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## National Dependability Policy Environments

### IRELAND

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Project Co-ordinator: RAND Europe (NL)

Partner: RAND Europe (NL, Project Coordinator); King's College London (UK);  
Cell Network (S); IABG (D); Almaweb (I); LINK (P); ELIAMEP (GR);  
Ernst Basler + Partner (CH), Isdefe (E)



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### ***Overview of the Country's Information Infrastructure***

With a population of just 3.8 million, Ireland has a relatively small economy. It has grown rapidly in the course of the past decade, however, and in 2000, the total value of Irish economic output was an estimated 110.3 billion EUROS. In the period 1995-2000, annual GDP growth averaged 9.9 %. With real GDP growth of 11.5 % in 2000, the pace of the Irish economy's expansion outstripped that of any other EU Member State for the seventh consecutive year. International economic uncertainty and lower levels of confidence domestically resulted in a sharp slowdown in growth in 2001, with real GDP estimated to have grown by 4.4%. Export growth decelerated sharply against a background of weak external demand, and will slow further throughout 2002, albeit less markedly.<sup>1</sup>

The fast economic growth of the 1990s was driven by hi-technology exports, particularly of chemicals and computer hardware and software. Industrial production, which accounted for 40% of GDP in 2000, is dominated by hi-technology multinational corporations, most of which are based in the United States. Most of what these companies produce is exported to markets in continental Europe, the UK, and North America. The importance of these firms can be seen in the large, persistent, and thus highly unusual gap between GNP and GDP. The repatriated profits of foreign firms in Ireland and Irish firms back to Ireland (that is, the difference between GNP and GDP) amounted to 16% of GDP in 2000.

Ireland has experienced a rapid growth in the information and communications technology (ICT) sector because the government has created a favourable investment environment. A number of global personal computer (PC) manufacturers, most notably Dell, Compaq, IBM and, Gateway, decided to base their European manufacturing and customer service headquarters in Ireland. The economic downturn in the third quarter of 2001, however, and the terrorist attacks in the United States have created panic in the hardware and software components of the information technology (IT) sector. The biggest loss so far involved Gateway Inc. At the end of August 2001, Gateway stated its intention to shed 900 jobs and completely pull out of Western Europe and Africa. Some estimates put the amount of money owed by the company to the Irish government at over 23 million EUROS.<sup>2</sup>

Notwithstanding the recent concerns, the Irish ICT sector has nearly 100,000 employees and it has exports of 23 billion EUROS annually. In 2000, the home market for ICT was 4.8 billion EUROS.<sup>3</sup> ICT expenditures in Ireland have grown steadily from 923 EUROS in 1997 to 1.29 billion EUROS in 2000. Since the late 1990s, the overall contribution of ICT to Ireland's GDP, nevertheless, has decreased every year. It fell from 5.66 % in 1997 to 5.35 % in 2000.<sup>4</sup> Still, there is an increasing number of professional organisation providing IT and telecommunication services.

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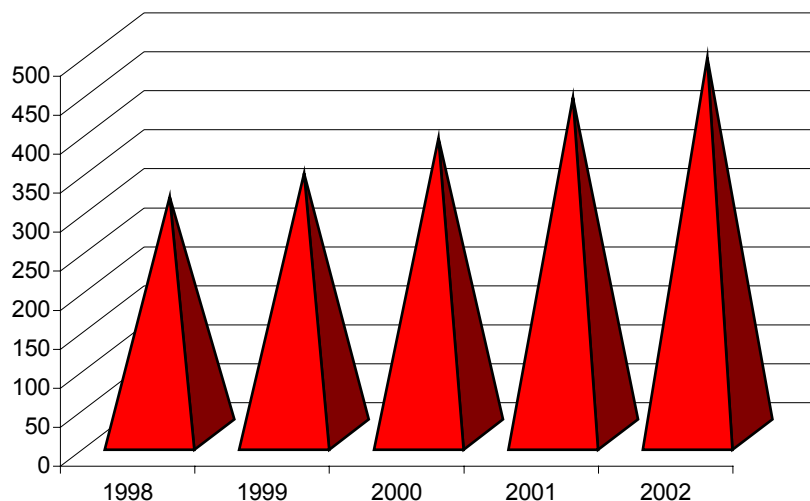
<sup>1</sup> Economist Intelligence Unit, [http://www.viewswire.com/index.asp?layout=country\\_home\\_page&country\\_id=IE](http://www.viewswire.com/index.asp?layout=country_home_page&country_id=IE) (visited on 21 March 2002)

<sup>2</sup> Ireland: 'Gateway's possible departure sends chills', International Herald Tribune, 15 August 2001.

<sup>3</sup> ICT Ireland Vision - strategy paper - 28/11/2001, [http://www.ibec.ie/ibec/press/presspublications/doclib3.nsf/\(Internet+Search\)/ICT+Ireland+Vision+-+strategy+paper+?OpenDocument](http://www.ibec.ie/ibec/press/presspublications/doclib3.nsf/(Internet+Search)/ICT+Ireland+Vision+-+strategy+paper+?OpenDocument) (visited on 21 March 2002)

<sup>4</sup> OECD, based on World Information Technology and Services Alliance (WITSA)/International Data Corporation (IDC), 2000. © OECD 2001.

**Increase in Internet and IT Services**  
(Source: EITO Report, 2001)



Statistics indicate that Ireland's Internet penetration is above the world average. 39 % of the Irish population were Internet users in 2001. Just over 10% of Irish Internet users shopped on-line.<sup>5</sup> Internet use is growing at annual rates of over 100 per cent, albeit from very low levels. Ireland is one of only two EU countries with Internet access in all primary and secondary schools.<sup>6</sup>

Overall ICT penetration in Irish households remains relatively low. Irish 'white collar' workers are believed to have the highest level of PC use in Europe, but employment in services and overall investment in IT are low, so PC usage among the population as a whole is low. In 1998, there were 15 PCs per 100 people, whereas the equivalent measure for 'white collar' workers was 78 per 100.<sup>7</sup> 39% of the workforce was using e-mail in 2000; 32% of businesses had a web presence in 1998. By 1999, 55% of businesses had a web presence. At present, 96% of Irish businesses have access to the Internet, and 77% of Irish businesses have web sites.<sup>8</sup> Finally, there is a solid increase in the number of servers in Ireland. This partially proves the increasing Ireland IT awareness.

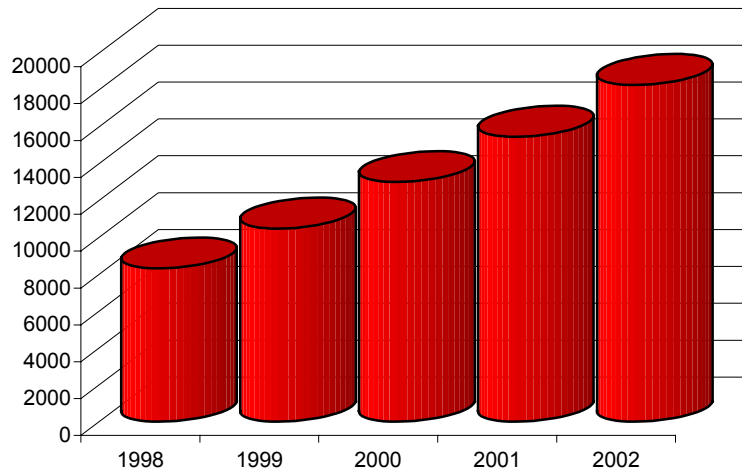
<sup>5</sup> ecommercetimes, [www.ecommercetimes.com](http://www.ecommercetimes.com) (visited on 21 March 2002)

<sup>6</sup> ICT Ireland Vision - strategy paper - 28/11/2001, [http://www.ibec.ie/ibec/press/presspublications/doclib3.nsf/\(Internet+Search\)/ICT+Ireland+Vision+-+strategy+paper+?OpenDocument](http://www.ibec.ie/ibec/press/presspublications/doclib3.nsf/(Internet+Search)/ICT+Ireland+Vision+-+strategy+paper+?OpenDocument) (visited on 21 March 2002)

<sup>7</sup> "Telework 1998": Annual Report from the European Commission, <http://www.eto.org.uk/twork/tw98/htmpages/tw98-3.9.htm#3.9> (visited on 21 March 2002)

<sup>8</sup> ICT Ireland Vision - strategy paper - 28/11/2001, [http://www.ibec.ie/ibec/press/presspublications/doclib3.nsf/\(Internet+Search\)/ICT+Ireland+Vision+-+strategy+paper+?OpenDocument](http://www.ibec.ie/ibec/press/presspublications/doclib3.nsf/(Internet+Search)/ICT+Ireland+Vision+-+strategy+paper+?OpenDocument)

**Number of Servers in Ireland**  
(Source: EITO Report, 2001)



Up until mid-2001, the development of information infrastructure in Ireland was proceeding at a pace faster than the rest of Europe, because of the country's low taxes, well-educated population, and membership in the Eurozone. Many US infrastructure providers saw Ireland as a useful way to get into Europe and as a major transit point for Internet and telecommunication networks between the US and the United Kingdom.

The government planned an Internet village, but initial funding of 126 million EUROS was halved in early 2001 amid cost concerns. Interxion established an Internet exchange centre in Dublin in May 2001 at a cost of 50 million EUROS. It remains to be seen whether other infrastructure providers will follow the IT hardware manufacturers in leaving the country.<sup>9</sup>

In just one year, the number of Internet hosts nearly doubled, from 62,400 in September 1999 to 111,300 by September 2000. By the end of that year, the number of secure servers in Ireland was the third highest in Europe, at 47.8 per million inhabitants.<sup>10</sup> The market value of telephone services (including Internet and on-line services) has increased steadily over the past five years. In 1998, the figure was 1.437 billion EUROS. By 2001, the sum had risen to nearly 1.6 billion EUROS. Investment in telecommunications infrastructure (both fixed and mobile) has risen from 209 million EUROS in 1998 to 397 million EUROS in 2001.<sup>11</sup> Ireland, however, remains the only country in Northern Europe with a level of ICT investment well below the EU average.

In terms of electronic commerce, business-2-business (B2B) activity has taken off since 2000, when an estimated 9% of Irish companies actively sold products or services via e-Commerce. In 2000, the total value of B2B trade was approximately 120 million EUROS. In terms of e-commerce, business-to-business (B2B) will be much more significant in Ireland than business-to-consumer (B2C) trade, purely because of the government's promotion of e-business as a means of stimulating economic growth. In addition,

<sup>9</sup> Country Commerce, Economist Intelligence Unit, September 2001. ( visited on 21 March 2002)

<sup>10</sup> Invest UK, [http://www.investuk-usa.com/sectors/xq/asp/SarticleType.9/Other\\_ID.124/qx/other\\_show.htm](http://www.investuk-usa.com/sectors/xq/asp/SarticleType.9/Other_ID.124/qx/other_show.htm) ( visited on 21 March 2002)

<sup>11</sup> European Information Technology Observatory (EITO) 2001

consumer awareness of e-commerce is low, Irish consumers are reluctant to shop on-line because of security concerns, and only one third of Irish citizens have credit cards. In terms of B2C commerce, the distribution of products follows patterns similar to those seen elsewhere; books and audio CDs are the two most popular products. Most transactions, however, involve Internet companies based in the UK. Only one in five purchases is made from an Irish e-retailer. E-commerce revenue as a percentage of GDP was 0.14 % in 1999. In 1998, 35 % of adults had mobile phones. Mobile phone penetration has subsequently doubled, as is it currently stands at 70%.<sup>12</sup>

### ***Main ICT Regulatory and Legal Developments***

A stated national goal is to be the e-commerce hub of Europe. The Irish hope that their experience in attracting foreign investment will help them achieve this goal. Like most of the European Union state telecommunication monopolies, Telecom Eireann is in the process of being privatised. Its first public offering was held on July 8, 1999. There are already numerous competitors in the market, particularly in the wireless area.

On 1 December 1996, a Steering Committee established by the then Minister for Enterprise and Employment produced a report entitled Information Society Ireland: Strategy for Action (1 December 1996). The report set out a strategy for realising the potential of ICT in Ireland's economic and social development. In accordance with one of the report's key recommendations, the government created the Information Society Commission in 1997.<sup>13</sup> This commission has been analysing the effects of e-commerce on Ireland and educating users.

The Government has frequently demonstrated its commitment to make Ireland a leading digital player, from broadening investment opportunities and tax relief to ensuring a favourable legal and regulatory climate. The e-Commerce Act, signed into law in 2000, gave legal recognition to encrypted digital signatures and electronic transactions. Removal of barriers to entry in this field lay at the heart of the e-Commerce Infrastructure Programme (eIP). This programme focused on the conduct of electronic business throughout the entire supply chain from the manufacturer to end-user delivery, with emphasis on inclusion of small and medium enterprises (SMEs). As part of the programme, over twenty companies participated in a number of different projects, ranging from company formation to logistics, through to customer-based shopping portals. The government was also involved in underwriting the transatlantic Global Crossing cable, which went live in mid-2000 and heralded an increase in bandwidth at significantly cheaper rates.

23 million EUROS of EU funding have been awarded to projects that bring broadband infrastructure to the regions, leveraging a total investment of 55 million EUROS. Outline proposals for further projects have been submitted to the Department of Finance for EU funding under the next Community Support Framework. In 1999, the government created an Information Society Fund to help progress initiatives consistent with the Government's Action Plan on the Information Society. The fund had 49 million EUROS in 2000 and 79 million EUROS in 2001. To co-ordinate and drive the process forward, a high-

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<sup>12</sup> ICT Ireland Vision - strategy paper - 28/11/2001, [http://www.ibec.ie/ibec/press/presspublications/doclib3.nsf/\(Internet+Search\)/ICT+Ireland+Vision+-+strategy+paper+?OpenDocument](http://www.ibec.ie/ibec/press/presspublications/doclib3.nsf/(Internet+Search)/ICT+Ireland+Vision+-+strategy+paper+?OpenDocument) (visited on 21 March 2002)

<sup>13</sup> Information Society Commission website, <http://www.isc.ie>, (visited on 21 March 2002)

level, inter-departmental Implementation Group has been set up, which is assisted by the Policy Development Team, based in the Department of the Taoiseach.

139 million EUROS of ICT education funding has been provided for the period 2000-02. The objectives for the funding program include providing high-speed access to the Internet from every classroom; reducing the ratio of pupils-to-computers; providing comprehensive ICT training to teachers; and ensuring greater use of technology in curriculum support.

The Government is planning to make it possible for citizens to access an increasing number of public services using modern technology, especially the Internet. It intends to allow citizens to transact business with Government or public service agencies (including local authorities, health boards, etc.) from a single point of their choice.

Ireland is also devising a solid legal environment for intellectual property protection. Infringement of IPR can be remedied either through injunctions to refrain from further infringement, delivery of infringing products, court action to recoup damages or account of profits at the plaintiff's discretion. The e-Commerce Act 2000 provides for the legal validity, enforceability, and admissibility of electronic records and signatures. It makes electronic signatures and digital certification equivalent to their paper counterparts, although there are some exceptions, and gives electronic contracts the same weight as paper contracts.<sup>14</sup> The Act explicitly protects users of encryption and forbids law enforcement from demanding that users hand over their encryption "keys" (the unique code that unscrambles encoded documents or emails). The Act also provides a framework for establishing a network of certification service providers, addressing the retention of electronic signatures and records and listing the requirements for Certification Service Providers.<sup>15</sup> It authorises the Minister for Public Enterprise to issue regulations to implement the Bill, as well as for the voluntary accreditation of certification service providers. Under the Act, defamation laws now apply to Internet content.<sup>16</sup>

The President signed the Copyright and Related Rights Act in 2000 to replace the Copyright Act of 1963. This act was created in response to US contentions that Ireland had not done enough to protect international intellectual property rights.<sup>17</sup> The United States had threatened to sue Ireland in the World Trade Organisation if it did not enact such legislation. The Act makes it easier for software companies to prove that piracy has occurred and stiffens the penalties for piracy.<sup>18</sup>

The government published the Criminal Justice (Theft and Fraud Offences) Bill in 2000, which would replace a series of bills dating from 1861 to 1990. It specifies fines and imprisonment for dishonest use of computers, and the section on forgery discusses types of electronic forgery.

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<sup>14</sup> Department of Defence e-Government Strategy Statement, February 2001, <http://www.irlgov.ie/defence/publish/dodstrat.pdf> (visited on 21 March 2002)

<sup>15</sup> Baker Mackenzie Law Firm analysis.

<sup>16</sup> Parc, [http://www.parc-group.com/aviation/legalemployer/310501\\_1.htm](http://www.parc-group.com/aviation/legalemployer/310501_1.htm), (visited on 21 March 2002)

<sup>17</sup> Delia Venables, Internet Newsletter for Lawyers, September/October 2000, <http://www.venables.co.uk/n0009gusireland.htm> (visited on 21 March 2002)

<sup>18</sup> Parc, [http://www.parc-group.com/aviation/legalemployer/310501\\_1.htm](http://www.parc-group.com/aviation/legalemployer/310501_1.htm), (visited on 21 March 2002)

The Child Trafficking and Pornography Act, 1998 provides a broad definition of child pornography. The act makes it illegal for anyone to knowingly produce, distribute, print, publish, import, export, sell, show or possess any child pornography. Knowingly producing and distributing such material is punishable by 14 years imprisonment and knowing possession is punishable by 5 years. Fines of up to £25,000 may be imposed.<sup>19</sup>

### ***Assessment of Phenomena Undermining Dependability***

The limited available data indicates that there have been relatively few instances where hackers have broken into computer networks of Irish-based organisations. In August 2000, a seventeen-year-old broke into the computers of Eircom's Internet service and gained access to the information on 30,000 users. The data were not damaged, but the need to change passwords disrupted service for several days.<sup>20</sup> Irish companies, nevertheless, seem to be as likely to be targeted by foreign hackers as by Irish hackers.<sup>21</sup>

When it comes to protecting networks against hacking, says Patrick Hynes of Ernst and Young, "Irish companies tend to be at least one or two years behind their US counterparts. Many Irish companies think they are secure but, when we check their systems, it turns out they are very vulnerable and there is a certain amount of naivety."<sup>22</sup> Several Irish-based web-sites with inadequate security have been defaced by "script kiddies," vandals in their teens or twenties who may have little or no knowledge of computers.<sup>23</sup>

The software piracy rate in Ireland is believed to be among the highest rate in Europe. An estimated 50% of software packages are used illegally, compared to an EU average of 34%. Much of the piracy now takes place over the Internet, as pirates can download software over the Internet in a relatively short period of time. For 1999, the estimated revenue lost to piracy was US\$118 million.<sup>24</sup>

These on-line criminal activities are having an impact on the development of several e-commerce services, like on-line banking. Irish consumers seem discouraged from banking on-line by the lack of protection against account misuse. In fact, at present there is no limit on the amount a customer can use from fraudulent use until the problem is reported, whereas other bank accounts have a limit on loss.<sup>25</sup> As in

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<sup>19</sup> Delia Venables, Internet Newsletter for Lawyers, September/October 2000, <http://www.venables.co.uk/n0009gusireland.htm> (visited on 21 March 2002)

<sup>20</sup> Eleanor Mannion et al, "Cyber-Crime: A Report on the European Draft Convention Cyber-Crime, and on the Impact of Cyber-Crime in Ireland," 8 March 2001, <http://www.redbrick.dcu.ie/~paulmay/projects/cybercrime.pdf>, (visited on 21 March 2002)

<sup>21</sup> Jamie Smyth, "Hacking Away at Cyber Underworld," Irish Times, 27 April 2001, <http://www.ireland.com/newspaper/finance/2001/0427/fin46.htm> (visited on 21 March 2002)

<sup>22</sup> Jamie Smyth, "Hacking Away at Cyber Underworld," Irish Times, 27 April 2001, <http://www.ireland.com/newspaper/finance/2001/0427/fin46.htm> (visited on 21 March 2002)

<sup>23</sup> Eleanor Mannion et al, "Cyber-Crime: A Report on the European Draft Convention Cyber-Crime, and on the Impact of Cyber-Crime in Ireland," 8 March 2001, <http://www.redbrick.dcu.ie/~paulmay/projects/cybercrime.pdf> (visited on 21 March 2002)

<sup>24</sup> Business Software Alliance, <http://www.bsa.org/ireland> (visited on 21 March 2002)

<sup>25</sup> Eleanor Mannion et al, "Cyber-Crime: A Report on the European Draft Convention Cyber-Crime, and on the Impact of Cyber-Crime in Ireland," 8 March 2001, <http://www.redbrick.dcu.ie/~paulmay/projects/cybercrime.pdf> (visited on 21 March 2002)

other states, Irish companies are reluctant to disclose incidents of cyber crime, because they fear that it would cause their customers to lose confidence in them.<sup>26</sup>

### ***Government Initiatives Aimed at Tackling Cyber-Security***

An Garda Síochána, the Irish National Police organization, has a computer crime unit that serves as a national reference centre for computer crime. The unit is a component of the Bureau of Fraud Investigation. Members of the unit have expertise in examining computer hardware and storage devices.<sup>27</sup> It is important to remember that Irish courts can issue search warrants for illicit computer software. Those caught with illegal copies can be fined up to 100,000 EUROS and receive prison terms of up to five years.<sup>28</sup> Few hackers, instead, have been convicted. When they are convicted, they can receive prison sentences of up to ten years.<sup>29</sup> No one in Ireland has been convicted for a child pornography crime involving the Internet.<sup>30</sup>

The Office of the Data Protection Commissioner promotes public awareness of data protection by publishing information on leaflets and the Internet. The office spends the majority of its time answering inquiries from the public about data protection. In 2000, they answered over 1,400 requests for information and received 131 complaints concerning data protection. The complaints most commonly involved unwanted use of personal information for marketing and other commercial purposes.<sup>31</sup>

### ***Industry and Other Non-Government Activities Related to Dependability***

Large companies such as Ernst and Young have developed Internet security teams. Companies in Ireland hire these teams to monitor their networks for attempted penetration and to track down suspected hackers. These teams also help companies improve their security systems and test those systems by attempting to gain access into them illegally.<sup>32</sup>

As in many other countries, the Irish chapter of the Business Software Alliance (BSA) provides information on software policy to software users and resellers. It provides auditing software to inform corporations of the software running on their computers, and warns those corporations of the adverse

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<sup>26</sup> Jamie Smyth, "Hacking Away at Cyber Underworld," *Irish Times*, 27 April 2001, <http://www.ireland.com/newspaper/finance/2001/0427/fin46.htm> (visited on 21 March 2002)

<sup>27</sup> An Garda Síochána Bureau of Fraud Investigation website, <http://www.gov.ie/garda/angarda/gbfi.html> (visited on 21 March 2002)

<sup>28</sup> Eleanor Mannion et al, "Cyber-Crime: A Report on the European Draft Convention Cyber-Crime, and on the Impact of Cyber-Crime in Ireland," 8 March 2001, <http://www.redbrick.dcu.ie/~paulmay/projects/cybercrime.pdf> (visited on 21 March 2002)

<sup>29</sup> Eleanor Mannion et al, "Cyber-Crime: A Report on the European Draft Convention Cyber-Crime, and on the Impact of Cyber-Crime in Ireland," 8 March 2001, <http://www.redbrick.dcu.ie/~paulmay/projects/cybercrime.pdf> (visited on 21 March 2002)

<sup>30</sup> Department of Justice, Equality, and Law Reform website, <http://www.irlgov.ie/justice/Publications/Internet%20Submissions/subnet3.htm> (visited on 21 March 2002)

<sup>31</sup> Data Protection Commissioner website, <http://www.dataprivacy.ie/5z.htm> (visited on 21 March 2002)

<sup>32</sup> Jamie Smyth, "Hacking Away at Cyber Underworld," *Irish Times*, 27 April 2001, <http://www.ireland.com/newspaper/finance/2001/0427/fin46.htm> (visited on 21 March 2002)

consequences of illegal software use. It operates a hotline to assist callers in their concerns about software piracy.

### ***Public-Private Partnerships***

The Shannon E-commerce Initiative in the Shannon region takes action to allow the Region's businesses to engage as rapidly as possible. One part of the initiative involves developing a joint public-private e-commerce hub for area companies, which will provide a secure means of transmitting data electronically. It is hoped that this hub will inspire the growth of e-commerce enterprises and enhance consumer and business customer confidence in electronic transactions.<sup>33</sup> Enterprise Ireland, instead, is a government program that works together with Irish and international companies on a wide variety of issues. They put special emphasis on assisting local new businesses and technology businesses.<sup>34</sup>

### ***Research and Development***

Enterprise Ireland oversees national and EU programs to build technological R&D capabilities and links between third level colleges and industry. These programs support R&D in areas such as product development, process development, R&D management training and technology acquisition. Third level colleges receive support for activities such as basic and strategic research, scholarships, campus companies and collaboration with industry. The Programmes in Advanced Technology are partnerships between Enterprise Ireland, industry and third level colleges. They were established to help industry gain strategic expertise and attract investment.<sup>35</sup>

Research and development in the field of dependability is almost non-existent in Ireland. There are, nevertheless, some academic departments where research are starting to examine these issues in greater detail. The Department of Computer Science at University College Cork is currently conducting research on computer security. They are focusing on verification tools and techniques and on security in computer-supported collaborative systems.<sup>36</sup> The Dublin City University School of Computer Applications supports research in cryptography and other aspects of computer security.<sup>37</sup> Interesting activities are also been carried by the Queen's University Computer Science Department and the Department of Computer Science and Telecommunications Research Centre at the University of Limerick. These institutions present particular strengths in the areas of crisis management, security systems architecture, sata secure transmission, virus research and intrusion detection.

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<sup>33</sup> Shannon Development, <http://www.shannon-dev.ie/shipp/enterprise.htm> (visited on 21 March 2002)

<sup>34</sup> Enterprise Ireland, <http://www.enterprise-ireland.com/english.asp> (visited on 21 March 2002)

<sup>35</sup> Enterprise Ireland, <http://www.enterprise-ireland.com/industry.asp> (visited on 21 March 2002)

<sup>36</sup> University College Cork, Computer Science Department, <http://www.cs.ucc.ie/research/security.html> (visited on 21 March 2002)

<sup>37</sup> Dublin City University, School of Computer Applications, [http://www.compapp.dcu.ie/CA\\_home.html](http://www.compapp.dcu.ie/CA_home.html) (visited on 21 March 2002)