – then the broad canvas of research in this area has many gaps in it. Research is needed on areas including: the characteristics of this pool of investors, how they make decisions, what sources of information they use and what types of decision tools and educational support would be needed to make interactive data benefits to them outweigh the costs. Unfortunately, the heterogeneous nature of the population makes this area unattractive for researchers because any research not conducted widely will face the challenge of not being representative or lacking external validity. The support of professional accounting bodies and other funding agencies for large-scale, coordinated projects would be important to make this area of research viable.51

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51 The ESRC has recently announced funding of £162,000 for a project titled: “Technology, Action and Cognition in Online Anonymous Markets: A Sociological Study of Non-institutional Traders RES-062-23-1204” to be headed up by Dr Alexandru Preda of Edinburgh University. A complementary study would be to look at the accounting perspective and how interactive data impacts the provision of information for ‘trading software’.
5. CONSTITUENTS’ PERCEPTIONS, GOALS, ACTIONS AND RESOURCES

Chapters 3 and 4 together provide the focus and the broad setting for our study of the interactive data constituency. We have previously defined the target problem as the provision of digital data with Level 2 functionality in a way that is appropriate for non-professional investors. This chapter focuses on the constituents who are actively pursuing potential solutions to the target problem. Research on the adoption and diffusion of technologies highlights the strong commitment, significant resource requirements and difficulty in achieving a change in a technology standard (Geels, 2004; Hanseth & Monteiro, 1997; Molina, 1997). Molina’s diamond of technological alignment highlights the need either deliberately or unconsciously, for the active participants in the technology development to seek to expand the numbers of individuals and groups aligned with their purpose (Latour, 2005; Lowe, 2004; Moore, 2002; Newell et al., 2000). In this chapter we first identify the key constituents of the interactive data project and consider how they have contributed to the project and created resources to work towards achieving a solution to the ‘target problem’. The limited role of non-professional investors in the project is made apparent in the analysis. As a consequence we then consider the importance of this group. Finally we consider the issues that may arise in attempting to form a socio-technical constituency to support a similar development in the Europe.

5.1 INTERACTIVE DATA CONSTITUENTS – GOALS, ACTIONS, RESOURCES AND RELATIONSHIPS

Figure 7 shows the key constituents in the interactive data project. The founding members of XII initially operated effectively as a small group to write and develop the technology. Keeping the number of participants low streamlines interaction and reduces the number of differences in interests and ‘visions’ for the project (see Bonaccorsi & Rossi, 2003, p1252; Kuk, 2006; Raymond, 1999). However, in order to diffuse the standard and promote its ‘production’ into software and applications an explicit effort is needed to structure the organisation to recruit other individuals and organisations and align their interests with the ‘solution(s)’ offered by XBRL. The early organisational design of XII included national or special interest jurisdictions with requirements for minimum government and/or company membership for ‘recognition’ (Locke & Lowe, 2007b). The governance of the organisation and how it has responded to the changing pressures as the XBRL project has progressed is discussed in the Chapter 6. Importantly though, the strategy meant that the XBRL US jurisdiction (which had only been set up as a separate entity from the AICPA in September 2006) had already enrolled important stakeholders to the XBRL project (in addition to the original founders of the consortium) and had created a viable US GAAP taxonomy (see http://xbrl.us/about/Pages/members.aspx). Because of this and XII’s achievement of a stable specification for XBRL, the SEC’s initial voluntary filers programme had the basic technology architecture required to provide the use cases for building a mandatory system. Or to put it the other way – it is most likely that without these resources in place the SEC would not have considered initiating an XBRL-based filing project in 2004.

Figure 7: Constituents of the Interactive Data Project

5 XBRL International Inc. is introduced in Chapter 2.
XII and the US jurisdiction provide key resources for free to potential filers and users and allowed the SEC initiative to crystallise into the voluntary filing programme. The five also provides the SEC with a privately-developed data standard, so that not only does the SEC not have to develop its own XML-based framework, but it can also encourage potential filers to participate by emphasising that the standard is a private initiative (Casey, 2007; Cover, 2004). This aspect of the relationship also ensures that the SEC has an interest in maintaining the standard as a private development, open and at least perceived to be free from undue government influence (Casey, 2007).

The importance to members of the consortium of the SEC’s decision to use XBRL and not develop a separate SEC taxonomy, relying instead on the US jurisdiction’s existing expertise, cannot be understated. The scale of the project, the ‘visibility’ of the data to a worldwide audience and the availability of tangible resources in the form of SEC contracts makes the relationship one of mutual benefit. The following observation from the XBRL US website is not surprising then:

‘Fall 2006 marked a turning point in the history of both XBRL and XBRL US when the SEC (Securities and Exchange Commission) awarded the consortium a $5.5 million contract to build out the US GAAP taxonomies and make them commercial grade …’ (http://xbrl.us/about/Pages/default.aspx, downloaded 18 November 2008).

Not only is the adoption and financial resourcing important, but the SEC’s requirement that companies use the US GAAP taxonomy as their base before company extensions affords it the authoritative support that it needs to have preparers adopt it consistently for a range of purposes. This prevents the splintering effect of other groups developing their own taxonomies and reducing the usefulness of the tags by creating diverse ‘standards’ taxonomies. The choice to have the jurisdiction develop the taxonomy was not a foregone conclusion. The trustees of the Financial Accounting Foundation (FAF) gave it permission in May 2006 to undertake a feasibility study the scope of which included overseeing the development of the US XBRL taxonomy. In August 2006 ‘Questions as to whether FAF involvement would complement the work of the voluntary consortium or supersede it remain[ed] unanswered’ (Stuart, 2006, p2). However, after allocating $US3m and forming and training a team the project was very soon after ‘transitioned’ to the then newly incorporated XBRL US (Financial Accounting Standards Advisory Council, 2007). The FAF and Financial Accounting Standards Board (FASB) declare a strong commitment to the SEC’s XBRL project and include the reviewing of taxonomies as an objective in the FAF mission statement (http://www.fasb.org/faf/Strategic_Plan.shtml).

The FASB has also undertaken a project to codify all accounting pronouncements and SEC reporting requirements into a single document. This was completed in 2007 and is currently undergoing a ‘verification’ process during which ‘constituents’ of the FASB are encouraged to provide feedback online (http://www.fasb.org/project/codification&retrieval_project.shtml).

It is expected to become the single source of authoritative non-governmental US GAAP on 1 July 2009 (http://www.fasb.org/news/nr120408.shtml). This restructuring of GAAP into a single source is not designed to change the accounting requirements but to simplify the use of the standards literature and facilitate convergence (Financial Accounting Foundation, 2007, pp14-15). The codified standards will ‘become the authoritative source of literature for the completed XBRL taxonomy’ (http://www.fasb.org/project/codification&retrieval_project.shtml).

The development of the comprehensive taxonomy by XBRL US and the FASB’s codification project are complementary and represent a significant synthesis of concepts. The decision of these constituency members to cooperate in the bigger task by working in their respective areas was important to the unified and rapid development and maintenance of the US GAAP taxonomy of which the 2009 release was available for comment in November 2008 (http://xbrl.us/usgaappublicreview/Pages/default.aspx).

Other regulatory adoptions made possible by the XBRL US jurisdiction, such as by the Federal Deposit Insurance Corporation (FDIC), are important to the interactive data project so that the SEC could demonstrate the existence of a network of adopters and acceptance of XBRL as a data standard. The SEC emphasised the size of already existing systems:

‘For the last year, approximately 8,200 U.S. financial institutions have been using XBRL to submit their quarterly Call Reports to U.S. banking regulators.’ (SEC, 2006)
International adoption of XBRL is also considered important by the members of the interactive data project. See for example Christopher Cox’s January 2008 speech in which he lists projects at various stages of development in Australia, China, Japan, Belgium (which requires US banks to file in XBRL), Israel, South Korea, the Netherlands, the UK, New Zealand, Spain and Canada (Cox, 2008; see also Casey, 2007). While these other projects are not directly ‘constituents’ in the target problem, and their projects may be significantly different to the proposed SEC implementation, their existence is important to give confidence to other organisations and individuals so that they can be enrolled into the interactive data constituency. The message is that this is not a cutting-edge technology-driven ‘pipedream’, but a solid and proven concept with successful adoptions and a case for adoption built on demonstrated regulatory efficiency and effectiveness. Once again this is a reciprocal relationship though. As the SEC uses the international adoptions as cases to support its project, they in turn can support their projects by reference to the SEC decision. Overall this approach serves to reinforce the position of constituents in the broader XBRL network as well as expanding the support for the interactive data project and increasing the constituency ‘at home’ in the US.

This reciprocal network of reliance on the success of other projects creates a tension regarding failure. As mentioned in Chapter 3, Eddy Wyneersch (CESR) identified interactive data as an important pilot project. The ease of its progress and early indicators of its ultimate success or failure (if they can be identified) will significantly affect further regulatory adoptions. Similarly the difficulties of other projects and even failures are played down by constituency participants. The fabric of confidence and enrolment of other members is woven with examples of success. So the necessary process of addressing the intransigent difficulties which are a normal part of the development of any technology are undertaken much more quietly than in a fully open source project (Bitzer & Schroder, 2005; Koch, 2005; Szczepanska et al., 2005). While this is an understandable part of the promotion of a new technology, it does entail risks. The best way to not repeat mistakes is to learn from the experience of others. The format for participants to do this in the XBRL consortium is to join and participate in members’ only on-line discussions and working groups and at the conferences. The publicised material on the whole does not highlight problems – just the ‘solution’ that XBRL offers.

The SEC’s decision to adopt XBRL, and its provision of significant funding resources were important to XBRL US and also provides a powerful mechanism for engaging constituents who may otherwise adopt a ‘wait and see’ approach. Funding for the development of investor software ($US500,000), and the commitment of an estimated $US48m over six years to the redesign of the EDGAR system to the ‘data centric’ ‘IDEA’ portal provides an important stimulus for software vendors. Resourcing is particularly important for software vendors who are faced with the paradox that they are expected by other constituents to design systems for emerging infrastructure technologies before there is a market for the software (Locke & Lowe, 2007a). The potential for losses should the architecture of the standard change or the new technology fail to achieve critical mass, fall directly on the software vendors. This creates an understandable inertia particularly among vendors of mainstream accounting, Enterprise Resource Planning (ERP) systems (from the preparer’s side) and analysis tools and is an important factor in the pattern of needing regulatory mandation to create a market for XBRL before these types of vendors commit to product development.

“We had changes in the design of XBRL as we started to understand some of the problems but the big problem in my industry is demand and you can create demand in lots of different ways. You can create demand by end users banging on our door and saying we want to buy our software … or you can create demand by accountants saying ‘we’ve got to have it, there is no escape’, or you can create demand by mandation. Well, our end users have not wanted it, and in fact those early purveyors of XBRL and their product have zero sales of their XBRL interface. (Keeling, 2006a)"

In the case of the SEC’s interactive data project, rapid steps towards mandating XBRL combined with funding (which while not as generous for the investor software development) has provided an important stimulus for active software vendor participation.

56 For example, at the Australian SBR/XBRL international conference in 2007, David Blaszkovsky and Christopher Cox (by video) contributed to a session entitled Regulatory Burden Reduction – International Experiences, along with representatives from the Netherlands, UK (Companies House) and Singapore.

57 The vast majority of publications are positive ‘hype’ (see Locke & Lowe, 2007a for examples). Academic papers that adopt an independent perspective are starting to emerge, but are limited by the control of information regarding difficulties with the technology (see for example, Bovee et al., 2002). There are some limited exceptions from the consortium itself; see Keeling (2004) and Van Kannon (2004). Note that Dennis Keeling was the CEO of BASDA (Business Application Software Developers Association) which joined XBRL International in 2006 (BASDA newsletter Summer 2006 myfiles.uk-plc.net/c132982/documents/BASDA-news/07%2006%20Summer2006_ssis_130706_PAGES.pdf).

58 The XBRL project has been generously supported by a number of software vendors, who created a range of specialised programs, particularly for preparers and developers. The point being made here is to do with the diffusion to more mainstream, widely used applications. See Appendix 4 for a list of packages and their functional orientation.
The SEC-sponsored systems created to date for accessing the tagged data includes two web-access portals; Interactive Financial Report Viewer (open source) and the SEC’s Financial Explorer (http://209.234.225.154/viewer/home/). These are proof-of-concept designs to demonstrate the nature and possibilities of interactive data. The approach that will be adopted in ‘IDEA’ is not limited to these early demonstrations of the possibilities, but they do demonstrate both the current strengths and limitations of the technology.

The Interactive Financial Viewer is a conservative design that uses a familiar horizontal and vertical menu system to make accessing data simple (see Figure 8). The user can choose between accessing companies’ filings from a scroll down list or search on the left of the screen, or a list of filings by date (most recent first) on the right. An option to create a company comparison report is also available – driven by a series of user choices. Once companies have been selected in the initial screens control over the type of data to be displayed and other functions is provided across the menu at the top of the screen. The data options are all traditional ones – in tabular format or charts. Users are given a choice of options for charting – bar, horizontal bar and pie. Like most such tools, the software generates any chart feasibly requested regardless of whether or not it may be appropriate (a pie chart of the same data variable in two different periods for example see Figure 8). One of the functions that is claimed to be able to save users the need to rekey or cut and paste is the ability to download into an Excel spreadsheet. This function is available and works; delivering the spreadsheet very promptly. The spreadsheet is automatically given the name of the company and other important context data such as the dates, currency and precision of figures (eg, $US ‘000) are included in the file. All these elements are important to ensure that the meaning of the information is preserved so that investors’ interpretation is facilitated. This reduces the need for the user to take care (for example in naming the file correctly) in a way that the charting option does not. Some situation sensitive guidance in the use and interpretation of graphs would be useful for non-professional investors.

Figure 8: Interactive Financial Report Viewer

What is missing from the data for viewing and downloading is the XBRL tags. The full functionality of XML-tagged data should allow users to not only download the data in a block – but also to free up the data from a single block format to allow the user to have the data placed automatically into a template structure of their own choosing. Some software to permit this currently exists (see Appendix 4), but it is still at the level of requiring considerable technical understanding of XBRL and therefore is not suitable for non-professional investors. The block downloading of data into a spreadsheet may reduce the time taken to undertake analysis, but it does not eliminate the need for potentially error-prone ‘cut and pasting’ exercises in order to get the particular items required into the particular cells in a spreadsheet to conduct analysis.

59 The link to this site was displayed along with the link to the financial report viewer – but it has recently been removed.
The absence of the tags both in the Excel and web view formats means that the additional meta-data they contain regarding links to sources for meaning such as accounting standards are not available. We asked several software vendors, including Hitachi the vendors of the Xinba product, about the ability to retain the tags in such processes and were assured that it was just a matter of time until the technology was developed to allow it.60

The other demonstration viewer, the Financial Explorer, took a slightly more adventurous approach to the representation of the tagged data.61 As well as the tabular format style, this site also demonstrated the possible use of objects to represent financial relationships. Figure 9 shows screen shots of the tabular presentation and interactive (atomic) diagram generated on request in the site. The use of objects as a way of improving non-professional investor’s interpretation of financial information was discussed in Chapter 3. Research has shown that objects can have unpredictable effects (Amer, 1991; Moriarty & Roach, 1977) and we recommended that further research specifically into their design and education surrounding their use should be undertaken. The Financial Explorer uses a simple device of representing increases from one period to the next as green circles around the grey circles (that represent the prior period). Decreases in the current period are represented by smaller red circles inside grey circles. The actual size of the circles is not related to the size of the change, but it is reported in absolute and percentage terms next to each circle. Circles are linked to show parent/child relationships. There is also the possibility to drill down to more detail, where it is available.

Figure 9: Financial Explorer

At face value this sounds like a useful representation, but the difficulty arises in the representation of changes in ‘negative’ items such as expenses and liabilities. We demonstrated the diagram at two seminars and a focus group at which experienced accountants were present. They were told that the green circles were increases and the red ones decreases. Almost all of those present assumed that the green circles represented good news and the red circles bad news.

60 Microsoft has been and early and ongoing supporter of both XML (Anonymous, 1998; http://msdn.microsoft.com/en-us/xml/default.aspx)and XBRL (www.xbrl.org). The technical difficulty partly relates to the additional complexity of XBRL (see Chapter 8).

61 As well as the key difference discussed in this paragraph this site did not provide Excel download format, but it does allow users to see the definition of the item by clicking on the question mark next to it. It also automatically generates a small bar chart of times series changes.
The only exception were Chinese members of the groups who drew the reverse conclusion on the basis that red is a lucky (good news) colour. The result is that for 'western' users this does not pose such a problem for revenues and assets (although an increase in current assets through increasing inventory and receivables levels may not be good news). However, in the case of expenses as shown in Figure 9 the intuitive message is the opposite of the underlying story of increasing expenses. Discussing this in an interview with a software designer, it was indicated that the problem of providing consistent and useful object representation arises in part from the inconsistency of underlying data tagging. This problem is likely to remain as long as the SEC continues to permit individual company extensions. The cross-cultural issue was identified as one that may not occur to software designers, despite the global reach of the project and the multi-cultural population of the US. The fundamental learning out of this demonstration is that the software designers need to interact with a broader range of stakeholders than simply the party contracting for the software if a really useful product is to be constructed. In particular in this case; research, academic and peer review as well as multi-national end-user (investor) testing could have resulted in an improved presentation – or perhaps the decision that there is not a presentation design that would currently communicate in an unambiguous way to users. The responsibility cannot be left to software designers themselves, although careful testing should be part of the design process. The constituency needs to foster closer relationships with groups that can provide the feedback and research needed.

Regardless of the missing functionality or representational difficulties experienced in the provision of these demonstration sites, the important contribution of these tools was a shift in emphasis away from software for preparers to general investor-relevant applications. The seed funding from the SEC permitted this development and reaping the benefits from it requires that developers learn from the experience, sharing and developing the skills and knowledge and expanding the range of available applications.

The view expressed by Kathleen Casey (SEC commissioner) at the 2007 XBRL international conference in Munich fits with this perspective of open and diffused development:

'The SEC is committed to doing everything we can to ensure that XBRL remains a truly international, stateless, open source standard. All of the XBRL software development that we do, and that we support, will be open source.' (Casey, 2007)

It may be that this does not suit the business model of all software vendors, however. Many, like Microsoft, have concerns with the GPL product licensing approach and prefer to be free to develop commercial software (Holtgrewe & Werle, 2001; Lerner & Tirole, 2002; Ricciuti, 2001).

Rivet software, however, responded to the SEC’s preferred approach and made its Microsoft Word and Excel add-in – Dragon View – open source (http://sourceforge.net/projects/rivetdragonview/). In a press announcement Rivet attributed its success in securing a contract with the SEC to create a viewer for its website (Interactive Financial Report Viewer) to the Dragon View software (Rivet Software, 2006). The decision to make the software open source was described in the following terms:

""Our release of Dragon View into open source is another important milestone in the continued evolution and adoption of XBRL," said Mike Rohan, president of Rivet. "By working with the open source community we hope to accelerate the ability of users and developers alike to create even more innovative applications based on the XBRL global standard."" (Rivet Software, 2006)

Rivet’s stated motivation is to expand the software resources available and the community of software developers. The evidence from the Sourceforge.net site where the Dragon view project is hosted is mixed as to whether or not this aim has been achieved (http://sourceforge.net/projects/rivetdragonview/). The full impact of making the code open source may not be reflected in the development of the project itself – developers may become aware of the technology and possible technical solutions that they use to develop completely independent applications (within the constraints of the license). However, the data from Sourceforge indicates a relatively high number of members for the project (11) compared with many of the XML projects listed; but a lower number than for some ERP projects, one of which had 79 members. The peak of downloads in June 2008 of 120 is dwarfed by a file sharing system Shareaza which had almost 600,000 downloads in October 2008. The important caveat in this comparison is that Dragon View’s use is much more limited and while this gives a sense of the possible scope of interest generated by Sourceforge developments, this volume of downloads and activity cannot be reasonably expected for XBRL-related software. However, it is important to its effectiveness that there are a broad range of users – whether they access the tagged data through portals such as the interactive data viewer on the SEC site, some other web-based
solution or through specialised software. Overall the data suggests that there has not been a significant, widespread uptake of the open source software or participation in its development. It may be that developers are still waiting for investor demand to arise out of the confirmation of the proposed rule on mandatory XBRL filing. Alternatively the lack of interest may reflect the open source approach not being attractive to developers.

It may be that the main source of dissemination of tagged data will not be as tagged data but through the automated widgets and summaries that may be made available on investor websites. Our consideration of the target constituents, non-professional investors, in Chapter 4 shows that the majority are likely to rely on the analysis and summary data presented in newspapers and websites rather than conduct their own fundamental analysis. Information disseminators and aggregators such as Business Wire, PR Newswire and Thomson Reuters (all members of XII) are likely to have a role in developing widgets (plug-ins) for news and analyst websites to provide access to automatically generated summaries or analysis of tagged data. I Metrix is an example of a data aggregation product that has used tagged data and further standardised and tagged existing data in order to generate a comprehensive database (http://www.edgar-online.com/OnlineProducts/IMetrixProfessional.aspx). As with many providers of large, normalised databases, the target market is professional analysts and institutional investors who can afford to pay the fees for access and additional customised services.

The development of the automated charting and dissemination possibilities that are more relevant to non-professional investors will be dependent upon a source of reliable tagged data and other complementary data standards and technologies to make it viable. The complementary technologies will be discussed in more detail in Chapter 7, but include the use of data standards for communicating analyst information (eg, RIXML) and web feed systems like RSS that allow automated dissemination of updated information. The SEC’s requirement for mandatory filing of tagged data is expected ultimately to provide the reliable data source required. However, the SEC’s rule does have some limitations that may impact on how quickly these developments become feasible. Initially the tagged data will be submitted as an exhibit to the filing (ie, it is not filed itself) and it will be subject to modified (reduced) liability under federal securities laws for the first 24 months of a company’s interactive data submission. It will also be excluded from ‘officer certification requirements’ and will most likely not be audited.

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The above discussion traces the interdependencies in the core of the constituency between the SEC, XII and XBRL US and the software vendors. The voluntary filing programme could not have been a success without the participation of companies. Some of these joined the programme early and many of those were members of XII. In order to expand participation, the SEC had to offer an incentive as described in Chapter 3. Despite an early preference for a completely voluntary filing programme (Stuart, 2006) the SEC has discovered, in common with other regulatory adopters, that the benefits for preparers are not so clear that they choose en masse to tag their statements. Mandatory filing in XBRL format is required to achieve the aims of the SEC project.

The participation of representatives of ‘end-users’ of tagged data is important to non-professional investors. There has been an increasing recognition at the XBRL International conferences that the technology is now developed to the point that it is in a position to demonstrate its potential to investors and it needs to enrol their interest and participation in order to deliver a relevant product. The investor representatives at conferences and in working groups tend to be professional analysts, however. The CFA Institute is one body that stands out as taking an active interest in the project (Figure 7). The reasons why end user representatives tend to be professional analysts or publishers are explored in the next section. In general terms the problem is to identify representative bodies and for the members to have sufficient access to funding to be able to participate (Locke & Lowe, 2007).

62 The SEC rule does not require an audit and does not require a ‘legend’ or statement to indicate that the data is not audited, although it notes that ‘an issuer can make clear the level of auditor involvement or lack thereof in the creation of the interactive data exhibit’ (SEC, 2009a, p97). The SEC rule notes that the Public Company Accounting Oversight Board (PCAOB) Interim Attestation Standard 101 is worded to permit attestation if the issuer chooses to engage an auditor (p96). There are significant issues for auditors arising from the current and potential changes to the financial reporting system arising out of the adoption of XBRL; including the potential for continuous audit of dynamic data and data level assurance (Pawlicki, 2008). The emphasis in this report is on non-professional investors so it is beyond our scope except to the extent that deficiencies in audit may impact on both the perception of and actual reliability of interactive data.

63 The views of the preparers in the voluntary project are interesting but because our focus is on the non-professional investor we will not cover them here.

64 The 17th XBRL International conference in Eindhoven had a track dedicated to ‘investment professionals’ in contrast to earlier conferences in which a small number of presentations from users would be included in other streams, usually external reporting.
To engage with a broader constituency both the FAF and XBRL US set up advisory bodies. The membership of the latter working group included representatives of constituent groups as follows: three filers (preparers), two auditors and one analyst (http://xbrl.us/about/Documents/Selected Candidates for the Taxonomy Working Group.doc). The analyst representative works for the CFA Institute in its Centre for Financial Market Integrity. The SEC has also included analysts and others who may potentially represent (speak for) non-professional investors in its interactive data roundtables. Table 7 shows the distribution over three roundtables held between June 2006 and March 2007. The results should be seen as indicative only because it is sometimes difficult to assign an individual clearly to a group since they may have more than one perspective.

Table 7: Representation at SEC interactive data roundtables

<table>
<thead>
<tr>
<th>Filers</th>
<th>Analysts</th>
<th>Accountants</th>
<th>Software Vendors</th>
<th>Publishers</th>
<th>Non-professional investors</th>
<th>Academics</th>
<th>Miscellaneous</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>9</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

While the filers are dominant in terms of numbers, it should also be noted that one of the roundtables (12 June 2006) was specifically devoted to a user perspective – with virtually all of the analysts being at that session. It is however, not clear what impact the roundtables had on policy direction. On the whole discussion tends to be more in line with a promotional effort than a tough thrashing out of issues.

One of the non-professional investors was the president and CEO of the American Association of Individual Investors. This type of presence is encouraging, although the statistics in Table 7 and logistics of participation (including the cost) suggest that professional analysts are likely to have a greater capacity to inscribe their views into the project outcomes. To the extent that this facilitates improved analyst information to the retail investor market this serves the interest of both investor groups. However, differences are likely regarding the need for; easy to use and low cost data access and software, carefully structured information delivery to avoid misinterpretation and the types of products and services preferred by retail investors, including education.

The constituents in the interactive data project have exchanged technology, financial resources, authoritative support, and expertise and have a project that is on the brink of a significant roll-out. A key contribution to its success is the trigger to make a critical mass of preparers adopt by passing the rule for mandatory tagged filings. This stage of the project was achieved on 17 December 2008, but not without some dissent. Commissioner Luis Aguilar expressed support for the aims of interactive data but voted against the proposed rule for mandatory filing on the grounds that it weakened investor protection. In particular he objected to the liability ‘carve outs’ for the first 24 months of each issuer’s interactive filing (Aguilar, 2008). These provisions remove interactive data from the registration statement, treating it as an exhibit and limit the preparer’s anti-fraud liability in the case of a good faith error in preparing the interactive data (Hannon, 2009; SEC, 2009a). Daniel Roberts, a past Chairman of the XBRL US Steering Committee, shared the Commissioner’s concerns and also identifies the lack of audit, the voluntary tagging of footnotes and the slow roll out as limiting the confidence investors are likely to have in the data (Roberts, 2008). Commissioner Aguilar linked his concerns to the current ‘turmoil’ in the market and the need to boost investor confidence rather than limit the liability of filers. These concerns should also be considered in the light of research that indicates that the quality of the tagging in the voluntary filing programme was not high (Boritz & No, 2008) and the limited guidance available to auditors in relation to assurance on interactive data (Pawlicki, 2009).

The analysis has shown that although an inclusive approach to participation has been attempted by the constituents, non-professional investors have been under-represented in the interactive data project. Some areas in which their interests may be different to professional investors were identified while there are also areas of overlap. The concerns raised on behalf of retail investors about the terms of the final rule mandating interactive data by constituent members were described. The next section discusses the importance of retail investors as a constituent group of the project.

The missing constituent – non-professional investors

The focus of this study is on non-professional investors and in Chapter 3 we have explored why they may be important in the context of capital market regulation and the SEC’s interactive data programme in particular. One way in which they were identified as important was as a diverse and disembodied stereotype on behalf of which actors could speak authoritatively in order to promote the abstract objectives of transparency and the modernisation of EDGAR. As a rhetorical device non-professional investors have limited power to act, contribute, or disagree.
with how their views are being represented. We would argue, however, that the diversity and dispersion that inhibits their ability to coordinate and lobby as a group gives them power in the context of the development and diffusion of Level 2 digital reporting and particularly the future of XBRL.

What didn’t happen in the process of aligning groups to XII’s objective of diffusing XBRL was a grass-roots demand for financial reporting formatted with the tags. The early expectations were that once the specification was established and word of the functionality that it enabled was spread, that it would take off in the viral way that open source developments such as Shareaza and Mozilla have. This demand simply did not emerge, and even institutional and professional analysts, who are in a better position to be aware of XBRL, are still not actively demanding tagged data (CFA Institute, 2008).

While there have been a significant number of regulatory applications of XBRL, it is not yet widely accepted through adoptions by a range of participants in the financial reporting supply chain (Boulton, 2005; CFA Institute, 2008; Gartner, 2006; Gunn, 2007; Hughes, 2008). As a data standard for the digital exchange of business information, XBRL, like all other network standards, requires a critical mass of adoptions to sustain it (Bonaccorsi & Rossi, 2003). Where the purpose of a technology is to facilitate exchanges its value to members in the network depends on the size of the installed base. With few users adopting it, there will be less software to choose from and fewer entities with which an exchange is possible. This is known as network externality (Katz & Shapiro, 1985; Locke & Lowe, 2007b; Shapiro & Varian, 1999). Or as Ken Williamson of Ernst & Young puts it; ‘we need a groundswell of adoption since it is only helpful to the extent people use it’ (Hughes, 2008, p.2).

Bonaccorsi and Rossi (2003) argue that the type of ‘groundswell’ adoption that is most effective is a heterogeneous group. The intuitive basis for this argument is that as members of a common interest group ‘discover’ the technology and its benefits, they recommend it to others they know. If the group is homogeneous, it is likely that they will quickly all hear the same news and run out of people to pass it on to. In a heterogeneous group – there will be many different contacts and rather than the recommendations tailing off new connections are opened up and contacts are diversified. This expansion of the network continues and reaches a much greater number of potential adopters. From this perspective the diversity of the people involved in retail investment in this context becomes a strength rather than an impediment. If demand spreads among this potentially very large constituent group, then the software vendors, data aggregators, publishers and public companies all have a very large market for their XBRL-related products.

The conundrum at this point in the development of the project is how to gain a good understanding of this market and create ways of engaging with members of this constituency so that the final product does meet their needs and generate a ‘groundswell’ of demand. Chapter 6 discusses some of the governance issues associated with an engagement with non-professional investors.

5.2 POTENTIAL EUROPEAN CONSTITUENTS

Chapter 4 contrasted the timeline of events between the US interactive data project and European moves to electronic company reports in a single European market. The important differences stem from the lack of a single regulator to drive and champion the effort required to form the constituency and agree or impose standardisation on a digital filing method. CESR is taking a lead in the area, but to date has preferred a decentralised, flexible system that does not require the European jurisdictions to adopt a single data format.

In the UK the FSA (the closest equivalent to the SEC) has not promoted the use of XBRL even though Companies House and HMRC are using it and have plans to extend its application in line with Lord Carter of Coles’ report (Lord Carter of Coles, 2006). The HMRC and Companies House projects differ from the SEC’s interactive data concept in that they are not concerned with dissemination to the public. In the case of Companies House it does make registrants’ statements available but there is a conflict of interest in ‘adding value’ to them in competition with third-party providers who are also their clients (see Chapter 3). These projects add support to a potential adoption in the UK, in the same way as the FDIC project did in the US; by demonstrating the feasibility of XBRL tagging and underwriting the technology and skill development in the UK.

65 Mosaic, the precursor to the open source web browser Mozilla, had a million users in just six months (Hamilton, 2003). The strength of this type of diffusion is that it is by word of mouth among a diverse group of users. It is not to be expected that XBRL could ever achieve such rapid adoption for at least two reasons. First, crucially it is an infrastructure technology that requires software development around its functionality among a supply chain of users. For example, it requires software for preparers to add tags to the data and analysis portals or stand alone software for the consumption and processing of the data. The second factor is the much less general appeal of tagged business reports than access to the (then still nascent) but nonetheless wider content offered through an internet browser.
There is thus no coherent constituency for a project to create the equivalent of the SEC’s interactive data portal (IDEA) in Europe or separately in the UK. It is possible that the current economic crisis may provide the stimulus for the EU to create a single regulator that could be powerful enough to provide the resources and promise of mandation that trigger the interest of key participants such as filers and software companies.\footnote{On 6 May 2009 the European Parliament adopted with amendments, the Community programme for financial services, financial reporting and auditing. The resolution gives the issue of the supervision of financial institutions and financial reporting and auditing central importance in the Community’s political agenda and stated: ‘The worsening of the financial crisis has emphasised the need urgently to strengthen supervisory convergence and cooperation at the EU level. The development of common information technology tools and a common supervisory culture by the three EU Committees of Supervisors, CESR, CEBS and CEDIPS are two instruments by which to achieve that aim.’ (http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P6-TA-2009-0368+0+DOCXMLV0+//EN#title3). See also footnote 15 which discusses the communication, Commission of the European Communities (2009).} At this point in time, however, while there are concerns and discussions there is no indication that the member states could quickly agree to such a significant step, nor that such a body would be necessarily favourably disposed to XBRL.

Figure 10 shows what could be considered the constituency supporting the technology in Europe. It is not closely aligned to regulatory bodies for company reporting. As in the SEC’s project, the work of XII to establish the technology itself is a vital but not sufficient foundation. The system of jurisdictions poses a problem in the European setting because of the need to coordinate so many national interests. The recent creation of the European jurisdiction is a useful tactical step to provide a single reference point for regulators and others with an interest in XBRL.

**Figure 10: Technical Constituency in Europe**

Another key member of the XBRL constituency in Europe is the IASC Foundation’s XBRL team (the team). This group works to create and maintain the IFRS taxonomy based strictly on the ‘bound volume’ produced by the IASB. The IASC Foundation joined the XBRL consortium as one of the founding members at the instigation of Kurt Ramin and Sir Brian Carsberg. An initial, basic taxonomy for International Accounting Standards (IAS) as they were then known was completed in 2000 by Kurt Ramin, Ian Wright and Mark Deakin. The work continued on the taxonomy by David Prather, at various meetings in Europe and at a meeting of a group of over 40 volunteer experts in Singapore in 2002 organised by Kurt Ramin, Roger Debreceny, Glenn Gray and Charlie Hoffman with the Institute of Certified Public Accountants of Singapore. Josef Macdonald was appointed as chairman of the XII IAS Taxonomy Working Group in 2002 and Charlie Hoffman (the inventor of XBRL) joined this group in the same year.

In 2003 Josef Macdonald was appointed the inaugural IASC Foundation XBRL Practice Fellow (on secondment from Ernst & Young).\footnote{A similar Practice Fellow position was created at the FASB in the US.} In 2004, Kurt Ramin, then Chair of XBRL International, together with Josef Macdonald established the IASC Foundation XBRL team to which a number of student interns were appointed and the system of six-month internships was established. Since then 16 interns have worked as part of the team. Olivier Servais now heads up the team which also has three full-time and three part-time members. Taxonomies based on the IASB’s...
standards have been created and/or maintained for the years 2002 to 2008 (and is ongoing) based on the bound volumes and the 2006 tags are available in eight languages. They provide guidance and educational material as well as resources such as the IFRS taxonomy Module Manager (ITMM) and taxonomy viewer (see http://www.iasb.org/XBRL/IFRS+Taxonomy/IFRS+Taxonomy.htm).68

In common with the developments in the Interactive data constituency, the team has sought also to expand the range of stakeholder input by creating two advisory bodies; XBRL Advisory Council (XAC) and the XBRL Quality Review Team (XQRT). The XAC has two professional analyst representatives and an academic, but otherwise is made up of representatives and observers from regulatory bodies, accounting professional bodies, and filers. Because of the technical nature of the work of the XQRT, there are no investor representatives.

Figure 10 emphasises the particular barrier that any digital reporting standard for adoption in the EU faces. The absence of a central point of coordination (see for comparison the SEC in Figure 7) in such a diverse setting means that bringing together the technology and the regulatory and social structure requires a formidable mechanism for coordination and resolution of competing interests. There is currently no clear contender for that position with the authority to underpin adoption.69

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5.3 SUMMARY

This chapter discussed the key elements of the interactive data constituency and explored the extent to which they are mutually supporting and share an interest in the success of the project. Despite this and some effort on the part of the SEC and XBRL US, the engagement with non-professional investors in the development process has been limited. This is in part a result of their diversity as a group and their lack of resources to participate effectively. We believe that this also leads to a temptation for others to speak on their behalf without clear insight or authority based on research. It may also be that the project has not yet demonstrated benefits that are perceived as significant enough to stimulate non-professional investors’ interest.

We recommend that as the tools and plug-ins for retail investors are developed, designers pay greater attention to their particular needs and decision frameworks. This may be achieved by research, user reviews or simply greater consultation with this group. Relying only on professional analyst input runs the risk of omitting important perspectives. These include the need for options for greater analytical structure to be provided in software tools and guidance for appropriate use of the data and education, among other things which perhaps are as yet unknown.

Finally the prospect for the formation of a European constituency that could parallel the type of development in the US was assessed and considered to be unlikely. The IASCXBRL team’s approach to building expertise through a system of intern placements was identified as a useful approach for other jurisdictions.

68  We would like to thank Kurt Ramín, Josef Macdonald, Olivier Servais and Maciej Piechocki for their assistance in this description of the development of the XBRL team at the IASC Foundation.
69  Since this report was initially drafted XBRL US Inc., has announced an intern programme (http://www.reuters.com/article/pressRelease/idUS16600307-Apr-2009PRN20090407).
70  See http://www.iasb.org/The+organisation/About+XBRL/About+XAC/XAC+members.htm and http://www.iasb.org/The+organisation/About+XBRL/About+XQRT/XQRT+members.htm.
The previous chapter considered the broad nature of the relationships, alliances and reliance placed on constituents in the interactive data network. These relationships allow the exchange of resources and the extension of the networks to include more constituents and strengthen the foundation for the project. Molina's diamond of socio-technical alignment highlights the importance of the particular governance structures in place to achieve coordination and efficient work within the constituency and for the effective outreach and interaction with potential members, complementary groups and even competing projects.

As shown in Figure 7, the SEC is the heart and driving force behind the interactive data project, however, there are advantages for government bodies if they adopt privately developed data standards (see Chapter 5). There are a large number of such private interest groups developing data standards for the internet; for example the Organization for the Advancement of Structured Information Standards (OASIS).71 There are also government-backed, but still voluntary groups, such as the United Nations’ CEFACI,72 that work collaboratively with OASIS on eb-XML.73 Professional bodies have been responsible for setting accounting standards in many jurisdictions and today the IASB is a very significant private (or ‘independent’) standard-setting body. While many of these groups work on a voluntary basis for the ‘public good’ (which may also serve their best interests to try to influence) the outcome is that many of these standards are adopted by government agencies, other regulators or simply become de facto standards. As a result these groups are effectively regulating and defining the nature, form and possibilities for government surveillance. Camp and Vincent (2004, p161) argue that ‘if code is law then standards bodies are governments’, raising the question of who is ensuring the accountability of such bodies? While there has been research in this area (eg, Backhouse et al., 2006; eg, Choi et al., 2004; Nurmiilasko et al., 2006), Lyytinen and King (2006) seek to stimulate further work. One area they identify as under-researched is the ‘examination of processes and factors that explain why and how such standards emerge and diffuse or fail to do so’ (p406, emphasis in original). Markus et al (2006) identify governance mechanisms as one way constituents may try to hold together collectives of heterogeneous participants to achieve successful standards diffusion (see also Chang & Jarvenpaa, 2005).

There are competing tensions for private standard-setting bodies in relation to their governance. They often have to attract scarce resources by obtaining funding, contributions of time and expertise from various interest groups. At the same time they need to retain an image of balanced standards development and ‘public good’ concerns. The effectiveness with which they remain open to broader stakeholder input while maintaining the perceived/actual benefits to interest groups is important. The need to maintain a balance between being perceived as authoritative and unbiased but also effective for contributing stakeholders determines whose interests are inscribed into the resulting standards. In turn, this affects the project’s ability to continue to attract adopters and other actors to its network. There are also tensions between proper governance, perhaps including consultation, exposure drafts and periods for comment and the speed that technology change demands from such bodies.74

While it may be considered better that private groups rather than national governments develop data standards, the representativeness and governance of private standard-setting bodies is varied and should be the subject of review in any decision to adopt their standards. It is interesting in this context that part of the SEC’s ‘Roadmap for Adoption of IFRS’ involves consideration of the IASC Foundation’s funding and accountability structures (SEC, 2008b).

There are interesting parallels between the need for appropriate governance structures for accounting standard setting and for digital reporting data standards. The link is highlighted

71 OASIS is a not-for-profit, global consortium that supports the development and adoption of e-business standards (http://www.oasis-open.org/home/index.php).
72 The United Nations’ Centre for Trade Facilitation and Electronic Business (UN/CEFACT) was created in 1996 and its purpose includes the creation of electronic business standards for the facilitation of the exchange of goods and services (http://www.unece.org/cefact/about.htm).
73 See Chapter 8 for more on eb-XML.
74 These contrasting approaches are described by Guilloux et al (2008) in the context of eb-XML (through UN/CEFACT) and XBRL GL (through XII).
by the SEC’s roadmap which also requires an appropriate set of tags to be in place for IFRS adoption by the US (p28).

This chapter proceeds by examining the governance of the interactive data project from the point of view of non-professional investors. It develops further the points made in Chapter 5 about attempts made to include participation by non-professional investors by the SEC and XBRL US as the key co-ordinating participants (see Figure 7). The barriers to retail investor participation are identified and potential avenues to improve participation suggested. Finally, the importance of governance structures to the success of XBRL taxonomy standardisation is discussed.

6.1 THE SEC AND INTER- AND INTRA-ORGANISATIONAL GOVERNANCE

As a regulatory body in the US, the SEC is bound by rules of procedures and concerns about legal liability. The procedures embody requirements for public disclosure and periods of comment before the Commissioners vote on proposed rules (see Figure 11).

Figure 11: How the SEC rulemaking process works

Rulemaking is the process by which federal agencies implement legislation passed by Congress and signed into law by the President. Major pieces of legislation, such as the Securities Act of 1933, the Securities Exchange Act of 1934, the Investment Company Act of 1940, and the Sarbanes-Oxley Act, provide the framework for the SEC’s oversight of the securities markets. These statutes are broadly drafted, establishing basic principles and objectives. To ensure that the intent of Congress is carried out in specific circumstances – and as the securities markets evolve technologically, expand in size, and offer new products and services – the SEC engages in rulemaking.

Rulemaking can involve several steps: concept release, rule proposal, and rule adoption.

**Concept release:** The rulemaking process usually begins with a rule proposal, but sometimes an issue is so unique and/or complicated that the Commission seeks out public input on which, if any, regulatory approach is appropriate. A concept release is issued describing the area of interest and the Commission’s concerns and usually identifying different approaches to addressing the problem, followed by a series of questions that seek the views of the public on the issue. The public’s feedback is taken into consideration as the Commission decides which approach, if any, is appropriate.

**Rule proposal:** The Commission publishes a detailed formal rule proposal for public comment. Unlike a concept release, a rule proposal advances specific objectives and methods for achieving them. Typically the Commission provides between 30 and 60 days for review and comment. Just as with a concept release, the public comment is considered vital to the formulation of a final rule.

**Rule adoption:** Finally, the Commissioners consider what they have learned from the public exposure of the proposed rule, and seek to agree on the specifics of a final rule. If a final measure is then adopted by vote of the full Commission, it becomes part of the official rules that govern the securities industry.

Source: [http://www.sec.gov/about/whatwedo.shtml](http://www.sec.gov/about/whatwedo.shtml)

In the case of the proposed rule to make interactive data mandatory the required steps are set out in Figure 11. The actual process adopted included a variety of mechanisms which go beyond these requirements for rule making, however (see Table 1). Following the concept release, the voluntary filing programme provided a set of use cases as a proof of concept. The progress report of the CIFiR recommendations set out how the requirement could be phased in and prerequisites for mandatory adoption. These were referred to in the rule for mandating interactive disclosure proposed 31 May 2008. The comment period was 60 days and the material supporting the proposed rule set out detailed lists of issues on which the SEC sought comment (SEC, 2008a). During, and just after, the comment period, 90 written submissions or memorandums of discussions (including the transcript of a roundtable) were reported on the SEC’s website ([www.sec.gov/comments/s7-11-08/s71108.shtml](http://www.sec.gov/comments/s7-11-08/s71108.shtml)). The SEC stated in the material supporting the proposed rule that it is:

‘...seeking comment from investors, registrants, accountants, analysts and any other parties or individuals who may be affected by the use of interactive disclosure in Commission filings, and any other members of the public.’ (SEC, 2008a, p32795)

There is often light-hearted banter about the standard disclaimer SEC employees must make before presenting at (XBRL) conferences.
An analysis of the submissions shows that the majority are from preparers (filers), which is not surprising since they are necessarily most directly affected (Table 8). There are no retail investor representatives, but there are eight information disseminators (although this includes five that are EDGAR related) and all together four from analysts and institutional investors. The importance of the SEC’s proactive efforts to encourage participation by investor groups is reflected in their much higher percentage representation in the membership of the roundtables that are reported in Table 7 than in the more passive response to the request for comments shown in Table 8.

### Table 8: Analysis of comments on SEC proposed rule on interactive data

<table>
<thead>
<tr>
<th>Classification</th>
<th>Count of submissions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filers</td>
<td>42</td>
<td>47</td>
</tr>
<tr>
<td>Accountants</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Information disseminator</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Software vendor</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Lawyer</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Filing intermediary</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Academic</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Analyst</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Institutional investor</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Independent technology expert</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>XBRL US</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>XII</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Enhanced Business Reporting Consortium</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Roundtable</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>90</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Apart from seeking feedback through comments and discussion at roundtable meetings, the SEC has formed committees (CIFiR and the 21st Century Disclosure Inquiry) and created the Office of Interactive Disclosure internally to facilitate the direction and governance of the interactive data project. The creation of a specific department formalises the project and ensures that a representative at the level of director is present at internal meetings and is clearly identifiable as a point of contact. The role of the director, David Blaszkowsky, is in part to ‘coordinate the agency-wide disclosure modernization program’ (http://www.sec.gov/news/press/2007/2007-213.htm). Within the structure of the SEC, interactive data could otherwise be diffused and lack focus. For example, the Office of Policy and Investor Outreach which is one of the functional areas of the Office of Investor Education and Advocacy:

> ‘...plays a leading role in the Commission’s efforts to ensure that investor disclosures are written in plain English, as well as the agency’s technology initiatives such as providing increasingly more investor information in “interactive data” format.’ (http://www.sec.gov/about/whatwe.do.shtml#org)

Within the SEC there is also an Office of Information Technology which has, ‘overall management responsibility for the Commission’s IT program including application development, infrastructure operations and engineering, user support, IT program management, capital planning, security, and enterprise architecture’ (http://www.sec.gov/about/whatwe.do.shtml#org) and has responsibility for operating EDGAR. The Office for Interactive Disclosure is part of the Office of the Chief Accountant which, inter alia, has responsibility for overseeing the private sector accounting standards-setting process. The placement of the Office of Interactive Disclosure in the accounting domain at the SEC completes the triangle of technology, investor and accounting interests in the interactive data project and ensures it has a point of focus. David Blaszkowsky also plays an outward facing role, engaging with other groups such as the XBRL Advisory Council of the IASC Foundation’s XBRL team, SEC roundtables, webinars, conferences and podcasts.

The SEC has also used its website as an interface to engage with stakeholders in the project. The interactive data project has a link on the SEC homepage as well as to the new IDEA site which opened with a short, sophisticated audio-visual presentation as well as a textual description. More recently the audio-visual presentation was not available on the site, perhaps due to the required name change.
allows users to send in comments on the Interactive Financial Report Viewer and the Financial Explorer. The difficulty for the SEC is that their mission is clearly focused around protecting individual investors – but they are very difficult to engage with as a group. The resources available to the SEC has meant that it has been able to be proactive and create both forums in which analysts are invited to participate and more passive channels through which investors generally may seek information and contribute views. One of the difficulties with the SEC’s web-based strategy is the possibility that investors on the wrong side of the digital divide may be disadvantaged in terms of their ability to represent their preference for the more traditional sources of information. Active consideration will need to be given to how to protect the less technologically savvy investor as the reporting channels emphasise digital data delivery.

### 6.2 XBRL US AND XII

XII is styled as a consortium for the development an open data standard. As discussed in Chapter 8, any group that does not have the power to mandate a data format may only provide the technology and support and hope that adopters make it into a standard. In Chapter 5 we described the resources that XII has contributed, particularly the 2.1 specification. The SEC has commented on the importance of the private development and open nature of XBRL as the technology underlying interactive data (SEC, 2008a). However, as discussed in Locke and Lowe (2007), while the specification for the data standard is freely available for download from the web, the processes for developing the standards and taxonomies are not open in the style of ‘open source’ projects.

Figure 12 shows the organisational structure of XII in 2005 compared to 2008. The key features that remain the same are the Board of Directors, a steering committee with sub-committees and working groups, all of which require membership for participation (Locke & Lowe, 2007). A Governance Restructuring Task Force in 2006 was chaired by the current Chairman of the Steering Committee, Michael Ohata who became Managing Director of KPMG (Chicago) in 2008 but worked for Microsoft for 11 years prior to that (http://www.xbrl.org/SteeringCommittee/).

The working groups were reorganised and an XBRL Standards Board created to oversee the technical quality of the development work. A Board of Advisors has been established in line with governance approaches that recommend stakeholder boards or councils that are separate from the Board of Directors (see Mallin, 2006). This has been a common development; also adopted by the IASC and the Financial Accounting Foundation (US), for example. The news announcements and a search of the XBRL.org website provide no information about the XII Board of Advisors, apart from its inclusion in the organisational structure diagram and the list of members included there (Figure 12).

**Figure 12: XII changes in organisational governance**

Source: Chang and Jarvenpaa (2005, p367).
There are no non-professional investors included on the board, but the CFA Institute (professional analysts) is represented. How successfully this board balances the lack of stakeholder representatives on the Board of Directors is difficult to establish, however, since Morgan Stanley (a member of XII) has two people affiliated with it on the Board of Advisors and only three of the nine members are not associated with a member organisation of XII. While the Board of Advisors members may be able to represent a variety of views independently of the rest of XII, the lack of a clear majority of external representatives and detailed information about its functions and meetings, it is hard to conclude that this body functions to effectively broaden the representation of interests in the XII development of XBRL.

The problem for non-professional investors, and ultimately for the effective development of XBRL as a data standard, is that the SEC experience shows that trying to simply request participation in taxonomy development in particular is stated in the working draft of XII’s Best Practice Board’s Practice Working Group document:80

>'Project leaders must not only bring together stakeholder communities to commit to taxonomy development, but also continually manage stakeholder engagement so that by the time the taxonomy is finalized, the taxonomy still has the full support of those and if possible, additional stakeholder communities.' (Project Management Topic 3)

However, the consortium’s insistence on membership presents a barrier to broad participation (Locke & Lowe, 2007). The XII’s Technical Working Group and Work Product Process81 document identifies a reliance on the World Wide Web Consortium’s (W3C) approach, but this does not extend to the inclusion of the equivalent of interest groups in XII. The W3C permits any member of the public who has subscribed to an interest group’s mailing list to participate in that group, while members of an interest group do not create recommendations in the W3C, they ‘bring together people who wish to evaluate potential Web technologies and policies’ (http://www.w3.org/2003/06/Process-20030618/groups.html). This type of role may be appropriate for investors who are unlikely to have the technical skills required to create the technology, but who may be able to contribute to a forum for discussing the consequences of decisions taken and provide feedback for future developments.

XBRL US Inc. is a not-for-profit organisation and jurisdiction of XII. It runs under the same membership structure as XII, but has extended this framework to create a Founders Council which entities pay $US1 million over three years to join (http://xbrl.us/about/Pages/Profiles.aspx). The site currently lists seven founder members; the AICPA, Microsoft, Deloitte, Ernst & Young, Deloitte Touche Tohmatsu, and KPMG.

Grant Thornton, KPMG and PricewaterhouseCoopers. The dominance of accounting interests is clear. The quantity of the resources available to the US jurisdiction through the patronage of these organisations and the SEC contracts is reflected in the fact that XBRL US employs eight staff members compared to XII’s three, and the extensive material provided on their website (http://xbrl.us). The SEC’s support of XBRL as the data standard to drive interactive data, also underpins the interest of accountants and other companies in contributing to the project (see Chapter 5). In line with due process adopted by accounting standard setters, XBRL US has released its 2008 and 2009 taxonomies for public comment (http://xbrl.us/usgaappublicreview/Pages/default.aspx). Despite the provision of a ‘quick start guide’ and reviewing tool, the likelihood of a range of retail investors responding to the public review is very low simply through lack of technical knowledge and awareness.

6.3 OTHER AVENUES FOR OUTREACH

The governance of the XII organisation and jurisdictions is not conducive to individual investor participation. The most successful approach was that adopted by the SEC to actively include investor representatives in the roundtable discussions. This reflects on the numbers of participants of course and not how effective they were in their contributions to the development of the interactive data project. It would be interesting to undertake research to see how responsive the taxonomy development has been to stakeholder input, but it is unlikely that investors have made sufficient contributions to this development for its impact to be measurable.

One suggestion to promote contributions by non-members of XII would be to adopt the W3C approach to interest groups, which could be grouped around the ‘supply chain communities’ reflected in the 2005 version of XII’s organisational structure.

Another possibility is to seek active participation by representatives of non-professional investors in the same way that analyst groups have been included. The requirement for membership of XII jurisdictions is a barrier to participation; however, the existence of these local groups offers a potential contact point for representatives of relevant groups. Since membership and conference attendance are prohibitively expensive for non-professional investors localised engagement through the jurisdictions could be a useful approach. It would require XII to change the current approach so as to encourage jurisdictions to reach out to these groups without requiring fees. Given the importance of these groups to the project, it seems reasonable to engage with them on this different basis.83

Potential representative groups are listed in Table 9. Local knowledge in the jurisdictions could be drawn on to identify individuals and other groups.

### Table 9: Investor associations

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Name</th>
<th>Contact information</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>UKSA – UK Shareholders Association</td>
<td><a href="http://www.uksa.org.uk/">http://www.uksa.org.uk/</a></td>
</tr>
<tr>
<td>Europe</td>
<td>Euroshareholders</td>
<td><a href="http://www.euroshareholders.org/index.asp">http://www.euroshareholders.org/index.asp</a></td>
</tr>
<tr>
<td>US</td>
<td>AAII – American Association of Individual Investors</td>
<td><a href="http://www.aaii.com/">http://www.aaii.com/</a></td>
</tr>
<tr>
<td>Australia</td>
<td>AIA – Australian Investors Association</td>
<td><a href="http://www.investors.asn.au/">http://www.investors.asn.au/</a></td>
</tr>
<tr>
<td>Canada</td>
<td>SIPA – Small Investor Protection Association</td>
<td><a href="http://www.sipa.ca/">http://www.sipa.ca/</a></td>
</tr>
<tr>
<td>Russia</td>
<td>Investor Protection Association</td>
<td><a href="http://www.corp-gov.org/association/association.php3">http://www.corp-gov.org/association/association.php3</a></td>
</tr>
<tr>
<td>India</td>
<td>Online Investor’s Association of India</td>
<td><a href="http://www.oliai.in/">http://www.oliai.in/</a></td>
</tr>
</tbody>
</table>

The internet provides other possible channels through which to reach investors and seek their opinions and provide relevant materials. One option is to use noticeboards on popular investor websites such as YahooFinance and Investopedia, etc. Another venue is social networking sites such as Facebook and Myspace. There are currently nine groups on Facebook related to XBRL, one of which is run by David Blaszkowsky (Director of the SEC’s Office of Interactive Disclosure). The group is not specifically focussed on interactive data or taxonomy development and is very relaxed in style with a low level of activity. While the internet is ideally placed to reach out to investors who may benefit from digital reporting, the social networking sites in particular

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83 We are grateful to Kai Jakobs for highlighting the importance of localised contact for resource poor groups in standardisation processes.
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do not tend to attract a broad demographic. Statistics on social networking sites vary considerably, but one source reports 52% of Facebook users are aged 18–25 (http://social-media-optimization.com/2008/05/social-network-user-demographics/), while other sites report that the fastest growing demographic is those 25 years or older (http://www.web-strategist.com/blog/2008/01/09/social-network-stats-facebook-myspace-reunion-jan-2008/). This group is not likely to be as heterogeneous as investors in general and naturally would not represent those who do not use the internet. With only one discussion topic with two posts and 11 wall posts, it also appears that participants don’t see the SEC group as a way of formulating considered responses to issues; it is rather a more relaxed way of connecting with others who share an interest (http://www.facebook.com/home.php#/group.php?gid=6413794830).

Despite the potentially old-fashioned nature of the approach, it appears that in the near future it is likely that face-to-face interaction stimulated by reaching out to representative groups is potentially the most useful approach.

6.4 Governance and Taxonomy Standardisation

The participation of individual investors in the interactive data project is important so that their views are included about what they would find useful from the functionality, the constraints they face in adopting it, what information they need to support their decision making etc. They are unlikely to have an interest in developing the technology and in particular in designing the taxonomies. However, the tags available in the taxonomy and the consequent balance between common taxonomies and company generated extensions are important for the ‘searchability’ and comparability of the tagged data produced. There are likely to be three levels of taxonomy applied in tagging a set of financial statements. The largest number of tags should come from the taxonomy of the accounting system being applied – that is either local GAAP (in this case US GAAP) or IFRS. There may then be industry or regulator specific disclosures and concepts. These could be created by a body for general use. Regulator requirements would be specified by the regulator, but industry concepts and disclosures pose a problem. How will they be made common and who will generate and ‘approve’ them? Finally, will companies be permitted to make their own extensions (additional concepts) and if so what proportion of the report is it reasonable to expect must be specific to an individual company?

Control over the taxonomies and their application in tagging is vital because one mechanism a company may adopt to mask poor relative performance or other difficulties, is to create their own non-comparable concepts. The greater the number of companies using customised taxonomy extensions and the greater the proportion of unique concepts used, the less useful and possibly more misleading tagged data becomes.

In the US two approaches to this issue have been adopted. First the SEC rule requires filers to use the USGAAP taxonomy approved by XBRL US Inc.: ‘For financial statements prepared in accordance with U.S. GAAP, a filer will use the list of tags for U.S. financial statement reporting. (p13).

Unless stated otherwise, when we refer to the “list of tags for U.S. financial statement reporting” we mean the interactive data taxonomy as approved by XBRL U.S. that is based on U.S. GAAP, Commission regulations, and common financial reporting practices used in the preparation of financial statements in the U.S. (footnote 49).’

The second approach has been to make the US GAAP taxonomy very comprehensive by building it inductively from actual reporting practise as well as deducing concepts from the financial reporting standards.

Two approaches the SEC has not adopted are:

- to ban or limit the proportion of company-specific tags; and
- to require the audit of tagged reports.

Many of the claimed benefits for the interactive data project in terms of automated search and analysis of data and disclosures requires standardised taxonomies while recognising its limitations in relation to rendering the statements in human-readable form (SEC, 2009a, fn 96 p33). The current US position does restrict the freedom of filing companies to some extent, but with no supervision (audit) over whether or not the creation of new concepts was actually necessary there is the potential at least in the initial supplementary filings for the SEC objectives to not be met. This would not be because of problems with the technology but a result of ‘weak’ regulatory and governance arrangements surrounding the submission of tagged data.

We are indebted to David Blaszkowsky for the points he raised about the Facebook group.
The issue will be more significant however as the convergence to IFRS proceeds and filers are submitting IFRS tagged reports. The approach to taxonomy development adopted by the IASCF XBRL team has been to include only the concepts specifically required by the officially promulgated standards. Therefore there is a need to create industry extensions that will be adopted by companies in that industry internationally. The issue becomes one of governance in that the SEC may require the application of the IFRS taxonomy as developed by the IASCF, but there will be a need for IFRS industry extension taxonomies that have authority and reduce the need for individual company extensions as much as possible. The most obvious entity to produce the extensions is the same one as produces the core taxonomy. The task requires a significant commitment of time and skill and so resources to support it will also be necessary. The success of the support structures for the development of common taxonomies is crucial to the achievement of the goals of the SEC’s programme for interactive data and for adoption in Europe.

6.5 SUMMARY
The chapter discussed the importance of governance structures in enabling the interactive data constituency to expand the individuals and groups participating in its development and adoption. The interactive data project exploits the synergies between the existing private development of the XBRL data standard and the regulatory processes and power to mandate its use. The governance of the public and private constituents is similar in its adoption of public exposure of taxonomies and periods for comment. There are also significant differences in the strict procedures and formalised attempts at engagement with stakeholders by the SEC and the model of payment for membership and participation adopted by XII and XBRL US Inc. While it may be argued that private standard setters need to raise funding – the open source or W3C models of project development offer an alternative.

Given the lack of participation by non-professional investors described in Chapter 5, attempts to engage with them are important and currently lacking. A review of approaches used by the SEC suggests that a positive strategy of engaging with individuals and representative bodies rather than the passive approach of requesting feedback is more likely to be successful. Since non-professional investors and their representative groups are relatively resource-poor, a localised strategy for engagement through XII’s jurisdictions and local regulatory bodies is identified as an appropriate approach. While internet-based forms of contact, such as Facebook reduce the cost and open out possibilities for discussion, they do not address the potential issues for investors who are not comfortable with the internet. Participation in these forums has also been observed to be rather limited.

The governance of the key technological aspect of taxonomies in the interactive data project is highlighted in the chapter. This is a more technical aspect of the regulatory setting for interactive data and it is important that the institutional arrangements and technology operate in a synergetic way to produce an effective platform. This is identified as an area where the regulators should be responsible for building requirements into the mandatory provision of interactive data to ensure that comparability is achieved through standardisation.

Governance structures also affect intra-organisational relationships that are important for the development of complementary ‘products’ and even for possible convergence and cooperation with competing standards. These relationships are discussed in the next chapter.

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85 XII has a system for approving taxonomies, but it has not been widely used by regulators and accounting standard-setters. Locke and Lowe (2007) discuss some possible issues surrounding this and more recently concerns have been raised about the approval mechanism requiring compliance with the Financial Reporting Taxonomies Architecture (FRTA) as specified by XII. The development of the taxonomy architectures has outstripped XII’s ability to maintain the FRTA to match the changes and so a comparison would result in many taxonomy features not being in line with FRTA despite being the current ‘best practice’.

86 The IASCF is aware of these issues and has been seeking stakeholder input (http://www.iiasb.org/About+Us/About+the+IASC+Foundation/About+XBRL/About+XAC/XAC+meeting+-%2811+November+2008%29+html).
7. INTERACTING COLLABORATING/COMPETING TECHNOLOGIES

XBRL is a relatively small part of an infrastructure combining many technologies that facilitate digital reporting. It is not useful, nor possibly even feasible, to discuss them all as part of this report. The purpose of Molina’s diamond of socio-technical alignment is to provide a framework to direct attention to elements of the target problem’s constituency, including technologies that may affect its ultimate success. Our focus is on the SEC’s interactive data project and its implications for any potentially similar project in Europe and the UK in particular, from the perspective of non-professional investors.

XBRL is an XML grammar that has been adopted as the data standard in the interactive data project (see Appendix 1 and Chapter 8). In order to be effective for investors it must be the dominant data standard (so that all relevant data is tagged in it) and it must be supported by a range of software products and be interoperable with other information communication technology (ICT) systems. The need for software development that meets the needs of investors was discussed in Chapter 5 and Appendix 4. As yet the range and types of software available for investors is limited. The SEC anticipates that the mandatory requirement to provide tagged reports through IDEA and on company websites will create the required market stimulus for software vendors (SEC, 2008a). Interoperability is a key requirement of networked systems and to provide a resource for the heterogeneous non-professional investor group, this needs to be as comprehensive as possible.

As an infrastructure technology it is also important that XBRL will be viable in the longer term. Disruptions to the structures that are built around the data standard are costly in terms of both time and money for investors and filing companies alike. An issue in the survival of the data standard is its dominance in its domain and its technical effectiveness. The technical issues associated with XBRL will be discussed in Chapter 8.

With these issues and our particular context in mind we will concentrate on three themes. First, what is the domain of XBRL and what other data standards operate in that domain? Second, we discuss the issue of incumbent data formats and standards for regulatory reporting. This is important to non-professional investors because a disruption to the current structures may ultimately result in benefits but in the meantime create the need to learn new approaches, obtain new software and cause companies additional compliance costs. As pointed out by an investor participant in our study, additional costs either to companies or individual investors are not always in investors’ best interests. Finally, the complementary technologies that may assist non-professional investors are identified and discussed before the chapter is summarised.

7.1 XBRL IN THE XML OPEN DATA STANDARDS DOMAIN

A feature of XBRL that the SEC has emphasised as bringing particular benefits to users and preparers is that it is an open standard (SEC, 2008a). As XII observe, what is meant by an open standard ‘is the subject of some considerable debate’ (XBRL International, 2007, fn 2). There is for example a distinction between an open source approach to technology development and open access to the end product. XII has been identified as providing open access to the data standard it has developed, but using relatively closed processes for development (Locke & Lowe, 2007). The implications of the requirement for membership in order to participate were discussed in Section 6. The point to emphasise here is that the standard (its specification and compliance tests and a range of taxonomies87) are freely available and the right to them preserved in an open source style of ‘copyleft’ protection. This does provide the foundation for software developers and developers of secondary sources of the interactive data to build a range of products and services around the standard and to ensure interoperability with other software products.

87 It is possible for the developer of a taxonomy to copyright it. A software vendor may include a taxonomy in a software product for resale. The difficulty in making taxonomies copyright is twofold. First, the point of XBRL as a data standard is to allow the exchange of tagged data so that the receiving entity can interpret the tags by reference to the taxonomy. If the taxonomy is not freely available, then this reduces the entities between whom the data exchange is likely to take place to those who are prepared to pay for access to the taxonomy. As long as there are freely available taxonomies it is unlikely that there will be a market for software that contains proprietary ones. Second, the key feature of all XML data standards is their extensibility. The taxonomies are relatively easy to modify and extend, so as long as there is a reasonable set of taxonomies available they are easily modified to suit a particular purpose, once again removing the incentive for anyone to pay a premium for access to a particular taxonomy.
The open availability of the standard means that both proprietary software vendors and open source developers may provide products to the various preparer and user markets. Chapter 5 described some of the resources for investors developed under contract for the SEC and the opening of the source code of Dragon View to try to stimulate further development.

The OASIS Tax XML Technical Committee described the benefits of open standards as shown in Figure 13 (OASIS Tax XML Technical Committee, 2005). The implication is that the more widely used the standard is beyond the SEC interactive data project, the greater the potential savings and efficiencies to its users. However, there is little evidence that savings will be made in the short-term or if they are, that they are likely to be reinvested in improved services as predicted in text accompanying the diagram. It does suggest that Eddy Wymeersch’s view that allowing the SEC to test and underpin the development of interactive data may be a good strategy for Europe (Chapter 3). While there may be some ‘first mover’ advantages for the SEC, Europe will be able to enjoy the benefits of compatible software and other resources created for the US market.

Figure 13: Open standards value proposition

The value of using commonly accepted open standards is to achieve savings in software development and business processing, which in turn results in reinvestment of savings and improved services being offered with greater interoperability that nets organizations with increases in processing efficiency. The end result is increased adoption of online business channels, as well as further adoption of the standards. This restarts the cycle for further savings and service improvements.

XML itself is an open standard and provides a general specification for the creation of customised mark-up languages for domains of interest. This means that just as there is no restriction on further development of the XBRL specification and schemas (with the exception that they would no longer be able to be called XBRL), then there is no limit to the number of standards that may be developed based on XML. In fact because of the extensibility of XML it is important that interest groups in a particular domain of interest generate a common standard. If this does not happen the benefits described in Figure 13 are not achieved and XML becomes the equivalent of a tower of Babel where groups of entities may choose to exchange information in XML formats agreed only between them on an industry or functional basis (Allen & Connelly, 2007).

Nearly 600 XML applications have been identified (http://xml.coverpages.org/xmlApplications.html). These cover a variety of subject areas including metadata for endangered languages and the biological species analysis project. Within the broad area of business data exchange there are approximately 20 XML standards (Hamscher, 2002a; Srinivas, 2004). For example there are standards for the insurance industry (ACORD), credit insurance (CRE FIS), financial services (FpML, IFX, SWIFTML, MDDI, FinXML), mortgage brokers (MISMO), real estate (REML); standards for human resource management (HR-XML), customer and other party information (CIQ), journal level tagging (XBRL GL), generic transaction recording (eb-XML), and standards for external party reporting including XBRL (GAAP or FR), NewsML, RIXML, and MarketML.

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88 For more detail about XML see Appendix 1.
89 Note these are not all related to content exchange, but the list is not likely to be completely exhaustive since anyone may start a project for a data standard.
The diagram in Appendix 5 relates established business standards to their stages in the business reporting supply chain. The different purpose of XBRL FR (or GAAP) and XBRL GL90 is indicated in the diagram. The technical distinction will be discussed in Chapter 8. The interactive data project uses XBRL FR taxonomies and architecture since external reporting is the appropriate domain. XBRL GL is designed to capture journal level detail. Appendix 5 shows on the left that there are a number of standards at the transaction level including eb-XML which will be discussed in the next section of this chapter. In the area of internal reporting the domain of XBRL GL overlaps partially with other standards that permit the internal consolidation process. At the external reporting end of the reporting chain, XBRL FR is the only standard currently focused on general purpose financial and narrative business reporting (Hamscher, 2002a; ICAEW, 2004). As we discuss next, however, the potential for competition with incumbent and developing standards is present and without proper cooperation and coordination threatens to impose additional costs on businesses and ultimately investors.

### 7.2 Incumbent Standards, Competition versus Cooperation

The adoption of XBRL enabled interactive reporting is not a first generation application of electronic data exchange for compliance with regulator requirements in the US. The EDGAR system is based on ASCII and HTML documents and other regulators internationally have used these formats, as well as PDF and Electronic Data Interchange (EDI) systems.92 The argument has not been that digital reporting was needed, as it was already a feature of US (and other regulators’) reporting systems;92 but rather that the improved functionality of XML-based enabling technologies would bring additional benefits to investors and filing companies that outweighs the cost and disruption of adopting a new technology (Higgins & Harrell, 2003; SEC, 2006, 2008a). Where there is a relatively simple evaluation of a single system such as EDGAR in the US, this decision may be made relatively clear (although competing interests will still have different views). In the European situation the ‘business case’ is not as straightforward. As discussed in Chapter 3 the national jurisdictions have many different systems and the timeline to adoption will be much longer.

In France for example, the dominant standard for reporting to government is EDIFACT – an EDI technology that pre-dated the development of XML (Guilloux et al., 2008). Eb-XML is being developed by UN/CEFACT and OASIS using the same modelling approach as EDIFACT (www.edifrance.fr). This suggests for organisations that are already reporting using EDIFACT, a migration to XML technologies would be more straightforward with a compatible standard such as eb-XML, rather than XBRL. As the timeline for adoption of XML-based reporting stretches into the future in Europe, it is possible that an extended eb-XML that includes financial reporting or a merged development with XBRL could be more efficient and effective. The boundaries between complementary and competing standards are blurred in this context.

XII has had an on-again, off-again relationship with the UN/CEFACT working group for eb-XML (Guilloux et al., 2008) and describes it as a complementary (transaction level) standard (Hamscher, 2002b). The benefits of open standards are achieved by increasing the commonality of standards and reducing the proliferation of overlapping standards (Figure 13). This suggests that a single general purpose XML standard for transactions through to reporting would deliver greater benefits for preparers and investors alike. There may be good reasons why such a standard would not be the initial target of any group. Appendix 5 shows that generally groups choose their specialist domains in which to develop a standard. Achieving an overarching standard as an initial goal would involve a level of difficulty and lack of focus that could be a significant barrier to getting participants to engage with the task. Now that a base of standards have been developed across the business reporting chain, the question is what effective convergence can be achieved in the time between the SEC adoption of XBRL and the potential adoption of XML technology for reporting in a pan-European setting?

XII reports in its governing documents that it has an interoperability pact with OASIS (taxML), HR-XML, UN/CEFACT (eb-XML), and OMG (http://www.xbrl.org/GoverningDocuments/Interoperability-Pledge.htm). These arrangements may be effective in varying degrees. For example, the level of interoperability with the UN/CEFACT standard is low. On the other hand XII has created provisional jurisdictions to cement working relationships with RIXML and GRC-XML (www.xbrl.org; Appendix 5). These relationships tend to be about cooperation and interoperability rather than the more difficult task of actually converging to a fewer number of standards.

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90 FR is short for financial reporting and GL is now understood to stand for global ledger rather than general ledger.

91 Note that XML-based standards also facilitate the electronic interchange of data. EDI as a term has become associated with a particular technology platform that pre-dated XML. See for example Silva (2004).

92 The comment by Jay Starkman to the SEC on the proposed rule argues that the Commission has not done enough to evaluate the costs and benefits of the change to interactive data (http://www.sec.gov/ comments/s7-11-08/s7108.shtml).

64 Interacting collaborating/competing technologies
There are a number of barriers to convergence of standards (Axlerod et al., 1995). First, once a group has formed a constituency around a standard it has a vested interest in protecting that domain and diffusing the standard further in order to justify the investment of time and resources. This creates a sense of protecting the standard from encroachment and competition rather than a spirit of open cooperation. Second, the separate development of the standards has lead to different architectures and modelling approaches being adopted. For example, the structure of eb-XML messages is so different to XBRL GL that informed participants seriously doubt that they can be reconciled (Guilloux et al., 2008). When these difficulties are multiplied across the large number of existing standards, the problem becomes potentially intractable. Significant benefits may be achieved for the long-term infrastructure for reporting in Europe by identifying the key data standards being used in different jurisdictions and evaluating the prospects for convergence within the timeframe set out by CESR (Chapter 3). A process and possibly a co-ordinating body to facilitate the work would be required as it is not likely that individual standards groups will have the motivation or resources to undertake the work.93

As discussed in Chapter 2, there is an unusual relationship between XML and XBRL. XBRL is based on XML, but has developed and progressed beyond simple compatibility with XML ‘ready’ software:

‘Unlike standard XML messages, which can be mapped directly to the underlying software data model, XBRL requires a user interface to be able to map the unique General Ledger Charts of Account to the many and varied XBRL Taxonomies.’ (Keeling, 2006b)

As a result, in some situations, XML has become a competitor standard for XBRL. For example the FSA chose an XML option in preference to XBRL. Its ease of use in some areas of the HMRC e-filing project (which is also using XBRL) has been praised:

‘We obviously listened very intently to Lord Carter this morning and as you will see most of the work that he has been doing is about redefining in XML and we participated in that right from the start with HMRC; first of all with self-assessment and then with PAYE filing and we had tremendous success there and the reason for that success is that it was XML, it could be mapped directly to our underlying data and all that our customers had to do was press a button and it was sent.’ (Keeling, 2006a)

The challenge for XII is to assess whether or not the benefits the functionality added to XBRL to meet the challenges of business reporting requirements justify the increased ‘distance’ from the base standard. This will be discussed in terms of the complexity of XBRL in the next chapter.

7.3 COMPLEMENTARY TECHNOLOGIES

One fundamental tenet of open standards is the achievement of interoperability. This makes a range of existing and potential software and technologies complementary to XBRL. We will focus here on ones that directly benefit investors, to truncate an otherwise extensive list of possibilities. It underlines the interesting relationship between XBRL and XML that many of the complementary technologies that benefit XBRL arise out of its basis in XML.

The most pervasive and important complementary technology (not including the internet itself, without which XML would not have a platform) is internet browsers. The most ubiquitous browser is Microsoft’s Explorer, but it has recently been challenged effectively by Firefox and Google Chrome is a new browser that has a strong ‘brand’ behind it.94 The SEC’s Interactive Financial Report Viewer and the Financial Explorer both use web portals accessed through a browser to present interactive data. A number of other emerging applications also adopt this approach, but use standardised data (see Appendix 4). The difficulty with browsing particular websites for interactive data is that it effectively creates silos of information (as chosen by the owner of the site, it may be SEC data, data collected by a particular stock exchange, etc.).

One of the advantages claimed for XML tagging is to allow a semantic search across the web for data with the context and content tags required by the user. This ‘intelligent searching’ is intended to dramatically reduce the number of links returned that are not what the user required95 (Debreceny & Gray, 2001). Beyond this it has the potential to allow search engines to do more than identify and return the location of semantic tags:

93 The Open Applications Group which states as its purpose the provision of free standards for business processes across industries. It lists 15 groups with which it says it is working collaboratively to achieve convergence: XII is not one of the groups listed.
94 The website TopTenReviews rates the top 10 available browsers from 1 to 10 as follows: Firefox, Google Chrome, Microsoft’s Internet Explorer, Opera, Safari, Maxthon, Flock, Avant Browser, Deepnet Explorer, and PhaseOut based on price, speed security and a range of features (http://internet-browser-review.topitenreviews.com/).
95 The normal textual keyword search cannot distinguish the meaning of derivative in a mathematical sense from a financial derivative, for example.
One way that semantic indexing is distinguished from traditional subject indexing of documents is that it focuses on concepts rather than the documents as a whole. Panel presenter Stephen Rhind-Tutt, president of Alexander Street Press, LLC, explained that semantic indexing can answer complex questions of who, what, and when, such as “What battles during the Civil War resulted in more than 1,000 deaths?” Regular indexing merely answers the question “What documents discuss this battle?” (Hedden, 2008, p40)

Semantic tagging and search capability are two elements of Tim Berners-Lee’s vision of the semantic web. While some of the enabling technology for this evolution of the web have emerged, it is yet to be realised and some claim that outside of limited domain areas it may not be feasible or particularly effective (Ng, 2008; http://en.wikipedia.org/wiki/Semantic_Web). One problem facing XML-enabled web search engines is the proliferation of standards and taxonomies. For example if a user wanted the revenues for all companies involved in manufacturing vehicles internationally, even assuming widespread adoption of XBRL for reporting, there may be an unknown number of taxonomies and tags representing this concept and the search engine would need to able to recognise them as synonymous and report them as such. The other difficulty is that by moving beyond the textual representation of HTML, once the data is located according to the machine readable tags there is the issue of how it should be presented to the human reader. This is a general problem with tagged data and developments such XHTML and in the case of XBRL, inline XBRL (XBRL tags embedded in HTML) are seeking to provide a solution to the rendering problem.96

One XML-based development that has enjoyed wide adoption is web feeds such as RSS.97 In conjunction with a feed reader such as Amphetadesk, the web feeder regularly checks for updated content on sites selected by the user and delivers them to the reader for viewing. Using a standardised XML-based format the web feeder allows the publisher of the information to syndicate their content to subscribers automatically. The SEC financial explorer site allows users to subscribe to updated content allowing investors to be notified as soon as new filings are available. The availability of this functionality is indicated by the orange RSS feed symbol: ‘Recent Filings.’

In addition to these web-based resources, interactive data needs specialised software for its production and use in analysis. Chapter 5 discussed some of the developments emerging from members of the constituency and Appendix 4 provides a review of available software and its functions undertaken in September 2007 – before the SEC voted in favour of the phased in mandatory filing of interactive data. The SEC expects that there will be an increase in software offerings, web based data providers, and news feeds driven by the increase in availability of interactive data and the market for its preparation and ‘consumption’. Jay Starkman in his submission to the SEC raises the concern that with little investor awareness, it is not clear that there will in fact be a market, and he argues that it will not stimulate interest for the open source development (see also our analysis in Chapter 5, http://www.sec.gov/comments/s7-11-08/s71108.shtml).

Software products may continue to leverage interoperability with dominant packages such as Microsoft Word and Excel as has Dragon Tag and Dragon View. This allows investors to use familiar tools for further analysis, but hopefully in the future preserving the tags once the data is downloaded. It is also desirable that other competing products such as OpenOffice have compatible software so that Microsoft is not given a dominant position in relation to XBRL (see also Starkman’s comment).

The concerns raised in Chapters 4 and 5 that some of these products may not enhance investor decision making should be considered by the providers of complementary technologies for investors. The risk is that there will be a rush to produce products to try and capture the market as early as possible and perhaps gain a competitive advantage. The lessons of the past two years should be learned here – that the market may not be the best judge of the quality of tools provided and careful research and monitoring of analysis tools for retail investors should be undertaken. The regulators and consortium members who have worked hard to ‘popularise’ interactive data have a responsibility to provide end-users with safeguards. Education regarding the risks to sound analysis in the new ability to easily ‘slice and dice’ information is also important. This is a currently neglected area of complementary service provision that the constituency should also promote. These considerations are particularly important in the phase-in period during which all stakeholders will be learning about the possibilities of interactive data, but the quality of the data is not assured, since under the phasing in approach

96 Rendering, including the use of style sheets, will be discussed more fully in Chapter 8.
97 RSS is said to be the abbreviation for rich site summary or really simple syndication (cyber.law.harvard.edu/rss/rss.html; www.webreference.com/authoring/languages/xml/rss).
some data does not carry legal liability for the preparers, it is not audited and detailed tagging of narrative disclosures is not required (Aguilar, 2008; Orenstein, 2008; SEC, 2009a).

7.4 SUMMARY
The distinction between competing and collaborating technologies is not clearly defined. Taking the longer-term perspective that is relevant in the European setting consideration should be given to achieving as much convergence as possible in the open standards domain. The longer time frame may be a disadvantage if the SEC’s interactive data project does provide investors with data they find useful and so gives the US capital market a competitive advantage in attracting capital (Chapter 3). On the other hand, European adopters may gain by using the time available to promote convergence and reduce the disruption and increase the potential benefits of fewer standards.

The choices made for the infrastructure of digital reporting need to take into consideration the long term as once made the platforms and systems need to remain stable. Frequent changes compromise effectiveness in reduced compliance costs and the benefits of common data standards that may be achieved through interoperable software and web-based search and data dissemination technologies. As these resources develop responsibility should be taken by the constituency to review products for suitability and provide education to users not only about the benefits, but also about appropriate analysis strategies and risks in the data-centric model of interactive data.
Molina (1999) distinguishes his work on the socio-technical constituency from Actor Network Theory (ANT) on the basis that he does not extend agency to technology objects. Nevertheless, he does recognise that the characteristics of the technology itself are crucial to determining how it is developed and diffused. This is in part because these characteristics also impact how constituency building and maintenance may be best achieved. Based on an analysis of the technology innovation literature he offers an initial ‘open-ended’ taxonomy of technology characteristics that form genotypes. They are presented in the diagram ranging from the most general on the left hand side to the most specific on the right (see Figure 14). The triangle at the far right of the diagram links the technology characteristics with the strategic and tactical implications for the creation, production and diffusion of the technology.

Figure 14: Open-ended taxonomy of technology genotypes

8.1 XBRL’s Technology Genotype

Molina (1999) proposes that a technology may not have a single genotype, but may be perceived in different ways by its constituency members. The purpose of working towards an understanding of the technology’s characteristics may be to achieve a more coordinated effort and increase agreement among participants as well as being a foundation for considering the strategic implications of those characteristics. In that vein we offer our assessment of XBRL’s technology characteristics not as an attempt to be definitive, but as a basis for further discussion and amendment as XBRL develops, its applications change or its constituency’s views change. Molina is also clear that the categories are not mutually exclusive. They arise out of a scattered literature and Molina’s expectation is that they may be refined over time.

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A genotype is ‘the genetic makeup of an organism … with reference to a single trait, set of traits, or an entire complex of traits’ (Oxford Dictionaries Online). In this setting it is the technical characteristics or traits that are relevant.
The XBRL consortium’s first task was to produce a stable specification for an XML-based standard capable of representing business reports. XML was identified by Charles Hoffman very quickly as an important breakthrough in permitting effective communication and standardisation of information exchanged on the internet (Hoffman et al., 1999). It inspired him, as an accountant, to apply it to the accounting domain. Initially, the standard was named XFRML – Extensible Financial Reporting Mark-up Language, but its core developers quickly saw that this scope would not be sufficient to capture all the important elements of business reporting w(Cover, 2000). The XBRL Specification 2.1 has been stable since 2003 after the rapid progression from the 1.0 version in July 2000, to the 2.0 version December 2001 and 2.0a in November 2002 (http://www.xbrl.org/SpecRecommendations/). Stabilising the specification is important otherwise implementations in older specifications may become incompatible with later versions, causing software applications to need rewriting and creating difficulty accessing data prepared under earlier versions. Adoption is unlikely to expand without participants being confident that the basic grammar of the standard will remain the same for a considerable period of time. The specification governs the valid form of the main elements required for the exchange of data – instance documents, taxonomies and linkbases.

In one sense the specification, which is an XML schema that defines the rules to which XBRL documents must conform could be considered a product. It was produced through effort (Molina, 1999, p27) and it is available as an entity from a known location (http://www.xbrl.org/SpecRecommendations/). In common with other digital products it is reproducible at virtually zero marginal cost. The fact that there is no charge for its use is not relevant to its status as a product. On the other hand, it may also be considered a method, since it sets out the rules or framework for understanding how the elements in an XBRL document may be validly formed.

The other key elements of the XBRL framework that the constituency must provide to make the data standard viable are taxonomies. Each taxonomy is made up of a schema file written in XML Schema language and up to five linkbases written in XLink. The taxonomy defines the elements, attributes and the relationships between them and links them to supporting information.

While a single taxonomy that covered all business reporting needs would be ideal for the purpose of standardisation, a difficulty that this creates is that the underlying accounting rules for reporting are not consistent between different jurisdictions, industries or even regulatory agencies. The XBRL consortium focussed on the development of taxonomies by jurisdiction and organised the structure of the consortium largely around national sub-groups (Chapter 5).

As with the specification, the taxonomies may be considered both a product and a method. The taxonomies are made freely available and are required in order that instance documents created by reference to the taxonomy can be interpreted by software receiving those documents. They also represent key aspects of the accounting model for the jurisdiction as interpreted by the designer(s) of the taxonomy. The elements represent the concepts identified as necessary for reporting and the linkbases provide an interpretation of the links between those concepts, between the concept and an outside reference, the structure of the calculation of the element, its normal debit/credit balance and its numeric type. This type of distilled understanding of business reporting requirements has lead proponents to argue that XBRL can be used, as a method, to assist in implementing new accounting standards, such as IFRS (Buys, 2004). Others have claimed that it may be a basis for structuring a chart of accounts (Willis et al., 2003). Figure 15 shows XBRL as both a product and a method to reflect these characteristics of both the specification and the taxonomies.

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*99 The need for a Business Reporting Language was outlined in an IASC (now IASB) discussion paper published in 1999 on the nature of online business reporting (Lymer et al., 1999).

*100 Note that in part the specification has been kept stable by modularising it. Other developments in the area of dimensions and formulas have been made outside of the core specification itself. As taxonomy developers start using this functionality, it will become more essential for software developers to incorporate.

*101 The linkbases may include – presentation, label, reference, definition, and calculation (http://www.ey.com/global/content.nsf/International/XBRL-What_are_Taxonomies).

*102 Other commentators suggest that this is not the case – see Hucklesby and Macdonald (2000) and Carr (2003).
At the next level of detail, moving to the right on the diagram, Molina suggests a range of possible features. We have selected three as most descriptive of XBRL. The category Molina (1999, p27) describes as software includes ‘the totality of programs usable on a particular kind of computer, together with the documentation … and operating instructions.’ XBRL is not a software programming language. It is more akin to a grammar and the specification, taxonomies and instance documents are designed to capture and convey semantic data for exchange rather than providing an application to perform a function. So rather than describing it as software, we have made this distinction by using the term grammar. This characteristic of XBRL is important because it means that it has to be built into applications in order to operate. XBRL is, as is shown in the next characteristic in the diagram, a component technology that forms part of more complex technologies. When built into a regulatory reporting requirement it becomes part of an infrastructure of technologies and social institutions.

The implication for the constituency has been the ‘catch 22’ situation in which producers of the more complex software that would make XBRL function for reporting and exchange of data, have waited for demand to emerge for tagged data. The broad demand did not emerge as a result of a lack of demonstrated use cases (from the preparers end) and a lack of data in instance documents available for analysis (from the investor/user end). The regulators have been the only entities with a strong enough business case to pioneer the development of the technologies in which XBRL is embedded.

Underlying these difficulties is the network characteristic of XBRL (the third element at this level in Figure 15). The purpose of XML-based schemas is to enable the exchange of data on a network, specifically the internet although intra-nets may also provide platforms for its use. The exchange of data over the internet is enhanced by XML, or in our case specifically XBRL, because the tagged data can be linked to the meaning it was intended to convey through the open availability of the taxonomy that relates to that data. This means anyone with access to the internet and the taxonomy can, if the appropriate interface or software is available, search, automatically download and process the data they need for analysis. The keys to making a network effective are interoperability and open access (as demonstrated by the impact of HTML on the development of the world wide web).

The three characteristics at the second level of the genotype construction mean that the fate of XBRL is not entirely in the hands of a small core constituency. A wide range of software vendors producing accounting and other business software such as Enterprise Resource Planning (ERP) systems must be enrolled in order to diffuse the technology. The need for open network availability means that the business case for the software vendors cannot lie in owning the specification and taxonomies and earning a return on selling the software containing them. So they look for market demand for the XBRL functionality in order to justify the investment necessary to modify their products. Without any market there is no software, but without the software there was no market.
In order to assess where XBRL is on the S-Curve, it is important to consider the elements matured rather than innovating and moving on. Companies persist in trying to glean marginal improvements in technologies once they have amounts of effort are required to achieve small advances. Foster (1987) argues that too many XBRL has ceased to be an unknown, emerging technology. ‘too complex’ compared to basic XML (Cushing, 2003; Udell, 2004). Having achieved a stable representation of debits and credits. Indeed, one of the consistent criticisms of XBRL is that it is of complex tasks that had not been addressed in any other XML application; for instance the voluntary input and scarce resources of contracted assistance to be applied to a large number in its application. The early days of the development of the stable specification required the increasing number of people, including accountants and programmers, who become experts use. As the body of this software grows, more of the technical challenges are addressed by an standard, the level of adoption is closely related to the availability of software that enables its production of instance documents tagged in XBRL. Once it is used widely enough it reaches a critical mass of adoptions that allows it to attract further adoptions more easily (Locke & Lowe, 2007). To date virtually the only route to increasing adoptions has been through regulator mandates. The advantage is that the promoters of the standard need to persuade fewer people of its benefits and technical superiority. This reduces the challenge of diffusing it as a standard, but also runs the risk of an adopter (regulated entity) backlash if it does not deliver benefits and ease of implementation.

The characteristics of network, component, network externality and standard are all closely linked in the nature of XBRL, and they are important to assessing its maturity as shown in the graph embedded in Figure 15. The S-Curve is incorporated by Molina into his analysis from work done by Foster (1987). The idea behind the curve is that emerging technologies generally experience a period of very slow takeoff in which a lot of effort is required to produce a small improvement in the technology (productivity). This may be followed (if the technology survives) by a period of rapid advance in which only small amounts of effort are required to advance the technology. Finally there is a period of slow maturation in which once again large amounts of effort are required to achieve small advances. Foster (1987) argues that too many companies persist in trying to glean marginal improvements in technologies once they have matured rather than innovating and moving on.

In order to assess where XBRL is on the S-Curve, it is important to consider the elements described above as characteristics. As a component grammar seeking to become a network standard, the level of adoption is closely related to the availability of software that enables its use. As the body of this software grows, more of the technical challenges are addressed by an increasing number of people, including accountants and programmers, who become experts in its application. The early days of the development of the stable specification required the voluntary input and scarce resources of contracted assistance to be applied to a large number of complex tasks that had not been addressed in any other XML application; for instance the representation of debits and credits. Indeed, one of the consistent criticisms of XBRL is that it is ‘too complex’ compared to basic XML (Cushing, 2003; Udell, 2004). Having achieved a stable specification and some regulator adoptions in various countries it is reasonable to argue that XBRL has ceased to be an unknown, emerging technology.

Note some dominant standards used for exchange on the internet have developed this way – for example the dominance of Microsoft Word and Excel even though they are proprietary packages arguably makes them a standard for the exchange of data. Adobe used the strategy of making its reader free and only requiring payment for software to create the documents. By providing valued functionality – ie, guaranteed accurate reproduction of documents, it has effectively become a standard for information exchange on the internet. The difficulty for XML-based standards is their open and component nature. The XBRL consortium could have chosen to focus on creating an application containing XML functionality linked to a proprietary taxonomy and worked to diffuse the package among preparers and users. There are low barriers to entry in this market, however, since the XML technology is openly available. There is also the problem that seeking to represent business reports globally is too large a task for a single development, so any single software product would have been open to competition from a ‘local’ tailored package.
The Gartner hype-cycle plots the visibility of a technology against time. Using proprietary metrics, Gartner estimates the position of key technologies which are said to pass through the stages of a rapid rise in visibility to peak at inflated expectations, which then fall away to low visibility and the trough of disillusionment. Technologies that survive that stage may then more slowly increase their visibility again through the slope of enlightenment until they reach the plateau of productivity. The focus on visibility in this approach means that it does not parallel the maturity of the technology as developed by Foster (1987) and the ‘productivity’ achieved in the Gartner construction is by the users of the technology, rather than the productivity of the work on improving the technology intended by Foster. Bearing in mind these differences the Gartner Hype cycle is useful as an evaluation of the level of adoptions (visibility) of XBRL. Unfortunately Gartner has not specifically covered XML technologies in recent years (http://www.gartner.com/it/products/hc/hc.jsp?_x), but had placed XBRL in the ‘trough of disillusionment’ in 2004 (Magliery, 2005). It is reasonable to assume that with the whole of government projects in the Netherlands and Australia and now the mandatory requirement by the SEC for interactive data reporting, with the additional resources and body of instance documents that it will provide to a growing constituency in the US, that if assessed again now XBRL would be moving out of the trough and onto the ‘slope of enlightenment.’

With increased visibility and resources, the constituency may be able to achieve more rapid improvements in the key technical areas that remain to be clarified (such as dimensions, versioning, and taxonomy architecture, including linking to notes). For this reason we have put XBRL at the ‘adolescent’ stage in Foster’s S-Curve, which he describes in the following terms:

‘Once the learning is done, we can begin to make significant progress for very little expenditure of effort. That usually does not last too long – perhaps a few years.’ (Foster, 1987, pp101–102, quoted in Molina, 1999, p26).

This suggests that if XBRL performs its function effectively without significant technical problems and meets with user acceptance it could achieve sufficient momentum to reach critical mass, and go on to become a mature technology.

There are three important considerations in the context of XBRL maturing and potentially becoming dominant in its domain. First the issue raised in Chapter 7 is whether or not the promotion of a single standard to dominance without consideration for possible convergence with existing and other emerging standards is the best outcome for adopters in the longer term. An open standard may be seen as successful as it moves towards achieving the benefits described in Figure 13, but the opportunity for improved working relations with both complementary and competing standards and technologies should also be taken. The confidence inspired by greater visibility should provide assurance that investment in the core technology of XBRL will not be wasted in any moves toward greater convergence.

The second important consideration is that the SEC project and other major adoptions have been in relation to XBRL FR or GAAP. Although the XBRL consortium made the decision not to distinguish between the two types of taxonomies in discussion of the unitary XBRL, the architecture of the taxonomy for XBRL GL is significantly different to the FR taxonomies (which also vary from one to another). XBRL GL focuses on the exchange of tagged data internally in an organisation at the level of the journal. This places it not at the transactional end of the business reporting supply chain (Appendix 5) and not at the external reporting end. It is designed to bridge the gap between the data required for external reporting and the data used to generate those reports in the organisation’s database. With sufficient care it is possible to achieve ‘straight-through’ reporting. That is, to be able to generate XBRL-tagged reports by requesting that an XBRL-enabled accounting system populate a report with items from its database rolled up based on the tags specified. Conversely, the data required to audit or decompose the figures would also be automatically available. The stated purpose of XBRL GL is to create the same type of flexible interoperability of data within organisations that XBRL FR aims to achieve externally. The development of the two perspectives on XBRL has proceeded in parallel, with some overlapping key participants taking an interest in each of the aspects, but some specialising their area of interest to FR or GL. The work on GL has lagged somewhat behind the FR developments with the GL taxonomy achieving recommended status in 2007.

XBRL GL and FR are complementary developments undertaken within the XII consortium. XBRL FR has found favour with regulators because they are collecting data from a large number of entities. FR facilitates the use of the internet for this purpose, allows automatic validation of the documents received and the potential for automated analysis, processing and further dissemination by the regulator. Regulators have also been able to enlist the support of filers by claiming that the initial difficulty and cost of filing in XBRL is low and that filers could go on to reap the benefits of ‘straight-through’ reporting.

104 It is believed Eric Cohen coined this phrase in relation to XBRL reporting.
XBRL GL is an important piece of the argument for compliance cost savings for entities required to adopt XBRL FR by regulators. As XBRL FR is diffused through regulator mandation, there is a risk that if filers do not take up the opportunity to expand the use of XBRL internally, then the ‘bolt-on’ systems currently popular with companies in the SEC’s voluntary filing programme will become the status quo. These systems work by taking the output of the organisation’s accounting system and other processes for generating the required filings and simply adding the tags at the end of the process before sending to the SEC. Rivet Software’s Dragon Tag has been mentioned by a number of voluntary filers in webcasts as a simple solution for this approach. If this type of after-the-fact tagging is the full extent of the adoption of XBRL by entities, then the problem for the diffusion of the technology is that it is simply one channel among many through which entities report to external parties and the preparing entity does not reap any significant benefits. Without a business case for expanding the use of XBRL in both FR and GL a barrier to its broader diffusion into non-regulator based applications is created. The scenario could be that XBRL is developed as a mature technology but becomes dominant only in communications required by regulator entities.

The third matter for consideration is the rendering problem. The key feature of the interactive data as enabled by XBRL is its data level tagging of business reporting information. This functionality ‘unlocks’ the data for searching and automated analysis, but provides a problem for consistent visual presentation (rendering). The following observation from the SEC’s final rule identifies this disadvantage:

‘If, on the other hand, an investor is interested only in the information from a specific company, then interactive data offer fewer benefits to the investor relative to other file formats, such as HTML, that offer data in a visually organized manner.’ (SEC, 2009a, p145)

The development of complementary software of which XBRL will be a component technology will need to resolve the rendering problem so that both filers and investors will be satisfied that they are communicating and receiving accounting information which is structured around a statement format as it was intended. The statement format is bound up with concepts such as presenting a true and fair view and the legal requirements for auditors and filing companies (interview with accountant; SEC 2009). A development that may be adopted at HMRC to resolve this issue is Inline XBRL which combines the ability of HTML to provide consistent formatting for presentation with the semantic tagging of XBRL (Mueller, 2009). The tension is between ‘paper paradigm’ legal and accounting concepts and the atomized data-centric view of digital technologies. The longer-term value and success of digital data standards for business reporting also relies on supporting changes to the currently accepted accounting and legal models.

These concerns are reflected in the strategic considerations on the far right of Figure 15. The creation process shows the specification, taxonomies (including GL) and remaining technical issues including rendering. Unlike some other technologies XBRL itself is not produced in the manufacturing sense – once created the specification and taxonomy are available with no further reproduction. The instance documents tagged in XBRL are produced as a result of the diffusion of XBRL; in this case mainly to regulators. The conjecture is whether or not the availability of a growing body of instance documents will lead to a demand for appropriate analysis tools and more tagged data by investors and whether companies will engage in more extensive use of XBRL internally by adopting XBRL GL. Ultimately institutional rules will need to change to support the expansion of digital data in business reporting so that the statement format is no longer the primary legal construct.

The remaining detailed characteristics of XBRL in Figure 15, not yet covered, include instrumental, generic, complex, customisable and labour-intensive. We will discuss each of these in turn.

Instrumental or enabling technologies ‘… can create new opportunities for application and fill a need that might or might not have been previously diagnosed’ (Molina, 1999, p26). This characteristic derives from XBRL being a component technology. It enables other software and systems to create possibilities for interaction and exchange that would otherwise require some other agreement or technology to achieve. In doing this, XBRL claims to have advantages in that it is human readable and compatible with data exchange on the internet. As an enabling technology, the constituency must enrol software vendors to incorporate it in their products as mentioned earlier. But the imagination and scope of the applications it is incorporated into is also a factor. It is possible that uses beyond those currently imagined will be devised, or possibly as discussed in relation to XBRL GL, possibilities may be ignored and its scope limited.

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Diane Mueller is the Chair, XBRL International Technical Working group on Rendering.
The characteristic of generic technologies is that they ‘provide the foundations for the development of a range of practical applications’ (Molina, 1999, p26). Once again this fits with the component and instrumental characteristics of XBRL as an open data standard.

XBRL has been argued to be complex (as mentioned earlier in this chapter). Proponents argue that XBRL is only as complex as is necessary to represent business reporting. The difficulty lies not with XBRL, but the underlying accounting model. The question that arises is what percentage of the solution does XBRL need to provide? The following is an extract of John Turner’s (Chair of the XSB) response:

‘The business need is to be able to convey the easily comparable stuff (90 or 95 per cent of a message) as well as those aspects of business performance that are regarded as unique, or special. That’s the way that accounting works, and we are modeling accounting (not changing a 500 year old system that everyone understands).

In practice that means that 95% of an instance document contains facts marked up using elements contained in a base or official taxonomy. Some small proportion will be marked up according to an extension taxonomy, created by the preparer, that the receiving system needs to process, but has never seen before. Typically, this will involve a human interacting with that system, deciding whether to (a) throw away a new concept the next time it is seen, (b) store a new concept because it is useful for a time series analysis or (c) map that concept to some other concept, because in the eyes of the beholder it is not as unique as the preparer might hope. This is only possible because we can express rich definitions inside these machine readable taxonomies.’

(Bray, 2007)

Complexity is relative and clearly there are technologies that are more complex than XBRL. For example, Enterprise Resource Planning (ERP) systems are renowned for not being amenable to a single person understanding them in their entirety (Quattrone & Hopper, 2005). A key aspect that XBRL has in common with ERPs is that they both require more than one speciality domain to combine their knowledge and understanding in order to develop the ‘product’.

In the case of XBRL, both accounting/business understanding and technical knowledge of XML and related technologies is required. The difficulty is to find enough people who have specialist knowledge in one area and sufficient knowledge in the other to be able to communicate in building the specification and taxonomies. This was particularly a barrier in the early development stages when the lack of expertise meant that the burden fell on a very few volunteers to expand the work started by Charlie Hoffman. As XBRL has developed, interfaces that help people with expertise in one area and not the other have been made available. Guidance notes for technical XML people and tools for interacting with taxonomies for accountants who may be tasked with reviewing a taxonomy or marking up reports (for example, TRAX, ABRA, the IFRS Taxonomy Modules Manager – ITMM).

Customisability is a key feature of XML and XBRL because of their extensibility. As discussed in Chapter 5 the ability of anyone to adapt the specification or taxonomies is both a strength and a weakness in building the constituency. It is a strength in that it enables taxonomies to be built for any business reporting application and flexibly adapted even down to individual organisation use. This encourages the participation of preparers and allows regulators to offer high levels of flexibility to filers if they choose to do so (Chapter 5). The weakness of the customisability is that it means that there is nothing to prevent other groups working in the same or very closely related domains and the development may easily be ‘forked’ by break away groups who choose to develop the technology differently (Chapter 7).

A critical disadvantage of the extensibility of XBRL from the point of view of investors is that the key advantage of automated comparability through standardised tags is easily lost without the intervention of some sort of regulatory or audit oversight. Since individual companies may extend the required base taxonomy at will and are permitted to do so under the SEC ruling, there is nothing to prevent the creation of new tags being used to obfuscate and reduce comparability. The technology alone is not enough to achieve the much vaunted improvements in transparency and automated regulatory oversight. It must also be supported with control over taxonomy extensions and audit of the appropriateness of the tagging. The SEC has not mandated either of these requirements and has removed the legal liability for company officers in relation to the interactive data exhibits for the initial 24 months of filing.

106 See for example the discussion at http://www.tbray.org/ongoing/When/200x/2007/12/12/XBRL-News#t197529508.553448.
The extensibility and large taxonomies designed to reduce the need for extensions also add to the complexity problem from the point of view of software vendors. Dennis Keeling (2006a) explains:

‘... we have huge taxonomies. Yes, it provides a consistent reference and I don’t disagree with that, it certainly matters in the accountants’ view and I don’t disagree that it would be a tremendous benefit to government and regulators. But, unfortunately ... that extensibility means complexity and complexity to my members isn’t easy, but worst of all to our customers is a ‘no, no’. And it’s that complexity to our customers that’s holding [it] back.’

The final characteristic included in the XBRL genotype is that its development is labour-intensive. That is, the largest proportion of the cost of developing it is in the specialised labour in the many person-hours dedicated to it over the past ten years. Much of the early development work was voluntarily contributed out of the private time of its proponents and more recently companies, sponsors, software developers, regulators and others have supported their staff in the development work. As interactive data is implemented in the US there will be an initial spike in demand for expert services which may reduce the availability of people to contribute to developmental work. The improved economic prospects of the standard should underpin development in the longer term, however, as companies and individuals identify it as worth investing the time to learn about.

8.2 THE XBRL GENOTYPE AND THE INTERACTIVE DATA PROJECT

In Chapter 4 a list of functionalities was identified as the claimed benefits of the interactive data project. In this section we will analyse these by reference to the discussion earlier in this chapter and in Chapter 7.

8.2.1 Automatic search and download at individual data item level

XBRL provides the basis for tagging individual data items but it must rely on complementary technologies to provide the search and download capability into yet other packages that will facilitate the structured analysis of the data. As yet the tools to search across the web for XBRL tags are not available and there is limited software for download and analysis. Website presentation of the data for comparison or download suffers from the problem of creating data silos outside of which the functionality of XBRL does not work. The prospects for automated searching and comparability are lowered due to the lack of control over taxonomy extensions and lack of audit. A risk to the medium-term success of the interactive data project is that the data will lack comparability and transparency may be threatened.

8.2.2 Automatic load into software for analysis (either graphical or numeric) in a pre-specified format (ie, no rekeying of data)

The lack of software to allow an investor who has no technical knowledge of XBRL to download data into an analysis model of their own design means that even if the data can be downloaded into a spreadsheet, tedious cut and pasting will still be required to format it for analysis. Currently the technology is unable to preserve the tags with their additional reference information when the data is downloaded into an Excel (or other) spreadsheet.

8.2.3 Validation of instance document to ensure its internal integrity

This is an important functionality for the regulator and filing entity since it aims to reduce the number of errors in a filing. The preparer can check the filing by validating it before submission and it is technically possible for them to receive a confirmation of validation almost immediately. This may not be significant to the initial mandatory filing requirement for interactive data as it is only being submitted as an exhibit. The technology development to be undertaken in IDEA may enable this functionality. It is important to note that the automatic validation is only capable of checking the submitted instance document against the taxonomy and other schema requirements. It does not provide any confidence that the data submitted is ‘true and fair’ or correct in any other sense; merely that it conforms to the rules in the schema. Concerns have been raised that different validation packages may identify different validation errors (or no errors) in the same instance document. Regulators will need to specify or provide validation software that they accept for their filings (where validation is required).

8.2.4 Links to narrative explanation (footnotes, and possibly management discussion)

Each footnote to the interactive data financial statements will only be required to be tagged as a block in the first submission; subsequently companies will be required to tag quantitative data in the footnotes and schedules in detail (Hannon, 2009; SEC, 2009a). Currently there is no requirement to tag the management discussion and analysis (MD&A) or other narrative disclosures, although companies may choose to do so (SEC, 2009a). A technical issue is whether or not the taxonomy structure will permit a linking between a financial item (which would
traditionally ‘appear’ in the financial statements) and a related footnote or narrative item which may include tables and text. The technical requirements to automate linking are not yet in place.\textsuperscript{107} Our analysis of the results of our pilot study of investor decision making suggests that it is very important that every effort is made to present the often critical information contained in the notes whenever that data item is stored or displayed. Not only should the link be available, it should be very difficult to break, so that investors are actively encouraged to consider the associated disclosures.

8.2.5 Display of meta-data tags that show the reference to relevant accounting standards for the tag
An additional feature that XBRL may offer beyond linking to the footnotes is the provision of information about the data item based on its tag. Some inline-XBRL presentations are now developing that are able to display information from the tag when the mouse is hovered over the item; see for example the IASCF financial statements (XHTML format).\textsuperscript{108} The tags contain context and reference information that should provide the user with a source for the meaning intended for the item. This may take the form of a reference to the relevant paragraphs in accounting standards. The availability of the tags for human viewing and not just for automated searching is important to underpin transparency. Preparers are able to change the labels attached to data items in the taxonomy (an action that may also need to be limited or prevented).

So if investors are to be able to clearly understand what the tag means in reference to other literature, such as accounting standards, the tags should be made available.

8.3 SUMMARY AND OVERVIEW FROM THE PERSPECTIVE OF THE NON-PROFESSIONAL INVESTOR IN EUROPE
From the point of view of a potential European application of an interactive data style regulatory filing system, the SEC’s adoption and resourcing of the technology underlying part of it – XBRL – helps overcome the ‘catch 22’ caused by its open-component-network-standard characteristics. The additional time that European regulators have before any possible adoption also means that it may be clear whether or not the current gaps in the XBRL’s technical capabilities can be resolved satisfactorily. The US adoption has driven the completion of the US GAAP taxonomy and it will provide a significant impetus for the creation of industry extensions for the IFRS taxonomy, which currently does not meet the reporting requirements of specific industries. The success of the taxonomies in achieving a high level of standardisation in tagging reports is vital if investors are to achieve automated comparability and analysis. European regulators will have the opportunity to observe how the lack of controls over taxonomy extensions, the use of labels and the lack of audit plays out in the US setting. If the quality of the data generated under the mandatory requirement is low, investors and other users might reject the technology, despite the fact that it may be the regulatory requirements that are causing the problem. If European regulators do adopt interactive data, the time delay will hopefully provide enough confidence among preparers, auditors and the regulators themselves that the normal liability and audit requirements will be applied to the tagged data and additional controls over company level extensions will be put in place.

\textsuperscript{107} Note that the Microsoft interactive financials on its own web-site show the narrative from a footnote when the item is clicked (http://www.microsoft.com/msft/IC/Default.aspx). This operates like a hyperlink, opening up another screen. This is a link that is created on the site and could not be maintained if the data was downloaded into a user’s own software/spreadsheet or if the instance document was loaded into XBRL compatible software. The text accompanying the site says that XBRL has been used to provide additional functionality, but it is not clear what that functionality is. See also the IASCF annual report for an example of linking to the footnotes (http://www.iasb.org/xbrl/resources/annual_report/resources/iascf_2008-02-28.xml).

\textsuperscript{108} http://www.iasb.org/xbrl/resources/annual_report/resources/iascf_2008-02-28.xml
9. SUMMARY AND CONCLUSIONS

Non-professional investors are widely talked about as part of the interactive data project, but as our study shows, much research and consultation remains to be undertaken to understand their position in any depth. Molina’s (1999) diamond of socio-technical alignment is a framework which has allowed us to consider the complex arrangements and interrelationships involved in creating and diffusing Level 2 Digital Reporting. The SEC’s interactive data programme is the most significant Level 2 reporting project yet undertaken in terms of its potential impact on non-professional investors. It has adopted XBRL as its data format standard (Nagesh, 2008; Orenstein, 2008) and in so doing provides important resources and status for XBRL’s further development, application and diffusion.

The questions we posed for this research were:
• What facilitating conditions and barriers exist for an interactive data project in Europe?
• What is the perspective of non-professional investors on interactive data?

The researchers undertaking this project have background knowledge of XBRL and undertook interviews to supplement this knowledge with expert opinion, attended XBRL and related conferences, conducted literature reviews and other secondary research, as well as running an experiment on investor decision making. This section summarises our findings, conclusions and recommendations. It is organised around three themes that cut across the segments of the Molina framework. These themes are addressed from the perspective of non-professional investors. How could an interactive data project emerge in Europe? Why would it emerge? And when may it emerge, if at all? After summarising the current conditions as they have been discussed in detail within the report, we comment on the theoretical basis of the study. Finally we turn to our recommendations based on the findings.

9.1 HOW COULD AN INTERACTIVE DATA PROJECT EMERGE IN EUROPE?

The preferred model for the dissemination of regulatory filings for the pan-European market is a distributed approach (shown in Figure 2). Under this approach each jurisdiction’s Competent Authority retains control over the data format that filers are required to use. Only a list of companies and links to their filings is centralised. The decentralisation is an important reflection of the nature of the EU as a group of co-operating nations. It has also been identified by the Chairman of CESR as superior as a technological approach to centralisation in a single, large database. Without a centralised mechanism for data collection, the standardisation required to achieve interactive data reporting would have to be agreed between the member states to facilitate automated searching and comparability of tagged data. Given the different conditions, across even the key EU constituent states, in terms of technological development, regulatory sophistication and cultural attitudes to technology in general and XBRL in particular, it would be a very substantial task to achieve and maintain consensus about a data format and taxonomy.

Factors that support a standardised data format for reporting in Europe are the already existing common IFRS accounting standards, and the IASC Foundation’s early support for an IFRS taxonomy through the creation of their in-house XBRL team. XII have also been proactive in creating an EU jurisdiction to provide a single point of contact for regulators and other interest groups in Europe. Over time any interactive data project in Europe will also benefit from the SEC’s experience with implementing their project and the data-centric ‘IDEA’ portal. The technology developments around XBRL, filing software and tagged data analysis will be boosted by the US project. The maturity of XBRL as a technology, which we have consider to be at the adolescent stage of Foster’s (1987) S-Curve (Chapter 8), means that rapid progress can be expected in resolving outstanding technical issues. The resolution of these issues which include versioning, rendering and taxonomy architecture should also give later adopters and software vendors confidence.

The positive factors may not be enough to offset the barriers created by disparate approaches by local regulators. The SEC’s interactive data project has benefited from enthusiastic support from the top of the organisation and, perhaps more importantly, being able to act unilaterally.
This is not to underestimate the difficulty in aligning the interests involved in achieving the regulatory mandate for interactive data in the US. The difficulty as identified in Figure 10 (Chapter 5) is that Europe lacks a single entity, equivalent to the SEC, to fill the role of an energising co-ordinator. The history of XBRL shows that such an entity needs to have regulatory authority to mandate the standard in order to underpin any nascent constituency. The demand for tagged data has not come from the grass-roots users – either preparers or investors, so unless the SEC’s project changes this there will be no pressure on local Competent authorities to coordinate themselves to adopt XBRL. It is also unlikely that individual EU jurisdictions will want to cede the autonomy the decentralised system gives them unless they have no choice but to hand it over to a central European regulator. This would require a very significant departure from the traditional approach in the EU. Next we discuss the factors that may motivate such a fundamental change.

9.2 Why would an interactive data project emerge in Europe?

The most compelling reason why Europe may adopt a more centralised approach to regulation is the current and continuing economic recession and its genesis in the global impact of the securitisation of sub-prime lending. In Chapter 3 we note the pressure on the Director General of Internal Markets and Services who describes the need to restore investor confidence and improve coordination among European regulators. If a ‘European Financial Services Authority’ was to be an outcome of the crisis in the capital market, a centralised filing system for company reports using a Level 2 reporting standard such as XBRL could be used to send a signal to the market that improved surveillance and tighter regulatory controls were in place. It could be argued that the ‘best practice’ standard of the US was being emulated. Note that to achieve this goal it would not be necessary to adopt XBRL, however. In Chapter 7 we discuss the range of standards available and note in Chapter 3 the UK FSA’s selection of a generic XML solution in preference to XBRL. In Europe there are strong foundations for eb-XML which could be extended and potentially (but possibly with great difficulty) converged with XBRL. If European regulators wanted to differentiate their approach, so as not to be seen to be simply following the US, these are possible solutions.

Another potential motivation for Europe to adopt an interactive data approach is to compete for global capital. Christopher Cox (SEC) and Eddy Wymeersch (CESR) both observe that there is a global market for capital in which jurisdictions must compete. In order to protect those markets, regulators should also cooperate according to Christopher Cox, who has promoted integration between the SEC and overseas authorities (Chapter 3). If these concerns are motivations for European adoption, then adopting XBRL in a compatible way to the US would be necessary. This would allow Europe to reap the benefits of developments in XBRL technology, but may cause greater disruption to existing European infrastructures for reporting and impose switching costs on preparers (Chapter 7).

There are also structural differences between the capital markets in the US and Europe as well as the institutional arrangements even in individual jurisdictions. The analysis in Chapter 3 (see Figures 5 and 6) also suggests that with non-professional investors making up a smaller percentage of the capital market in the UK, regulators here at least, may not have the same degree of motivation in relation to individual shareholder protection as the SEC. The SEC’s mandate has a strong emphasis on retail investor protection and part of its role is to provide free dissemination of company filings. The FSA UK’s role is different in that it is not responsible for the dissemination corporate disclosures; this is undertaken by the Primary Information Providers. The role of the Companies House in the UK was discussed in Chapter 3. While it has a programme for the acceptance of tagged submissions, there is currently no policy to make the filings available as anything other than a document or an electronic image. Even if it was decided to provide the instance document data in the future, there is a structural barrier to the widespread dissemination of tagged data to non-professional investors via this mechanism because Companies House is required to be self-funding. Any fee structure for data downloading is likely to be a significant disincentive for non-professional investors. From the point of view of Europe, the division of responsibilities across institutions within its member countries reduces both the motivation and capacity to introduce standardised tagging and is further entrenched in the decentralised approach currently preferred.

What did not emerge as a strong motivator for interactive data adoption was investor demand, either from non-professionals or analysts. There is evidence of growing professional analyst participation in interactive data and XBRL constituencies (Chapter 6). However, analysts as a group still have a low level of awareness of XBRL (CFA Institute, 2008). Non-professional investors are a heterogeneous group that research suggests is not knowledgeable about XBRL, may prefer simple PDFs when they do undertake financial statement analysis, but otherwise prefer to use other sources for investment decision making (Chapter 4). A shareholder representative suggested that they are concerned about increases in compliance costs caused
by interactive data requirements that may reduce the returns to investors. At present there is not enough research to suggest that non-professional investors will benefit directly through improvements to their decision making as a result of the functionality of interactive data. Our pilot experiment and other experimental research on data formats shows that investor surrogates have mixed attitudes to tagged data and on the whole their decision performance is not significantly different. It may be that this conclusion could be changed with improved investor education in the use of digital data and with improvements in the technology (e.g., links with narrative information, Chapter 8) and analysis software and portals (e.g., object presentations, Chapter 5).

9.3 WHEN COULD AN INTERACTIVE DATA PROJECT EMERGE IN EUROPE?
The structural barriers to a pan-European regulatory adoption and within individual jurisdictions, such as the UK (Chapter 3), suggest that the four to five years the SEC has taken to implement interactive data would be a tough schedule for the EU to achieve. This presumes that a decision was taken to pilot a project and agreement had been reached among Competent authorities or by a new single European regulator. The process of getting to an agreement or a restructured regulatory system could take a number of years in itself. A mitigating factor that may reduce the time for implementation once a decision was made to go ahead, would be the experience developed in the SEC’s programme, assuming it is successful. The greater knowledge, skills, software and filer awareness could reduce the time for technical implementation.

Whether or not there is a significant disadvantage as a result of the time delay depends on the effectiveness with which regulators would be able to use tagged data for surveillance. If there is a potential for significant improvements in monitoring that enhance investor protection, then the delay may indeed be costly. The technology on its own is not sufficient to ensure the success of such a programme. If the regulatory structures such as staffing and systems are not in place to take advantage of the access to detailed data then improved monitoring may not materialise. Similarly, the benefits also may be delayed by liability carve outs and the lack of audit requirements reducing the (perceived) reliability of the data and filer commitment to accuracy of tagging.

The delay will not cause non-professional investors a direct disadvantage, since they are currently not concerned with access to tagged data. It may be that over time, they become aware of interactive data functionality enabled in other jurisdictions. It is unlikely, however, that this would generate a strong demand, since research suggests that most non-professional investors use other sources of information for investment decision making. It may be that if data aggregators achieve efficiencies through tagged data, they may be motivated to put pressure on OAMs to adopt it. On the other hand, the lack of tagged data in Europe may allow data aggregators to apply differential pricing to European data and recoup any differences in the cost of production. To the extent that professional analysts still use aggregators after audited tagged data becomes available, it may be only a question of them receiving more flexibly organised data or at a lower cost. While filing companies are still permitted to create individual company extensions, the data aggregators will retain a role in normalising data for analysts.

One advantage of the time delay is the opportunity to see how the SEC implementation goes. Hopefully an open sharing approach will be adopted so that the difficulties as well as successes in the project will be shared with other regulators as part of the coordination of global financial market regulation. It also allows time for standards to converge, reduce the switching costs for entities and increase the benefits available from an open network standard (Figure 13, Chapter 7).

9.4 THEORETICAL OVERVIEW
The research questions pose a significant theoretical and methodological challenge. The settings include both Europe and the US; global and local concerns; institutional and organisational structures as well as individuals’ approaches to investment decision making. The span of issues is well accommodated by Molina’s (1999) socio-technical constituency approach, which permits researchers to focus and organise their analysis in a holistic way. We believe that it provided a useful basis for a rich and detailed study of relevant issues and offers a foundation on which further research may be conducted.

One of the important features of Molina’s diamond is an explicit recognition that the target ‘stakeholders’ may not be part of the constituency. The concern with the perceptions and interests of stakeholders ensures that we give them some attention as opposed to the obvious focus on those who are active in the technology development process. It is one role of researchers to afford space to those who have a stake in technology development but are not able or are not allowed to participate. This is an important consideration in the case of non-professional investors who have had a very limited role in the interactive data project. The model also encourages the researcher to examine the project from the perspective of other technologies that are likely to have an interest in the development. The interaction between the target
technology and competing and complementary technologies may involve some of the most frustrating and confronting issues faced by a constituency. It highlights especially the need to cooperate, persuade and conciliate with many groups with different interests even while the constituency has to work hard to develop the technical aspects of their own product. Depending on the nature and maturity of the technology the focus of activity may need to move from the technical development to constituency building; perhaps requiring different skills and so different people to provide direction and even a different governance structure.

To address the wide variety of issues raised by considering the research question through the lens of Molina’s model, it is appropriate that multiple methods should be applied. Research in accounting is more frequently adopting multiple methods to investigate issues and we believe this is a useful approach (Efferin & Hopper, 2007; Lukka & Mouritsen, 2002; Modell, 2005). A significant difficulty for much research in accounting and business is the need to ‘slice and dice’ it into journal article-sized pieces. The support of professional institutions such as ICAEW and other funding bodies to provide a vehicle for the production of research with a broader scope is important for the development of an understanding of such topics. For example, our review of the trend to global adoption of IFRS, coordinated approaches to regulation and the close link between these and the economic environment and technological development suggest that there is a need for researchers from the accounting domain to work with others to describe and analyse the implications and provide a basis for policy formation. The possible adoption of IFRS in the US by 2014 means that there is important research work to be done regarding the economic, institutional, organisational, and individual implications. There is still time and opportunity to provide research that could form a basis for decision making at all these levels.

The approach we have adopted in our research does have limitations and naturally there are important issues that will need to be the subject of further research. Molina’s model highlights a target constituency; in this study non-professional investors. It could equally well be used to consider issues from the perspective of preparers of instance documents, regulators, software vendors, auditors and accountants. In the course of discussing the investor perspective we have touched on issues relevant to these stakeholders, but only to the extent that they affect investors. There is scope for research on how preparers perceive interactive data and the mandatory requirements; the impact of taxonomy size on the need for extensions and the impact on software vendors in contrast to regulators, and the list could go on. We hope we have raised enough issues within the construct of Molina’s model to pique the interest of others. We identify further research that we believe is needed from the perspective of retail investors in the recommendations following. There are also emerging research questions better addressed using other methodologies. For example, an interesting conceptual question is how the legal and accounting requirements could be reframed to best achieve the potential of digital reporting.

9.5 RECOMMENDATIONS
‘The key to technology success lies in the quality and effectiveness of the alignment strategies and tactics implemented to keep all these aspects evolving in a convergent and synergistic direction’ Molina (1999, p.9). This report considers the implications of the SEC’s interactive data project for a similar European development from the perspective of non-professional investors. Our conclusions about the existing conditions suggest that achieving alignment in Europe is a challenging task. Our recommendations speak to some of the issues involved in supporting such an effort as well as more specific considerations. We have organised the discussion into four categories with the specific statements of recommendation numbered through the section.

9.5.1 Non-professional investors
Non-professional investors are remarkably absent both within the research agenda and from the digital reporting constituencies. We identify this group as an important area for research, especially given the growth in alternative sources and media for investment analysis on the internet. A better understanding of how they make investment decisions, the information sources that they use, the effects of different types of data formats and presentations is needed to guide both policy decisions and the development of software tools and data presentation portals. The difficulties in undertaking such research are reflected in the tendency to use students as surrogates. We would encourage more attention be given to the actual population of non-professional investors so that the issue of their heterogeneity as a group can be properly incorporated into the analysis and findings. There are practical difficulties associated with working with subjects who are dispersed, hard to identify and who may not see the value in being researched. Because non-professional investors are generally unaware of interactive or tagged data, experimental studies of investors’ use of different data formats or different aspects of interactive data functionality are needed at this stage. Survey and interview methods may be used to identify what functionality they would value and how they would prefer to access data as well as the topics noted above.
We encourage professional bodies, accounting standard-setters and regulators who act and speak in the name of retail investors take the initiative to support research such as ASIC’s study in Australia (ASIC, 2008).

**Recommendation 1**
Funding should be explicitly made available to encourage research to be undertaken to develop our understanding of the role of non-professional investors in capital markets, how they engage with these markets and information providers in practice and what role the different functionality of data formats plays in their investment decision making.

Just as it is hard to research non-professional investors, it can be challenging to facilitate their engagement with the active constituency for data standard development. Nonetheless, while the reporting is at least in part targeted at them, they are the ‘target constituency’ whose views should be included in developments in regulatory structures and the technology. Evidence from participation in SEC forums suggests that proactively inviting representatives of shareholder groups to participate in person is a successful approach. Because retail investors do not have corporate resources to support their participation, reducing cost barriers and providing reimbursement should be considered. In the case of the XBRL consortium this could involve providing a mechanism for participation that does not require payment for membership or attendance at conferences with the associated travel costs and fees. This could be achieved through invited representation on its advisory board and publication of the board’s agendas and minutes of meetings. It may also require a reconsideration of the governance structure of XII which currently excludes non-members from decision making and access to full information. The use of local jurisdictions to actively encourage contact with retail investor representatives without membership charges reduces the cost of participation.

Another obvious approach for XII and other elements of the interactive data constituency would be on-line participation through email, wikis or social networking sites; however these are limited in their effectiveness for two reasons. Firstly they only provide access to investors who have an active interest in the internet and secondly they are passive options that require the target constituent to take the initiative to locate the site or forum and participate. Building personal contact with a group of investors and their representatives is required at least at this early stage of their participation. While this may require some expense and effort on the part of the constituency, the disparate investor group is important for the diffusion of the technology and ultimately achieving a critical mass of acceptance for XBRL as a standard for business reporting.

**Recommendation 2**
The XBRL consortium and regulators considering interactive data implementations should increase the level of dialogue and engagement with non-professional investors. Participation by non-professional investors should be encouraged at all levels of development from strategic oversight on stakeholder boards through to operational functionality design, tool creation and roll out of XBRL applications.

**Recommendation 3**
As the technical development of XBRL reaches maturity, the XBRL consortium should reconsider its governance and organisational structure to permit full participation without membership fees.

### 9.5.2 Interactive data in Europe

The report identifies institutional barriers to the development of an interactive data project in Europe and important issues for consideration in relation to the purpose and intended audience for digital reporting. The perceived benefits of maintaining localised autonomy through a decentralised system and the centralising tendency of standardised regulation should be carefully evaluated. The economic crisis has created a desire by governments and regulators to demonstrate action designed to prevent a re-occurrence of regulatory failure. Standardised digital data formats provide enabling technology for greater surveillance and monitoring, but need to be part of a coordinated approach to regulatory improvements in order to be effective. The delay before Europe is able to institute such a policy allows time for a longer-term view to be taken and also time to consider the impact on existing infrastructures and standards. Convergence and interoperability of standards should be actively encouraged or even required by regulators adopting them in order that the benefits of open standards are passed onto those who implement and use them rather than imposing unnecessary switching costs.
Recommendation 4
The economic crisis stimulates demand for improved regulation. Standardised digital reporting can provide a basis for improved surveillance but only in conjunction with appropriate regulatory resourcing and systems for audit, analysis and review.

Recommendation 5
The consideration of an interactive style corporate reporting regime in Europe should balance the perceived benefits of decentralisation with the pressure for centralisation that attends the mandation of a single data format and standardised taxonomies.

Recommendation 6
Opportunities to increase interoperability between data standards and increase convergence between XML-based standards in the accounting and reporting domain should be promoted and actively pursued.

If, given the considerations above, there is a desire to create an interactive data equivalent in Europe then significant effort and political support is required to build the necessary constituency. Enrolling the support of a powerful entity with the ability to mandate adoption by competent authorities and OAMs may be required to overcome the diverse interests in the various national jurisdictions. Increased awareness and technical expertise may be built through adoption of an intern system like that instigated by the IASC Foundation’s XBRL team. This approach could be extended to other organisations in the constituency. Outreach to non-professional investors is discussed above.

Recommendation 7
The European constituency of XBRL needs the support of a regulatory body with the power to impose a standard for reporting purposes and to expand its constituency to regulators in the national jurisdictions.

Recommendation 8
Wider adoption of the IASC Foundation’s system of six-month internships should be encouraged to expand technical expertise and support for XBRL.

The regulatory framework within which the technology is implemented is also important. Consideration should be given to implementing a digital reporting standard only when requirements, such as management liability and audit, can be placed around it to ensure high-quality data is produced. One important claim for interactive data is that it improves comparability. Regulatory action to restrict individual company taxonomy extensions to only essential differences is required to prevent manipulation of tagging to reduce comparability. To make such restrictions feasible, a comprehensive set of authoritative industry level taxonomies are required to make as many tags as possible common within (and across) industries. If international comparisons using IFRS are the aim of the project, then the industry taxonomies must also be internationally applicable, with minimal requirements for individual company extension.

Recommendation 9
If mandatory filing of tagged company reports was to be instituted in Europe, full filer responsibility, audit and detailed tagging of notes to ensure the quality of tagged data should be required. Authoritative IFRS taxonomies at the industry level need to be available so that restrictions can be placed on company level extensions to facilitate comparability and reduce the potential for manipulation of tagging.

9.5.3 Technology development
The formulation of XBRL as an XML standard has proceeded to the point where rapid developments should now be possible. There are important aspects that remain to be resolved some of which lie with XBRL and some with complementary technologies. These include the ability to link to relevant narrative disclosure to the financials, download into standard software (e.g., spreadsheets) with tags and links to narratives preserved, reliable rendering in statement format, semantic search based on indexed taxonomy terms across the web, easy-to-use software for automated download into customisable analysis templates, investor friendly data portals with supporting analysis tools. The experiment conducted for this study highlights the importance of these developments in assisting the investor in integrating narrative and financial
information. The results also suggest that users will have a tendency to perceive calculated ratios as accurate despite the fact they may be non-comparable. The software developed to meet the technical issues above should be developed with an understanding of how naïve users will interpret the data in its ‘atomised’ form and aim to offset any potential negative effects.

Although many of the complementary software applications and analysis sites will be provided by open source developments or software vendors, a means of providing retail investors with confidence about the usefulness of different software/portals should be considered. An independent ranking (such as for that for web browsers) could be undertaken and publicised as the number of products increase. If the initial purpose of the interactive data project is to improve conditions for investor decision making, this could be seriously undermined if poor analysis products proliferate.

XBRL GL or alternatively interoperability between XBRL and other internal data management systems is important to preparers if they are to reap the efficiency gains of ‘straight through’ reporting. If XBRL becomes simply another data format ‘bolted on’ at the end of the accounting process to communicate with a particular sub-set of external entities, then its wider diffusion may be limited. Convergence or straightforward interoperability with other data standards in the accounting and reporting domain is important to all preparers and users.

### Recommendation 10

Members of the XBRL and interactive data constituencies should maintain and if possible increase efforts to further develop the technical functionality of XBRL, and work towards interoperability and convergence with other XML standards in the business domain. Independent reviews of software products for non-professional investors should be regularly publicised to help users to select appropriate tools.

### 9.5.4 Education and further research

The dramatic impacts on the world economy as a result of the collapse of the sub-prime lending market provide a compelling context for future research to examine issues related to the regulation of corporate reporting in capital markets. A fundamental, but perhaps controversial question that arises out of our analysis is whether or not the needs of non-professional investors should be a key focus of agencies regulating reporting in financial markets. The growth of institutional investment and the response of the G20, the IASB, FASB and the Financial Stability Forum, among others, to the financial market crisis brings to the fore (again) the issue of what should drive the corporate reporting model? How are economic concerns, accounting theory, stakeholder decision making, investor and creditor interests to be resolved by a single accounting standard-setter for international markets? Should investors be given primacy and if so how are they to be understood and characterised so that standards and regulation are appropriate? What is the role of standardised digital reporting with its potential for much more frequent and rapid information dissemination?

### Recommendation 11

Further research into the objectives of financial reporting, regulation and the role of digital reporting should be undertaken in the light of recent concerns about the role of accounting and regulation in the international financial market crisis and the move to international convergence on IFRS.

As interactive data becomes available there will be an important role for education about the benefits and risks of investment analysis using the data extraction techniques made possible by data tagging. The results of our experiment raise concerns about investors analysing isolated items of financial data or ratios without reference to related financial items, footnotes and other contextual narrative information. Accountants who are authorised to give financial services advice and accounting educators are well placed to provide guidance and support materials. These activities may have to be funded by government or professional bodies since our research indicates that retail investors are not likely to pay for courses or materials. The resources should also be useful for developers seeking to design appropriate tools for investors. A reciprocal arrangement for research and education with software vendors could be a productive strategy.

### Recommendation 12

Accountants who are authorised to give financial services advice and accounting educators should take a role in educating non-professional investors and software designers in appropriate analysis techniques using tagged data.
APPENDIX 1: AN INTRODUCTION TO XBRL AND THE INTERACTIVE DATA PROJECT

XBRL
Extensible Business Reporting Language (XBRL) is a technology for attaching identifying tags to financial and narrative data in business reports. The tags contain information about the context of the data item, its meaning and its relationship to other tagged data items. Context information includes the company identifier, the period, the type of report, the currency and the level of rounding in the data item (eg, £'000) and the type of data item (eg, ratio). The meaning and relationship between tagged items is defined by reference to a dictionary called a taxonomy that sets out the name, label and a reference or description to define the item's meaning. The relationship between items in the taxonomy is defined in a hierarchical parent-child structure such that the children are subordinate to the parent and financial items should ‘roll up’ into the summary figures at the parent level.

The implication of the ability to tag individual items in a financial report is that they may be searched for and identified in isolation from the report as a whole by computerised applications (sliced and diced). Once they are identified, they may with appropriate software, be automatically downloaded in a template structure specified by the user for further analysis or processing without the need for the user to rekey the data. As long as the tags are retained with the data the full context and meaning of the financial or narrative item is available to the user, including references to accounting standards that define the item, where they have been used in the taxonomy. This functionality is not yet fully available in user-friendly software, but is technically feasible.

The taxonomy may be easily extended to add new items or change existing ones. This means that entities reporting data may flexibly apply XBRL to achieve ‘true and fair’ reporting in the same way that they may prepare financial statements using spreadsheets and word processors. The more companies use individually created tags, the less comparable they are across companies. Standardised taxonomies for reporting based on accounting standards applicable in the relevant jurisdiction have been developed to reduce the need for companies to create new tags. If the data tags are not standardised the user’s ability to identify ‘operating revenue’, for example, for a set of companies of interest is undermined if one company creates a different tag for essentially the same item.

XBRL is based on XML (eXtensible Mark-up language), which is derived from the same original standard as HTML (Hypertext Mark-up Language). Its purpose is to represent data so that it can be exchanged between different systems. XML may be used to exchange data about anything – it only requires someone to define the tags for a particular exchange or set of exchanges within a domain. XML acts as a foundation for XBRL by providing the basic rules for forming valid XML documents. XBRL has extended the basic XML rules to support particular business concepts such as the precision of numbers and debits and credits. Thus, while XBRL is an XML-based standard it is also distinct from XML.

There are a number of resources for learning more about XBRL, including:
www.xbrl.org/Home/
www.iasb.org/XBRL/XBRL.htm
Interactive data

The Securities and Exchange Commission in the US renamed XBRL-tagged data as interactive data on the basis that the technological terminology in 'XBRL' was not attractive to users (speech by Christopher Cox to the XBRL conference in Vancouver, 2007). The SEC's project started with a voluntary programme for company filings tagged with XBRL and has since been made mandatory in a phased-in programme starting with the largest registrants (those with a worldwide market capitalisation of more than $US5bn). These companies must begin submitting tagged data in reporting periods ending on or after 15 June 2009. By 15 June 2011 all registrants will be required to submit interactive data.

The rules surrounding the submission of interactive data are not the same as for ASCII or HTML formats. It is to be provided as an exhibit accompanying the main filing and is not subject to the same legal and audit requirements as the main filing. Deloitte (2008) summarise the requirements for tagging as follows:

- **Face of financial statements** (each line item on the face of the financial statements will be tagged).
- **Notes to the financial statements** (each note will be individually tagged as a single block of text in the first year of adoption; detailed tagging of individual amounts within each footnote also will be required in subsequent years).
- **Financial statement schedules** (each schedule will be individually tagged as a single block of text in the first year of adoption; detailed tagging of individual amounts within each schedule also will be required in subsequent years).

There will be no requirement to tag a registrant’s MD&A disclosures.

A 30-day grace period will be granted for (1) an entity's initial interactive data submission and (2) its initial submission that includes detailed tagging of the financial statement footnotes and schedules.

Interactive data will be excluded from the officer certification requirements under the Securities Exchange Act of 1934, and no auditor assurance will be required for the interactive data exhibits. The final rules are expected to include certain liability limitations similar to those in place for the existing voluntary program; however, these provisions will be phased out over a two-year period for each registrant. (Deloitte Audit and Enterprise Risk Services, 2008, pp1-2)


See also:


# APPENDIX 2: ACKNOWLEDGEMENTS

<table>
<thead>
<tr>
<th>Name (alpha)</th>
<th>Employer/Affiliation</th>
</tr>
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<tr>
<td>David Blaszkowsky</td>
<td>Office of Interactive Data, SEC</td>
</tr>
<tr>
<td>Dr Paul Booth</td>
<td>ICAEW</td>
</tr>
<tr>
<td>David Clark</td>
<td>ICAEW/IIA-UK</td>
</tr>
<tr>
<td>John Court</td>
<td>Head (retired) ICAEW IT Faculty</td>
</tr>
<tr>
<td>Richard Davies</td>
<td>rd:ir independent investor relations consultancy</td>
</tr>
<tr>
<td>Kirstin Gillon</td>
<td>ICAEW</td>
</tr>
<tr>
<td>Michael A Hadfield</td>
<td>Chartered Accountant, ICAEW IT Faculty committee member (OBE, FCA)</td>
</tr>
<tr>
<td>Simon Hurst</td>
<td>ICAEW</td>
</tr>
<tr>
<td>Kai Jakobs</td>
<td>RWTH Aachen University, Computer Science Department</td>
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<tr>
<td>Roger Lawson</td>
<td>United Kingdom Shareholders’ Association (UKSA)</td>
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<td>Robert Lemense</td>
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<tr>
<td>Paul Lewis</td>
<td>Consultant</td>
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<tr>
<td>Kevin Misselbrook</td>
<td>Access Accounting Ltd</td>
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<tr>
<td>Peter W. Morriss</td>
<td>Independent Consultant</td>
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<tr>
<td>Thierry Nederlandt</td>
<td>Dexia</td>
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<tr>
<td>John Oates</td>
<td>Baker Tilly, IT Advisory Partner</td>
</tr>
<tr>
<td>Michael Ohata</td>
<td>KPMG (formerly Microsoft) Chair XII Steering Committee</td>
</tr>
<tr>
<td>Maciej Piechocki</td>
<td>IASC Foundation’s XBRL Team</td>
</tr>
<tr>
<td>Kurt Ramin</td>
<td>Global Chairman (Emeritus) of XBRL International</td>
</tr>
<tr>
<td>Olivier Servais</td>
<td>IASC Foundation’s XBRL Team</td>
</tr>
<tr>
<td>John Turner</td>
<td>Corefiling, Chair XBRL Standards Board (XII)</td>
</tr>
<tr>
<td>Representative of</td>
<td>Wall Street On Demand</td>
</tr>
<tr>
<td>Ian Whittaker</td>
<td>WASSOC</td>
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The researchers would like to thank all the participants in the research. In particular, the Accounting Information Systems class of 2007 at Waikato University, New Zealand are not listed, but their participation in the experiment is very much appreciated. While we could not have written the report without the assistance of these people, the views expressed are our own and are not attributable directly to any of these individuals or organisations.
European legislation relating to services and securities is based on a framework of principles at three levels. Level 1 principles are established through EU legislative procedures. The process is that the European Commission makes a proposal to the Council of Ministers and European Parliament. An understanding of the scope of the implementing measures associated with the Level 1 directives and regulations is established as part of their creation. These technical implementation measures are Level 2 in the framework. A method for CESR, the European Commission and the European Securities Committee to decide on the Level 2 implementation measures has been created. It involves a process of consultation and the establishment of a clear mandate for the recommendations. At Level 3 in the framework close cooperation between the member states’ regulators and CESR is required to achieve the uniform ‘transposition’ of the directives or regulations.

(http://www.cesr-eu.org/index.php?page=institutionalcontext&mac=0&id=)
APPENDIX 4: LEVEL 2 DIGITAL REPORTING PILOT EXPERIMENT

This appendix provides further details of the supporting argument, data and results of the pilot experiment conducted in October 2007.

Survey of software: August and September 2007

A search for software that would meet the needs of non-professional investors wanting to use interactive data was carried using; the list provided on the XBRL website (http://www.xbrl.org/ProductsAndServices/); software vendors at the 2007 Munich XBRL conference, individual vendors’ websites, email exchanges and conference calls. The survey shows that the majority of the software was focussed on regulators, preparers of instance documents and XBRL taxonomy developers. This profile is not surprising given the stage of development of the XBRL and the dominance of regulators as adopters. See Table A4.1 for a summary of the packages.

The investor software available falls into two types:

1. Those that provide web-based applications that offer very simple portals to access Level 2 digital data. These tend to be very easy to use but offer limited functionality. For examples: SEC interactive data viewer, IA, SavaNet.

These portals suffer if the taxonomies and data are not standardised. The apparently easy comparisons result in many items being unique to one company – even if they appear to have potentially been similar – and missing items. The SEC evaluation screenshot below shows an example where cost of sales is missing in one case and where there were also individual company items.

SavaNet is a more sophisticated tool targeted at the professional analyst market that solves this problem by inserting a layer of standardisation, but this means that the data must be processed by the company to conform to the SavaNet template. The problem with this approach is that it requires all the companies an investor wishes to evaluate to conform or else a third party (aggregator) has had to make assumptions to ‘fit’ the data with the template. This reduces part of the ‘transparency’ benefit of Level 2 data where the preparer is the direct provider of the information for evaluation. It is also likely to be outside of the price range of the average investor to subscribe to this. Some of these services anticipate a market such that newswires, newspapers or other investor sites pay the subscription and allow subscribers to their services access to the tagged data or provide it for free to attract people to their pages.

Another problem with this category of ‘solutions’ is that the download to Excel does not allow any control over which items are placed where (so automatic slice and dice is not achieved) and
the tags are stripped out of the data so that access to taxonomy definitions of items and further automated analysis is not possible. The researchers approached relevant software vendors about the lack of tags after downloading and were told that it is technically feasible, but has not yet been built into the software. They anticipated it being available in the future, although not in the short term.

2. The second type of software focuses on more general ‘reader’ and analysis capabilities. Some of these offer very sophisticated options including the type of functionality that allows users to ‘slice and dice’ the tagged information according to their own models (Xinba for example allows the user to set up their own template). The downside with these approaches currently is they require the user to understand technical aspects of XBRL and some patience in accessing all the required files. The ability to download flexibly into spreadsheet software and retain the tags with ‘drag and drop’ ease is not yet available in software on the market.

Table A4.1: Summary of XBRL packages

<table>
<thead>
<tr>
<th>Package name</th>
<th>Vendor</th>
<th>Website</th>
<th>Purpose description</th>
<th>Internal Company©; External users (Ext.) Developers (Dev); Regulators (Reg.)</th>
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<tbody>
<tr>
<td>Pro Management Automaterising BV</td>
<td>from XBRL website – not easy to find on web</td>
<td>Consulting – classified by Higgins and Harrell (2003) as professional services.</td>
<td>C</td>
<td></td>
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<tr>
<td>SAP AG</td>
<td>from XBRL website</td>
<td>Mapping elements in report generator to create publishable XBRL instance documents. For internal company use.</td>
<td>C ✓</td>
<td></td>
</tr>
<tr>
<td>Automator XBRL Professional</td>
<td>UBmatrix</td>
<td>Build taxonomies.</td>
<td>C; Dev ✓</td>
<td></td>
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<tr>
<td>Batavia XBRL Data Driver (BXDD)</td>
<td>J2R</td>
<td>Report generation – linked to accounting systems and ERP; internal and external reporting.</td>
<td>C ✓</td>
<td></td>
</tr>
<tr>
<td>BDS Bundesanzeiger Bundesanzeiger</td>
<td>from XBRL website</td>
<td>Instance document creation.</td>
<td>C ✓</td>
<td></td>
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<td>CaseWare IDEA</td>
<td>CaseWare <a href="http://www.caseware.com/fsf.asp">http://www.caseware.com/fsf.asp</a></td>
<td>Internal working paper software.</td>
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<td>CaseWare Scenarios</td>
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Table A4.1: Summary of XBRL packages (continued)

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<td>Allocation Solutions Inc</td>
<td><a href="http://www.Allocation.solutions.com/products.html">http://www.Allocation.solutions.com/products.html</a></td>
<td>‘Universal data aggregation end to end XBRL solution that bridges incompatible software systems creating cross-platform information preparation, analysis, and stakeholder consumption.’ Internal company use.</td>
<td>C</td>
</tr>
<tr>
<td>DB2</td>
<td>IBM</td>
<td></td>
<td>Linked to xfy – a hybrid database that uses relational indexing and XML; not appropriate for external users.</td>
<td>C</td>
</tr>
<tr>
<td>Digital reporting platform</td>
<td>Software AG</td>
<td></td>
<td>Provides: ‘validation, text retrieval, report publishing and integration into existing systems for analysis’.</td>
<td>C</td>
</tr>
<tr>
<td>Dragon Tag</td>
<td>Rivet Software</td>
<td></td>
<td>Tagging data to create instance documents.</td>
<td>C</td>
</tr>
<tr>
<td>Dragon View</td>
<td>Rivet Software</td>
<td></td>
<td>Viewing tagged reports.</td>
<td>Ext</td>
</tr>
<tr>
<td>EBI XBRL Edition</td>
<td>Edicom</td>
<td></td>
<td>E-commerce (EDI) orientation.</td>
<td>C</td>
</tr>
<tr>
<td>Financial Analyzer</td>
<td>Duzonerp</td>
<td>not easily accessible through google; found site by trial and error – it’s Korean <a href="http://www.duzonerp.co.kr/">http://www.duzonerp.co.kr/</a></td>
<td>Description includes development of specification, instances editor.</td>
<td>C</td>
</tr>
<tr>
<td>FRx</td>
<td>Microsoft</td>
<td>from XBRL website</td>
<td>SME &amp; divisions financial reporting application.</td>
<td>C</td>
</tr>
<tr>
<td>Imagine</td>
<td>Invoke (French)</td>
<td></td>
<td>Financial analysis – Google translation: ‘Intended for the professionals of the financial sectors, at the organisations of regulation…’</td>
<td>C, Reg</td>
</tr>
<tr>
<td>I-Metrix</td>
<td>Edgar Online</td>
<td></td>
<td>Professional analysts/companies tracking industry trends. Pricing makes it not appropriate for individual users.</td>
<td>C</td>
</tr>
</tbody>
</table>

Appendices
<table>
<thead>
<tr>
<th>Package name</th>
<th>Vendor</th>
<th>Website</th>
<th>Purpose description</th>
<th>Orientation</th>
<th>Production of instance documents</th>
<th>XBRL development</th>
<th>Report viewing</th>
<th>Report analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ipedo</td>
<td>from XBRL website</td>
<td>Instance document generation from a variety of sources.</td>
<td></td>
<td>C</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open Digital</td>
<td>IBS</td>
<td>from XBRL website</td>
<td>Internal and external reporting process.</td>
<td>C</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Report Direct</td>
<td>Corefiling</td>
<td><a href="http://www.corefiling.com/">http://www.corefiling.com/</a></td>
<td>Data collection suitable or regulators – with Adobe.</td>
<td>C; Reg</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Semansys Business</td>
<td>Semansys</td>
<td><a href="http://www.semansys.com/xbrl.html">http://www.semansys.com/xbrl.html</a></td>
<td>Generated by the integrator element of the application. Integrated suite of packages designed for use by a company – emphasis internal reporting.</td>
<td>C</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Semansys XBRL</td>
<td>Semansys</td>
<td><a href="http://www.semansys.com/xbrl.html">http://www.semansys.com/xbrl.html</a></td>
<td>Checks and validates the correctness of an XBRL report.</td>
<td>C; Reg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snappy Reports</td>
<td>Moonbeam corporation</td>
<td><a href="http://www.snappyreports.com/">http://www.snappyreports.com/</a></td>
<td>‘Snappy Reports features include taxonomy/extension creation/development and storage, comparative version control, … XBRL/FRS validation, taxonomy composing and extending, a dimensions designer, a development collaboration communication system, instance documents and extensions, an Excel and accounting systems interface, quick and easy comparative reports in Excel, Word or the web’.</td>
<td>C; Dev</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Spidermonkey</td>
<td>Corefiling</td>
<td><a href="http://www.corefiling.com/">http://www.corefiling.com/</a></td>
<td>Taxonomy building.</td>
<td>C; Dev; Reg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toscany Fas</td>
<td>Invoke (French)</td>
<td>Reporting – consolidation of group accounts</td>
<td></td>
<td>C</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UBS</td>
<td>UBmatrix</td>
<td>Server-based XBRL application for web applications.</td>
<td></td>
<td>C; Dev</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XBRL Converter</td>
<td>UBmatrix</td>
<td>Server-based – to import, convert, validate and export data into XBRL.</td>
<td></td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XBRL integration</td>
<td>TIE</td>
<td>Busines to business integration.</td>
<td></td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XBRL Office Express</td>
<td>Blast Radius</td>
<td><a href="http://www.blastradius.com/index.jsp">http://www.blastradius.com/index.jsp</a></td>
<td>To import, create, validate and export XBRL instances.</td>
<td>C</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>XBRL Reader</td>
<td>SavaNet</td>
<td><a href="http://www.savanet.net/AboutReader.aspx">http://www.savanet.net/AboutReader.aspx</a></td>
<td>‘The SavaNet® XBRL Reader™ is a free software application that allows everyone from financial professionals to independent investors to easily access, view, analyze, compare, print, and export financial data.’</td>
<td>Ext</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table A4.1: Summary of XBRL packages (continued)

<table>
<thead>
<tr>
<th>Package name</th>
<th>Vendor</th>
<th>Website</th>
<th>Purpose description</th>
<th>Application/functionality</th>
<th>Internal Company©; External users (Ext.) Developers (Dev); Regulators (Reg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>XBRL Spy</td>
<td>Batavia Business Reporting</td>
<td><a href="http://www.batavia-xbrl.com/">http://www.batavia-xbrl.com/</a></td>
<td>Conversion both ways.</td>
<td>C</td>
<td>☑</td>
</tr>
<tr>
<td>XBRL toolkit</td>
<td>UBmatrix</td>
<td></td>
<td>For use by software vendors to develop XBRL solutions.</td>
<td>C; Dev</td>
<td></td>
</tr>
<tr>
<td>XBRLAPI</td>
<td>Galexy Pty Ltd</td>
<td>from XBRL website</td>
<td>Java API for XBRL (application programming interface) – technical for the development of software [GNU public license].</td>
<td>C; Dev</td>
<td></td>
</tr>
<tr>
<td>Xinba</td>
<td>Hitachi</td>
<td><a href="http://www.hitachi-system.co.jp/xirute/e/financial_report_player.html">http://www.hitachi-system.co.jp/xirute/e/financial_report_player.html</a></td>
<td>'It provides the capability to consume XBRL financial information directly into Excel and present financial statements with user-designed templates.'</td>
<td>Ext</td>
<td></td>
</tr>
<tr>
<td>Xwand</td>
<td>Fujitsu</td>
<td></td>
<td>‘Enabler’ for use by regulators and businesses.</td>
<td>C</td>
<td>☑</td>
</tr>
</tbody>
</table>

Company accounts used in the experiment

Two sets of company accounts were created. The financial statements were presented as being for:

‘... hypothetical multinational companies that are in the same industry (manufacturing branded consumer products such as packaged and canned foods, drinks, cleaning products, shampoos, etc...).’

One company in each pair had generated their brand value internally (Convenience Products Ltd or Canwright Products Ltd) and the other had acquired brands by purchasing companies (Goodwin Consumer Products Ltd or Global and Pacific Ltd). Applying IFRS the brands are treated differently – the internally generated are not recognised in the financial statements while the purchased brands are. The accounting policy for intangibles is set out in the notes (with some insignificant variations between the versions of a company):

Goodwill and intangible assets

No value is attributed to internally generated intangible assets. All potential intangible assets acquired in a business combination are identified and recognised separately from Goodwill where they satisfy the definition of an intangible asset and their fair value can be measured reliably. Goodwill (being the difference between the fair value of consideration paid for new interests in group companies, joint ventures and associated companies and the fair value of the Group’s share of their net assets at the date of acquisition) and identifiable intangible assets purchased after 1 January 1998 have been capitalised and are amortised in the income statement over the period of their expected useful lives, up to a maximum of 20 years. Periods in excess of five years are used only where the Directors are satisfied that the life of these assets will clearly exceed that period. Goodwill and intangible assets purchased prior to 1 January 1998 were written off in the year of acquisition as a movement in retained earnings.

Purchased goodwill and intangible assets are subject to review for impairment in accordance with IFRS requirements. Any impairment is charged to the income statement as it arises.

The estimated useful lives of existing finite purchased intangible assets are as follows:

Customer lists 5 to 10 years
Brand names 40 years
Intellectual property 5 years
Software development costs 1 to 7 years
The note for intangibles was of the form:

Intangible assets

|                      | Customer lists | Brand names | Intellectual property | Total intangible assets
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost (gross carrying amount)</td>
<td>2,776.1</td>
<td>6,852.7</td>
<td>942.4</td>
<td>10,571.2</td>
</tr>
<tr>
<td>Accumulated amortisation and impairment</td>
<td>20.6</td>
<td>48.1</td>
<td>29.6</td>
<td>198.3</td>
</tr>
<tr>
<td>Net carrying amount</td>
<td>2,655.5</td>
<td>6,804.6</td>
<td>912.8</td>
<td>10,372.9</td>
</tr>
<tr>
<td>At 1 July 2006, net of accumulated amortisation and impairment</td>
<td>2,655.5</td>
<td>6,804.6</td>
<td>912.8</td>
<td>10,372.9</td>
</tr>
<tr>
<td>Additions</td>
<td>1,201.2</td>
<td>95.4</td>
<td>1,296.6</td>
<td></td>
</tr>
<tr>
<td>Amortisation expense</td>
<td>32.9</td>
<td>69.5</td>
<td>81.2</td>
<td>183.6</td>
</tr>
<tr>
<td>Impairment charges</td>
<td>34.2</td>
<td>41.3</td>
<td>75.5</td>
<td></td>
</tr>
<tr>
<td>At 30 June 2007, net of accumulated amortisation and impairment</td>
<td>2,588.4</td>
<td>7,936.3</td>
<td>885.7</td>
<td>11,410.4</td>
</tr>
</tbody>
</table>

In accordance with accepted practice, the useful life of customer lists is considered to be finite. They are amortised on a straight line basis over ten to twenty years. In assessing the useful life of brand names, due consideration was given in the decision to purchase the brands to their expected lives. The Company has a policy of substantially extending its portfolio of brands through strategic acquisitions of companies and brands. The brands are expected to generally have an indefinite life given proper maintenance through advertising and quality control over production. A limited number of brands in the cleaning products range have been evaluated as having finite lives as a result of a significant shift in consumer preferences in the geographic regions where they have been traditionally the strongest sellers. Intellectual property has a finite useful life, and amortisation is on a straight line basis over fifteen years. All intangibles were assessed for impairment.

The different company strategies for developing brands were indicated in the Chairmens’ reports. The key piece of information for the participants to identify was that the companies with internally generated brands had a significant asset value not included in the balance sheet (and not being amortised):

‘The requirements of IFRS have applied in the financial statements. However, because the Group has developed its brands internally over a long period of time, the Directors commissioned an independent valuation of the Group’s brands. The International Brands Group, which is widely accepted as the leading brand valuation firm, was retained. Their conclusion was that the Group’s intangible assets are undervalued in the financial statements by $42,670,000 as at 30 June 2007 and $38,720,000 as at 30 June 2006.’

An effort was made to make the reports as realistic as possible. The notes to the accounts took up about eight pages in the PDF format. This meant that the participants did need to locate and integrate the key difference in the accounts and should have provided the digital data formats with an advantage over an assumption that it would not be identified in hard copy, but as it transpired none of the participants identified the key information in digital format either. They were provided to the students in 100% size and of course they were able to manipulate them for size and positioning. One of the surprising observations of how the students worked was that very few opted to open the PDF files side by side.

Statistical analysis of results of the experiment
This additional analysis is presented in conjunction with the full description of the experiment in Chapter 4. The data collected includes a simple choice between the companies, the percentage investment and the narrative discussion of the participants’ approach to the analysis and perception of the data format. In this part of the Appendix we present the statistical analysis of first the discrete choice between companies and then the t-test for differences between the means on the percentages invested (a continuous variable).
Table A4.2: Cross-tabulation of company choice with data format

<table>
<thead>
<tr>
<th>Choice</th>
<th>Group</th>
<th>PDF</th>
<th>XBRL</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disclosure company</td>
<td>Count</td>
<td>26</td>
<td>29</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Expected count</td>
<td>27.5</td>
<td>27.5</td>
<td>55.0</td>
</tr>
<tr>
<td></td>
<td>% within choice</td>
<td>47.3%</td>
<td>52.7%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>% within group</td>
<td>59.1%</td>
<td>65.9%</td>
<td>62.5%</td>
</tr>
<tr>
<td></td>
<td>% of total</td>
<td>29.5%</td>
<td>33.0%</td>
<td>62.5%</td>
</tr>
<tr>
<td>Recognition company</td>
<td>Count</td>
<td>18</td>
<td>15</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Expected count</td>
<td>16.5</td>
<td>16.5</td>
<td>33.0</td>
</tr>
<tr>
<td></td>
<td>% within choice</td>
<td>54.5%</td>
<td>45.5%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>% within group</td>
<td>40.9%</td>
<td>34.1%</td>
<td>37.5%</td>
</tr>
<tr>
<td></td>
<td>% of total</td>
<td>20.5%</td>
<td>17.0%</td>
<td>37.5%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>44</td>
<td>44</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>Expected count</td>
<td>44.0</td>
<td>44.0</td>
<td>88.0</td>
</tr>
<tr>
<td></td>
<td>% within choice</td>
<td>50.0%</td>
<td>50.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>% within group</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>% of total</td>
<td>50.0%</td>
<td>50.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table A4.3: Tests of statistical significance on company choice

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
<th>Exact Sig. (1-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>.436</td>
<td>1</td>
<td>.509</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuity Correction</td>
<td>.194</td>
<td>1</td>
<td>.660</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>.437</td>
<td>1</td>
<td>.509</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fisher's Exact Test</td>
<td></td>
<td></td>
<td>.660</td>
<td>.330</td>
<td></td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>.431</td>
<td>1</td>
<td>.511</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td></td>
<td>88</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tables A4.2 and A4.3 were generated using SPSS 16.0

Fisher's exact test is the most appropriate for our analysis because we are using a 2X2 design with numbers less than 50 in the cells. The results are not significant.

Table A4.4: Results of t-tests on percentage invested

<table>
<thead>
<tr>
<th>Test</th>
<th>t-test</th>
<th>Standard deviation</th>
<th>Degrees of freedom</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDF v XBRL All Students Test</td>
<td>-0.762</td>
<td>17.5</td>
<td>86</td>
</tr>
<tr>
<td>PDF v XBRL First Students Test</td>
<td>1.09</td>
<td>17.5</td>
<td>42</td>
</tr>
<tr>
<td>PDF v XBRL Second Students Test</td>
<td>0.170E-01</td>
<td>17.7</td>
<td>42</td>
</tr>
<tr>
<td>Using PDF Group A v Group B</td>
<td>0.319</td>
<td>17.5</td>
<td>42</td>
</tr>
<tr>
<td>Using XBRL Group A v Group B</td>
<td>0.782</td>
<td>17.7</td>
<td>42</td>
</tr>
</tbody>
</table>

Group A was presented with the PDF format first and the XBRL second. Group B used XBRL first and PDF second. The difference between the percentage invested in the two companies comes closest to being significant when the results of PDF and XBRL choices are compared for the students who used each of those data formats first. The result is still, however, a long way from statistical significance and so no particular conclusions are drawn from this.
APPENDIX 5: XML OPEN STANDARDS IN THE BUSINESS INFORMATION SUPPLY CHAIN

List of selected standards, descriptions and sources


RIXML: Research Information Exchange Markup Language – ‘…an open standard for investment and financial research. This unified system makes it easier and more efficient to categorize, aggregate, compare, sort and distribute research.’ http://www.rixml.org/

MDDL: Market Data Definition Language – ‘...a publicly available standard that provides a generic XML-based interchange format for the fields needed to describe financial instruments (including identifiers and current/historical values), corporate events (including specific corporate and instrument information affecting value and tradability), and market-related information (including economic and industrial indicators). The goal is to promote data interoperability.’ http://www.mddl.org/page/about/default.asp


GRC-XML: Governance, risk management, and compliance XML – ‘The Technology Council of the Open Compliance and Ethics Group (OCEG) has established a provisional XBRL jurisdiction which enables OCEG to use the XBRL reporting standard in the representation of OCEG’s GRC management standards and process framework. A jurisdiction is granted the exclusive right to represent XBRL International (XII) in its area (or area of interest) and is able to provide official support to XBRL projects and initiatives. ...OCEG has a range of XML initiatives for GRC taxonomy, workflow and reporting under way and is interested in integrating the XBRL Standard in its work. OCEG’s initial GRC-XML work group will complete, publish and popularize new GRC-related schema in an Open Standard, under the GRC-XML heading, in 2009. The GRC-XML Jurisdiction will develop the related work groups needed to create and publish additional sub-domains in 2009 and 2010.’ http://www.oceg.org/Details/GRC-XML

OAG: Open Applications Group – ‘The Open Applications Group was formed in 1994 to promote business process interoperability for both inter & intra enterprise business processes and to encourage the creation of and/or create and endorse one or more standards to assist organizations in achieving connectivity and multiple-source integration of inter & intra enterprise business processes.’ (http://2007.xmlconference.org/public/schedule/detail/458)

References


REFERENCES


References


References


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The Economist (2008c, 8 October), ‘Money for the banks: The government bails out Britain’s banks’, The Economist.

Trites, G. D. (1999), The impact of technology on financial and business reporting, Toronto: Canadian Institute of Chartered Accountants.


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