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Innovation and the Information Society: A study of Policy Coherence and Governance in Ireland

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A study performed within the framework of the Irish OECD MONIT
network on innovation governance

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1. Introduction

This paper is part of the Irish contribution to the OECD project on ‘Monitoring and Implementing Horizontal Innovation Policy’ (MONIT). The objective of MONIT is to generate knowledge on how to improve innovation policy governance so as to create a more coherent and comprehensive innovation policy. Central to this is the achievement of greater degrees of horizontal coordination and coherence between the areas of innovation policy and those of other policy domains. The focus of MONIT therefore is on the capabilities of the policy making system that lead to innovation policies that are coherent with non-core innovation policy areas. The present study centres on the linkages and coherence between the policy making processes in the area of innovation policy and those of the Information Society (IS).

The MONIT-project takes place in the context of recent discussions on the need for a new generation of innovation policies which acknowledge the links between innovation policy and a number of other sectoral policy domains. Innovation policy has gone through significant changes over the past few decades. First generation innovation policy, based on the linear science-push model, focused on fostering scientific and technological advance and on the flows of knowledge down the innovation chain. During the 1980s, this model of innovation was replaced by the so-called second generation innovation policy which recognised the importance of interactions and feedbacks between the different phases of the innovation process. Under second generation innovation policy, the innovation system was conceptualised more broadly than science and technology to include all areas of the economic, political and social system which had an impact on innovative activities. Policy in this period aimed to strengthened communication across different points of the innovation chain and between different parts of the broader innovation system. More recently, however, the need for a new, a third generation, innovation policy which places innovation at the heart of all other policy areas has been raised (EU 2003; Lundvall 2002, OECD 2002). The rationale for a third generation innovation policy is the diverse and pervasive nature of innovation in a knowledge (or learning) economy. At the same time a number of policy areas which are not exclusively focused on innovation, both influence and are influenced by innovation. A third generation

innovation policy would therefore emphasise the need for coordination of a wide set of policies and give innovation a central place in all policy areas.

The aim of MONIT is to contribute to the development of a new generation innovation policy by studying the development of national capabilities of innovation policy governance and the creation of a more co-ordinated and coherent innovation policy. As part of the MONIT project, this paper studies the links and relationships between innovation policies and those of the Information Society. The development of policies for the Information Society will therefore only be discussed in the context of their relationship with innovation policy.

2. Analytical concepts and terminology of MONIT¹

In this section we introduce the analytical concepts and terminology that define the MONIT study. Governance concerns the systems and practices used to make priorities and set agendas, implement policies and derive knowledge about their impacts and effectiveness². It therefore concerns the ways in which the policy cycle is managed. In MONIT, the policy cycle is defined in three broad stages:

- Agenda setting, policy formulation and prioritization
- Implementation
- Evaluation and learning

Governance capabilities are defined as the ability to³

- **Recognise systems characteristics** (strengths, weaknesses, problems, development potential)
- Define the focus and the topics for political actions (**agenda setting**)
- Make diverse players coordinate their activities in and beyond their policy fields (**co-ordination/horizontalisation**)
- Implement these policies (**implementation**)

¹ This section of the paper is based on the MONIT conceptual paper and MONIT progress reports

² From Progress report and highlights from the OECD/TIP MONIT Project

³ From the Austrian Study on the Information Society

- Learn from the previous experience, e.g. from evaluation of results (**policy learning**)
- Adjust over the complete policy cycle (**policy cycle**)

An important part of this study is also to identify who are the main stakeholders involved and how they make an impact on the governance of the policy making system (e.g. how they are consulted). Governance include both formal and informal practices, part of MONIT therefore is to study the role of history, tradition and culture as well as the formal mechanisms of the policy making process.

The governance capabilities of national policy making systems will have an important impact on the degree of policy coherence of the system. Coherence is understood as the degree of consistency and lack of conflict in the policy system; it describes the state of a system⁴. MONIT distinguishes between three basic dimensions to coherence:

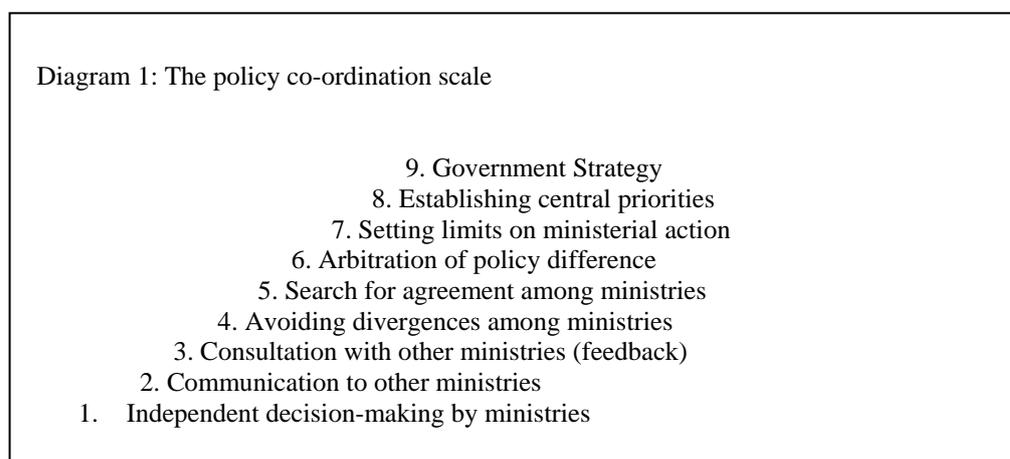
- **Horizontal coherence**; ensuring that individual, or sectoral policies, build on each other and/or minimise inconsistencies in the case of conflicting policy goals;
- **Vertical coherence**; ensuring that public outputs are consistent with the original intentions of policy makers;
- **Temporal coherence**; ensuring that today's policies continue to be effective in the future.

Coordination that is, the explicit activities of players to align aims, harmonise policy instruments and actions, etc is one important element for bringing about coherence. Other factors, however, such as political leadership and effective communication and information networks are also necessary in order to achieve coherence (OECD Centre of Government Network). Conscious coordination efforts are needed to ensure that all affected interests are involved at appropriate stages of policy development and to ensure that collaborative working relations within and among all sectors of the administration. On the other hand political leadership sets the strategic overview of

⁴ From Austrian Information Society document

governmental policy activities and views new policy proposals in relation to overall government objectives and in relation to other existing policy areas. Effective communication and information networks are needed for informed decision making, to guarantee good feedback and to coordinate policies and institutions. All three factors discussed above are necessary to challenge administrative cultures of departmentalisation that prioritise sectoral rather than common goals. The activities of strong players, *system drivers* or *change agents*, who strongly influence the activities of other actors can also lead to greater coherence. In this case coherence arises through adjustment to the strategy of the system driver. Such agents are sometimes integrated into the system on purpose when processes of change are too complex for using other coordination mechanisms (Austrian Information Society Report).

Diagram 1 shows different levels of horizontal coordination in the policy making system. The assumption is that the higher on the coordination scale, the more horizontal the innovation policy will be. Moving up this scale seems more likely in the case of the IS than innovation policy, partly because the IS is seen to ‘pollute’ everybody’s agenda and involves numerous ministries.



Source: OECD 2002

This paper is concerned with policy coherence across two policy domains, that of innovation policy and policies for the information society. Both these terms need some clarification in the context of this study. Also, given the complexity of the relationship between these two policy areas, the limits of the present study need to be set out.

Information Society

In this paper, policies on the IS are broadly defined to include measures related to the diffusion of ICT throughout the economy and society. The definition includes policies related to the Internet, but it is not limited to the dissemination of this medium. This is in fact the definition that appears in official documents on the IS in Ireland (see for example Information Society Steering Committee Report 1996 and present Information Society Commission webpage). In the case of Ireland, the development of the Information Society is also linked to the building of capabilities in the ICT producing sectors. This is explained by the importance of the ICT producing sector in the Irish economy. Official documents related to the IS (Information Society Steering Committee Report 1996 and New Connections 2002) highlight the importance of policies leading to the development of a strong ICT sector.

Innovation Policy

Innovation is understood as the development of new products and processes as well as the reorganisation of business processes and adoption of new business models. In terms of innovation policy, MONIT uses a definition of innovation that goes beyond the limits of science, technology and industrial policy to include the framework policies that are important for realising innovation (such as competition, education, labour market and financial policies).

The complexity of the relationship between innovation and IS policies and the limits of the present study.

Information and communications technologies (ICT) have been defined as a 'techno-economic' paradigm; that is a technological system with pervasive effects throughout the economy (Freeman and Perez 1988). The development of ICT has not only led to the emergence of whole industries with new ranges of products, services, production processes and business models but it has also had a major impact in practically every existing branch of the economy and society. The diffusion of techno-economic paradigms usually requires profound transformations of existing organisational,

institutional and social framework. The policies for the information society are about this transformation; they are about establishing the infrastructure, the legal and regulatory framework, the adequate skills base, the social awareness, etc, that are necessary for the successful adoption of the new technological paradigm. In most, though not all countries, the implementation of IS policies has gone hand in hand with policies of re-organisation and redesigning of business processes. It is from this point of view that the information society policy area can be seen as an integral part of innovation policy, even though it is not the sole responsibility of the ministries traditionally responsible for science, technology and industrial policy. Because of the magnitude and complexity of the subject, in order to study horizontal coordination and coherence between the policy making process in the areas of innovation and the information society this reports will focus on two specific policy fields, that of enterprise building and egovernment.

Research methodology

The study uses a historical approach on the basis that the present form and operation of national systems of innovation and policy mixes are to a large extent inheritances from past innovation governance and performance (MONIT Conceptual paper). The research is based on a detailed analysis of policy documents in the areas of innovation and the information society and semi-structured interviews with representatives of a number of policy making bodies both in the areas of innovation and the information society. The interviews were conducted between in the early months 2004 and included people at various levels of seniority in both policy making areas. In both policy areas, however, representatives from the most senior levels were interviewed.

Organisations Interviewed

Information Society Policy Unit (ISPU)
Information Society Commission
Enterprise Ireland (EI)
Department of Enterprise Trade and Employment (DETE)
Department of Communications, Marine and Natural Resources
Fórfas
Science Foundation Ireland
Irish Council for Science, Technology and Innovation (ICSTI)
Irish Council for Science, Engineering and Technology (IRCSET)
Higher Education Authority (HEA)
Irish Software Association (ISA)

3. Overview of ICT/IS and innovation policy in Ireland

In order to understand the policy processes that determine the degree of coherence between the areas of ICT/IS and innovation policy it is necessary to place them in the context of the particular conjuncture Ireland was facing from the mid to late 1990s. From 1987 till the end of the 1990s Ireland experienced a period of unprecedented economic growth, earning the country the title of ‘Celtic Tiger’. The decade was in sharp contrast with the relatively weak economic performance which had been a characteristic of much of Ireland’s past. The dominant force behind this period of high growth was the manufacturing operations of large US-owned multinational corporations located in Ireland, a significant number of them in the ICT industry.

In the midst of this period of exceptional growth, Fórfas, the policy advisory body of the Department of Enterprise, Trade and Employment (DETE), produced a document outlining the need for a long-term framework for enterprise development (Fórfas 1996). The document noted the increasing importance of ICT in the organisation of international production. The new technologies in combination with increasing liberalisation and the entrance into the world economy of a number of low-cost locations was leading to the intensification of international competition for foreign direct investment (FDI). The document acknowledged that this combination of factors would pose major challenges for Ireland but also open new opportunities. One of the areas of opportunities was the ability of ICT to overcome the constraints of distance

and time; this was seen as particularly important given Ireland's small national market and peripheral location in Europe. Amongst the key elements for a future strategy the document identified: the importance of developing the services sector (with a special emphasis on the ICT-intensive international-traded- services); the need to develop innovative capability in indigenous industry; and the central role of ICT (with a big emphasis on telecommunications policy) in a future economic strategy. Innovation policy and above all the Information Society were singled out as key elements of a future enterprise strategy (*Ibid*). Both policy areas have been given priority since the late 1990s.

This section of the report gives a historical account of the evolution of ICT/IS policy and innovation policy in Ireland. Before entering this discussion, however, sections 3.1 gives a picture of the importance of the ICT sector for the Irish economy and section 3.2 discusses some of the features of Ireland's innovation performance.

3.1 Importance of ICT sector for Irish economy

The ICT industry fuelled an important part of the economic growth in the period of the 'Celtic Tiger'. In 1995, Ireland became the favourite location for US electronic hardware overseas investment, attracting 30% of new projects in the EU (Sweeney 1999). According to Information Society (2003) in 2000 the ICT sector accounted for over 11% of total value added in industry and services, compared to an EU average of 5.1%. The sector also accounted for 33% of exports, an important indicator for a small economy whose growth is closely correlated with export performance. According to figures from Enterprise Ireland (EI), in this period approximately 60% of all software sold in Europe originated from Ireland⁵.

The ICT manufacturing segment of the industry is heavily dominated by multinationals, above all those from the USA. Foreign owned firms account for 40% of ICT manufacturing enterprises, employ over 80% of employees in this segment of the industry and are responsible for 94% of gross value added. Despite the dominance

⁵ www.nsd.ie/htm/its/profile.htm

of MNCs, the ICT sector is one of the few sectors which has seen the development of innovative Irish-owned firms.

In contrast with other countries, the ICT industry located in Ireland developed from manufacturing rather than R&D activities. The figures for R&D intensity show that the Irish based ICT industry is considerably below the OECD average (Inter Departmental Committee on Science, Technology and Innovation 2004). The industry however is central to Ireland's R&D activities. More than half of the R&D expenditure of Irish-owned industry is accounted for by the ICT sector (computer software and electronics). Computers, electronics and software also account for the majority of the R&D activities of the foreign-owned sector. Despite the low R&D intensity of the industry at present, competencies acquired through manufacturing activities have been extremely important for the development of management expertise and the formation of a skilled workforce. Policy circles hope that these developments, along with recent efforts to build a research base in the academic sector, will lead to a new generation of higher valued investment.

3.2 Overview of Irish NSI

From a very low base, Ireland's R&D in business, higher education and public research institutions made important progress during the 1990s. Despite these advances, in 2002 Ireland's gross expenditure on R&D as a percentage of GDP was significantly below that of the EU average. A recent report to the Inter-Departmental Committee of Science, Technology and Innovation (Steering Group 2004) recognised that despite the growth of R&D spending in the 1990s, the R&D performance of the business sector lagged behind that of leading countries in terms of the number of significant R&D performers which had achieved sufficient minimum scale of R&D activities and had sustainable absorptive capacity for scientific and technological advances.

About two-thirds of R&D being carried out in Ireland at present is being performed by the MNC sector. Two thirds of this activity is accounted for by nineteen firms. Much of this R&D is related to manufacturing process improvements rather than product

development (Cogan 2002). One-third of indigenous enterprises (about 1000 firms) have some expenditure on R&D, the great majority of this however is very small.

To a large extent therefore, Ireland's present NSI still reflects the country's late industrialisation and dual industrial structure. Despite recent advances in areas such as software, the majority of Irish-owned industry is still concentrated in mature, low-growth sectors and do not undertake innovative or R&D activities. At the same time the foreign-owned sector of industry operates, for the most part, in global production and innovation networks and contributes little to the resource base of the Irish innovation system (Cogan 2002). One consequence of this is that the foreign-owned sector only participates to a very limited extent in the numerous interactions that build up national technological capabilities such as inter-firm technical cooperation and user-producer linkages (Cogan 2002, O'Sullivan 2000). The linkages and interactions between foreign-owned owned industry and the country's academic research system are also weak.

3.3 Historical development of ICT/IS policy in Ireland

Policies related to the IT sector, and later on to the Information Society, have been closely linked to the process of industrialisation of Ireland. It is helpful, therefore to place the evolution and present dynamics of policies for the Information Society in the broader context of Ireland's policies for industrial development. The creation of an industrial economy in Ireland really began in the 1960s with the abandonment of the strategy of economic development based on tariff protection, import substitution and restriction on foreign ownership of domestic industry. The inability to establish a viable industrial base on the basis of protectionist policies led to the introduction of an industrial policy centred on foreign direct investment (FDI) and export-led growth. To a large extent, from the 1960s, Ireland became the 'model' for industrialisation via the FDI route.

The 1960s to 1980s

The main government body responsible for overseeing the implementation of this new industrial policy was the Industrial Development Agency (IDA). The agency was established in 1950 within the Department of Industry and Commerce to advise ministers on industrial development and initiate proposals for industrial investment from both domestic and foreign sources. In the early years the mandate of the IDA was to attract FDI with the highest job content in order to tackle the high levels of unemployment in the country. By the 1980s, however, the IDA's strategy had evolved into one that involved the selection of a number of 'high-technology sectors' with high export potential. One of the sectors selected in the mid-1970s was electronics, despite the fact that at this time there was no domestic industrial tradition or academic specialisation in this sector (Mac Sharry and White 2000).

The 1970s saw a number of US electronic firms locating production facilities in Ireland. This was a time when US electronic firms were looking for ways of entering the European market. Ireland offered them generous tax incentives and financial grants, as well as an English speaking workforce with relatively high levels of education. ICT services were also targeted as a source of employment intensive FDI. The IDA first launched its Service Industry Programme in the early 1970s which gave priority, amongst others, to computer services including software production. The 1980s saw a number of computer services sectors becoming eligible for employment grants and low tax rates. The decade of the 1980s saw the beginnings of a flow of US software investment into Ireland including firms such as Lotus, Microsoft and IBM.

From the late 1970s a series of measures were adopted in the areas of education, telecommunications and research facilities in order to bolster the development of an ICT industry in Ireland (Mac Sharry and White 2000). In education for example, steps were taken by the Higher Education Authority (HEA) in conjunction with the Finance Department and other government bodies to ensure that an increase in the number of graduates and technicians in electrical engineering met the needs of industry. In the area of telecommunications, the 1980s saw a significant upgrade in the telecommunication network with the use of ISDN, satellite and fibre optic technologies. This last effort was a prerequisite for targeting FDI in ICT-intensive

internationally traded services industries such as software development, customer support and data-related services. In 1979 the arrival of the first high-volume semiconductor production facility by US firm Mostek, also prompted government funding for a research centre at University College Cork (The National Microelectronics Centre). The account shows that the main motivation for these initiatives was the wish to attract and consolidate FDI in the electronics and, later on, the ICT sector. The importance of ICT multinational corporations (MNCs) make them one of the most powerful stakeholders in the Irish policy making process.

During the 1970s, the main activities located in Ireland by MNCs in the electronics sector was the manufacture and/or final assembly of computer hardware for the European market. This fitted well with the objectives of industrial policy in this period which was mainly concerned with industrial employment. This strategy, however, came in for severe criticisms in the 1980s when Ireland was severely hit by the world economic crisis and the fall of US FDI flows. From 1980 to 1986 there was a severe contraction of manufacturing employment. The early 1980s saw increasing concerns being voiced about the lack of sophistication of much of FDI, the lack of potential of this investment for substantial improvement and the non existence of mechanisms that would allow Ireland to move towards higher-value businesses (Trauth 2000). The fact that MNCs did not undertake R&D activities in Ireland undermined initiatives to strengthen innovative capability. One example of this was the ‘brain drain’ of the 1980s, when well qualified but underemployed engineers flooded out of the country (*ibid*).

We have focused on FDI because the development of the ICT industry in Ireland was driven by developments in this sector. Foreign investment was also to provide the dominant stimulus to the new investment, employment and exports which underpinned the emergence of the ‘Celtic Tiger’ in the 1990s. One of the difficulties for Ireland however has been that, while it has been very successful in attracting various waves of FDI, its model of industrial development has encountered major difficulties with respect to its indigenous industrial base. In fact, one of the features of Ireland’s process of economic growth since the 1960s, has been the emergence of a dual economy with an underperforming and uncompetitive indigenous sector and a

very productive but highly dependent foreign-owned sector. This has had important implications for policy and is reflected in the structures of the policy making bodies.

Indigenous Irish industry experienced a devastating shakeout after the abandonment of the import-substitution model in the 1960s. The crisis in Irish-owned industry was particularly acute between 1973 and 1994 when the sector experienced very high number of jobs loses. The severity of the crisis in the indigenous sector was the background to two important government reports which eventually led to important changes both in policy and in the structure of the state agencies responsible for industrial policy.

The 1990s- the ICT industry at the heart of the Celtic Tiger

Foreign direct investment, including investment in the ICT, were key driving forces of the period of prolonged economic growth experienced by the Irish economy from the end of the 1980s. In terms of ICT policy, the early 1990s saw a broadening of the range of services promoted by the IDA to include the customer and technology support service functions of the ICT MNCs already established in Ireland. By the mid-1990s, the international service sector had expanded to include pan-European call centres in areas such as telemarketing and reservation centres. The success of this sector led Fórfas to identify ICT intensive services as a key sector for future economic growth (Fórfas 1996). The recognition of the employment potential of FDI in ICT-intensive international traded service industries was central to the increasing priority given to policies for the 'Information Society' from the mid-1990s.

The 1990s also saw the remarkable development of an indigenous software sector with a sharp growth in employment, exports and revenues. The 1990s saw the rise of a number of firms built around product innovations. Most of these firms came out of the Irish operations of US MNCs with a minority regarding themselves as academic spin-outs (HotOrigin 2002). According to O' Sullivan (2000) in the mid-1990s Irish-owned software industry ranked close to Israel and India in terms of sales and exports. More importantly, R&D spending in the indigenous software industry rose quite dramatically in the 1990s surpassing that of its foreign-owned counterpart (*Ibid*). In

order to speed up the development of infrastructural support for this sector of indigenous industry, the government created the National Software Directorate in 1991 with the aim of enhancing the technical capability of Irish companies and to improve the international image of the Irish software industry. Today areas of the indigenous software industry (for example the digital content industry) are being targeted by Enterprise Ireland as priority areas for the development of high-technology enterprises.

From IT to ‘The Information Society’

The mid-1990s marked the beginnings of a broadening of government policies from the IT sector to the creation of an ‘information society’. As discussed in section 3, the potential that the convergence of information technology with telecommunications represented for overcoming some of the difficulties that had held back Ireland’s economic and social development was increasingly recognised. The ability of ICT to reduce the constraints of distance were seen as particularly important for overcoming many of the limitations posed by the small scale of Ireland’s national market, its peripheral location in Europe as well as the geographical dispersion and low density of its population. Section 4 discusses policies for the IS.

The ICT industry and the policy making process

A crucial role in the development of the ICT industry in Ireland was played by the IDA. In many ways, by its numerous initiatives, the IDA played the role of change agent in the system. To a large extent the IDA could be described as the advocate of the FDI sector (including the powerful ICT sector) with the various government departments. The IDA has also played a key role as a coordinator of different government departments and agencies, often in response to situations of crisis.

According to Sweeney (1999) the IDA played the role not only of an executive agency helping industry but in the 1970s it had become the centre of policy making. This is partly explained by the fact that the agency had a very strong planning department. Such dominant role in industrial policy making was strongly criticised in a report on

industrial policy, the Telesis report of 1982. The Report argued that the formulation of industrial strategy should rest with the Department of Industry and Commerce rather than the agency (Sweeney 1999, Mac Sharry and White 2000).

The Telesis Report also pointed to a number of shortcomings in Ireland's FDI-led industrial policy. Amongst the issues highlighted were the high costs of government incentives to MNCs, the low levels of skills involved in this investment, the lack of R&D within foreign-owned plants, the weak linkages with local suppliers, and the tendency of MNCs to leave Ireland once the tax incentives had expired. With respect to the indigenous sector, the Report noted that the technological and marketing sophistication of indigenous industry had stagnated over the two previous decades (Cogan 2003). In the case of the IT industry, the Report noted the existence of few component suppliers to the multinational firms and the small size of the software sector (Trauth 2000). The Report argued for a shift in state aid from foreign to indigenous industry, the creation of greater linkages between indigenous firms and MNCs, the provision of greater support for Irish-owned firms, and encouraging R&D and innovation. Despite its criticism the Report recommended the continuation of the industrial policy of job creation through inward investment by MNCs.

In 1992, a second report on industrial policy, the Cullinton Report, repeated the conclusions of the previous Telesis report that more efforts should be directed towards the development of Irish-owned industry. In order to focus efforts on the development of indigenous industry the Cullinton Report suggested a major restructuring of the IDA. Unlike its predecessor, the Cullinton Report did lead to important changes. One of these was the Industrial Development Act of 1993, which split the IDA into three separate though interlinked state agencies. One of these agencies became part of what is now known as Enterprise Ireland (EI), a body focused solely on indigenous industry. A second agency (which kept the name IDA) took sole responsibility for the MNC sector. The powerful planning department of the IDA became Fórfas, the policy advisory body and coordinating board for industrial development, science and technology within the Department of Enterprise Trade and Employment (DETE). Today, Fórfas leads policy formulation at the DETE, the IDA and Enterprise Ireland (it also coordinates the two agencies). The influence of Fórfas however goes well beyond that of the DETE and associated agencies. Fórfas provides intelligence and

policy advice to numerous government departments and agencies and in this way is one of the main mechanisms for policy coherence in the system.

3.4 Overview of Innovation Policy

Innovation policy, as distinct from industrial policy, only really began in Ireland in the 1980s; in fact some would say that the Irish national system of innovation (NSI) only emerged in the decade of the 1990s (Cogan 2003). Today, Ireland's NSI still reflects the country's late industrialisation and an industrial policy which, until recently, was based on importing technology through FDI. The small percentage of firms involved in innovative activities and the lack of an innovation culture is a legacy of this history. As is the weakness of the country's public sector research institutes, including a weak research tradition in the academic sector and a lack of industry-oriented applied research institutes (Cogan 2002). Another set of difficulties for the Irish NSI arises from the country's small national market and its peripheral location in relation to major international markets. This has made it difficult to develop innovative capabilities from the interaction with users and has been an obstacle for the development of market knowledge.

In the 1980s, partly influenced by its membership of the European Union, Ireland introduced a number of measures to enhance the technological sophistication and innovative performance of Irish based industry. A major policy change, however, has occurred since the late 1990s with a powerful drive to build the country's scientific and research capability. The five-fold increase in resources for science, technology and innovation (STI) in the National Development Plan (2000-2006)⁶ the first time that funds from the Irish exchequer are devoted to STI policy, are the result of this policy shift.

⁶ Government investment in STI increased from €0.5 billion over the period of the previous National Development Plan (1994-1999) to €2.5 billion in the current National Development Plan (2000-2006).

1980s- 1990s

The 1980s and early 1990s saw the introduction of a number of industry-oriented measures with the aim of strengthening the capacity of firms to adopt and adapt external technologies (Cogan 2002)⁷. The importance of these measures for the Irish system stemmed from the fact that a large majority of Irish-owned industry lacked the capabilities to perform R&D. The late 1980s also saw initiatives to develop linkages between Irish universities and the institutes of technology and industry⁸. All these measures were financed by European structural funds and were operated and managed by industry agency staff sometimes in conjunction with the Higher Education Authority. According to Cogan (2002) these non-R&D innovation measures did not prove particularly successful in increasing the technological capabilities of indigenous SMEs and have been scaled back in recent years.

R&D support measures to industry begun to be introduced in the mid-1980s with the objective of increasing the numbers of 'first timers' and firms progressing to 'continuous R&D'. The main policy instrument used for this was the public subsidy of R&D expenditure. Though there have been numerous changes in the title of these schemes, the changes relate to the size of the grants available and there has been little qualitative change in the nature of the measures themselves (Cogan 2003). The early 1990s saw a significant increase in the funds available as a result of a windfall of EU structural funds and the objective was set to raise Irish business expenditure of R&D (BERD) to the EU average. Figures for the late 1990s show that Irish BERD did increase to about three-quarters of the EU average but have since reached a plateau (Cogan 2003).

The most dramatic change in the Irish NSI however has been the major realignment of the university research system taking place since the late 1990s. Since then significant

⁷ Technology Transfer initiatives include the Technology Acquisition Grants Scheme and the Technology Transfer & Partnership. A number of measures were also introduced to encourage mobility of human capital, for example the Techstart and Techman programmes.

⁸ Initiatives at the university level included the Programmes in Advanced Technology (PATs) with a remit that included a combination of contract research for industry and related longer-term strategic research. At present three of the six PATs are in the area of electronics and ICT technologies (Giblin et al 2003).

new resources have been directed towards academic research and a new set of institutions to manage those funds have been created. Two major public funding decisions taken at the end of the 1990s set the new trend in science, technology and innovation policy. The first initiative was the *Programme for Research in Third Level Institutions* (PRTLTI) launched by the Higher Education Authority (HEA) at the Department of Education and Science (DES). The second initiative, the *Technology Foresight Initiative*, was organised by the Irish Council of Science, Technology and Innovation (ICSTI) in conjunction with Fórfas at the Department of Enterprise, Trade and Employment (DETE). Though the two initiatives were launched more or less simultaneously they were developed independently from each other with no coordination between the two government departments involved.

The aim of the PRTLTI initiative is to facilitate the strategic development of the research capabilities of the university sector through the establishment of centres of academic excellence, the enhancement of the numbers and quality of graduate output and the development of inter-disciplinary and inter-institutional research. Since 1999 the PRTLTI has allocated substantial funds to university research, two-third of which have gone into capital expenditure programmes. In 2000 and 2001 the HEA implemented two new funding initiatives with the establishment of the Irish Research Council for Science, Engineering and Technology (IRCSET) and the Irish Research Council for Humanities and Social Science (IRCHSS). These initiatives by the DES have radically changed the landscape at the level of academic research establishing for the first time a well funded and peered reviewed university system (Cogan 2003).

The second initiative that led to the transformation of Ireland's academic research system was the technology foresight exercise carried out in 1999 under the auspices of the Irish Council for Science, Technology and Innovation (ICSTI). One of the key findings from the Technology Foresight Exercise was the lack of world class academic research in Ireland. Technology Foresight Ireland was instrumental in securing significant public funding in the NDP (2000-2006) for high-quality academic research (often headed by leading international researchers) above all in the areas of biotechnology and ICT. One of the initiatives launched by this programme in 2003, and which in future will secure an important part of the funding, are the campus-

industry partnership projects, the Centres for Science and Technology. To administer these funds a new body was created in 2000, Science Foundation Ireland (SFI).

It is important to note that one of the characteristics of the present shift towards scientific research is the adoption of a policy model closer to first generation ‘science-push’ innovation models. As Cogan (2002) notes the present emphasis on science and technology policy has gone hand in hand with a scaling back of non-R&D innovation measures in the NDP (2000-2006). He notes that this is a serious problem for the great majority of Irish-owned industry who still require assistance to monitor, adopt and adapt technology. Moreover there seems to be little awareness amongst policy makers of the role of demand-led innovation policies based on the interactions between users and producers.

STI policy making bodies

1980s and 1990s

The formulation and implementation of STI policy is organised on a departmental and sectoral basis, as a result all government departments are responsible for STI within their respective portfolios. However, the two government department most closely associated with science, technology and innovation policies are the Department of Enterprise, Trade and Employment (DETE) and the Department of Education and Science (DES). Of the two it is DETE who has main responsibility for overall science and technology policy as part of its mandate to promote and assist overall industrial development. Since 2002, the Minister for Enterprise, Trade and Employment has had overall responsibility for science, technology and innovation policy.

Within DETE, the Office of Science and Technology (OST)⁹ is responsible for the development, promotion and co-ordination of Ireland’s STI policy including responsibility for the science and technology budget (both Exchequer and EU funds). The remit of the OST covers all aspects of the national system of innovation, including basic research, applied research, industry R&D, technology transfer and

⁹ Established in 1987

funding for innovation. The OST is advised by Fórfas and the Irish Council for Science, Technology and Innovation (ICSTI), a body established in 1997 to advise government on the strategic direction of science and technology policy. One of the features of ICSTI which is considered important is the fact that it is made up of both academic and industrial representatives.

Three state agencies, under the aegis of Fórfas, have an important role in implementing STI policy. The two industrial promotion agencies, IDA and Enterprise Ireland (EI), have been the main government bodies behind the implementation of industry-oriented innovation policies. Science Foundation Ireland (SFI) administers NDP (2000-2006) funds won as a result of the technology foresight exercise. Most of the activities funded by SFI take place within the university sector including the Centres for Science and Technology (CSETs) which would also include industry funding.

The Department of Education and Science (DES) also has a significant funding role, above all since 1999 through the PRTLTI initiative. The Department's funds for the higher education sector are managed by the Higher Education Authority (HEA). Two new funding bodies have been created by the Higher Education Authority since the start of the NDP (2000-2006), the Research Council for Social Sciences and the Research Council for Science and Engineering.

Coherence in the NSI

When discussing the degree of coherence of the Irish NSI it is important to note that many of its features are relatively new. A number of organisations and institutions that are today playing a key role in the system have only been established in the last four or five years. Moreover, a number of the recent changes, for example some of the initiatives surrounding the technology foresight fund and Science Foundation Ireland, were actually designed to shock the system into change. In this context a number of our interviewees described the Irish NSI as an 'immature system'.

4 IS Policy Governance

Public policy engagement with the Information Society (IS) agenda began in the mid 1990s strongly influenced by the rapid development of the Internet. In 1996, under the impetus of F6f6fas and the DETE, an Information Society Steering Working Group was established to study the implications of developments in ICTs for Irish society and to set out a strategy for the development of an Information Society. The IS Steering Group was set up at the same time as Forfas published a set of proposals for a long-term framework for enterprise development which highlighted the need to develop an internationally-traded services sector; the importance of creating innovative capabilities in Irish industry; and the urgency of early and decisive action towards the development of an 'Information Society' (F6f6fas 1996).

In 1996, the IS Steering Group produced a report which set out a strategy to prepare Ireland for the IS and made a number of recommendations in the areas of broadband infrastructure, legal and regulatory framework, training and lifelong learning, eGovernment and the modernisation of the public sector, ICT and social exclusion, and ebusiness. A number of recommendations linked specifically to the area of innovation policy were made in the report. The most important of these relates to the targeting of the content and multimedia industry for product and application innovations. The report also called for the development of an indigenous software industry capable of competing in niche markets including the development of knowledge management products and services for the Internet. With respect to innovation in the non-ICT sectors of industry, the report noted the potential of ebusiness for opening new markets. It noted however, that innovation in products, services and markets would not be realised in Irish-owned industry without a fundamental change in enterprise culture.

The Steering Committee also proposed a governance structure for the implementation of the IS. It advised government to set up an Information Society Commission made up of representatives of government departments and the social partners (the trade unions, employers and farmers organisation, and voluntary groups) at the Department of An Taoiseach to shape and manage the national IS strategy. The role of the

commission would be to: (i) monitor the implementation of the key actions required from the relevant government departments and other key actors; (ii) establish and monitor key benchmarks for the development of the IS; and (iii) report annually to the Oireachtas (parliament) proposing future steps (Information Society Steering Committee, 1996).

Following the recommendation of the Information Society Steering Committee the responsibility for the development and implementation of IS policy was taken on by the Department of An Taoiseach, a powerful government department with the responsibility of providing overall vision and strategy for government policy. Soon after an Inter-Departmental Implementation Group on the Information Society was established to push forward the implementation of the IS agenda. At the end of 1998 the Inter-Departmental Group published a report which proposed a plan of action to take the IS forward. The Group proposed the development of a comprehensive policy framework which identified key areas where action was needed, assigned clear responsibility for the tasks to be undertaken and indicated the deadlines by which they should be completed (Department of An Taoiseach, 1998). The plan of action proposed by the Inter-Departmental Group was published by the Department of An Taoiseach in early 1999 under the name 'Information Society Action Plan'. This document became the primary focus of IS policy until 2002 when a revised version, *New Connections*, was published

As part of its report, the Inter-Departmental Group proposed an IS policy implementation structure which was also adopted. This included an Inter-Departmental Group made up of senior civil servants with the task of ensuring that the Action Plan was implemented by the appropriate departments and agencies. The Group also had the task to prepare proposals for future developments. The Inter-Departmental Group also proposed the establishment of an Information Society Policy Development Team within the Department of An Taoiseach to assist the Implementation Group, to coordinate activities related to the implementation of the IS and to contribute to policy development. An Information Society Commission, made up of stakeholders outside the policy making system, to advise government on the development of IS policy had been set up in 1997.

The 1999 Action Plan focused on five issues: the telecommunications infrastructure, legislative and regulatory measures, the development of eBusiness, eGovernment, and various enabling measures that ranged from steps dealing with social exclusions to the study of electronic payment mechanisms. The Plan also identified a number of what it called ‘support areas’ where action was needed. This included a number of issues which form part of the narrower definition of the innovation policy agenda, for example the need to assess and take measures related to ICT skills, lifelong learning and R&D. The Department of Enterprise, Trade and Employment (DETE) along with the Department of Education and Science (DES) and a number of agencies and bodies associated with these departments were designated to come up with proposals.

In setting out the strategy for action the 1999 Action Plan designated the departments responsible for particular initiatives, this included both the lead department which was meant to provide the initiative along with the supporting departments. In a number of cases the Action Plan provided target dates for the completion of action points. An Information Society Fund was established soon afterwards to facilitate progression of the initiatives set out in the Action Plan¹⁰. The implementation of the 1999 Action Plan involved the mobilisation and coordination of nine government departments and numerous agencies and bodies located in different parts of the policy making system. Tables 1 and 2 show the departments, agencies, and other bodies that needed to coordinate their activities to implement government actions related to the telecommunications infrastructure and enabling measures as set out by the 1999 Action Plan.

¹⁰ Up to the end of 2001, €109m had been made available to support approximately 150 projects across government departments and agencies (New Connections).

Table 1: Telecommunications Infrastructure		
Departments Responsible	Agencies, Offices	Actions
Ministry for Public Enterprise Department of Enterprise, Trade and Employment	Numerous agencies within a number of Departments	International connectivity
Department of the Marine and Natural Resources Department of Public Enterprise		Submarine cable licensing
Various departments	Office of the Director of telecommunications Regulation (ODTR) The Competition Authority The Independent Radio and Television Commission (IRTC) New Entity responsible for digital television transmission	Regulatory issues
Department of Public Enterprise Department of Enterprise, Trade and Employment		Nation-wide broadband network
Departments from Northern Ireland and the Irish Republic		North-South Digital Corridor
Department of Public Enterprise	Office of the Director of telecommunications Regulation	Local Access
Department of Public Enterprise		Telecom Eireann IPO and divestiture of Cablelink
Department of Public Enterprise		Communications Infrastructure Group

From 1999 Action Plan

Table 2: Enabling Measures		
Departments Responsible	Agencies, Offices	Actions
Department of the Environment and Local Government Department of Social, Community and Family Affairs. Not defined		Access. To ensure that PCs, ISDN connections and internet access are installed in public libraries. To provide computer facilities and training to community and voluntary organisations. A report on extending access to those who do not have PC/internet access
Department of Public Enterprise		Internet Access Costs
	Information Society Commission	'E-mail for all'
Department of Public Enterprise in conjunction with other Departments developing projects for the electronic delivery of public services		The establishment of Certification Authorities and digital certificates.
Department of Enterprise, Trade and Employment		Protection rights and data
Department of Social, Community and Family Affairs, Departments for Health and Children, Department of Enterprise, Trade and Employment	Numerous agencies	Public services access interfaces.
	Financial institutions	Electronic payment mechanism

From 1999 Action Plan

4.1 IS Policy Structures

In the initial period, horizontal policy coordination was in the hands of the Inter-Departmental Group, departments and agencies also co-operated on an ad-hoc basis. There was however no single agency responsible for the overall implementation of the government strategy and it was increasingly felt that this affected the coherence of the IS agenda. In order to strengthen the implementation of the 1999 Action Plan, in 2001 a new set of structures based at the Department of An Taoiseach were put in place to improve inter-departmental cooperation and develop a more coherent approach. These structures are still in place today and consist of:

The Minister of State: The Minister has responsibility for the coordination of the IS agenda across all government departments.

A Cabinet Committee on the Information Society: This Committee drives the implementation of the Information Society Agenda. The Committee is chaired by the Taoiseach and is convened by the Minister of State. The cabinet committee includes (10 departments out of a total of 15) the following Ministries:

An Taoiseach
Finance
Enterprise, trade and Employment
Communications, Marine and Natural Resources
Education and Science
Community, Rural and Gaeltacht Affairs
Social and Family Affairs
Environment and Local Government
Health and Children
Equality and Law Reform

Five government departments have been excluded:

Defence
Agriculture & Food
Foreign Affairs
Art & Sport
Transport

An eStrategy Group of Secretaries General: This group addresses national strategy issues and complements the work of the Cabinet Committee on the Information Society. The committee is made up of the Secretary General, that is the highest civil servant, of the 10 departments.

An Assistant Secretaries eGovernment Implementing Group: The objective of this group is to ensure that IS policy is implemented in a coordinated manner across all government departments and agencies. The Committee is made up of senior civil servants from 10 departments.

The information Society Policy Unit (ISPU): This unit based at the Department of An Taoiseach has overall responsibility for developing, monitoring, co-ordinating and driving the implementation of the IS agenda. The ISPU also has functional responsibilities for the areas of eGovernment, the eCabinet initiative. The ISPU in

conjunction with the Department of Finance, also has the task of evaluating submissions to the Information Society Fund.

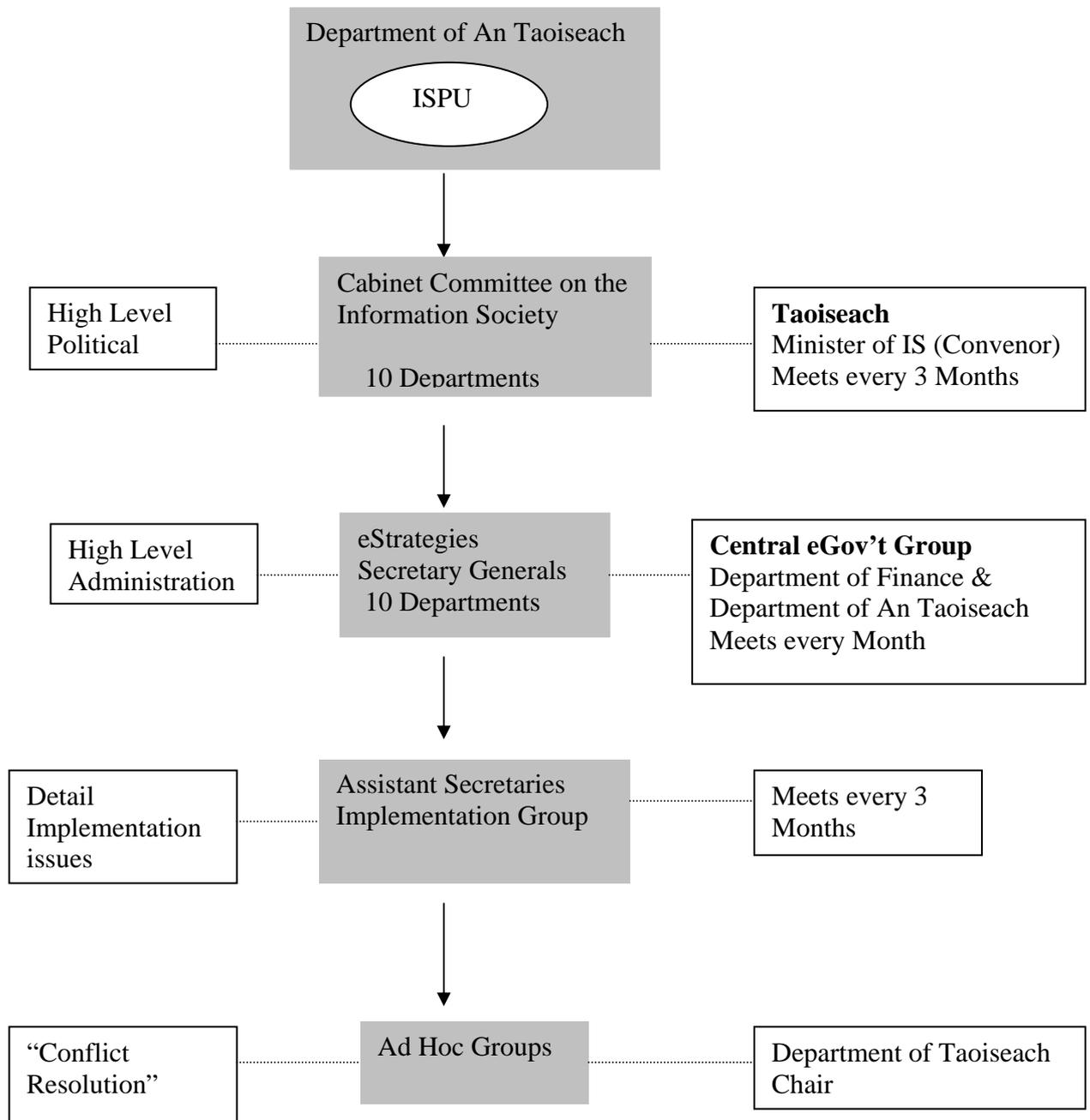
Figure 1 shows the IS structure at the high levels of government, the role of the committees and the frequency of meetings.

The government also appointed a second Information Society Commission (ISC) in 2001. The ISC is an independent advisory body to the government and is appointed by the Taoiseach. The role of the ISC is to provide independent expert advice to government and to help monitor Ireland's progress with respect to the IS.

According to New Connections the new arrangements were

“...designed to deliver a more coherent overall approach, at the highest levels of government, to formulation and implementation of policy on a wide range of issues that increasingly cut across traditional departmental boundaries-between Departments and Agencies and between central and local government” (New Connections p4)

Figure 1: High Level Structure of the Information Society



4.2 IS Policy Governance

The main government department with responsibility for IS policy is the Department of An Taoiseach. Within this department, the Information Society Policy Unit (ISPU) has the main responsibility for managing the IS policy cycle of agenda setting, implementation and learning. It also has responsibility for monitoring and evaluating the process of IS policy implementation.

4.2.1 Agenda setting

The original impetus in the mid-1990s for the development of an IS policy agenda came from Fórfas and the Department of Enterprise, Trade and Employment (DETE). After the report from the Information Society Steering Committee in 1996, the responsibility for the overarching strategy for the IS passed to the Department of An Taoiseach (and from 2001 the ISPU within that department). There has been no White Paper or policy document outlining the broad government vision with respect to the IS. The general strategy for the development of the IS has been conveyed in the two Action Plans (the 1999 Action Plan and New Connections 2002) developed by the Department of An Taoiseach in consultation with the various government departments. In these documents the government set out the priorities for action and nominated the departments that would take lead responsibilities for these areas.

In New Connections (2002) the government prioritised seven strands of policy. Three of these areas of policy (the development of the telecommunications infrastructure, of the legal and regulatory environment, and eGovernment) were identified as key enabling measures necessary for the implementation of the IS. The four other strands of policy (ebusiness, R&D, lifelong learning and eInclusion) were seen as necessary to underpin the development of the IS. The actual development of the policy agenda for each one of these seven areas was delegated to the departments with jurisdiction over those particular policy fields. The Department of An Taoiseach and the ISPU, however, took responsibility for the development of the eGovernment policy agenda, an area that crosses all government departments.

One result of this agenda setting structure is that the different strands of IS policy have been developed by the government departments with responsibility for those particular areas. The strategy and concrete policy initiatives for ebusiness, for example, has been developed by the DETE and Fórfas, along with two industrial development agencies, EI along with the Shannon Development Agency. The Department of Education and Science has developed the policy programme for elearning and life-long learning. Numerous departments and agencies have been involved in the development of specific programmes on the issue of einclusion. The development of policy with respect to the telecommunication infrastructure has been mainly the responsibility of the Department of Communications, Marine and Natural Resources (previously Public Enterprise), though other departments have also had responsibility for the development of specific policy initiatives in this area. To a large extent therefore the IS policy agenda has been a combination of measures designed to extent the use of ICT, and above all the internet, with the broader policy agenda already being followed by of the various government departments. This structure for setting the IS policy agenda means that the extent to which the IS policy agenda has an innovation component depends to a large extent on whether the various government departments, and above all DETE and related agencies, are following an innovation agenda (this will be discussed in the context of specific case studies on egovernment and ebusiness).

A second important issue related to this agenda setting structure arises from the dual role of the Department of An Taoiseach and the ISPU in both coordinating the overarching IS policy agenda and at the same time taking responsibility for egovernment. Though all departments report to the ISPU the progress being made in their respective areas of responsibility, the IS structures created around New Connections (and above all the ISPU) are identified mainly with the area of egovernment, a complex agenda that crosses all government departments.

How policies are determined and priorities set within departments is less clear. Much of the initiative for specific IS policy measures is left to the Heads of Units who have the responsibility for developing concrete policies. At this level the process of designing policy and setting priorities seems to be relatively haphazard and contingent, subject to a number of immediate pressures (including pressure from well

organised stake-holders, the availability of different budgets for specific policy initiatives, the amount of resources in terms of people and time dedicated to that policy area, the particular motivations of the individuals in charge of that policy area). Issues of policy coordination between different agencies and policy units arise at this stage. One example of this is the work of the two industrial development agencies (the IDA and EI) under the coordination of F6rfas. A close working relationship exists between these three bodies. The Chief Executives of the three agencies sit on each others boards, so at senior level there is a sharing of strategy. However, at the operational level, the extent to which there is policy coherence and coordination between these three bodies will often depend on the specific project. Recently, for example, the three agencies took the decision to focus attention on the development of policies for the digital content industry. However, from this shared overall strategy, the IDA and EI picked “different flavours”. The result is that the two agencies are focusing their efforts on different sectors of the content industry with the loss of opportunities for synergies. In this case the lack of policy coherence is not a product of the lack of horizontal coordination between agencies but is a reflection of different needs in the two sectors of industry (foreign-owned and indigenous). This example indicates that lack of policy coherence may be a reflection of different stages of development, different needs and time horizons. In such situations the achievement of policy coherence across or even within government departments may not be a desirable outcome.

Stakeholders

Since much of the IS agenda is being developed by separate government departments, IS policy is being influenced by the various stakeholder groups that influence the policy agenda of the specific departments involved. At a high level of government there is one formal and official forum for IS stakeholders, the Information Society Commission (ISC). It is also clear from our interviews that powerful interest groups, for example multinational corporations with large investments in Ireland, have access to ministers and senior civil servants and can influence particular aspects of the IS policy agenda.

The ISC

The second ISC was appointed by the Taoiseach in 2001 to advise government on issues related to the IS. This is the main formal forum for IS stakeholders outside government and includes representatives from some of the large MNCs operating in Ireland, industry associations, chambers of commerce, trade unions, county councils, NGOs, and numerous regional bodies.

Initially the ISC established some working groups around areas relating to the implementation of the IS, but as an advisory body the Commission found it difficult to make a clear contribution in this area. More recently therefore the ISC has been focusing on issues such as developing a better understanding and establishing a broader consensus around the meaning of the IS. Amongst the issues the ISC is discussing at the moment are the relationship between ICT and productivity as well as the relationship between the IS and the development of Ireland as a knowledge-based society (see for example ISC 2002).

The ISC has produced a number of reports (for example in the areas of ehealth, the knowledge society) which have been passed to the assistant secretaries implementation group for consideration. Some of the members of the ISC interviewed for this project indicated that the ISC was not a powerful stakeholder in the IS policy making process. It is also clear that within the ISC some interest groups are more influential than others, for example the interests of the large multinational companies operating in Ireland have a more powerful voice than those of the smaller indigenous firms and certainly more influence than consumer groups.

4.2.2 The evolution of the IS agenda

Over time there have been important changes in the IS agenda in Ireland. As discussed in section 3, up to the mid 1990s, the policy agenda focused on attracting various waves of FDI from ICT MNCs and international traded services. From the mid-1990s the policy agenda broadened into one of societal engagement with the internet. At this

stage the thinking around the IS was dominated by the notion that the internet was the IS and as long as there was widespread engagement with the internet you had a successful Information Society. Central in this thinking was the notion that improvements in productivity and value would arise automatically with the introduction of these new technologies. The collapse of the dot.com bubble and the slowdown of economic growth rates (resulting in a slowing down of the move towards internet adoption) as well as the experience with egovernment and ebusiness in the indigenous sectors of the economy has led to a new discussion amongst sections of IS policy makers about the meaning of the IS.

According to a number of policy makers interviewed for this project, one of the issues that is increasingly being discussed at the highest level of IS policy making, is the link between ICT (including the internet) and productivity. Discussions about the relationship between the new technologies, organisational and managerial innovation, along with investment in human capital and the relationship between all these factors and productivity are only crystallising at the moment. A number of our interviewees raised that there was no shared understanding or consensus in the policy-making system on a number of these issues.

One area where the relationship between the introduction of ICT and organisational change has increasingly dominated discussions is egovernment. The objective of the 1999 Action Plan was the online delivery of public services. Since the publication of *New Connections* in 2002, there has been an attempt to shift the emphasis from one purely focused on the internet to one where the introduction of ICT is linked to the programme of modernisation of public services (a programme which has been going on for about ten years). It is interesting that the ISPU, who has responsibility for both overall IS policy as well as for egovernment, is now attempting to shift the focus of the discussion away from the E in an attempt to redirect attention from technology issues towards the reorganisation of business processes. The ISPU (which will be dissolved at the end of 2004) is now calling for the establishment of a government CIO with responsibility of developing the technology strategy within the public sector and for the establishment of a new body focusing on organisational and managerial change within government. From their point of view egovernment and the 'Information Society agenda', understood as the diffusion of the internet, is no longer

seen as relevant and the key issues are linked to organisational and managerial change to take advantage of ICT (see section 5.1).

4.2.3 Horizontal Policy Coordination and Implementation

The implementation of the IS policy agenda has required a major effort of horizontal and vertical coordination throughout government. To a large extent the coordination structure for the implementation of the IS has been given by the two Action Plans which have focused and unified the efforts of the various government departments. At the same time since the departments and agencies had to report on progress in their respective areas of responsibility, a reporting structure developed around the Action Plans. This policy implementation structure has been greatly facilitated by the creation of an Information Society Fund managed by the Department of Finance along with the ISPU. The Fund was set up by government in order to enable prioritisation of projects in the 1999 Action Plan and has acted as a catalyst for numerous projects related to the IS across the different departments.

The formal structure for the implementation of IS policy has been set out in section 4.1. The main political body is the Cabinet Committee on the Information Society which brings together the Ministers that have responsibility for areas under the New Connection Action Plan. The role of the Cabinet Committee is to take a high-level political view of the IS agenda. The eStrategy Group of Secretaries General complements the work of the Cabinet Committee and is also responsible for high level administrative decisions. The Assistant Secretaries eGovernment Implementing Group has the objective to ensure that IS policy is implemented in a coordinated manner across all government departments and agencies. All these committees link their work to the Action Plans and have substantial budgets. Our interviews suggest however that this structure has not been effective in coordinating the efforts of the various government departments outside the area of e-government.

There have also been numerous inter-departmental working groups and committees formed around specific policy areas such as telecommunications, skills-needs, e-business and e-inclusion. These inter-departmental committees have been formed on

an ad-hoc basis as the need for coordination arose. Much of the coordination between departments has actually taken place in these specific committees. Along with the inter-departmental coordinating bodies, most departments have created special units to develop and implement policy measures related to the IS. These units have had the role of coordinating the various divisions and groupings within departments with respect to IS policy. For example, the ICT Policy Unit at the Department of Education and Science manages the formulation and implementation of IS policy, including the coordination of a number of measures, within that department (New Connections). Within the DETE and affiliated agencies, e-business units have been created which work closely together. In this respect the IS agenda has created a number of collaborative initiatives within and across departments.

The role of the ISPU in coordinating the implementation of the IS agenda across departments is complex. The unit has responsibility for driving the implementation of the overarching IS strategy around the New Connections Action Plan. The fact that the ISPU was located within the Department of An Taoiseach has given the unit the authority to coordinate policy between the various departments. One of its key roles, for example, has been to mediate between departments when there is conflict over the implementation of IS policy. If there are disagreements between departments there are no formal processes of arbitration, the procedures are entirely informal; in this respect the ISPU has played an important role in 'oiling the wheels' on interface issues. On the other hand, as discussed in section 4.2, the ISPU is more closely associated with the area of e-government than anything else.

The above represent the formal structures of coordination in the policy system. Informal networks, however, are just as important. Ireland is a small country where social networks are often the mechanisms for information exchange and contact both inside and outside government. Our interviews confirm that much of the contact between departments and agencies and between the policy making system and stakeholders are in fact informal.

Though there are numerous examples of coordination problems and difficulties (see for example the discussion on e-government), our interviews give a mix picture with respect to the extent to which departmentalisation is an impediment for horizontal

policy coordination. Some of our interviewees in senior positions in the policy making system referred to the difficulties in getting departments to work together on a continuous basis. It was argued that part of the explanation for this was a history of weak strategic decision-making at top government levels and a political system which was short-termist in outlook creating problems for policy cohesion. It was suggested that groups of ministers would have to work together for significant periods of time for consensus to build up and filter down the system. Other interviewees however expressed the view that there were no major structural or organisational impediment to policy coordination (the implementation of the IS Action Plans were given as examples of this). It was argued that access to the various levels of decisions making was relatively easy and that the system was relatively flexible from the point of view of inter-departmental interactions. It is clear however, that a key role in the creation of horizontal linkages was played by individuals in the system that seemed to be well informed about initiatives taking place in other departments, that were conscious of possible policy links and synergies, and had the authority and drive to take initiatives.

4.2.4 Policy evaluation and learning

The ‘modernisation’ of the public sector including the concept of ‘evidence-based policy making’ has been part of the policy agenda in Ireland for the past ten years. Our interviews suggest that a number of reforms have taken place in the civil service that have made the policy making process more professional, more flexible and more agile. It is probably the case however that important differences exist between government departments and even within different units of the same departments.

With respect to the IS, the Department of An Taoiseach, and specifically the ISPU, constantly monitor and evaluate progress with the implementation of IS policy. The main mechanisms for evaluation are the progress reports structured around the specific actions set out in New Connections. The only evaluation criteria here are the target dates for the completion of projects set out in the Action Plans. Similarly at the level of the specific units developing and implementing policies for the IS, their main evaluation criteria is the extent to which internal targets have been met.

The key issue that arises from these methods of evaluation therefore is how targets are set. Some of our interviews indicate that targets are set by management without real discussion about their meaning and relevance. In these cases targets are not used as a mechanism for policy evaluation and learning but have more the characteristics of an accounting exercise. This would tend to happen when the managers responsible for a particular area are under-resourced and when this particular policy area is not their main concern. In other cases, however, the development of targets is a serious exercise related to the expectations from particular policy initiatives. In these cases meeting or not meeting targets does lead to policy learning. International benchmarking is another mechanism for policy evaluation. Some of our interviews indicate that these exercises are not coupled with policy learning but are mainly used to compare Ireland's performance in relation to other countries. In other cases, however, international benchmarking is used to open up more in-depth discussions about international differences in performance. What these two cases demonstrate is that target setting and international benchmarking can open deeper discussions about performance leading to policy learning but it depends how they are used. Our interviews suggests that there are differences in the use of these tools across the IS policy making structure.

Apart from international benchmarking of performance, learning from the experience of other countries through participation in international, and above EU, forums is important. This is not only at the level of the official meetings but also as a result of numerous unofficial international networks. It is also the case that various government departments have offices in the USA and Asia, whose task is to inform about developments outside Europe. The Department of Communications, Marine and Natural Resources for example has offices in the USA and Singapore to monitor developments, including technological developments, in those areas. The same is true for EI and the IDA.

4.3 Link between IS policy and Innovation Policy

Engagement with the IS agenda started at a very special conjuncture in Irish economic development. As discussed in section 3, from the late 1980s the economy experienced high levels of economic growth largely driven by the activities of multinational firms located in Ireland. From the mid to late 1990s policy documents begin to reflect concerns about the sustainability of this high growth based on the existing model of low cost competition. The idea of moving ‘up the value chain’ towards a ‘knowledge economy’ is raised as an alternative model of economic development. In this context, the ST &I agenda increasingly begins to appear in the policy documents of the late 1990s. The late 1990s is also a period of important policy initiatives in the Irish science and research system (for example the PRTLTI and Technology Foresight exercise). This emerging concern with ST&I policy finds reflection in the two IS Action Plans which acknowledge the importance of R&D and innovation in the development of the IS.

Though the two Action Plans acknowledged the importance of ST&I, the task of linking these policy areas with that of the IS was delegated to the DETE and associate bodies and agencies (namely Fórfas, the IDA and EI) and to a lesser extent the DES. There are important areas of policy where the concerns of the IS fit well with those of the government departments and agencies responsible for enterprise development and innovation policy. For example, one of the areas of priority of Fórfas and Enterprise Ireland is the development of the informatics sector (this includes the traditional software sector, technologies for the telecommunications industry, the digital content industry) (see Enterprise Ireland’s ITS 2007). These policy areas are being developed with no involvement of, or link with, the policy bodies developing the IS agenda. Because of the reporting structure organised around New Connections, the DETE and the DES, do inform the ISPU of progress made on a number of initiatives where the IS and innovation agenda converge (see for example New Connections: Progress Report 2003, 2004). The ISPU monitors progress with respect to the targets set out in the Action Plans but it does not engage in any depth with the implications of progress being made in the area of innovation for the IS.

The ISPU only concerns itself with innovation in so far as it has a bearing on e-government¹¹. It is clear from our interviews, both with the ISPU and the various bodies involved in innovation policy, that the ISPU does not see innovation as part of its remit. There are in fact no formal linkages between the ISPU and bodies such as Fórfas, EI, the IDA, IRCSET, SFI concerned with innovation. The only indirect linkage that exists is through the IS Fund where these bodies can apply for funding for some of their initiatives. This has meant that in at least one policy area - government procurement- where policies for the IS could have had a powerful impact on innovation, opportunities have been lost. Section 5.2.2 discusses in more detail the link between the areas of government procurement and innovation policies, our interviews indicate however that one of the main reasons for a lack of policy coherence in this area is the perceived conflict with competition policy. This indicates a conflict between innovation policy and competition policy, including EU competition policy, to the detriment of innovation policy.

Our interviews also show that even government departments and agencies that do have a clear mandate in the area of innovation policy, for example the DETE and EI, are often not linking the IS with innovation in the design and development of policies (Section 5.2.1 discusses these issues with respect to e-business). Our interviews indicate that this lack of coherence between these two policy areas is not mainly one of organisational structures, that is the lack of horizontal coordinating mechanisms, but is also related to the extent to which the innovation policy agenda has been adopted, understood and implemented by the relevant policy bodies.

One factor that tends to limit the possibility of horizontal coordination between departments and agencies is the complexity of the various agendas that are being simultaneously pursued by government. These agendas involve complex issues and there is often no consensus around them. In many of these policy areas innovation can play an important role but it is not the main issue. In these circumstances an innovation agenda will only develop to the extent that the bodies implementing policy understand where innovation presents a solution to their problems. This is an issue related to the understanding of the role of innovation rather than coordinating

¹¹ The ISPU define innovation as the re-designing of business processes.

mechanisms. In these situations the role of education, information, and creating awareness of the role that innovation can play in different policy areas is far more important than coordinating mechanisms. In these instances, rather than formal coordinating structures, the link between innovation and other policy areas can be better made by well placed individuals within the system who can spot where synergies exist. This suggests the importance of informal linkages and networks and of a policy system that allows initiative and an element of experimentation.

The research undertaken for this project indicates that in the case of Ireland the innovation agenda has not yet been widely understood and adopted by policy circles outside the STI area. This seems to be one of the key reasons for the lack of coherence between IS and innovation policy. According to several of our interviewees in senior positions, a debate is currently taking place in the policy making system about the relevance and therefore the priority that should be given to ST&I policy. At the heart of this debate is whether the policies that drove the period of economic growth of the 1990s are the same policies that should be promoted today. Some sections of the policy making system are arguing that though R&D and innovation did not drive the growth of the 1990s they are essential for the next period of growth. These ideas however have not yet been accepted throughout the policy making system.

As discussed in sections 3.4, research and innovation as a public policy agenda is relatively recent in Ireland, dating to the late 1990s. Though the 1980s and 1990s saw examples of policy measures that encouraged technology adoption and that promoted R&D, the recent initiatives in innovation policy have tended to be aligned with science and research policy; in this sense innovation policy in Ireland is closer to first generation (technology push) models. It is the changes that are taking place in the academic research system, along with issues such as the commercialisation of research, intellectual property rights and the creation of high-technology start-ups that have dominated much of the recent policy discussions. The need for a broader innovation policy has only recently begun to emerge in policy circles and there is at the moment no consensus across the public policy process of what innovation policy should be. This debate is not only between government departments. Our interviews show that the innovation agenda has not reached sections of the policy making system even within the government departments that are most closely associated it.

5 Case-studies

This section look at two areas of policies which have been important for the IS and discuss their link with innovation policy. Section 5.1 looks at the area of e-government. Section 5.2 looks at the area of enterprise development.

5.1 E-government

This case study on E-Government highlights two central issues: first the evolution in understanding and policy focus for e-government and second the complexities that have been encountered in the co-ordination of e-government. One of the central developments in agenda setting for the Information Society was the introduction of strategies for the implementation of e-government. The initial objective of this agenda was to provide integrated public services online, facilitated by the introduction of centralised, Internet-enabled technology. At this stage the assumption was that the introduction of the Internet would be sufficient to enable the required level of process integration among departments. The focus of modernisation policies had encouraged individual departments to use IT to gain process improvements; the e-government agenda differed in that it demanded inter-departmental integration. As a result the policy focus encouraged the development of front end online access to services without emphasis on re-organising back end processes.

Over time the implementation of this policy has lead to significant implementation problems. The complexity of co-ordinating the multitude of service providers has hindered the development of e-government both in terms of technical compatibility and issues of organisational change. As a result the policy focus has recently shifted from a reliance on the Internet to provide a mechanism of coordination, to consider issues relating to wider ICT productivity strategies for modernisation in the public sector. Towards the end of 2004 the ISPU will be dissolved on the basis that “The Information Society is here” and its final recommendation is that two offices be set up: first a Central Information Officer to deal with technical issues of compatibility and the second is the Office of Innovative Government to oversee the introduction of

process change in government departments¹². As such this case study provides an example of an evolving policy agenda where implementation issues have led to clear policy learning.

Pre ‘Information Society’ Modernisation Agenda

As a precursor to specific mandates for e-government initiatives, there have been a number of government policy documents that relate to the modernisation of the public sector. These national programmes are relevant in providing a context for the subsequent development of policy for e-government, as the potential of Information Technology (IT) is developed as a core component of the modernisation agenda.

These agendas advocated the use of office technology in tandem with changes in basic reporting structures, and information management practices involved in individual departments. At this stage the focus was on superficial improvements in work processes rather than fundamental re-designing of processes and organisational structures.

From the late 1990’s the modernisation agenda became linked with e-government with the intention that the Internet would provide easy access to citizen-centred services. This conception was initially outlined in the Action Plan 1999 and developed in New Connections 2002. Both of these documents were released before their EU counterparts; Lisbon strategy published in March 2000 and eEurope 2005 in June 2002.

Policy Formulation for E-Government

In January 1999, the first action plan for the Information Society outlined a three-strand approach to online delivery of public services: information services, interactive services and integrated services. The objectives of information services were to mandate government agencies to develop web sites for the purpose of providing better access to public service information. This strand also set standards for web site

¹² At the time of interview the ISPU was still formulating the roles and locations of both the CIO and the Office of Innovative Government

development to ensure the needs of people with disabilities were met. The focus of interactive services was to guide the development of electronic service delivery, electronic payments, and other electronic exchange methods between government agencies and citizens. Various pilot schemes were identified for the purpose of developing delivery channels for e-government services. Finally, integrated services gave recognition to the organisational complexity in developing fully integrated services and proposed a detailed examination of the technical and organisational issues involved to ensure successful implementation.

The plan spearheaded the drive to make better use of the Internet for information dissemination and introduced the concept of a portal as the possible architecture of a public service access interface. Towards the end of 2000 the Reach agency was officially established to implement e-government strategy and to provide management of the overall e-government initiative.

Central to achieving our strategic targets for e-government is the Reach agency – this body has the essential responsibility of managing the complexities involved in developing better services and in ensuring the support of service agencies for the implementation of the PSB.

Department of An Taoiseach, 2003

Initially Reach was composed of 11 members, all civil servants who were drawn from a variety of departments, reporting to the Department of An Taoiseach. The Reach agency was given responsibility over two strands outlined in the 1999 Action Plan: the development of an electronic access interface for interactive services and to research the technical and organisational issues involved in developing integrated services. The concept of a portal based Public Service Broker (PSB) was adopted by Reach as the central mechanism for delivering these objectives (figure 1). The PSB will provide a single point of access to all services of both central and local government. The revolutionary aspect of the PSB is that the service is to be provided from the customer's perspective not the service provider. The PSB will make services available through many access channels; these include online self-service, assisted service through telephone contact centres and one-stop shops.

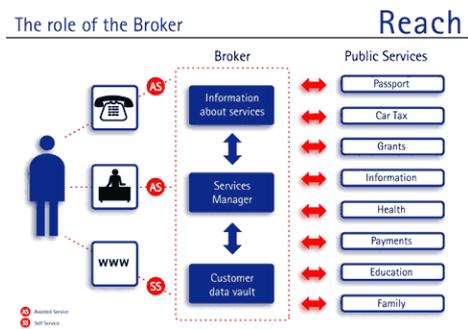


Figure 1: The Public Service Broker, Source: Reach internal documentation

In April 2002, the second government action plan entitled ‘New Connections’ was published. At the centre of this policy document was the decision to use IT and in particular the Internet to facilitate the implementation of e-government. The model of the PSB was endorsed in the document and the introduction of pilot schemes for the development of integrated services from multiple access channels prioritised. The pilot schemes, which included both online and offline initiatives, were also identified as appropriate to test various organisational models necessary to support service integration. The government also made a commitment to have all public services capable of electronic delivery available through a single point of contact by 2005.

Policy Implementation

In response to a clear mandate to modernise service provision, local and national agencies took the initial step in 2000 of developing individual web sites, providing detailed information to citizens and businesses respectively. The OASIS www.oasis.gov.ie and BASIS www.basis.ie web sites were also launched, providing detailed information on government services to citizens and businesses respectively. With a focus on customer requirements, these sites broke the long standing tradition of distributing government information along functional lines.

However, the critical development of service delivery in government agencies was the provision of a centralised portal. The central challenge to implementing e-government policy was to have every local authority paper based form available online for electronic download and submission. Each of the 114 local authorities had over 100 forms that they required to be individually customisable; this resulted in a total

requirement of in excess of 13,000 forms. Reach thus identified the need for an efficient system for managing forms and an accessible location for delivering forms. To meet this requirement, LGCSB (Local Government Computer Supply Board) developed a centrally administered system that would allow each local authority access to an electronic form builder. The form builder tool enables the local authority to create their customised form that is then uploaded onto the reachservices site. Each local authority administrator can select which e-forms are to be made available for their authority and can customise or edit those forms online. Reach, in partnership with LGCSB, progressed the development of e-forms and enabled the provision of an interim level PSB. This development was called reachservices.

Pilot Initiatives

Two delivery channels have been developed to interface the PSB: online access through the pilot reachservices site and physical access through a counter, shop front. The primary development in providing online access to services was the portal reachservices. This delivery channel allows registered users to submit forms electronically to the relevant department. Part of this registration is an authentication process that is managed by the Department of Social and Family Affairs. The individual may then access the reachservices site using their Personal Public Service (Social Security) number and password. This provides the authority with proof of the individual's identity and enables features like intelligent form filling – a feature that allows certain fields to be populated automatically based on the information stored on each citizen. At present the front-end interface is fully automated while the back end system still relies on human interaction.

The strategy adopted by the Irish government for developing the physical channel has been to test a pilot initiative in a selected area. Reach chose Co. Donegal to pilot the physical channel of the PSB and was supported by central government with an allocation of Euro 1.8 million to the research and development of the project. Reach believed Co. Donegal to be an appropriate test site for a physical channel as the incidence of PC ownership and Internet connectivity are not high in that area. Furthermore, senior management in Co. Donegal predicted that there would be

significant need for assisted or mediated access to the Public Services Broker, particularly for sections of the community that require regular or frequent access to public services, such as the socially excluded (DCC, 2001).

At the centre of the pilot scheme was the development of Integrated Service Centres (ISC). These centres offer integrated services to local citizens, delivered through physical channels. The ISC provides a range of core local government services e.g. housing and unemployment services and has developed an intermediary service from which services can be activated as well as the provision of detailed information and advice. In the past citizens were required to contact every agency involved in the delivery of a particular service, for example, to avail of housing services citizens were forced to contact the North Western Health Board, Donegal County Council, the Department of Social Community and Family Affairs and the Revenue Commissioners individually. The ISC however, has developed sufficiently effective collaboration between local agencies that the citizen is only required to make a single interaction with the ISC to expedite the service. The process of developing the ISC was initiated in 1999 and a total of six ISC are planned for County Donegal with 4 currently in operation.

Implementation Problems: Local Authority Involvement and Support

Initially the reachservices portal was adopted by every local authority and by the majority of health boards. Customisable forms combined with the usability of the form builder and the existing relationships between LGCSB greatly impacted on the rate of buy-in by the local authorities. Recently however, the level of support for reachservices has significantly deteriorated among local agency stakeholders. Two main issues have emerged in the implementation process: technical problems in providing services through the PSB and organisational obstacles hampering the necessary managerial and work-process changes.

Local authorities reported that the main reason for the current lack of support for reachservices is that e-government development at a technical level is inadequate. Only two local authorities stated that their service departments had the technical

ability to receive forms submitted from citizens and in these cases there was no means to electronically process the form. For one of these local authorities, although the form could be received by the relevant agency, the service could not be progressed until an identical paper-based form was also received from the citizen in the traditional physical manner.

Part of this problem stemmed from the lack of progress made between local and national government service providers in developing common technical communication standards for the PSB. Historically, agencies and local authorities have developed information systems and data storage and communication standards autonomously and as a result many of the current systems in operation are incompatible. Attempting to integrate all service providers to a central portal whereby sensitive citizen data can be transferred securely is not only an extremely complex technical task but also one requiring significant managerial support from the agencies involved. In this case the Reach agency has not been able to achieve sufficient consensus to effect the necessary technical changes.

A further obstacle arose from the complexity inherent in the business logic required to process service application forms. Many local authorities reported that the process logic for their forms were too complex to be implemented digitally on the PSB. For example, many application procedures required interaction and data from a number of different government departments as well as the flexibility to account for the variety in potential user. In some cases data may not always be digitally available or would contravene data protection rules if supplied. There was concern that a sufficient level of human interaction in the application procedure was not easily replicable online. As a result of this complexity the technical framework of the PSB was regarded by local authorities as not appropriate for the majority of their services.

The other major implementation issue centred on the organisational implications required by the introduction of the PSB. In order to complement the technical changes introduced by the PSB organisations were required to make changes to work processes and managerial structures to support data integration and provide a more citizen-centred service by co-operating with other service departments. In this

instance local authority IT managers acknowledged that local authority managers were resistant to initiatives that required changes to existing power structures and displayed aversion to committing funds to experimental projects. Local authorities identified a lack of involvement from Reach in local development issues and highlighted the need for practical frameworks from which to implement necessary organisational changes.

Local authorities also noted that they have had little or no contact with central government in formulating a national strategy for e-government and that their attitudes or opinions regarding the process of e-government implementation have not been requested. Furthermore, each local authority has met only once with the Reach agency, during its official launch in 2000. Most local authorities believed that the initial drive to put services online was to satisfy the imminent benchmarking test that was to be conducted by the EU in 2002 and that subsequently there has been a lack of commitment and pressure for development at a senior management level. As a result local authorities have become resistant to certain initiatives, in particular reachservices, and believe that senior management were interested only in presenting services online and were not supportive of initiatives that sought to e-enable back-end processes.

Innovation by Local Government

One exception to national e-government implementation was Donegal County Council (DCC). In this case back-end redesign was prioritised and significant organisational restructuring was achieved to support this. DCC reformed its organisational structure to support the process of developing innovative services through the ISC. By replacing the traditional, bureaucratic structure, senior management in DCC delegated decision-making to the area management level to foster novel inter-agency working relationships that created new work practices and organisational processes. The decentralisation of the management structure allows decision making to occur in the distributed locations of the ISC and promotes cross-functional activities between service providers.

The process of organisational restructuring was identified by management as critical to achieving better co-operation between agencies and to create an environment that will support the introduction of new technologies. An important feature of the process of organisational restructuring was the delegation of authority to the local management level. This is a radical change from the traditional bureaucratic reporting framework of the Irish public sector, but was deemed essential to support the process of developing cross-agency linkages in the provision of services. By allowing local management greater decision-making abilities, senior management enabled the creation of more productive working relationships among local departments. Not only has this increased the usefulness of relationships that can be formed, but the consequent service to citizens has also resulted in being more effective and coordinated.

The development of inter-agency collaboration has further enabled departments to provide a more flexible and responsive service: given the decentralised nature of the ISC and the closer contact with other service agencies, local managers are better able to form a deeper understanding of citizen needs and a more holistic appreciation of the services provided by local government. This case of organisational restructuring has resulted in an increased need for customer relationship management and has further enabled management to view the service they had traditionally provided from a departmental perspective from a citizen-centred one.

Conclusions and Future Directions for E-Government Policy

The approach adopted by the Reach agency implicitly assumed that the technical approach to implementation would be sufficient to foster co-operation and inter-operability among departments and thereby deliver the e-government agenda. As this has become clearer the focus has moved from a focus on technology to one more concerned with re-organising business processes. Implementation problems have been found in both the technical challenge of implementing e-government but also the organisational element of introducing e-government strategies. As a result it appears that the evolution of policy has now begun to focus more on the re-organisation of business processes, as has been progressed by management in Donegal. In this instance identifying and including stakeholders in the change process was essential to

identify and resolve important developmental issues to support the achievement of e-government policy.

Although, the technical developments of reachservices were innovative, through the complex task of organizing and presentation of more than 13,000 forms online, the lack of co-ordination of local service providers denied the portal basic transacting functionality and was limiting to the overall implementation of E-Government policy. The failure to establish common technical standards among service providers, an essential feature to allow for electronic communication in the process of providing e-enabled services was further highlighted by the Information Society Commission in 'Building the Knowledge Society' and 'E-Government: more than an automation of government services' highlighting a concern that a lack of standards and specifications had the potential to undermine the implementation of the e-government agenda.

A report produced by the Information Society Commission, also reports similar findings indicating that the agenda for the IS has evolved (ISC, 2003). The report highlights the importance of streamlining and re-engineering back-end processes in order to fully e-enable services. In addition to delivering services online, the report also highlights the potential of e-government to improve the quality of existing services delivered through more traditional channels. Due to the lack of back-end development, this report believes that the development of e-government in Ireland is unlikely to achieve the target of providing all appropriate services online by 2005 (ISC, 2003). The recommendation for the future of the PSB highlights the implementation of certain shared services common to a select number of departments.

The ISPU and the Department of the Taoiseach have indicated that the development of e-government policy will highlight the need for innovative improvements to government processes and better co-ordination between government departments and agencies. Information technology will play an enabling but not central role in this strategy. In particular officials in the Department of the Taoiseach stress a growing awareness of the need for a new corporate or enterprise centre which would dictate policies in relation to technology deployment and procurement to ensure that there is

interactivity and interoperability in government; it is proposed that a CIO is introduced to ensure that technology is exploited effectively in the attainment of better government. The ISPU also has proposed the Office of Innovative Government to oversee the introduction of measures aimed at gaining innovative improvements in government processes.

5.2 Enterprise Strategy

The department with responsibility for linking the IS strategy agenda to enterprise development is the DETE along with its associated agencies. Because of Ireland's dual economy structure, two quite distinct enterprise sectors exist: (i) the multinational sector and (ii) indigenous firms. This duality has also found expression in the organisation of government policy with the existence of two industrial development agencies, one with a remit to develop Ireland's indigenous sector (Enterprise Ireland) and a second agency with responsibility of attracting FDI to Ireland (the Industrial Development Agency). There are issues about the degree of coordination and coherence in policy development and implementation between the IDA and EI though the two agencies do work closely together under the aegis of Fórfas. This section focuses on the policy initiatives developed by Enterprise Ireland and the link between its policy initiatives in the area of the IS and innovation.

Enterprise Ireland has developed a two-pronged strategy for the development of IS and enterprise development. One set of strategies is concerned with the development of an indigenous software industry with a special focus on informatics and the content industry. The second set of strategies concerns the development of ebusiness in indigenous industry. These two policy areas within EI are being developed quite independently from one another. Of the two areas, priority has been given to policies for building high-technology software firms.

5.2.1 Ebusiness

The report by the Steering Committee on the Information Society (1996) highlighted the important opportunities for Irish indigenous industry opened by ICT and the

internet. Above all it allowed access to previously 'inaccessible markets' due to Ireland's peripheral geographical location. The document also pointed out that without changes in the enterprise culture in these sectors of industry growth would not be sustainable. The New Connections Action Plan set out that public policy towards the development of ebusiness would focus primarily on fostering a supportive environment (this includes issues such as affordable access to telecommunications services, a secure and predictable legal framework and driving engagement with ICT through the government's own business processes). Targeted support measures to build ebusiness capacity in the indigenous SMEs would also be introduced.

During the late 1990s a number of initiatives were organised to build awareness of the potential of ebusiness for the indigenous SME sector. These programmes were followed up by a number of initiatives to accelerate the up-take of ebusiness by SMEs. This included the establishment of the ebusiness Accelerator Fund designed to fast track significant scale projects that integrated ICTs into business processes. This programme was followed by another initiative that focused on providing strategy assistance to SMEs. One of the conditions for receiving support was to write up case-studies which could be used to diffuse the lessons learnt by firms developing ICTs strategies.

Since 1999, an ebusiness policy structure has been created within the DETE and the associated (mainly EI, and the Shannon Development Agency) There is regular and close contact between these organisations as well as with Fórfas, something which has developed as a result of the drive to implement the IS agenda. The link between the ebusiness policy groups and the ISPU is through participation of the ebusiness unit at the DETE in the meetings of the Assistant Secretaries Implementation Group. At these meeting the ebusiness unit reports on progress being made in their area. There is also a link to the ISPU through the IS Fund which has been used to finance a number of ebusiness initiatives.

Whilst originally policies focused on encouraging SMEs to adopt the internet, the focus of ebusiness policies has shifted towards promoting 'best practice' in the use of IT. The practices being promoted included issues like the need for an IT strategy, the need for back-up and security, to be careful of bespoke solutions to problems, to try

and make the best use of the internet. Innovation however is not one of the issues being actively encouraged by EI's ebusiness unit.

There appear to be a number of reasons which explain why innovation is not being actively promoted. The main one is that the indigenous SME sector tends to be concentrated in mature industries where little innovation is taking place. The majority of these firms have difficulties adopting ICT and developing basic ICT skills and are not perceived to be in a position to innovate with this technology. As a result though the DETE and EI are bodies closely associated with the innovation agenda, these organisations are not pushing this agenda. EI's mandate is to improve the competitiveness of indigenous industry, there are however numerous ways to do this including e-enablement and innovation but also world class manufacturing, better marketing, better corporate governance and many others. The bodies responsible for developing and implementing ebusiness initiatives are confronted with a number of issues and no clear guidelines on how to prioritise between them.

It can be argued that, to the extent that the innovation agenda is understood and adopted at all levels of the policy making system the measures that link ebusiness to innovation will develop. An issue here however is that the present 'science-push' model of innovation being implemented in Ireland is not seen as relevant by sectors of policy makers dealing with the indigenous sector. This particular innovation agenda however, is leading to lost opportunities. One of the areas of capabilities of indigenous software firms identified in the past was in fact the area of ebusiness. The possibility of bringing together ebusiness software firms with SMEs in order to foment learning on the basis of user-producer relationships leading to the development of new products has not been considered.

5.2.3 The development of a knowledge-Intensive Indigenous Industry and government procurement

One area where the lack of linkages and horizontal coordination between IS and innovation policy is having a detrimental effect on innovation, is the area of government procurement. Public technological procurement¹³ is an important demand-side instrument designed to enhance the technological competencies of firms by emphasising the role of the user (Lundvall and Borrás 1997). The complex interactions in technological procurement between government, in the role of the user, and firms lead to important exchanges of information and knowledge in the areas of technology and management expertise. Government procurement has been used as a very powerful policy instrument in countries like the USA where contracts have often been given to SMEs.

As discussed in section 3.3, the 1990s saw the beginnings of an indigenous software industry with innovative capabilities. In its report on the IS, the Information Society Steering Group (1996) highlighted the content industry as an area of potential development for Ireland. Since then a number of studies have been undertaken by Fórfas and EI on the content industry and a number of sub-sectors have been identified as areas of potential growth (see EI 2000, ITS 2007). One of the difficulties for the development of this sector, however, has been Ireland's relative distance from large sophisticated markets. A Fórfas study for the ICT industry, for example, acknowledged that one of the problems for Irish firms in the digital content sub-sector was a lack of local sophisticated demand. Similarly, according to this study, the e-business sub-sector had found it difficult to find relevant markets (Fórfas 2004). A study on the requirements for the development of the digital content industry carried out by Fórfas identified government sponsorship of specific projects/initiatives acting as a catalyst for skills and market development as an important factor in the development of this sector.

¹³ The placing of an order for a product or services which does not exist at the time but could develop within a reasonable time period

Public technology procurement policies to help the development of the indigenous ICT industry have not been part of the IS policy agenda. The main reason given for this is that these policies would come into conflict with EU competition policy.¹⁴ It is also the case, however, that public sector organisations, for example the public health sector, are not conscious of the links between their activities and innovation policy. One of the areas that is losing out as a result of this is ehealth, an area where Irish software firms could grow developing products for remote diagnosis. It was pointed out in interviews that the bodies responsible for the implementation of the IS, above all the ISPU, but also the DETE were not coordinating with the Department of Health or the Health Boards in order to explore possibilities for the development of software SMEs. The same is true for the digital content industry which, as pointed out by the Fórfas study, could benefit from the experience of working closely with public sector users.

Our interviews indicate that as a result of a lack coordination between the policy bodies responsible for the IS, innovation policy, and other government departments, Ireland is losing out on the possibility to strengthen its national software industry through the use of public technological procurement initiatives. As in the case of e-government and innovation policies, rather than creating mechanisms for formal coordination on these issues it would probably be more effective for units developing high-technology ITS firms to make the link between public bodies that may require a technological solution and the appropriate firms.

6 Main Findings and conclusion

Our account of the development of policies in the areas of innovation and ICT/IS shows the importance of both path dependence and radical change in policy development. While in the 1970s there was no ICT sector in Ireland, by the 1990s this industry had become a major force in the Irish economy and a powerful stakeholder in the policy making process. After period of exceptional economic growth (the years of the Celtic Tiger) the late 1990s saw a number of major initiatives both in the areas of

¹⁴ One of the issues being pursued by the Irish Software Association (ISA) is that the e-procurement programme within government should mandate that 25% of purchases be made from SMEs.

ICT and STI policy. From the mid to late 1990s we see a broadening of ICT policy to embrace the concept of the Information Society (IS), basically the diffusion of ICT to wide sections of the economy and society. The late 1990s also saw the introduction of a major drive in the area of science and technology policy. One key feature of this period has been the adoption of a policy model akin to first generation 'science-push' technology policy.

This section sets out our main findings with regards to: agenda setting, horizontal policy coordination, policy evaluation and learning and the link between innovation and IS policy.

Agenda setting: The original impetus for IS policy came from Fórfas, the policy advisory body within the Department of Enterprise, Trade and Employment. It is important to note that Fórfas' influence in the policy making system goes well beyond that of the DETE. There has been no White Paper or broad policy document outlining the government's vision with respect to the IS. Instead, the government's IS strategy has been conveyed through two Action Plans which were developed in consultation with the government departments involved.

The Action Plans set out the numerous areas of policy priorities and nominate the government departments with responsibility for each area. The actual development of each policy area however was left with the departments. As a result there has been no clear overall strategic plan for the development of the IS agenda. Instead, IS policy became the policy agenda already being followed by each department with a set of policies designed to extend the use of ICT (and above all the internet). This structure for setting IS policy means that the extent to which there is a link between the innovation and IS policy agendas depends on whether government departments are following an innovation agenda. In the majority of cases this is not the case.

The process by which the IS policy agenda is being set within each department is much less clear. Many of the specific measures related to the IS are being developed by Heads of e-Units. At this level at least the process of designing policy and setting priorities seem very haphazard, subject to a number of immediate pressures. Our

interviews suggest that at this level there is not much awareness of the potential benefits of linking IS to innovation policy.

Over time there has been important changes in the IS agenda. In the late 1990s the thinking around the IS was dominated by the notion that the 'internet is the Information Society'. More recently questions have been asked in various policy circles about the meaning of the IS. Increasingly discussions have focused on the relationship between technology, organisational and managerial innovation and investment in human capital. Our interviews indicate that at present there is no 'shared understanding' or consensus in the policy-making system about a number of these issues.

Horizontal policy coordination and implementation: In its initial period, horizontal IS policy coordination was in the hands of an inter-departmental group. Government departments also collaborated on an ad-hoc basis. Frustration at the lack of coordination and coherence of IS policy led to demands for a single agency responsible for overall implementation of government strategy. In 2001, a new set of structures based at the Department of An Taoiseach, the government department with responsibility for providing a broad strategic view of government policy, were put in place. An Information Society Policy Unit (ISPU) was created within the Department of An Taoiseach with responsibility of managing the IS policy cycle. The ISPU also took responsibility for the area of e-government a complex policy area that crosses government departments.

One of the issues that arises from our research is the confusion that exists about the actual role of the ISPU. On the one hand the ISPU and the IS structures around it are seen as a high-level bodies responsible for the IS. The fact that the ISPU plays a key role in the management of the IS Fund reinforces this perception. On the other hand, the structures around the ISPU are mainly seen to be of relevance to the area of e-government and little else. It is possible that giving this relatively small unit responsibility for e-government, a complex task in itself, detracted from its role as an overarching coordinating structure. The result is that though in theory there is a coordinating structure placed at the highest levels of government, in practice these bodies are not seen as relevant by the policy making bodies outside the area of

egovernment. Having said this, the ISPU has played an important role in mediating between departments on occasions where there has been conflict over the implementation of the IS.

Though the actual structures of the IS have not played an important coordinating role the two Action Plans have been powerful tools to unify, galvanise and focus the efforts of the various government departments in the implementation of the IS agenda. At the same time since departments and agencies had to report on progress made in their respective areas of responsibility a reporting structure developed around the Action Plans. This was made easier by the establishment of an IS Fund to prioritise projects set out in the Action Plan.

The main efforts of coordination across departments have actually occurred through numerous inter-departmental working groups and ad-hoc committees formed to resolve specific policy issues that cross departmental boundaries. It is important to note that problems of policy coordination arise not only between departments but also between the various divisions within departments and between these and their affiliated agencies. As a result, along with inter-departmental coordinating bodies, many departments have created special e-units to develop, coordinate and implement policy measures related to the IS.

Informal networks play an important role in information exchange and in aligning efforts. A key role in this is also played by individuals in the system that seem to be well informed about initiatives taking place in other departments, that are conscious of the possible policy links and synergies, and have the authority and drive to take initiatives.

Policy evaluation and learning: The main mechanisms for evaluation of IS policy are the progress reports structured around the specific actions set out in the two Action Plans. At the level of the implementing units, their main evaluation criteria are the extent to which internal targets have been met. The key issue for the effectiveness of this method of evaluation from the point of view of policy learning is whether meaningful targets have been set. The process of setting of targets is uneven. When managers are under-resource and when IS policy is not their main concern the process

of setting targets can be a formality rather than a mechanism that can lead to learning. In other instances, the development of targets is a serious exercise related to the expectations from particular policy initiatives. In these cases, not meeting targets does lead to policy learning. The same argument is relevant for the use of international benchmarking exercises. One issue that requires further exploration is the role of the large multinational management consultancy firms in the process of benchmarking and policy learning. Participating in international forums however is very important for policy learning.

The link between IS policy and innovation policy: Science and technology policy have only appeared as a serious concern in the policy agenda since the late 1990s. This emerging concern with ST&I policy has found a reflection in the two IS Action Plans which acknowledge the importance of R&D and innovation in the development of the IS. The actual task of linking these two areas of policy has fallen on the Department of Enterprise Trade and Employment (DETE) and associated agencies and to a lesser extent to the Department of Education and Science (DES). The structures around the ISPU do not see innovation policy as part of their remit. Our interviews also show however that even government departments and agencies that do have a clear mandate in the area of innovation policy are often not linking these two policy areas together. This indicates that the lack of coherence between innovation and IS policies is not only one of organisational structures, that is the lack of horizontal coordination mechanisms, but is also related to the extent to which the innovation policy agenda has been adopted understood and implemented by the policy system.

We would like Highlight two issues with respect to the difficulties of linking the IS and innovation agenda. The first is related to the complexity of the various policy agendas being simultaneously pursued by government. The agendas involve complex issues where there is often no consensus. In some of these policy fields the innovation agenda will only develop to the extent that policy making bodies understand where innovation presents a solution to their problems. This is an issue related to the understanding of the role of innovation rather than coordinating mechanisms. In these situations the task of creating awareness of the role of innovation within policy making bodies is far more important than coordinating mechanisms. In these

instances, rather than formal coordinating structures, the link between innovation and other policy areas can be better made by well placed individuals within the system who can spot where synergies exist. This points to the importance of informal linkages and networks and of a policy system that allows initiative and an element of experimentation.

The second issue is related to the nature of the ST&I policies being implemented. One of the difficulties for creating linkages between policies for the IS and innovation is the fact that Ireland's present innovation policy agenda is more akin to first generation (science-push) models than second generation innovation policy. One implication of this is that for many in the policy making system the relevance of innovation policy to the IS are not at all clear. This is true even for sections of the departments most closely associated with the innovation agenda. In the case of Ireland a broader innovation policy is needed before effective policy linkages can be made between the two policy fields.

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