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GERMANY

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Overview of the Country's Information Infrastructure

Germany is one of Europe's leading ICT countries. Per capita expenditures for ICT were 1400 Euro per person in 2000, which is a 10% increase compared to the previous year.¹ In terms of expenditures, ICT expenses represent almost 6% of the GDP.² Finally, ICT related employment has risen by 4.3% in 2000.³ According to a BITKOM report⁴, 75,000 new jobs were created, which increased ICT employment by 10.1%. However, a slower growth was expected for 2001 in this report.

The German ICT success is visible in the data related to ICT penetration. A survey carried out between 1 April and 31 May 2000 produced the following answers for Germany⁵: 39% of the population have a mobile phone at home, 34% personally use it; 32% of the population have a desktop computer at home, 28% personally use it; 14% of the population have an Internet connection at home, 11% personally use it; and 12% of the households own an ISDN line with 2% personally using it. At the end of 2000, about 22% of households had a PC with internet access, 70% had a mobile phone, and about 3% a notebook with communications interface.⁶ In 2000, there were 28,010,000 web users in Germany; for 2003, 47,760,000 are expected⁷. The percentage of web users among the 14 – 69 year old population increased from 40% (22.2 million) in spring 2001 to 50% (27.3 million) in Autumn 2001.⁸ This compares well with the share of web users of the total population with 34% in 2000 and expected 58% in 2003.⁹

Similar trends involve ICT businesses. In 1999, the number of PCs per 100 white collar workers was 62 (26 per 100 inhabitants)¹⁰. According to some predictions, by 2010¹¹ the telephone will remain the most important medium for communications. Fixed line telephony, nevertheless, will be replaced by mobile

¹ European Information Technology Observatory 2001 – EITO, pp 504 – 505, tables 78 - 83

² EITO, pp 504 – 505, tables 78 - 83

³ BITKOM, "Wege in die Informationsgesellschaft" p. 18, – Status quo und Perspektiven Deutschlands im internationalen Vergleich" (Roads into the information society – status quo and Germany's perspectives in an international comparison), Edition 2001, BITKOM e.V., download via <http://www.bitkom.org> -> Publikationen -> WegeInfo2001.pdf, German only

⁴ BITKOM, "Arbeitsplätze ITK Juni 2001" (Jobs ICT June 2001), see www.bitkom.org -> 07.06.2001 Informationswirtschaft Beschäftigungsmotor Nr 1 -> Downloads, (visited 31 Jan 2002)

⁵ EITO pp 414 – 439. Link to the report (visited on 24 January 2002) http://europa.eu.int/ISPO/basics/measuring/eurobaro/eurobaro53/docs/mis2000_report.doc

⁶ see „Entwicklungstrends im Telekommunikationssektor bis 2010“ (Development trends in the German telecommunications sector until 2010) study performed for the German Ministry of Economics and Technology, April 2001, downloaded from http://www.bmwi.de/Homepage/download/telekommunikation_post/Entwicklungstrends.pdf (visited on 8 January 2002) (below referred to as "Entwicklungstrends") p. 98 fig. 6-10

⁷ EITO p. 96 table 1

⁸ http://www.gfk-webgauge.com/titlesite/index_keyresults.htm, visited 12 Feb 2002

⁹ EITO p. 98 figure 2

¹⁰ EITO p. 140 table 7

¹¹ „Entwicklungstrends im Telekommunikationssektor bis 2010“ (Development trends in the German telecommunications sector until 2010) study performed for the German Ministry of Economics and Technology, April 2001, downloaded 8 January 2002 from http://www.bmwi.de/Homepage/download/telekommunikation_post/Entwicklungstrends.pdf pp. 78 - 81

systems. ISPs and ASPs are to benefit from increased web presence and web use. Other key words with increasing importance are information management, access by mobile users, facility management, tele-learning, video-conferencing. As an enabler for many of the expected ICT services, the required PKIs /PKI services are expected to be fully available by 2010.

Germany's Internet infrastructure is also developing. The number of web-sites per 1,000 inhabitants, in fact, has increased from 1.6 in 1998 to 19.6 in 2000.¹² Meanwhile, the number of Internet hosts has increased by 44% and reached 99 million in 2000, and the number of users who access the Internet via PC increased by 12.2 million to reach 22.9 million. For 2002, BITKOM expects an additional growth of 32%. By 2003, it is calculated that every second German could access the Internet via PC.¹³

Internet Hosts in Germany
(Source: EITO and OECD, 2001)

	July 1998	July 1999	Sept 1999	July 2000	Sept 2000	Oct 2000	July 2001
No. of hosts	121,500	1646,100	1,713,300	2,297,500	2,443,100	2,600,100 1,921,379	2,294,637
Hosts per 1,000 inh.	14.8	20.1	21	28.0	30	31.7	

Due to these strong ICT rates, e-commerce is set to improve. A recent survey has clearly indicated that German business community has started to embrace more fully the potential of the web, resulting in solid growth of the market of e-business services.¹⁴ Similar results were obtained by another survey¹⁵ indicating that, in 2001, 49% of SMEs used their web-site merely as an electronic business card, but also indicating that use of the internet for electronic ordering, B2B or even complete business processes in 2001 by 8, 9, and 4% of the enterprises participating; these numbers are clearly increasing for future planning: 16, 17, and 11%. In terms of revenues, B2C electronic commerce has generated revenues of over 500 million EUROS and this figure is set to reach 6.473 billion by 2003. Meanwhile, B2C electronic commerce is presently at 879 million and expected to reach 10.677 billion by 2005. Similar statistics have been presented in a BITKOM report in 2001.

Germany is also set to exploit the commercial potentialities brought forward by wireless technologies. Almost all members of the population are set to have a mobile phone by 2003. Nevertheless, the future ultimately depends on the success of UMTS services. The Universal Mobile Telecommunications System (UMTS) licence auction has exceeded expectations reaching 50.5 billion EUROS, over five times the amount forecast by the German Finance Ministry. Successful players (T-Mobil, E-Plus, Group 3G, Viag Interkom, Mobilcom, and Mannesmann) have already started investing in UMTS infrastructure. Services are expected to be launched in 2002.¹⁶

¹² OECD Telecommunications Outlook 2001 p. 113

¹³ BITKOM "Wege in die Informationsgesellschaft...", op. cit., pp. 4f

¹⁴ EITO p. 115

¹⁵ "Internet und eBusiness im Mittelstand" (internet and e-business at SMEs), initiated by the journal impulse and by IBM Germany, addressing about 270 enterprises; downloaded from http://www-5.ibm.com/de/mittelstand/loesungen/loesungen_ecom.html (visited on 21 March 2002)

¹⁶ EITO pp. 116 and 244, and BITKOM "Wege in die Informationsgesellschaft...", op. cit., p. 9

Main ICT Regulatory and Legal Developments

In Germany, the liberalisation of critical infrastructure sectors has brought not only new competition and significant consumer price reductions, particularly in the telecommunications services. It has also brought significant changes in the role of the government as the sole provider of infrastructure services. Several of these changes have been brought forward by the EU regulatory approaches and regulations in this area.

The Information and Telecommunications Services Act (IuKDG¹⁷) of 1996¹⁸ has been the starting point for the liberalisation of the telecommunications market. Despite a slow start, new entrants have already taken over 40% of the market in 2001.¹⁹ The IuKDG has also initiated the unbundling of the local loop bringing Germany to the top of the table when the respective EU regulation was enacted in 2001.²⁰

The German government has launched an action programme to push for more innovation and ICT jobs in September 1999, which set a series of targets to be achieved by 2005. ²¹ First, it called for the increase in the share of Internet subscribed by more than 40% by 2005. The need for an appropriate legal and regulatory framework was also set as an objective. The third goal was to equip all schools, training centres and university with the necessary ICT services and goods. Finally, it called for the increase of the number of multimedia firms and networking companies.²²

The German government has also been pushing for the fostering of e-government. On 1 December 1999, a German cabinet decision launched a programme called “Modern State – Modern Administration”²³, initialising 38 pilot projects and aiming at a common internet portal for all German public administration offices²⁴. This programme complements previous efforts that started in 1997. By 1997, already 40 towns with more than 50,000 inhabitants had an Internet site, but even today, most towns only use this for providing information. Currently, these local efforts have been intensified under the e-government initiative “BundOnline 2005”²⁵, aiming at providing a manifold of services of the Federal Administration electronically²⁶. At the time of writing this report, 18 different services are available, from the employment office (<http://www.arbeitsamt.de>) to the electronic format of tax declaration (<http://www.elster.de>)²⁷. To support government agencies in establishing their eGovernment facilities,

¹⁷ IuKDG = Informations- und Kommunikationsdienstegesetz, (Information and Telecommunications Services Act)

¹⁸ List of English texts of related German law texts <http://www.iid.de/iukdg/gesetz/engindex.html> (visited 13 Feb 2002)

¹⁹ OECD Communications Outlook 2001 p. 26

²⁰ There are 16 operators reported in OECD Telecommunications Outlook 2001 p. 34 table 2.6

²¹ <http://www.bmbf.de/pub/inno21d.pdf>, English version: <http://www.bmbf.de/pub/inno21e.pdf> (Nov. 1999), published by BMBF and BMWi, (visited 8 Jan 2002)

²² e.g. “Bildung in der Informationsgesellschaft”, BITKOM July 2001 (only German), www.bitkom.org -> Publikationen -> Bildungspolitik.pdf, downloaded 31 Jan 2002; “Chancen neuer Bildungsstrategien für das Beschäftigungspotenzial in Deutschland“, Initiative D21, October 2001, <http://www.initiatived21.de/broschure/hintergrundpapier.pdf>, (visited on 30 January 2002);

²³ also <http://www.staat-modern.de/eng/programme/index.html>

²⁴ “Moderner Staat – Moderne Verwaltung: The Programme of the German Government”, downloaded from http://www.staat-modern.de/eng/download/info/programme_en.pdf (in English) on 18 Feb 2002.

²⁵ <http://www.bundonline2005.de> (visited 15 Feb 2002)

²⁶ <http://www.bund.de/Wir-fuer-Sie/Bund-Online-2005-Elektronische-Dienstleistungen-.5293.htm> (visited 13 February 2002.)

²⁷ “Entwicklungstrends...”, op. cit., pp. 87 – 96

an eGovernment Handbook was initiated and made publicly available.²⁸ This handbook is continuously updated.

Secure e-commerce is also an area of significant interest for the German government. In 1997, Germany had one of the first digital signature legislations in Europe. It was updated to comply with the relevant EU directive in November 2001. In addition, in May 2000, the “Partnership for Secure Internet Business” was initiated by the Minister of Economics and Technology and ten prominent associations and companies²⁹. Interestingly enough, by 2001, this number had increased to 40. The first objective of this initiative is expanding services at www.sicherheit-im-internet.de. This is a website launched by the BMI³⁰ and BMWi³¹ and supported by the BSI³² and RegTP. It offers update information on information security problems, as well as recommendations, advice for SMEs and the private user. In addition, a “Security Road Show Germany” has been launched. It is also important to emphasise the efforts in fostering email security and secure access to the Internet through the distribution of electronic authentication and signature products taking into consideration the activity related to Bridge Certification Authority launched by TeleTrust Deutschland. Particular attention has also been given to define approaches and initiatives to observe trends in sensitive infrastructures, increasing awareness of the dangers brought by industrial espionage and to develop appropriate early warning and information sharing activities.

Assessment of Phenomena Undermining Dependability

Information about Internet crime is presented in the Periodic Security Report.³³ The following table gives statistical data for credit and ATM card misuse, computer fraud, unauthorised access to communications services, data forgery of legally binding data, data and computer sabotage, software piracy (private use and commercial), espionage, and the resulting overall numbers for computer criminality. Misuse of credit cards and ATM cards has the highest growth rate and since the early nineties takes the largest share of reported computer related crime.³⁴

Criminal statistics related to online criminal activities 1987 – 2000 (with percentage of solved cases)

²⁸ for information <http://www.bsi.bund.de/fachthem/egov/index.htm>, for the handbook texts themselves <http://www.bsi.bund.de/fachthem/egov/3.htm> (both visited 15 Feb 2002, most texts were updated on 13 Feb 02)

²⁹ “Erster periodischer Sicherheitsbericht”, <http://www.sicherheit-im-internet.de/themes/themes.phtml?ttid=4&tid=100&tddid=76&page=0;> for more information in English <http://www.sicherheit-im-internet.de/themes/themes.phtml?ttid=20&tsid=265> (visited 8 Jan 2002)

³⁰ BMI = Bundesministerium des Inneren, Federal Ministry for Interior Affairs

³¹ BMWi = Bundesministerium für Wirtschaft und Technologie, Federal Ministry for Economy and Technology

³² BSI = Bundesamt für Sicherheit in der Informationstechnik, Federal Agency for Security in Information Technology

³³ <http://www.bmi.bund.de/downloads/27.pdf> (downloaded 15 Feb 2002)

³⁴ data from http://www.bundeskriminalamt.de/pks/zeitreihen_2000/pdf/historie_1.pdf and http://www.bundeskriminalamt.de/pks/zeitreihen_2000/pdf/t01.pdf (visited 15 Feb 2002); relation of crime types see also [http://www.bundeskriminalamt.de/pks/pks2000\(bka_docs_2000.zip](http://www.bundeskriminalamt.de/pks/pks2000(bka_docs_2000.zip), there Punkt 3.21 Computerkriminalitaet.doc (downloaded 15 Feb 2002)

	1987	1990	1993	1995	1996	1997	1998	1999	2000
<i>card fraud</i>	879	3,963	10,754	23,315	26,802	30,727	35,909	36,613	44,284
<i>Solved</i>	48.8	45.2	38.7	39.7	38.5	42.4	39.4	42.2	41.8
<i>comp fraud</i>	2,777	787	2,247	3,575	3,588	6,506	6,465	4,474	6,600
<i>Solve</i>	41.1	63.7	51.2	52.6	55.2	57.5	60.7	54.9	67.0
<i>unauth.acc.</i>							2,109	1,412	2,198
<i>Solved</i>							31.5	88.1	81.5
<i>forgery</i>	169	82	156	227	198	380	349	124	268
<i>Solved</i>	98.8	93.9	96.2	94.7	94.4	93.7	89.7	79.0	90.3
<i>sabotage</i>	72	95	137	192	228	187	326	302	513
<i>Solved</i>	41.7	47.4	36.5	41.7	37.7	52.9	40.2	57.6	52.6
<i>espionage</i>	49	77	103	110	933	213	267	210	538
<i>Solved</i>	73.5	58.4	57.3	60.9	95.0	60.1	80.1	65.2	46.1
<i>sw-piracy prin.</i>			501	363	192	546	362	972	1,361
<i>Solved</i>			95.0	97.8	96.4	99.3	96.4	98.9	97.3
<i>sw-piracy com</i>				120	187	772	289	1,252	937
<i>Solved</i>				92.5	96.3	98.8	98.3	99.2	99.6
<i>comp.crime</i>	3,067	5,004	13,898	27,902	32,128	39,331	46,022	45,353	56,684
<i>Solved</i>	44.8	49.2	43.5	42.9	43.0	47.5	43,4	47,9	48.9

Cyber-crime is rarely reported to the police. The Periodical Security Report states that data from studies and surveys of non police institutions vary widely and cannot be regarded as reliable. The high percentages of solved cases must, however, not be interpreted as convictions. Numbers here are still very low for a number of reasons such as technical complexity of the cases and low availability of court capacity. The prognosis expects more cases for the future, with forbidden pictures and texts as well as all kinds of computer related fraud outnumbering the rest. The introduction of minimal international standards for media content is expected to reduce the first number noticeably without significantly impeding the dynamics of the Internet.

To meet the challenge that cyber-crime often ignores national borders, Germany is participating actively in the G8 cyber crime consultations, and has signed the Cyber Crime Convention in Budapest.³⁵

Government Initiatives Aimed at Tackling Cyber-Security

The Federal Agency for Criminal Investigation (BKA³⁶) provides a small number of publications on cyber crime prevention³⁷. Active measures to secure information and information systems is provided by the Federal Agency for IT security, BSI³⁸, or through the web page “www.sicherheit-im-internet.de”, which also links to the BSI recommendations.

³⁵ Convention No. 185 “Cyber Crime Convention” of the European Council, text to be accessed through <http://conventions.coe.int/Treaty/en/Treaties/Html/185.htm> (visited 26 Jan 2002)

³⁶ BKA = Bundeskriminalamt, Federal Agency of Criminal Investigation

³⁷ <http://www.bundeskriminalamt.de/text/publ.html> (visited 15 Feb 2002)

³⁸ www.bsi.bund.de (visited 15 Feb 2002)

Government support for many initiatives headed by the private sector must also be seen as trust and confidence building measures for a joint campaign to enhance cyber-security. In this context, the Ministry for Economics and Technology (BMW_i), the Ministry of the Interior (BMI) and the Ministry of Education and Research (BMBF) are playing a very important role. Apart from the longstanding agency BSI (subordinated to the BMI), there are no new or specially formed bureaucratic structures to tackle cyber-security. Public awareness of the role and work of the BSI has certainly increased with the preparations of the Y2K event and with the advice given after the Melissa virus and the ILOVEYOU worm in 2000. As mentioned before, following these events, the web site www.sicherheit-im-internet.de also came into life with updated information security information.

At the BSI, there is a section responsible for Critical Infrastructures. Its work is currently focused on increasing the dependability of the “critical infrastructure” of government and public administration³⁹. The aftermath of 11 September 2001 brought additional financial resources to be used under the heading “combating terrorism”. These will include a substantial share for combating cyber-terrorism. The additional resources will partly be used to enhance or accelerate ongoing initiatives, but may also lead to setting up new ones.

Industry and Other Non-Government Activities Related to Dependability

An increasing number of registered associations are being created and existing associations, especially those supporting SMEs, are taking up new tasks to address issues related to ICT technologies. It is not possible to give an exhaustive list, but many of those that emphasise IT security issues can be reached through the internet site www.sicherheit-im-internet.de.

Many of the initiatives brought forward through these associations are supported by one or more government agency, mostly by the Ministry for Economics and Technology (BMW_i) and the Ministry of the Interior (BMI), but also by the Ministry for Education and Research (BMBF) and the Kultusministerien (Ministries for education and cultural affairs) of the Bundesländer. It is difficult therefore to distinguish between industry and other non-government activities related to dependability and public-private partnership initiatives.

These are some of the most active organisations:

- BITKOM Bundesverband Informationswirtschaft, Telekommunikation und Neuen Medien e.V. (German association for information technology, telecommunications and new media e.V.)⁴⁰ is an association at federal level for companies in the information economy, telecommunications and the new media. BITKOM represents 1,250 companies, some 600 of which are direct members. These include almost all of the leading players in the industry, as well as more than 500 smaller, medium-sized and new businesses.
- Initiative D21 e.V.⁴¹, founded on 27 July 1999 as one of the newest, is a non-profit registered association with the objective of accelerating the transformation of Germany from an industrial society to an information society to make better use of the chances offered by the information society with regard to competitiveness, growth and employment. Initiative D21 e.V. has 226 participants: 94

³⁹ e.g., currently vulnerability and threat assessment for government agencies is under way.

⁴⁰ www.bitkom.org (visited 31 Jan 2002)

⁴¹ www.initiatived21.de (visited 31 Jan 2002)

member companies, 33 sponsors, 59 supporters and 43 advisory council members. All sectors of industry - not only ICT providers - are represented, as are institutions and politics.

- ZVEI Zentralverband Elektrotechnik- und Elektronikindustrie e.V.⁴² with almost 1400 member enterprises, represents the economic, technological and environmental policy interests of the German electrical and electronics industry at the national, European and international levels. It not only represents the interests of security manufacturers but also the interests of enterprises concerned as users. The themes range from security in e-commerce to protection against espionage and sabotage.
- TeleTrusT e.V.⁴³ was founded in 1989 with the objective of enhancing trustworthiness of ICT in open systems environments.
- eco Electronic Commerce Forum e.V.⁴⁴ regards itself as a non-competitive, comprehensive information source that provides orientation in what is happening on-line all over the world and in electronic commerce. A recently started initiative "Mittelstand online"⁴⁵ is focusing on SMEs.
- Bundesverband e-Commerce e.V.⁴⁶ is an association of enterprises, consultants, and scientists active in the e-business area founded in April 2000.

Concerning CERTs, the CERT-Bund⁴⁷ is currently providing early warning and information sharing capabilities to the German federal government. Similar services are provided by similar organisations:

- BITKOM-CERT, (under construction, www.bitkom.org)⁴⁸
- [dCERT](http://www.dcert.de) (T-Systems / debis, www.dcert.de)
- [DFN-CERT](http://www.scert.dfn.de) (www.scert.dfn.de)
- [IBM ERS](http://www.ers.ibm.com) (www.ers.ibm.com)
- [Micro-BIT](http://www.microbit.uni-karlsruhe.de) (www.microbit.uni-karlsruhe.de)
- [RUS-CERT](http://cert.uni-stuttgart.de) (cert.uni-stuttgart.de)
- [S-CERT](http://www.s-cert.de) (CERT of the German Sparkassen organisation, www.s-cert.de)
- secu-CERT, Secunet (www.secunet.de)
- Siemens-CERT (www.siemens.de)
- Telekom-CERT (www.telekom.de)

Another noteworthy non-government initiative is Bridge CA⁴⁹, founded by Deutsche Bank and Deutsche Telekom in October 2000. It is operated by the non-profit organisation TeleTrusT⁵⁰. The Bridge CA bridges the gap between various security infrastructures, expanding their range of use.

⁴² www.zvei.org (visited 14 Feb 2002)

⁴³ www.teletrust.de (visited 14 Feb 2002)

⁴⁴ www.eco.de (only German, visited 14 Feb 2002)

⁴⁵ see press release at http://www.eco.de/presse/mitteilungen/2002/02-01-16_de.htm (German only, visited 14 Feb 2002)

⁴⁶ <http://www.bv-ecom.de> (visited 31 Jan 2002)

⁴⁷ <http://www.bsi.bund.de/certbund/index.htm> (visited 14 Feb 2002)

⁴⁸ will soon change to Mcert, then be available at www.bitkom.org/mcert

⁴⁹ www.bridge-ca.org (visited 31 Jan 2002)

Public-Private Partnerships

Most, if not all of the above mentioned initiatives, may be considered as public-private partnerships. Promotion by federal and/or regional ministries and active participation of these public organs are important not only to enable such initiatives but also to increase and support acceptance amongst the addressed audiences. SMEs will take more time and risk investments if the proposed measures are also encouraged by official bodies or by organisations that have government support and therefore trust. Nevertheless, AKSIS is to be considered as an important initiative. AKSIS (Arbeitskreis Schutz von Infrastrukturen – Working Party on Protection of Infrastructures)⁵¹ is the only Germany-wide activity focusing on the critical infrastructure dependability issue. It is still purely voluntary and informal, and still has no official government or industry mandate. There are about two meetings per year, which from the outset achieved good attention from government and industry. At the last meeting in 2001, a steering group was created as a first step to the creation of organisational structures.

Research and Development

Numerous initiatives were put in place in 2000 by German Federal Government and the Bundesländer to address the lack of ICT skills in German Industry. The issues involved are the increase of the number of ICT specialists (undergraduate formation, re-direction training schemes) and attracting high-profile ICT workers from Europe and the rest of the world. Despite the forecast of a huge need for computer specialists, only 6,000 students of computer science graduated in Germany in 2000. Two projects of the initiative D21⁵² are addressed specifically at schools. The initiative promotes the mechanism of Internet enabled classrooms.⁵³ In August 2000, the BMBF published its concept for action to increase IT in education⁵⁴.

One initiative that is specifically set up to promote information assurance is Eurubits⁵⁵. The faculty for electrical engineering and information technology at the University of Bochum offers a special study programme for IT security. Other universities and technical colleges with a computer science programme offer IT security courses. However, these are not yet mandatory everywhere.

Among the universities contributing continuously to the field of information assurance, critical infrastructure protection issues and related dependability requirements of the information society are the Technical University Munich, Computer Sciences; the University of Hamburg, Computer Sciences; and the Fachhochschule Rhein-Sieg, Applied Computer Sciences, IT Security.

Among the non computer science faculties, the “Institut für Informations-, Telekommunikations- und Medienrecht ITM” (Institute for Information, Telecommunications, and Media law)⁵⁶ at the university of

⁵⁰ TeleTrusT e.V. www.teletrust.de

⁵¹ www.aksis.de (visited 14 Feb 2002); a major event was the "CYBER TERROR EXERCISE" which was performed at IABG with major infrastructure providers and users (including government) in November 2001

⁵² www.initiatived21.de (visited 31 Jan 2002)

⁵³ EITO pp 66f

⁵⁴ “Online – offline: IT in education”, downloaded from http://www.bmbf.de/pub/itkon_e.pdf (visited on 8 Jan 2002)

⁵⁵ “Europäisches Kompetenzzentrum für IT-Sicherheit (Centre of excellence for IT security) an der Ruhr-Universität Bochum”, see www.eurubits.de (visited 8 Jan 2002)

⁵⁶ <http://www.uni-muenster.de/Jura.tkr/> (visited 18 Feb 2002)

Münster needs to be mentioned as it focuses on the analysis and recommendations for the legal framework of the information society.

The situation of funding is quite complex. A study funded by initiative D21⁵⁷ gives a survey of supporting programmes for SMEs and entrepreneurs in the Bundesländer⁵⁸. An important project title funding a variety of projects with relevance for the development of the information society and of dependable services for that society, is Multimedia. The administration and management is carried out by the “Projektträger⁵⁹ Multimedia”⁶⁰ commissioned by the BMWi. The Projektträger Multimedia is located at the DLR⁶¹, together with the Projektträger BMBF, the Projektträger for information technology of the BMBF and others, enabling information exchange and co-operation between programmes.

Among the Multimedia projects, the following have some direct relevance to information assurance and dependability.

- FairPay⁶² is a joint research and development project aiming at the dependability of e-payment in particular and of e-commerce and e-business in general. FairPay is offering a generic process model for the development of dependable IT solutions in e-payment, e-commerce, and e-business.
- VERNET - “secure and dependable transactions in open communication networks”⁶³ - has the following objectives: secure and dependable data exchange; protection of private networks and data as well as safeguarding anonymity; security/safety of distributed software applications; and guaranteeing authenticity of information and transactions. Eight distinct projects are sponsored and the results will be analysed and made publicly available by an accompanying research project.
- AN.ON⁶⁴ aims to develop powerful protocols and architectures enabling anonymous and unwatchable user movements in the Internet. Application of the resulting tools is aimed especially for pay services to avoid misuse of user data.
- ASPIK⁶⁵ is the authenticating security platform for Internet communications.
- Biotrust⁶⁶ evaluates and tests biometric technologies for e-commerce applications (a project of TeleTrusT working group 6) as an interdisciplinary pilot project of biometric identification methods in the banking sector.
- Dasit - data protection while using teleservices – is developing possibilities for anonymity/transparency for customer and vendor trustworthy and reliable Internet shopping.

⁵⁷ http://www.initiatives21.de/broschure/e_busi_mittelstand.pdf (downloaded 30 Jan 2002)

⁵⁸ because of the federal structure, such programmes are rarely if ever found on the federal level

⁵⁹ no English translation available for “Projektträger”, meaning: element of project management organisation responsible for one project title

⁶⁰ <http://www.pt-multimedia.de/> (visited 15 Feb 2002)

⁶¹ Deutsches Zentrum für Luft- und Raumfahrt, <http://www.dlr.de/DLR-Homepage> (visited 15 Feb 2002)

⁶² <http://fairpay.dfki.de/home-en.html> (visited 31 Jan 2002)

⁶³ <http://www.vernet-info.de/>, German only (English overview under construction, visited 4 Feb 2002)

⁶⁴ <http://www.rewi.hu-berlin.de/Datenschutz/DSB/SH/projekte/anon/index.htm>, German only (visited 15 Feb 2002)

⁶⁵ <http://www.pt-multimedia.de/foerderthemen/aspik.html>, German only (visited 15 Feb 2002)

⁶⁶ <http://www.biotrust.de/> (visited 15 Feb 2002)

At the end of February 2002, a new IT R&D programme was launched by the German Federal Ministry of Education and Research, called “Förderprogramm IT-Forschung 2006”, or “IT Research Program 2006”⁶⁷, which among many other areas also addresses dependability and information assurance issues.

A detailed analysis of the main academic institutions undertaking R&D in dependability-related areas indicates that Germany has some major strengths in several areas. First, several institutions such as, for example, the Department of Computer Science at the University of Bonn and the Department of Computer Science of the University of Dresden, are carrying advance work in the areas of vulnerabilities analysis and simulation. Cryptography as whole is also a major area of academic interest in Germany as confirmed by the activities in institutions like the Communication Security Group at the University of Bochum, the Institute for Data Communications Systems of the University of Siegen and the University of Freiburg. System analysis, such as secure system architecture or interdependency analysis, is also an field of particular strength in Germany.

Germany has also developed a strong academic appreciation of the socio-economic and legal implications of dependability. This is confirmed by the activities of the Institute for Computer Science and Social Studies at the University of Freiburg, the Department of Informatics at the BTU Cottbus, the University of Bonn, in addition to the activities of the Max Planck Institute.

⁶⁷ <http://www.it2006.de>, German only (visited 27 Feb 2002)