

THE DUTCH DIGITAL DELTA

The Netherlands oN-Line

INTRODUCTION AND SUMMARY

1. 'National Action Programme on Electronic Highways: from metaphor to action' (published in Dutch), Parliamentary Proceedings II, session 1994-1995, 23 900, No. 20.

2. 'Review of the National Action Programme on Electronic Highways (Above-NAP)', Parliamentary Proceedings II, session 1997-1998, 243565, No. 7.

3. Recently issued: Electronic Commerce Action Plan, submitted by the Minister of Economic Affairs with covering letter dated 9 March 1998; Action Plan on Investing in Progress, No. OCW-97-603; Action Programme on Electronic Government, Parliamentary Proceedings II, 1998-1999, 26 387, No. 1; White Paper on Legislation for electronic highways, Parliamentary Proceedings II, 1997-1998, 25 880, Nos. 1-2; the policy statement 'Cable and Consumer' and the policy statement on 'Trusted Third Parties' were submitted to the Lower House in June with covering letters from the State Secretary of OC&W and the State Secretary of V&W respectively.

Publications to be issued shortly include: the evaluation of the Software Action Plan, a further white paper on cable use, and a white paper on developments in telecommunications.

Although information and communication technologies (ICT) are nothing new in themselves, we are currently in a period which is undeniably characterized by a wave of new ICT applications. A wave that is fuelled on the one hand by the constant improvement in performance and fall in prices of computers and on the other hand by the possibility to interconnect computers in networks. The Internet is the latest illustration of that. And the technological possibilities which the medium now offers are still only a faint reflection of what may become reality at the beginning of the next millennium.

With the new possibilities of these ICT developments, the ICT sector can reinforce its competitiveness, the government can improve its services to citizens and businesses, and new means of communication and data collection are available to citizens. The Cabinet considers it essential to our national prosperity and well-being for this country to make the best possible use of those possibilities. The Netherlands must be optimally equipped for that purpose: the Netherlands as digital delta.

The ICT wave is accelerating the development of the information society, a development which is taking place to a large extent on an autonomous basis. The white paper indicates what contribution the government wishes to make to that development. It defines five pillars which together are of essential importance to the country's starting position. In this white paper, the Cabinet wants to state clearly the ambitions that exist with regard to those pillars, the role that the government sees for itself there, and the existing and future measures that this Cabinet is/will be implementing to fulfil this role.

'The Dutch Digital Delta' is the follow-up to the National Action Programme on Electronic Highways¹ (dating from 1994) and the letter 'Review of the National Action Programme on Electronic Highways' sent to the Lower House in April 1998.²

'The Dutch Digital Delta' offers a framework for a range of specific measures, which are comprehensively described in recent or forthcoming white papers.³ This white paper presents supplementary measures on a number of aspects. 'The Dutch Digital Delta' works with a horizon of three to five years.

This white paper is therefore a response to a motion by the Lower House in which the House finds that government initiatives in the ICT sector are threatening to become fragmented, and asks the government for greater coherence and streamlining in those initiatives.⁴

The Netherlands as digital delta

For the Netherlands to succeed in enlarging its prosperity and well-being with the new opportunities offered by ICT, it is necessary to be and remain outstandingly equipped. The Netherlands must have a first-class ICT base.

Although the ICT wave is international, we ourselves determine to what extent we will or won't surf along on the crest of that wave. By putting and maintaining our ICT base in order we will be able to create a climate in which new ICT applications can be developed and used so that the country's firms can remain competitive, the government can improve its services, and citizens can utilize new means of information collection and communication.

The technology continues to develop at such speed that there can be no question of 'blueprint thinking'. In the transition to an information society we must dare to search, experiment and pioneer. What is needed is a climate of flexibility and adaptability, a climate that counteracts rigidity and compartmentalisation, and induces innovation, creativity and co-operation. With such a climate the Netherlands will be able to become a digital delta indeed.

Our starting position is relatively favourable, for the Netherlands ranks seventh in a group of 55 countries. Together with the United States, Singapore and the countries of Scandinavia, the Netherlands is classed in the leading group known as '*the information elite*'.

But in a world of very fast-moving developments - as in ICT - a good position today is by no means a guarantee of a good position tomorrow. World-wide, we see governments, organizations, firms and markets already repositioning themselves to make sure they will soon be able to profit to the fullest extent from the potential offered by ICT. To maintain a good position will therefore take great effort. And that applies all the more in order to strengthen the somewhat weaker elements of the ICT base that exist in the Netherlands as well.

4. Motion by MP Voûte-Droste, raised and adopted during the Finalization of the expenditure and income budget of the Ministry of Economic Affairs (XIII) for 1999. Lower House, session 1998-1999, 26 200, No. 20.

The government's role in strengthening the ICT base

Firms, organizations, consumers and citizens fuel the ICT base in the Netherlands. They determine whether or not they want to make use of the ICT opportunities offered. They utilize ICT because of the benefits it can give them, and for that reason they invest in computers, networks, software, education and training, new applications, and so on. Many developments in ICT therefore take place without government intervention. The massive growth of the Internet is a good example of this.

However, the government cannot merely stand passively by. There are a number of reasons for this:

- the use of ICT in the market sector may be impeded by market failure or by inadequate institutional preconditions;
- a first-class ICT base is very important for the attractiveness of this country as a place to locate business activities; if that base features any shortcoming it is important for the government to do whatever is in its power to strengthen that base;
- where its own services to citizens are concerned, by definition the government itself may not disregard the opportunities to make use of ICT to increase the quality and reduce the cost of providing these services.

The Cabinet there sees an active role for itself with regard to the (further) strengthening of the ICT base in the Netherlands. This policy is to be based on the principle that it will put those preconditions in order for which the government itself bears responsibility and help to remove any remaining impediments to ICT usage in so far as suppliers and users themselves are unable to do so. The Cabinet distinguishes five pillars which together determine the strength of the national ICT base:

Pillar A: The (tele)communications infrastructure

The infrastructural base for information traffic. The Cabinet's ambition is for the Netherlands to have and retain a first-class, affordable, accessible and reliable (tele)communications infrastructure. The role to be played by the government here is to encourage innovation and investment in the telecommunications infrastructure by assuring competition on the telecommunications market, by allocating frequency space efficiently, and by safeguarding the technical reliability of the telecommunications infrastructure.

The position of the Netherlands is favourable because of the degree of liberalization on the (tele)communications market and the opportunities

offered by the relatively dense national cabling system. One item of concern, however, is the fact that the rate at which the capacity of the infrastructure is being expanded is lagging behind the rate at which capacity demand among business and private users is increasing, above all due to the explosive growth of the Internet - 100% a year in this country - and mobile traffic. At the same time the potentials of the cable are still under-utilized.

Pillar B: Know-how and innovation

Know-how and innovation are absolutely essential if information and communication technologies are to be put to effective and innovative use in the Netherlands. The ambition of the Cabinet is that this country should have a premium-quality know-how position of its own (both in ICT technology and applications) and strong ICT clusters in which developers and users jointly utilize that know-how. To prevent a situation where manpower and expertise shortages hamper innovations, this country requires a top-level training infrastructure for ICT researchers and specialists.

The government's role is to encourage the (joint) development of know-how in firms and technological institutes, to help create application clusters, to help to promote entrepreneurship in the ICT industry, and lastly - as provider and financier of education - to ensure that the quantity and quality of ICT specialists matches the labour market demand. Although our know-how position does not appear bad (with a reasonable volume, and a strong position in certain areas), there are also indications that the productivity of the research efforts is only moderate and that public and private players sometimes find it difficult to get along. There are still too many impediments to new entrepreneurship within the ICT industry. Finally: although a shortage of ICT manpower exists in all countries, this problem appears to be relatively large in the Netherlands.

Pillar C: Access and skills

These relate to the absorptive capacity within society: do citizens and firms have the opportunity to keep up and work with the new ICT developments. The government wants to encourage people to become acquainted with modern ICT and to acquire ICT skills. For the future work-force there is a special responsibility, because the education system must prepare them for the labour market.

In the Netherlands - both in firms and in households - relatively many modern facilities are present (such as PCs etc.). Internet usage is growing

fast and there is increasing attention for the electronic provision of governmental and cultural information. Within the education system, however, a large catch-up effort is needed.

Pillar D: Regulatory aspects

This relates to the system of formal and informal agreements that determine how we deal with one another in the communication society. The government's role is to further equip national legislation and regulations in order to assure legal security and to enlarge confidence in the information society.

The Dutch starting-position is good, because the country's legislative and regulatory system is framed in a comparatively technology-independent way. This means that the system does not need to be modified to cope with every new technological development. Impediments (and this applies not only to the Netherlands) are that users still have insufficient confidence in identification, fraud-proofness, etc. so that they are still rather reserved about electronic transactions, and that there continues to be lack of transparency concerning tax regimes that apply.

Pillar E: The use of ICT in the public sector

The ambition is to optimize the use of ICT in the public sector, so that the provision of services is of very good quality and the public sector can serve as a model for others. By 2002 at least one-quarter of public services are to be delivered electronically.

The opportunities for this are increasing now that a catch-up effort has been made in terms of ICT implementation in central government workplaces and experience has been gained with new - albeit sometimes small-scale - ICT applications. One impediment is the fragmented availability of know-how and experience within the public sector.

The financial framework

The Cabinet is undertaking a large number of measures to strengthen the ICT base in the Netherlands. This is illustrated by the tables following this introductory summary. Besides the NLG 70 million allocated annually to developing the electronic highway, the total sum involved up to and including 2002 is over NLG 1 billion. In addition the Cabinet also provides resources for R&D programmes⁵ and generic instruments like BTS (*Besluit-subsidies Bedrijfsgerichte Technologische Samenwerkingsprojecten*, Business-Oriented Technological Co-operation Projects Subsidies Order)

5. For example the IOP Man-machine interfaces, research schools like COBRA, and EUREKA projects like MEDEA and ITEA.

and WvA/S&O (*Wage Tax and Social Security Contributions Reduced Remittances Act/Research and Development*). These are also used to encourage ICT developments. Lastly, government departments provide funding for a large number of ICT activities when it comes to the application of ICT in their own organization and the areas of policy for which they bear a specific responsibility. At the present moment, therefore, the Cabinet sees no reason to reserve additional funds for ICT policy.

Working on the Dutch digital delta

A first-class ICT base demands an *integral* government policy. The government cannot therefore choose at will between attention for the communications infrastructure, know-how and innovation, access and skills, regulations, or in-house application of ICT. An integrated, horizontal approach is required. *Communication*, too, must play a major role in ICT policy. Not only because citizens and organizations in the Netherlands must be aware of what fundamental changes are taking place, or may take place, in our society as a result of ICT development. But equally because the high speed of those developments inevitably means that government policy has to be regularly adapted to changing conditions (that is precisely necessary). This does impose additional requirements on the quality of public information on ICT policy.

Finally: *benchmarking* is essential. The demands to be met by a good ICT base require constant modification. It is therefore impossible to conduct effective ICT policy without regularly measuring the national position. Keeping up requires adaptation and flexibility.

The Cabinet is therefore taking a number of new measures in order to further strengthen the integral nature of ICT policy, improving benchmarking, and devoting more attention to communication. For instance, an ICT benchmark is to be developed in order to get an integral two-yearly picture of the international relative position of the Netherlands in the ICT sphere, by means of a range of indicators. In addition a small but authoritative external forum is to be set up. The objective of this is to fuel the ICT policy in dialogue with persons playing a prominent role in the development of the information society.

Our digital delta cannot be created overnight. We will have to check regularly where we stand, whether we are making enough progress with our actions, whether we are responding effectively to new developments, and whether the Dutch digital delta is materialising. We will report periodically to the Lower House on these matters.



PILLAR A: THE (TELE)COMMUNICATIONS INFRASTRUCTURE

A.1 Supporting innovation, competition and investment in the (tele)communications infrastructure

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Drafting White Paper on telecommunications developments	V&W	White Paper in preparation	Talks with interested (market) players; Paper completed by 2000	
2.	Defining Dutch position on review of ONP directive	V&W	General position being prepared pending Commission's Green Paper (due Nov. '99)	Definition of position early 2000	
3.	Facilitating debate on capacity shortage	V&W	In preparation	Debate to take place before year-end 1999	
4.	Periodical benchmarking of (tele)communications infrastructure	V&W	Benchmarking system in preparation	First benchmarking study in 2000	
5.	Allocating WLL licences	V&W	Licence allocation in preparation	Licence awards to start year-end 1999	
6.	Allocating UMTS licences	V&W	Licence allocation in preparation	Licences to be awarded in 2000	
7.	Drafting incentive framework for new (tele)communications technologies	V&W	Scheme in preparation	Start-up year-end 1999/early 2000	For 1999 NLG 3 million from 1999 NAP budget
8.	Further White Paper on cable use as an equivalent alternative	V&W, EZ, OC&W	Consultations in preparation; economic analysis of cable sector in preparation	Further White Paper by year-end 1999	

PILLAR A: THE (TELE)COMMUNICATIONS INFRASTRUCTURE

A.2 The ether: greater efficiency and capacity through digitization

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Award of licences for DVB-T and T-DAB	V&W, OC&W	Licence allocation in preparation	Licences to be awarded year-end 1999/early 2000	
2.	Allocating analog broadcasting frequencies	V&W, OC&W	In preparation	Allocation in 2000	

A.3 Technical reliability of the (tele)communications infrastructure

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Identifying weaknesses in the infrastructure	V&W	Identification study in preparation	Study to be completed by December 1999	
2.	Drafting National Telecommunications Continuity Plan	V&W	In preparation	Plan completed by March 2000	

PILLAR B: KNOW-HOW AND INNOVATION



B.1 The development of (technological) know-how

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Expansion of GigaPort	EZ, V&W, OC&W	GigaPort organization completed	Monitor further development	NLG 142 million allocated from FES fund for period 1999-2002
2.	Expansion of Watergraafsmeer Science and Technology Centre	OC&W	Project under construction	Monitor further development	NLG 30 million allocated from FES fund for period 1999-2002
3.	Telematics Institute	EZ, OC&W	Created in 1998	Interim evaluation in preparation	NLG 9.8 million contribution for 1999 from EZ budget
4.	R&D support	EZ	Several specific (IOP) and generic (WvA/S&O, BTS) schemes	Support further project co-operation between firms and science & technology institutes	Resources allocated from various sources
5.	Improved accessibility of IT research	EZ, OC&W	Scouting project II started (implemented by SERC)	Feasibility study completed by September 1999	Feasibility study funded from EZ budget

PILLAR B: KNOW-HOW AND INNOVATION

B.2 Supporting strong ICT clusters

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Evaluation of Software Action Plan	EZ	Evaluation in preparation	Evaluation completed by 2000	
				Then decision on follow-up	
2.	Twinning	EZ	Twinning organization completed, with initial budget of NLG 70 million	Monitor further development	NLG 20 million extra allocated (partly from 1999 NAP budget)
3.	Improve accessibility of KREDO: - lower threshold - intensify information effort	EZ	In preparation	Threshold lowered at opening of second tender in 1999	KREDO budget for 1999: NLG 25 million from NAP budget
				Information effort intensified for second tender in 1999	

B.3 Sufficient ICT personnel: labour market and education

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Task Force on ICT shortages	EZ, OC&W	Task Force appointed	Strategy formulated by September 1999	NLG 9 million from 1998 NAP budget available for implementing strategy
				Then decision on further actions	
2.	E-commerce in education	EZ	Study being carried out	First results known by year-end 1999	Funded from 1998 NAP budget

PILLAR C: ACCESS AND SKILLS



C.1 Access to information (services)

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Fiscal facility for donation of PCs to schools etc.	Fin	Facility operational since early 1999		
2.	Government-Citizen Communication Project	BZK	Project being implemented	Continuous monitoring Evaluation at year-end 2000	NLG 20 million from NAP budget for period 1999-2000
3.	Expansion of Syntens activities (InnovatieNet and Sp.OED secretariat)	EZ	In preparation	InnovatieNet to start year-end 1999 Integration of Sp.OED secretariat year-end 2000	NLG 12 million from NAP budget for period 1999-2000
4.	Evaluation of MediaPlaza and decision on follow-up	EZ	Operational since 1997 Evaluation started	Year-end 1999 decision on continuation of MediaPlaza in 2000 and beyond	
5.	Improve accessibility of cultural and scientific heritage	OC&W	Various current projects (Websites, Digital Heritage Consortium)	Further extension of projects	Current projects funded from 1998 NAP budget NLG 4 million available in 1999 NAP budget

PILLAR C: ACCESS AND SKILLS

C.2 Skills

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Education On Line Action Plan	OC&W	Under discussion	Decision on implementation method	Period 1997-2002: Once-only contribution of NLG 900 million
2.	Introduction of ICT as optional subject in second stage of secondary/pre-university education	OC&W	Being implemented	Monitor further development	
3.	Introduction of ICT in higher education	OC&W	Being implemented	Year-end 1999 decision on contributions for 2000 and beyond	OC&W contribution of NLG 4.5 million to SURF Foundation for project in 1999
4.	Fiscal incentives for training efforts	Fin	Operational since 1998 Extra incentive for SMEs and older employees		NLG 235 million + NLG 35 million for lost premiums
			Non-profit facility operational since 1999		Non-profit facility: NLG 110 million



PILLAR D: REGULATORY ASPECTS

D.1 Equipping general regulatory and legislative provisions

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	White Paper on Legislation for the Electronic Highways	Justice	In progress	Progress report to Lower House in autumn 1999	
2.	Policy Paper on liability of intermediate organizations	Justice	Promised to Lower House	Policy Paper in summer 1999	
3.	Policy Paper on international developments	Justice	Promised to Lower House	Policy Paper by year-end 1999	
4.	Amendment of basic rights in digital age	BZK	Commission on Basic Rights appointed	Advisory report completed by May 2000	
5.	Continuation of 'IT and Law' Programme	Justice	Decision taken to continue programme	Further definition of programme set-up and content	NLG 2.5 million for 1999 from 1999 NAP budget
6.	Creation of virtual legal reference centre	Justice	Motion passed in Lower House	Implementation by 'IT and Law'	

D.2 Legal security

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Computer Crime Bill II	Justice	Being drafted	Summer 1999 submission to Lower House	
2.	Data Protection Bill	Justice	Before Lower House		

PILLAR D: REGULATORY ASPECTS

D.3 Fiscal regimes

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Implementation of international agreements on fiscal regimes for electronic commerce	Fin	OECD agreements on imposition of VAT International talks on other aspects ongoing	Follow-up international talks	
2.	Finalization of cabinet paper on fraud control 1998-2002	Fin		Setting up of ICT know-how transfer group, electronic commerce and fiscal matters within Tax Service	
3.	Fiscal incentives for ICT participation and ICT use	Fin	Report on 'Taxes in a World without Distance' discussed with Lower House	Elaboration of report's recommendations	

D.4 Building confidence

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Trusted Third Parties	V&W, Justice, EZ	Policy Paper on pre-conditions applicable to TTPs submitted to Lower House early June Implementation initiated	Consultation with Lower House Investigate possible need for legislation in certain areas	
2.	Drafting Electronic Commerce Code	EZ, Justice	Code being developed	Code to be launched in autumn 1999 Results reported to OECD	
3.	Directive on 'Some Legal Aspects of electronic commerce'	Justice, EZ	NL position reported to European Commission	Negotiations with Commission and EU member states	

PILLAR E: ICT IN THE PUBLIC SECTOR⁶



E.1 Improving external services

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Improved accessibility to government	BZK, EZ, VWS, VROM	Decision taken to set up three integrated (virtual) sites	Implementation in period to 2002	Funding from 1999 NAP budget based on project proposals
2.	Improved accessibility to government information	BZK	www.overheid.nl in preparation	www.overheid.nl operational in September 1999 Next step: accessibility of Parliamentary proceedings and laws and regulations	NLG 3.6 million from 1998 NAP budget, plus various NAP projects for opening up government information
3.	Development of government information on Internet	BZK	Various activities in preparation	Subsidy scheme for ZBOs, Planning Bureaux and Advisory Bodies	Funding from 1999 NAP budget based on project proposals
4.	Studies into impact of ICT on performance of democracy and government organizations	BZK	Study in preparation	Includes participation in international programme on 'Governance in the digital economy' (1999-2001)	

6. In the 1999 NAP budget NLG 30 million is reserved for the implementation of the Electronic Government Action Programme.

PILLAR E: ICT IN THE PUBLIC SECTOR

E.2 The internal performance of the government

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Development of government infrastructure	BZK	Preliminary studies initiated	Government Intranet to start up in 2000	Preliminary studies funded from NAP budget
2.	Enlarging number of authentic registrations	BZK	To be initiated in four areas	Implementation of projects in chosen areas	For 1999 NLG 5 million available from 1999 NAP budget
3.	Reducing administrative burden	EZ, BZK	Commission on Administrative Burden has compiled interim report	Cabinet response to recommendations	
4.	Implementing expertise to be combined in single new unit	BZK	Currently several programme bureaux (OL2000, ON21, COB)	New unit to be operational by year-end 1999	
5.	Strengthening co-ordination function for ICT within central government	BZK	Directors and Cluster Forum on Electronic Government appointed	Plans for further strengthening by year-end 1999	

PILLAR E: ICT IN THE PUBLIC SECTOR

E.3 Model function of the government

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Support introduction of electronic tendering	EZ	Pilot to be started within EZ	Pilot to be completed early 2000	NLG 1 million from 1999 NAP budget
2.	Carry out pilot on (electronic) remote identification	BZK	Pilot to start second half 1999	Pilot to be completed early 2000	Funding from 1999 NAP budget on basis of project proposals
3.	Study of electronic payments to/by government	BZK, EZ	Study in preparation	Carry out study	
4.	AWB to be adapted to digital age	BZK, Justice	In preparation	Further elaboration of AWB adaptation	
5.	Development of an infrastructure platform for electronic identification	BZK	Start-up before summer	Completion by mid 2000	
6.	Support for use of TTPs by government	BZK, EZ, V&W, Justice	TTP policy paper to be submitted to Lower House	Further elaboration	
7.	Support for E-commerce Code within government	EZ, BZK	Code being developed	Further elaboration prior to code completion	
8.	Drafting framework for disclosure of government information	BZK	Cabinet response to Green Paper has appeared	Framework completed year-end 1999	
9.	Promotion of digital sustainability	BZK, OC&W	Feasibility study to be presented in summer 1999	Developing (+ amending regulations) - record-keeping system - digital depot	Funding from NAP 1998 and 1999 budgets

THE DUTCH DIGITAL DELTA: INTEGRATION, COMMUNICATION AND BENCHMARKING

	Project	Lead	Status	Forthcoming actions	Budget (if applicable)
1.	Strengthening information effort on impact of ICT	EZ, V&W, BZK	Communication plan being developed	Implementation of communication plan	
2.	Providing ICT policy overview on Internet	EZ, BZK	Inventory drawn up www.overheid.nl being developed	Further development of website	
3.	Development of periodical ICT benchmark	EZ		Benchmark to be developed by autumn 1999	
4.	Improved information on societal impact of information society	OC&W	MES programme developed	Programme start-up (by NWO)	NLG 1 million for 1999 from 1999 NAP budget
5.	Appointment of external forum as an informal sounding board	EZ		Forum to be appointed in 1999	
6.	Infodrome	OC&W	Programme has started	Programme implementation	NLG 5 million from OC&W budget

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1 THE NETHERLANDS: DEVELOPING INTO AN INFORMATION SOCIETY

1.1 The development of ICT

Although information and communication technologies (ICT) are nothing new in themselves, we are currently in a period which is undeniably characterized by a wave of new ICT applications. A wave that is fuelled on the one hand by the constant improvement in performance and fall in prices of computers and on the other hand by the possibility to interconnect computers in networks. This wave is speeding up the development of the information society.

Because information and communications technologies are becoming increasingly powerful and less expensive, they are now to be found throughout society. They are all-pervasive in nature, and modern life would be unimaginable without ICT. They are as it were a carrier wave bringing major changes in the way we live and work in the Netherlands.

The development of ICT in the Netherlands¹

In 1956 there were four computers in the Netherlands. Forty years later that number was four million. The total amount of external ICT expenditure in 1998 was NLG 21.5 billion, of which NLG 3.5 billion was spent by households and NLG 18.1 billion by the business market.

Above all the interconnection of computers into networks and the interconnection of those networks into a world-wide network of networks (the Internet) provides enormous opportunities for information exchange. Opportunities which, when the National Action Programme on Electronic Highways was presented in 1994, were only foreseen by a few. The Internet is developing tempestuously, in the Netherlands as well.

Internet in the Netherlands

At the end of 1994 fewer than 100,000 Dutch citizens had access to the Internet. Four years later, at the end of 1998, that number had grown to over 3.3 million citizens aged 15 and older, and a further 1.5 million persons of that group indicate that they will have access within one year. The estimate is that by the end of this year (1999) almost five million Dutch citizens will have Internet access either at home or at work. That amounts to 40% of the Dutch population aged over 15.²

1. Sources: 'The rise of information technology in the Netherlands', History of Technology Foundation, Eindhoven 1998, p. 140, 'Automation in the Netherlands', CBS/FENIT, Voorburg-Heerlen 1997, p. 21-22; FENIT-Marktmonitor 1998-1999', FENIT in conjunction with Heliview, February 1999.

2. National Internet Monitor 3rd quarter 1998, Pro Active and Adformatie, 1998.

The technological developments are still far from coming to a standstill. The number of transistors per semiconductor is doubling every 18 months, the capacity of glass fibre is doubling every 12 months, and the capacity of wireless connections is doubling every nine months. If this trend continues, the result will be a 250-fold increase in network capacity by 2005.³

It is difficult to overestimate the consequences of this development.⁴ Information can be found, processed and exchanged still more inexpensively and speedily, with important economic and societal consequences. This is the subject of the following section.

1.2 The impact of ICT

In Western society, a lot of work is based on working with information, such as searching for and exchanging information for preparing, conducting and settling transactions (e.g. tendering, ordering, payment). The percentage of 'information-related work' in the societies of developed countries is increasing rapidly. In 1994 the figure was already over 60%.

3. 'The Global Communications R/Evolution', presentation to the Ministry of Economic Affairs by B. Martin, Chief Technology Officer, Lucent Technologies, 18 May 1999.

4. Of course, ICT developments are not confined to Internet applications. Matters such as product and process innovation and the totally new products created as a result of ICT remain very important and will continue to demand industry and government attention in the coming years. The rise of the Internet however creates totally new challenges, to which the present white paper focuses attention.

5. Data for the United States. McKinsey analysis of data from the Bureau of the Census and the Bureau of Labor Statistics; Pat Butler et al.: 'A revolution in interaction', McKinsey Quarterly 1997, No. 1.

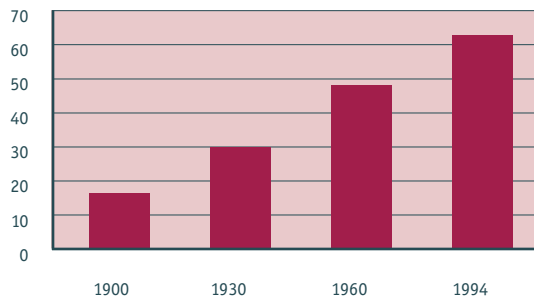


Figure 1-1: Information workers as a percentage of total employment⁵

ICT - provided it is applied appropriately - is capable of drastically reducing the costs of these information acts. Table 1-1 gives some examples of this. But for the trade in physical goods as well, electronic commerce enables large cost economies to be achieved, for example in administrative and customs charges (estimated by the WTO at over 25%).

	Ordering airtickets	Banking	Paying bills	Software distribution
Traditional	\$ 8	\$ 1.08	\$ 2.22 - \$ 3.32	\$ 15
By telephone		\$ 0.54		\$ 5
By Internet	\$ 1	\$ 0.13	\$ 0.65 - \$ 1.10	\$ 0.20 to \$ 0.50
Cost saving	87 %	89 %	67 to 71 %	97 to 99 %

Table 1-1: Examples of cost savings by ICT⁶

This drastic reduction in the costs of information processing can lead to major changes in the way in which organizations and markets are structured and operate. This has important implications for firms, the public sector, and citizens/consumers. A few examples:

- Because of the direct contact between those demanding and those supplying information via electronic networks, an economy and public services in which goods and services are modified to meet personal wishes ('mass individualization' instead of uniform 'mass production') is more possible than ever. At the same time customers will gain a growing influence on organizations. Organizations will be able to know their customers better and approach them in a more individual way.
- Many of today's distribution chains are based on the - planned or estimated - development and production of goods and services which are then directed to the customer via numerous links in the chain (wholesale, retail, executive agencies). In the information society, new chains are created which do not begin at the supplier but at the customer. The customer has the option of bypassing intermediate links and contacting the supplier direct.
- The citizen benefits, also as a consumer, from the applications described above. There is also a wide range of new possibilities for recreation, for collecting information and for communicating, at times and places dictated by personal preference. For democracy, too, the Internet offers countless opportunities. Ample availability of government information contributes to this.
- These developments are further reinforced by the fact that ICT gives a whole new dimension to concepts like 'distance' and 'time'. Firms and government organizations, consumers and citizens can contact one another round the clock, seven days a week, totally independent of their physical location.

6. Estimate from various sources, collected by the OECD. 'The economic and social impacts of electronic commerce', OECD Paris, 1999.

1.3 *Innovating with ICT*

ICT enables many new departures to be made in the economic and societal spheres. These are needed in order to maintain and improve our prosperity and well-being.

For that reason this white paper focuses on encouraging the *use* of ICT in the market sector, in the public sector and in society as a whole. Essentially, therefore, the objective is to equip the Netherlands effectively in order to innovate with ICT: the Netherlands as digital delta.

This will require fast work. World-wide, we see governments, organizations, firms and markets already repositioning themselves to make sure they will soon be able to profit to the fullest extent from the opportunities. Although ICT is a world-wide development, the manner in which the Netherlands responds to it is essential to the country's future position.

ICT developments move fast and are not readily predictable: the world-wide breakthrough of the Internet is a clear example of this. There can therefore be no question of 'blueprint thinking'. The ability to respond to the constant flow of opportunities offered us by ICT requires flexibility and adaptability, and a first-class ICT base. The following section deals with the government's ambitions and role in creating a first-class ICT base.

2 AMBITIONS AND ROLE OF THE GOVERNMENT

2.1 *The ambition: the Netherlands as digital delta*

As indicated in the previous section, it is necessary to equip the Netherlands properly to innovate with ICT: the Netherlands as digital delta. This is essential for the country's future prosperity and well-being and it requires (further) strengthening of the Dutch ICT base. The Cabinet distinguishes five pillars in that ICT base:

- The (tele)communications infrastructure: the infrastructural base for information traffic in the information society.
- Know-how and innovation: absolutely vital in order to use ICT effectively and innovatively; the source of innovations in industry and the public sector.
- Access and skills: the opportunity to have access to modern ICT and possess the necessary skills to make use of ICT.
- Regulatory aspects: the system of formal and informal agreements that determine how we deal with one another in the information society.
- The use of ICT in the public sector: the government itself has the obligation towards its citizens to use ICT as efficiently and effectively as possible.

To a large extent the ICT base in the Netherlands is fuelled by firms, organizations, consumers and citizens. They determine whether or not they want to make use of the ICT opportunities offered. They utilize information and communication technologies because of the benefits it can generate, and for that reason they invest in computers, networks, software, education and training, new applications, and so on. Many developments in the ICT sphere therefore take place without government intervention. The massive growth of the Internet is a good example of this.

However, this does not mean that the government can merely stand passively by. There are a number of reasons for this:

- the use of ICT in the market sector contributes to prosperity and well-being, but it may be impeded by market failure or by inadequate institutional preconditions;
- a first-class ICT base is very important for the attractiveness of this

country as a place to locate business activities; if that base features any shortcoming it is important for the government to do whatever is in its power to strengthen that base;

- where its own services to citizens are concerned, by definition the government itself may not disregard the opportunities to make use of ICT to increase the quality and reduce the cost of the provision of these services.

The Cabinet therefore sees an active role for itself with regard to the (further) strengthening of the ICT base in the Netherlands, for which purpose it has formulated the following ambition.

The Netherlands among the European leaders on the electronic highway

The Netherlands has the ambition to belong to the group of European leaders on the electronic highway: the Netherlands as digital delta.

This requires an excellent starting position in various fields. In this white paper the Cabinet therefore defines this ambition in more detail. For each of the five pillars of the ICT base it spells out the current status, the ambitions, the role of government and the actions. Policy development in these areas must be integrated in character and clearly communicated, and progress must be assessable by benchmarking. For those reasons measures are announced designed to add strength here too.

It is the Cabinet's ambition to achieve a first-class ICT base in the Netherlands, specifically, for the five pillars this means:

- The (tele)communications infrastructure: a first-class, affordable, accessible and reliable (tele)communications infrastructure;
- Know-how and innovation: a high-grade know-how position (both in ICT technology and in applications). Strong ICT clusters in which ICT suppliers and users provide for innovative applications of that know-how. An outstanding infrastructure for the training of ICT researchers and specialists;
- Access and skills: encouraging citizens and firms to acquire access to the new electronic media and the relevant skills. A (future) work-force that is ICT-skilled;
- Regulatory aspects: any legislative and regulatory impediments to the development and application of ICT are to be removed. Public confidence in the use of ICT;
- ICT in the public sector: optimized ICT use in the public sector so that government services are of good quality. The Action Programme on Electronic Government includes the ambition that by 2002 at least one quarter of public services must be delivered by electronic means.

2.2 The government's role with regard to the five pillars

The Cabinet will do all in its power to make a contribution towards an outstanding quality of the five pillars of the ICT base. Our future prosperity and well-being demands this. This policy is based on the principle that the Cabinet arranges the preconditions for which it bears responsibility and helps to remove impediments to ICT usage in so far as suppliers and users themselves are unable to do so.

At the same time, however, we must remember that often the Netherlands is unable to operate in isolation. ICT developments are by definition determined globally. That applies not only to technological developments. The use of ICT is also subject to agreements made in international organizations such as the EU and OECD. The Netherlands, as a member of these organizations, has a voice in drafting these agreements but at the same time this membership also limits the influence which this country can bring to bear on the solutions. This means that the Dutch room for manoeuvre is sometimes more limited than we might wish.

Pillar A The (tele)communications infrastructure⁷

A reliable (tele)communications infrastructure with sufficient capacity and operating to generally recognized standards is an essential building block of the ICT base.

Market players develop and build those infrastructures and hardware, and set the standards. The government has liberalized the telecommunications market and encourages competition on and between alternative communication infrastructures, such as telephone lines, cable networks and the ether.

In a liberalized market, there is in principle no task for the government in investing in the capacity of the communications infrastructure. Only very incidentally does the government itself invest in that infrastructure in order to encourage developments considered to be societally desirable, but for which there is no basis for commercial operation. In the case of market failure, the government can also lower investment thresholds by means of incentives. It can bring players together, organize forums, or - by means of a (financial) incentive - give players the opportunity to

7. This relates to 'regular' or 'commercial' (tele)communications infrastructure. Infrastructures for specific activities and target groups like GigaPort (R&D activities and universities and polytechnics) and the NAFIN network (defence) are explicitly excluded.

gain know-how in and experience with new technologies and applications in pre-commercial stages.

The telecommunications market cannot operate without a government that sets clearly defined frameworks for its operation, because this market is characterized by very strong network effects and - for historical reasons - established players with considerable market power. This may be detrimental to competition and hence to innovation or investment. The government therefore sets rules of the game (e.g. governing market entry and precluding abuse of a dominant market position) so that competition remains possible. At the same time the government assures independent monitoring.

In the allocation of frequency and number space the government plays a dominant role, among other things for reasons of shortage and vital public tasks. The government seeks to ensure an objective, efficient and timely allocation so that new opportunities can be accomplished fast.

The strong integration of ICT in society means that the functioning of society itself is becoming increasingly dependent on the technical reliability of the (tele)communications services. Protecting the security of information systems and communications infrastructures, and managing the growing complexity of ever more advanced applications, are therefore becoming more and more important.

To summarize, the role of the government in this area consists of:

- encouraging innovation, competition and investment in the (tele)communications infrastructure (§ A.1);
- ensuring the efficient allocation of frequency space (§ A.2);
- safeguarding the technical reliability of the (tele)communications infrastructure (§ A.3).

Pillar B Know-how and innovation

As with other forms of R&D, investments in the acquisition of ICT know-how are in principle the responsibility of players in the market sector and of technology institutes.

Because R&D has positive external effects (it leads to expansion of the knowledge reservoir on which others in turn can build on) governments have traditionally played a role in encouraging the acquisition of

knowledge in society, for example by promoting fundamental and strategic research at universities and technology institutes, and by encouraging investment in R&D by market players themselves. By promoting the dissemination of knowledge at the same time, the government can also ensure better utilization of the positive external effects of knowledge acquisition.⁸

The government proceeds on the basis of the same responsibility with regard to the development of knowledge in the ICT sphere.

This knowledge base must be present in the Netherlands itself: information can travel around the globe fast, but knowledge cannot. The acquisition and dissemination of knowledge still depend to a large extent on physical contacts - and hence proximity - notably because of the necessity to ensure a good fit between ICT potentials on the one hand and organizational and business strategies on the other. That requires local knowledge. ICT clusters (partnerships between organizations developing and applying ICT) play an important role in the development and dissemination of knowledge.

Lastly: knowledge can only be developed, disseminated and applied if there is sufficient manpower available to store it. In other words, sufficient well-trained ICT researchers are needed. There is also a need for sufficient ICT specialists, e.g. in the installation and maintenance of computer and network systems. The government, as financier and supplier of education, has co-responsibility for this.

To summarize, this means that the government has a role to play in the following areas:

- the development of (technological) know-how (§ B.1);
- the promotion of strong ICT clusters (§ B.2);
- the promotion of sufficient ICT personnel: labour market and education (§ B.3).

8. 'Space for industrial innovation. An agenda for industry and services policy', letter from the Minister of Economic Affairs to the Lower House in June 1999; 'Knowledge in Action', Parliamentary Proceedings II, session 1994-1995, 24 229, Nos. 1-2.

Pillar C Access and skills

Access and skills are important from the societal viewpoint (to prevent social division), from the economic viewpoint (participation in the labour market, creation of a large consumer market) and from the democratic viewpoint (access to government information). The pace of ICT developments and the growing number of possible applications impose high demands on the capability of our society to keep up with

and utilize all this. This applies all the more with regard to the ambition to exploit these potentials to the full.

In principle there is no problem in gaining access to the Internet.

Practically everybody has a telephone connection, increasing numbers of cable companies offer Internet access, and communication charges and PC prices continue to fall. In addition, there are tax incentives designed to encourage PC ownership.

There is indeed one possible problem. For reasons of ignorance citizens and firms may be hesitant to become acquainted with the latest developments or not know how to utilize them due to a lack of skills.

Many people also come into contact with ICT in their job, and there they will maintain their skill at using new ICT. Employers and employees must in principle be regarded as being capable of taking their own steps to upgrade their skills in time and to make proper arrangements for access to services.

Efforts by job-seekers to obtain conversion training, further training or retraining in ICT skills are important to their chances on the labour market. This is important in order to deal effectively with long-term unemployment. Such a strategy is intended to progress towards a situation where in five years' time the entire new inflow of jobless (in so far as they are not able to find work by themselves) are offered a work-targeted training programme. ICT skills are very important in that respect.

An area of priority attention is our future work-force. Now that ICT skills are becoming more and more of a precondition for participation in society, and above all in the labour process, it is crucial for the education system to provide for the acquisition of these elementary skills.

To summarize, the government's role focuses on the following areas:

- encouraging the capability of citizens and firms to gain access to information (services) (§ C.1);
- encouraging ICT skills in the (future) work-force (§ C.2).

Pillar D Regulatory aspects

A society cannot function without regulation. Regulation ensures an orderly society. Now that we can no longer imagine our society without ICT, regulation is therefore needed which is and remains tailored to the possibilities of ICT and its usage. In an electronic environment as well, the government must guarantee a number of fundamental norms and values of the democratic constitutional state, protect basic rights, and assure the enforcement of law. In addition, it must be possible to offer legal security and fiscal clarity, in order to provide incentives for the (transfrontier) use of the potentials of modern ICT.

The pace of the development of ICT technology and its international character create a constant tension between on the one hand the wish to have a rapid answer to the question of what is possible and permissible, and on the other hand the task of dealing carefully with the sometimes fundamental issues raised by ICT. In this respect it is necessary to pursue an internationally realistic course.

In 1998 the white paper 'Legislation for Electronic Highways' set out in comprehensive detail what principles the Cabinet applies for this purpose.

In summary, the government's role consists of:

- Equipping general legislative and regulatory provisions for the information society (§ D.1);
- Offering legal security (§ D.2);
- Creating clarity concerning fiscal regimes (§ D.3);
- Building confidence in the information society (§ D.4).

Pillar E ICT in the public sector

Of course the government must have its own affairs in order. The recent Action Programme on Electronic Government of the Minister for GSI states the objective of this pillar. This can be summarized in three themes: improved internal management in central government, good electronic accessibility of government, and improved public services.

The government is obliged to spend each guilder raised in taxes as effectively as possible. Moreover it is not good enough for the government merely to encourage the use of ICT in the market sector, but it will have to demonstrate by its own actions what the potentials of ICT are.

To summarize, this means that - apart from making government information available on an ample scale (§ C.1.2) - the (central) government has a role to play in the following areas:

- improvement of external service provision (§ E.1);
- the internal performance of the government (§ E.2);
- the model function of the government (§ E.3).

2.3 Does the Netherlands have a first-class ICT base?

A recently published benchmarking study takes 23 indicators to compare the degree in which countries are equipped to utilize the opportunities of information and communication technologies.⁹

The Netherlands has a relatively favourable starting position, occupying seventh place among the 55 countries studied.

The 23 indicators are taken from sources of IDC, International Telecommunications Union, Freedom House and UNESCO. These indicators together yield a score on an 'information society index'. A total score higher than 3,500 puts a country in the leading group. In 1998 the Netherlands scored 3,532. For 2002 a score is expected in the region of 4,800.

According to this study, compared to a year ago the Netherlands has now joined the leading group, or 'the information elite'. Besides the Netherlands, this group now consists of the US, Singapore and the Scandinavian countries.

Country	1998	2002	Country	1998	2002
United States	1	1	Australia	8	4
Sweden	2	3	Japan	9	5
Finland	3	8	Canada	10	6
Singapore	4	2	United Kingdom	14	13
Norway	5	11	Belgium	15	15
Denmark	6	12	Germany	16	14
Netherlands	7	7	France	19	20

Table 2-1: Ranking on the 'information society index'

9. '1999 Information Society Index, the IDC/World Times Information Society Index 1999', International Data Corporation, April 1999.

The rankings are not stable, however, and there is great dynamism in the way countries are repositioning themselves.

For instance, the three Scandinavian countries are expected to drop behind the Netherlands. Australia, Japan and Canada, however, will be picking up speed faster than the Netherlands, so they are set to overtake us.

We should also realize that our fairly favourable total score is the sum of a number of extremely good scores which benefit the position of the Netherlands, but also of a number that have an impeding effect. This also appears from supplementary source material.

The following section will discuss those strengths and weaknesses in detail. They are summarized in the following overview.

	Opportunities	Threats
(Tele)communications infrastructure (Pillar A)	<ul style="list-style-type: none"> • degree of liberalization • high cabling density 	<ul style="list-style-type: none"> • growing pressure on capacity • under-utilization of opportunities in cable use
Know-how and Innovation (Pillar B)	<ul style="list-style-type: none"> • strong position in certain areas (fundamental software, telematics, microelectronics) • fairly good volume 	<ul style="list-style-type: none"> • poor productivity of research effort • poor R&D supply-demand match • insufficient dynamism and innovative capacity • shortage of ICT researchers and specialists (at all levels)
Access and skills (Pillar C)	<ul style="list-style-type: none"> • PCs a common feature in firms and homes • large and growing number of people with access 	<ul style="list-style-type: none"> • catch-up effort needed in ICT in education • absorptive capacity of SME's
Regulations (Pillar D)	<ul style="list-style-type: none"> • legislation and regulations relatively technology-independent 	<ul style="list-style-type: none"> • insufficient confidence in new transaction forms
ICT in the public sector (Pillar E)	<ul style="list-style-type: none"> • catch-up effort completed in terms of central government workplaces • experience gained with new applications 	<ul style="list-style-type: none"> • small scale of innovative applications • fragmented know-how and experience and poor co-ordination • in recent years financial and human resources needed to deal with the millennium problem

Lastly, a first-class ICT base cannot be created without a government policy that makes an integrated contribution, without sufficient pace being maintained, and without regularly reviewing our position. Keeping up demands adaptability and flexibility. Working on the information society is not only a long-term job, but it is also a task that will never be completed. Holding on to a leading position is only feasible if we have an open eye for new developments and opportunities, and continually redefine our ambitions. Section 4 outlines a number of new measures for this.

3 WORKING ON THE ICT BASE

Pillar A: The (tele)communications infrastructure

Ambition:

A first-class, affordable, accessible and reliable (tele)communications infrastructure.

The government's role:

- encouraging innovation, competition and investment in the (tele)communications infrastructure;
- ensuring the efficient allocation of frequency space;
- safeguarding the technical reliability of the (tele)communications infrastructure.

A.1 Encouraging innovation, competition and investment in the (tele)communications infrastructure

A.1.1 Current status

International developments

The international character of telecommunications finds expression above all in the policy frameworks, which are defined largely at the European and international levels.¹⁰ Following the developments in the US, the liberalization of the telecommunications markets was begun in the late 1980s. The aim was to give an additional boost to employment, economic growth and competitiveness through an improved utilization of competing infrastructures and services.

Opening up access to the market was made subject to rules intended to promote a smooth transition to a competitive market. This is based on the principle that rules must only be imposed if they are strictly necessary in the light of the goals to be accomplished and interests to be protected. For instance, specific obligations may be imposed on established market players concerning the grant of access to their networks to third parties

10. This is expressed at the European Union level, where agreements are made with a view to strengthening and harmonizing the internal market. In addition, international organizations like the ITU (e.g. for frequencies) and the WTO (services) play a very important role.

on the basis of transparency, objectivity and non-discrimination (*open network provision, ONP*). In addition, for certain services they are required to apply cost-oriented charges.

The Netherlands

In the Netherlands, the telecommunications market has been liberalized step by step, with the entry into force of the Telecommunications Act in December 1998 marking the provisional end. The OPTA is the body which monitors compliance with the requirements set by this act concerning access to and use of the public telecommunications infrastructure. As an independent body, it is the OPTA's responsibility to ensure that the transition from a monopoly market to a competitive market takes place in such a way that - within the (statutory) preconditions imposed - progress can be made as far as possible towards a balanced market situation in which the interests of all players are respected.

Our starting position is favourable. The infrastructural facilities are excellent.¹¹ Moreover, within the EU the Netherlands is relatively far advanced in liberalizing the (tele)communications market.

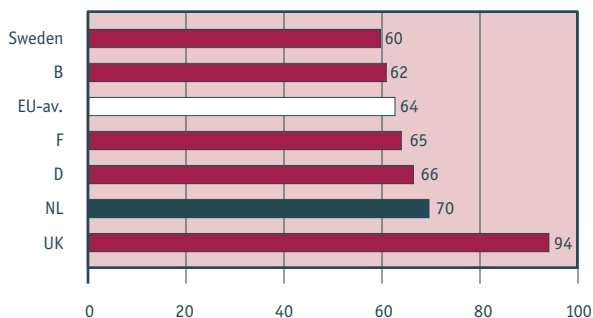


Figure A-1: Degree of liberalization of telecommunications markets (100 = maximum score)¹²

This liberalization has already led to enormous market dynamism. Different infrastructures are able to compete with each other, the supply of services is increasing, and charges are being reduced.¹³ The following figure shows Dutch charges in an international perspective:

11. 'Benchmarking Diffusion and Utilization of Information and Communication Technologies and New Organizational Arrangements', European Commission, Directorate General III-Industry and Ministry of Trade and Industry, Finland, 1998.

12. This indicator consists of the (unweighted) sum of four sub-indicators (regulations, interconnection, competition between infrastructures, and non-discrimination). BT 'Liberalization Milestones', 1999.

13. OPTA 1998 Annual Report.

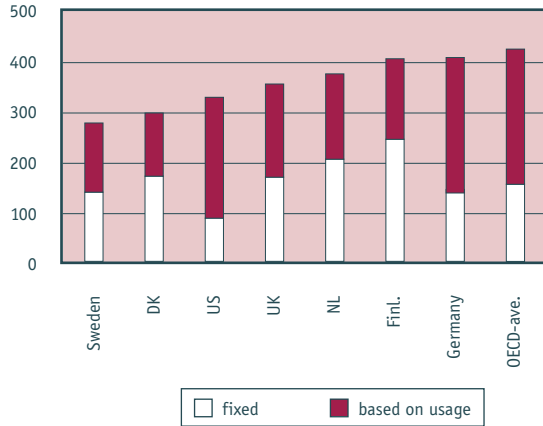


Figure A-2: Telecommunication charges for private use in US\$ PPP ¹⁴

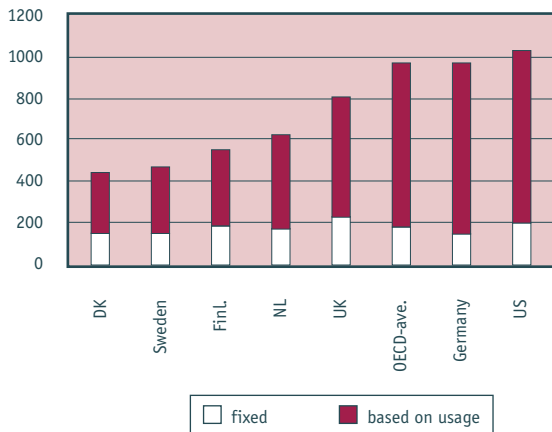


Figure A-3: Telecommunication charges for business use in US\$ PPP ¹⁵

14. 'Communications Outlook', OECD, Paris, 1999. The figures are from August 1998 and refer to average annual spending incl. tax.

15. ditto, but excl. tax.

16. 'Convergence, Competition and Divergence', Vecai, September 1998.

At the same time the Netherlands has a very dense cable network that has the potential to be used as a full-scale alternative communications infrastructure.¹⁶

The Dutch starting position at the moment is therefore a good one, but we must make sure it stays that way. In this context there are two important items of concern:

- terrestrial networks: threatened by failing capacity;
- cables: a potential which to date remains largely under-utilized.

Terrestrial networks: threatened by failing capacity

There is an excessive growth in demand for capacity, particularly due to increasing mobile traffic and Internet use. Internet is growing at 100% a year. Internet log-on traffic is set to exceed local voice traffic next year, and by 2002 it is expected to be four times as large.¹⁷

This need for capacity relates not only to (inter)national communications but also to local connections. New applications will only increase the demand for capacity and speed still further, in both business and private markets.

In principle this job will have to be done by the market. However, because of the unpredictability of this growth it is difficult for market players to anticipate it effectively. The excessive growth of traffic across the communications infrastructure is therefore proceeding spasmodically. One of those spasms is the shortage of network capacity which is currently affecting the KPN Telecom network. Increasing numbers of firms are inundating KPN with ever-larger volumes of traffic to manage for them.¹⁸ There is also a shortage of materials, manpower and equipment for laying new lines and networks.

OPTA has meanwhile ruled that KPN must have solved its capacity shortages before 1 July 1999 and that - should shortage nevertheless persist - it must allocate network capacity with due care.¹⁹

Apart from that, market players are substantially increasing their investments in enlarging capacity. KPN, for instance, has increased its investments in switching and interconnection capacity from NLG 2.3 billion to NLG 3 billion this year. Special attention is focused on relieving the pressure on capacity in the Amsterdam region.

The problem concerning shortage of infrastructure capacity is above all a problem of this moment. It is therefore questionable to what extent it represents sufficient reason to take any structural measures to deal with it, for example by amending legislation and regulations.

In the event of structural market failure, the government has a responsibility to review the regulations, for instance where - despite the lowering of thresholds to market entry - innovations of infrastructures and quality improvement fail to take place. In the light of the capacity issue, it is important to examine what impacts the policy and the applied statutory instruments have had on the desired level of investment in the market.

17. 'Shortage in the KPN Telecom telecommunications network', public version 1.1, Stratix, 9 March 1999.

18. That this traffic growth has led to problems emerges from the fact that since the spring of 1998 there have been increasing signals from the market that KPN is not meeting its delivery times, that carrier-select callers increasingly get the 'engaged tone', and that KPN is not achieving the agreed quality levels in traffic management. Apart from the enormous autonomous growth, a major factor is the disproportionate traffic load in the Amsterdam region.

19. Opinion of OPTA dated 23 April 1999 (www.opta.nl/actueel). The opinion is based on two studies by Stratix: 'Study into interconnection shortage at KPN Telecom' (23/3/1999) and 'Shortage in the telecommunications network of KPN Telecom' (9/3/1999).

The cable: an under-utilized potential

The very dense cable network in the Netherlands potentially represents an important alternative infrastructure for electronic services (e.g. telephony, Internet and pay-per-view).²⁰ However, this potential has so far remained largely under-utilized.

Now that demand for electronic services is rising sharply and the power of the cable companies has increased in recent years,²¹ the opportunities for developing the cable into an alternative infrastructure appear greater than ever. To that end a number of thresholds need to be eliminated: investments in network technology are required, and legislation and regulations require modification.

First of all, the capacity of the cable networks will require enlarging. Although that capacity has increased in recent years as a result in investments in glass-fibre cabling,²² it can be further enlarged by digitization of the cable networks (at present signals are still transmitted in analog form).²³ A decision is also required on a standard for the return channel.

A.1.2 Actions by this cabinet

The present ONP is due to be reviewed in the forthcoming period. That is necessary because of the ongoing technological development (such as convergence) and growing competition on the liberalized markets of the European Union. As part of this review the Dutch government - in consultation with firms and socio-economic organizations - is preparing a general position statement, in response to the European Commission's Green Paper which is expected out in November 1999. The approach is based on the principle that rules are only to be set if they are strictly necessary in the light of the goals to be accomplished and the interests to be protected. The rules which are imposed must form a coherent and uniform regulatory framework for a number of different infrastructures and network-dependent services.

Furthermore the Ministry of Transport, Public Works and Water Management (V&W) together with OPTA and the players in the field will be willing to facilitate the debate on the shortage issue in order to be able to make a balanced assessment between the policy, the chosen instruments and their impact in the market.

20. Tenders put out by the government for the provision of national transport and Internet services can offer an opportunity to encourage usage of the cable infrastructure for government services as well.

21. The concentration ratio of the top 15 cable operators has risen from 48% in 1991 to 85% in 1997. 'Vision expressed in words', VECAL, The Hague, September 1998.

22. Since 1995 glass-fibre cables have been laid with a total length nation-wide of about 5,000 km. By the end of 1999 about 85% of the cable networks will have been converted to the glass-fibre type and will be suitable for two-way traffic. Vefica/Intercai study, presented at the Cable Congress, October 1998.

23. With digital distribution it will be possible to at least double the number of relayable TV stations (from 50 at present to at least 100). The diversity of interactive services can also increase further.

In addition the government has the task of continuing to monitor the impact of the policy and the instruments to implement it. Also in view of experience in other countries, V&W will therefore carry out comparative studies at regular intervals to establish the infrastructural position of the Netherlands. The findings will be entered into the ICT benchmark study which is announced in section 4 below. If necessary measures will be taken to help resolve any bottlenecks identified.

At the same time the government is conducting a policy aimed at the short-term market introduction of newly developed technology. This will enable the increase in demand for capacity, speed and diversity to be met (at least in part). New technologies to be brought onto the market shortly are UMTS (end of April 2000)²⁴ and WLL (end of 1999).²⁵ The latter technology enables competition in telephony (also at local level) without requiring new cabling to be laid to individual users.

The government is to develop a structural stimulatory framework designed to prevent a situation where the launch of modern applications is delayed or fails to take place altogether. Its objective is to enable players to jointly gain application-oriented know-how and experience in a pre-commercial stage, thereby reducing the uncertainty surrounding many new technologies.²⁶

24. UMTS (Universal Mobile Telephony System) enables the provision of personal multimedia communication, incl. moving image at speeds up to 2 million bits per second. UMTS brings convergence between terrestrial and mobile one step nearer, because UMTS services will also be accessible by terrestrial networks. The consultation round made it clear that there is great market interest in prospective applications of UMTS.

25. WLL (Wireless Local Loop) is a wireless connection to the network. A WLL consultation document has been drafted, on the basis of which a hearing was held early in 1999. This revealed sufficient interest.

26. An experimental section (Section 18.1) has been included in the Telecommunications Act for this purpose.

Deepening the vision

The numerous technological and international developments in the telecommunications and ICT sphere raise many new questions of policy. The broad general perspective is presented in the context of this white paper. They will be further elaborated by V&W in a separate white paper in the course of this year and discussed with relevant (market) players.

The cable

Until digitization, freedom of choice and the competitive market have been accomplished in full, it will remain the government's task to guarantee, where necessary by regulatory means, that every citizen has access to an affordable and pluriform programme offering that guarantees the public interests of pluriformity, accessibility and affordability of information provision. The recent policy statement 'Cable and Consumer' indicates how the statutory policy instruments will be applied for that purpose.

At the same time it is necessary to make sure that the digitization of

the infrastructure and the introduction of the decoder are effectively guided in proper channels. In the opinion of the Cabinet, the point of departure is a commercial strategy for the introduction of decoders that will appeal to the public. Consumers must be rewarded for buying their decoders by an interesting supply of (new) services and programmes based on added value, individual freedom of choice and fair prices. It is in keeping with this development that, should individual choice be possible and a free market featuring actual competition between and/or on the infrastructures exist, the regulations will be adjusted or relaxed in line with the new market relations.

The Cabinet expressly intends to consult at short notice with all parties concerned on how the digitization and development of the decoder can be encouraged. The Cabinet is also to make a thorough economic analysis of the cable sector. For that purpose studies are taking place into the cost orientation and profitability of the cable sector and the fairness of consumer charges. Partly on the basis of this consultation and these studies, before the end of the year the Cabinet is to publish a further white paper setting out its policy regarding cable operation in the Netherlands.

A.2 The ether: greater efficiency and capacity through digitization

A.2.1 Current status

The radio frequency spectrum (also referred to as 'ether frequencies') is a natural resource which makes wireless communication possible. Besides the cable, the satellite and telephone line, the ether is an important medium enabling competition between alternative infrastructures.

The principles applied by the Cabinet for frequency allocation are described in the White Paper on Frequency Policy and further elaborated in the National Frequency Plan.²⁷

Recent years have seen a growing demand for ether frequencies. And this demand is expected to continue to increase, because of the greater use of mobile communications for business and private purposes.

27. White Paper on Frequency Policy, Parliamentary Proceedings II, 1994/1995, 24 095, Nos. 1 and 2, to be elaborated in the National Frequency Plan, June 1999.

Mobile communications in the Netherlands

The mobile telephony market in the Netherlands appears to be still far from saturated. On 1 April 1999 KPN had about 2.4 million mobile customers, and Libertel had 1.4 million users. Ben, Dutchtone and Telfort have around 200,000 customers each. According to figures from the IDC the number of mobile phones in the Netherlands will rise from 3.3 million in 1998 to 8.6 million in 2002.

To be able to meet this growing demand it is important to utilize the ether more efficiently and increase its capacity. Digitization will play a key role here. The Cabinet will therefore act speedily in allocating ether frequencies, enabling new digital techniques to be introduced rapidly.

A.2.2 Actions by this cabinet

Because digitization is developing rapidly, the frequencies for both digital television and digital radio will be awarded in late 1999/early 2000. This ambition represents a good performance by the Netherlands. Digital television is currently available to the public in the UK only. Digital radio has already been introduced on a somewhat wider scale (among other countries in the UK, Sweden and Germany).

Digitization of the ether

DVBT (Digital Video Broadcasting Terrestrial) and TDAB (Terrestrial Digital Audio Broadcasting) are new digital techniques, featuring efficient use of frequency space (more programmes on the same channel), broader scope for providing data services besides traditional broadcasting, and the possibility to offer consumers a substantially improved range of programmes and services.

In addition, in 2000 analog broadcasting frequencies will be made available (zero-base auction).

A.3 *Technical reliability of the (tele)communications infrastructure*

A.3.1 *Current status*

The government must not only set rules for the performance of market players. It must also keep an eye on the public interest. The security and reliability of (tele)communications networks form part of this. Many functions, such as financial and logistic functions, depend on effective operation of the infrastructure for their various data and voice services. Furthermore, there are certain strong inter-dependencies, such as between energy, communication techniques and computers.

Networks are in principle vulnerable both to technical failure (cable fractures, computer crashes) and to hacker intrusion. The millennium problem has taught us how dependent we have become on computer reliability and how danger can lie in unexpected places.

The potential vulnerability of the ICT infrastructure has recently attracted international attention as well.²⁸

Standards

One possible way to reduce the vulnerability of the ITC infrastructure may be the use of internationally accepted and tested standards. In this case standardization relates to the establishing of clear (technical) rules to enable communications via the telecommunications infrastructure. This is important for end users (the business community and consumers) because standards facilitate competition, lead to a wide range of choice (brand-independent) and lower prices, and promote uniform usage of the network (e.g. GSM).

For manufacturers, standardization means a larger market, enabling larger product series and lower product cost. For suppliers of networks and services, standards offer the possibility to enter the market or to gain access to a larger market through interconnectivity of networks and services, and brand independence. Through these interests, manufacturers and suppliers of networks make an important contribution towards the setting-up of standards, a process which takes place via sectoral organizations, on the national scale as well as the international

28. For instance, in March 1998 President Clinton set up the National Infrastructure Protection Center, based on the final report (1997) of the President's Commission on Critical Infrastructure Protection.

scale via direct or indirect participation in international standards organizations.

For governments, standardization is an instrument for promoting the development of the telecommunications market, while assuring societal preconditions (security, health) and strengthening the competitive positions of European firms (based in the Netherlands) operating in the sector.

Governments play a facilitatory role and provide for optimized structures across which the standardization process can take place.

As a result of increasing globalization, the importance of world-wide standards enabling world-wide communications is only growing larger. At the same time, market liberalization means that the government plays an increasingly hands-off role and that the industry assumes an increasingly important role, although governments do of course play a mediating role in the various international organizations (such as ETSI, ITU, WTO).

A.3.2 Actions by this cabinet

V&W is to perform a survey of the vulnerabilities and weaknesses of the ICT infrastructure, focusing particular attention on developments in the sphere of the Internet. On the basis of this survey, the Cabinet will indicate whether measures are needed, and if so what they should be. This survey is due to be completed by December 1999.

Furthermore, a National Continuity Plan for Telecommunications (Nacotel) is being drawn up, to ensure that a certain level of (tele)communications services will be available in the event of exceptional circumstances. This plan will be available in March 2000.

Pillar B : Know-how and innovation

29. 'Space for Industrial Innovation. An agenda for industry and services policy', letter from the Minister of Economic Affairs to the Lower House, June 1999; 'Knowledge in Action', Parliamentary Proceedings II, Session 1994-1995, 24 229, Nos. 1-2.

Ambition:

A premium-quality know-how position (both in ICT technology and applications). Strong ICT clusters in which ICT suppliers and users provide innovative applications for that know-how. A top-level training infrastructure for ICT researchers and specialists.

The government plays a role in the following areas:

- development of (technological) know-how;
- promotion of strong ICT clusters;
- assuring sufficient personnel: via the labour market and education.

B.1 The development of (technological)

know-how

30. As against approx. 2,000 ICT researchers in the public sector. 'Benchmarking know-how position: the ICT knowledge infrastructure in the Netherlands', TNO-STB March 1998.

31. The number of R&D personnel engaged in ICT research and the scale of the R&D budgets give some indication of this. However, data refer to 1996. In addition, on the basis of its own databases the CWTS has made a comparison of numbers of publications in authoritative scientific journals. The analysis was performed for two years (1993 and 1996) and for three domains within ICT research (telecommunications, computer hardware and computer software). The Patent Information Service supplied patent information on telecommunications, information technology and semiconductors. Data are included in the benchmarking study by TNO-STB (note 30).

B.1.1 Current status

A strong position in the field of technology is an important asset for the Netherlands.²⁹ That certainly applies in the case of technologies such as ICT, where the development and application of know-how are strongly interlinked.

The 'production' of new technological know-how takes place above all in the fundamental and applied scientific research performed at universities, at scientific institutes and in industry. The industry plays a predominant role in those R&D investments. According to a rough estimate, approximately 16,000 ICT research staff are employed by the industry in the Netherlands.³⁰

Although there are hardly any well-comparable figures available, there are rough indications³¹ that the volume of ICT research in the Netherlands is relatively respectable (although its scale is fairly limited in certain important subsectors). However, the productivity of these research efforts - in terms of numbers of publications and patents - seems to be capable of improvement: in the case of scientific publications, the Netherlands has a relatively poor position, and it is notable that the Netherlands has been losing ground since 1993. In the case of patents the relative position is a little better (average), but here too a slight decline has occurred.

The lack of qualified researchers represents a major obstacle in building up and expanding a strong technological know-how position.

R&D nuclei in the Netherlands

Important industrial R&D nuclei are to be found for example in Philips (hardware), KPN Research, Lucent Technologies and Ericsson (telecommunications), Cap Gemini, CMG, Getronics, Origin, Baan, Exact and IBM (software).

Important public-sector R&D nuclei are for example the Telematics Institute, the Centre for Mathematics and Information Technology (CWI), research schools such as the Delft Institute of Microelectronics and Submicron Technology (DIMES), Communications Technology Basic Research and Applications (COBRA), the Microelectronics and Sensors and Actuators Institute (MESA), the Advanced School for Computing and Imaging (ASCI), the Institute for Programming and Algorithmics (IPA) and the School for Information and Knowledge Systems (SIKS). Other research centres like TNO Multimedia and Telecommunications, and the Software Engineering Research Centre (SERC) also play a role.

Good co-ordination and co-operation between the public R&D institutes and industry is of essential importance in the ICT area as well.³²

A fundamental problem for such co-operation is the very fast world-wide development of information and telecommunications technologies. This places severe demands on the adaptability of the knowledge infrastructure and makes it difficult to formulate the demand for knowledge in the (medium-)long term. Another problem is the fragmentation of research efforts in the public knowledge infrastructure. This leads to lack of transparency and does not promote co-operation.

Other bottlenecks occur above all with regard to the new areas of growth, such as the Internet, multimedia and electronic commerce. These are areas which have developed at tremendous speed with the result that specialized researchers are still in very short supply. However, research has shown that the degree in which these bottlenecks make themselves felt varies according to area of research.³³

The government invests in the development of knowledge at universities, public research institutes and firms via its policy on science, technology and clusters, and thereby promotes their mutual co-operation.

For instance, firms carrying out R&D in the area of ICT can make use of general measures for the encouragement of technology, such as the R&D fiscal facility (WvA/S&O) and the co-operation scheme for R&D (BTS). Innovative Research Programmes (IOP's) encourage the knowledge infrastructure and firms to set up more sustainable forms of co-operation on a given technology.

32. This interaction can be given shape in the form of industrial research projects awarded to technology institutes or industrial participation in research institutes or research networks (such as the Telematics Institute and GigaPort). In addition, industry makes use of the results of work by the knowledge infrastructure, directly or indirectly via intermediary organizations like TNO.

33. 'TechnologieRadar, Part 3 Technology profiles', Chapter 11-13. RAND Europe, Coopers & Lybrand in co-operation with Innovation and Technology Management SA (Battelle), The Hague, March 1998.

With the TechnologieRadar instrument the government wants to set up a permanent discussion between the business community and the public research community on the best way to achieve a sufficient level of technology development. A number of workshops - also on ICT - have been organized in 1998 and for 1999 in response to the TechnologieRadar, such as on language and voice technology, multimedia, and data and knowledge systems.

In addition there are a number of European R&D programmes aimed at ICT, such as MEDEA and the IST programme.³⁴

The four centres of technological excellence (*Technologische Topinstituten*) set up by the previous Cabinet are a major initiative towards strengthening structural co-operation in R&D. One of these, the Telematics Institute (TI), works specifically on ICT. This institute was opened in early 1998, and besides the government it is a partnership undertaking between a large number of firms and technology institutes. The TI is conducting an ambitious programme of research on the interfaces between information and communication technologies, combining the needs and specialists of firms with the knowledge and expertise of technology institutes. Currently there are about 60 researchers employed at the TI and their number is expected to rise to 80 by the end of this year. A further rise is anticipated in the coming years, partly as a result of the GigaPort project.

The R&D work carried out into ICT also features a considerable level of policy competition. The US recently announced an increase of almost 30% in government funding in support of R&D starting in 2000. The objective is to speed up the development of information technology, combined with accelerated development of the second-generation Internet (Internet2).³⁵

B.1.2 Actions by this cabinet

Very recently, two initiatives were launched which focus specifically on the development of knowledge in emerging ICT areas such as Internet2 and multimedia: the GigaPort project and the Watergraafsmeer project.

Internet technology: GigaPort

The government has allocated NLG 142 million for the GigaPort project for the period 1999 - 2002, with the intention of enabling the Netherlands to play a leading role in the development of the second-generation Internet.

34. MEDEA is a Eureka programme which focuses on numerous aspects of microelectronics. The IST programme forms part of the 5th framework programme of the EU and is intended to encourage research into a wide range of aspects of the information society. It focuses on both new applications and on the underlying technologies.

35. State of the Union 1999. The IT² (IT Square) plan is described in 'Information Technology for the 21st century: a bold investment in America's future', January 24, 1999, <http://www.ccic.gov>

GigaPort

GigaPort consists of two parts: GigaPort network and GigaPort applications.

GigaPort network relates to the upgrading of the present SURFnet4 research network and its associated international links. This network will serve the scientific research community (universities, polytechnics and industrial research laboratories) and is to become one of the world's fastest research networks, running ahead of what is available on the normal commercial market. A direct link to the US Internet2 networks has already been established, which means that the Netherlands has taken the lead over the rest of Europe.

GigaPort applications relates to the development of applications (including the necessary generic software) made possible by such high-speed networks for sectors such as manufacturing industry, financial services, education and healthcare.

GigaPort will give a great boost to partnering between firms and the public knowledge infrastructure, and will provide important support for other initiatives such as the Watergraafsmeer project and the Twinning programme. Moreover, it will not only enable the Netherlands to continue to play a role in research into networks themselves but also to perform early work on extremely advanced applications that can be used in the Netherlands itself. In addition, GigaPort will enhance the attractiveness of the Netherlands as a location for telecom and information technology research, as has already been confirmed by announcements by Lucent Technologies and IBM that they intend to concentrate certain R&D activities in this country.

Watergraafsmeer

An amount of NLG 30 million for the period 1999 - 2002 has been allocated to the Science and Technology Centre Watergraafsmeer (*Wetenschap en TechnologieCentrum Watergraafsmeer, WTCW*), whose main partners are Amsterdam University and NWO. WTCW focuses on knowledge development, knowledge distribution and activities in the field of multimedia and information analysis and virtual systems, and within that area special interest in bio-information technology and biodiversity. It is incorporated as a public limited liability company, with participation open to both technology institutes and firms (ICT suppliers and customers). GigaPort and WTCW will work together closely.

In order to improve the accessibility of current information technology research to the business community, the Scouting II project was started up in April 1999. This project is being carried out by SERC, and consists of the organization and technical implementation of a web-based information system for giving access to projects and results of scientific research in the area of software in the Netherlands. The project builds on the Scouting study of 1993, the NWO/SION research information system developed in 1998, and the Netherlands Research Database available at the Netherlands Institute for Scientific Information Services (*Nederlands Instituut voor Wetenschappelijke Informatiediensten*, NIWI). On completion, NIWI will take over management and maintenance of the system.

B.2 Supporting strong ICT clusters

B.2.1 Current status

A strong technological position alone is not enough. The key is innovative use of ICT opportunities in the Netherlands.

Knowledge developed here - and elsewhere - must be put to innovative use. That is of ever-increasing importance for the future competitiveness of many economic sectors in the Netherlands (like financial services, transports and logistics, and manufacturing industry), but also for the degree in which our public sectors (such as education, healthcare and local government) can succeed in improving the efficiency and effectiveness of their service provision.

The development of innovative ICT applications is taking place to an increasing extent in co-operation between suppliers of various ICT technologies and (prospective) customers. For the physical proximity of local organizations, markets and customs is a very important factor. This trend is also referred to as *ICT clustering*, where ICT developers and suppliers work together with firms practising intensive ICT applications, with support from the knowledge infrastructure. Strong ICT clusters, with close contacts between suppliers and users, play a major role in translating knowledge into practical applications in this country. The government fosters the formation of ICT clusters with the aid of its cluster policy.

The Dutch ICT sector³⁶

The production value of the Dutch ICT sector in the broad sense (including the 'content' industry) today totals around NLG 80 billion, and provides 335,000 full-time jobs.

Almost 7% of Dutch GDP in 1995 was created in the ICT sector and this percentage is expected to rise in the years to come. This growth will be accounted for not only by the 'traditional' ICT firms but also by 'content' suppliers finding new market opportunities, and by new firms taking advantage of, for example, Internet opportunities.

At the same time, dynamism within the ICT industry itself is also an important factor. With their manoeuvrability and flexibility, starting and young ICT firms play a crucial role by rapidly developing and marketing innovative applications of new ICT knowledge. In turn, this has the effect of challenging their competitors not to lag behind.

The dynamism and innovative capability within the ICT industry can be further increased.³⁷ However, the ICT industry is characterized by a number of start-up and growth problems. The reasons include poor flow of public knowledge to the market sector, the conservative investment climate³⁸, the relatively high risks associated with the development of innovative services, and a lack of human resources to develop innovative applications.

Besides the initiatives outlined above intended to promote the flow of public knowledge to the market sector, the Software Action Plan 1996-2000 (SWAP) has produced a number of actions to the same end. Recently, a number of supplementary measures were taken designed to give a further boost to dynamism and innovative capability. For example, the Cabinet supports dynamism and innovative capability within the ICT sector by means of the Twinning Initiative, which makes it easier for new market entrants to get off the mark. The Twinning Initiative provides encouragement to starting Dutch ICT enterprises in their very earliest stage.

36. 'The emerging information & communication cluster in the Netherlands; report prepared for the OECD Focus Group on Cluster Analysis and Cluster Policies', Dialogic 1998.

37. 'Boosting Dutch Economic Performance', McKinsey Global Institute, Amsterdam, September 1997.

38. In the US, for example, 60% of venture capital goes to ICT companies. In the Netherlands that figure is only 17%. 'Netherlands ICT Twinning Centers and Investment Funds', Booz Allen Hamilton, February 1998.

Dynamism and innovative capability: Twinning

Twinning consists of three parts:

The Twinning Network, made up of prominent ICTers who have gained their spurs in this sector. They provide the start-ups with advice, contacts and other support.

The Twinning Centres: these are business concentration centres where Twinning firms can locate.

Twinning funds: the start-up fund (seed fund) and the growth fund from which venture capital is provided to (re)starting entrepreneurs.

The Twinning Centres in Amsterdam and Eindhoven are already operational. Twinning is currently seeking a formula, within the financial frameworks, to allow locations to be set up in more regions. At present 15 'Twinning' firms are already present in Eindhoven and Amsterdam.

Lastly, the Electronic Services Development Loan Order (*Kredietregeling Elektronische Dienstenontwikkeling*, KREDO) supports the development of new electronic services.

B.2.2 Actions by this cabinet

Three years after the appearance of the SWAP programme, the effects will be examined of the measures announced in it in order to co-ordinate these - together with other, more recent initiatives - to the new developments which will have taken place by then. This will be completed early in 2000.

Ahead of this, it has already been decided to make a further NLG 20 million available in addition to the NLG 70 million allocated by the previous Cabinet to the Twinning programme.³⁹

Furthermore, a recent evaluation of KREDO indicates that the scheme does meet a demand but that greater emphasis should be placed on publicizing it and its accessibility for smaller and above all starting firms.⁴⁰ For that reason the information effort has been improved and - with effect from the second 1999 tender (opened on 21 June 1999) - the threshold within KREDO has been lowered from NLG 500,000 to NLG 200,000.

In order to encourage ICT usage, the recommendations of the report 'Taxes in a world without distance' (published in Dutch as '*Belastingen in een wereld zonder afstand*'), will be further elaborated (see D.3.2).

39. Parliamentary Proceedings II, session 1998-1999, 26 200, No. 22.

40. 'Results of evaluating KREDO', B&A Group for Policy Research & Consultancy, The Hague, February 1999.

B.3 Sufficient ICT personnel: labour market and education

B.3.1 Current status

41. 'Education' is understood here as explicitly including private education. The private sector makes a substantial contribution towards ICT training of society. According to the TNO/STB ICT benchmarking study, over 300 institutes in the Netherlands received 1,190,000 course attendees in 1995.

42. 'The structural need for information technologists', Advisory Council for Science and Technology, February 1998, <http://www.awt.nl/nl/a31.pdf>

43. 'Working on ICT', the Cabinet's response to the AWT advisory report, Parliamentary Proceedings II, session 1998-1999, 25 518, No. 15.

44. Refer inter alia to 'Shortage of Information Technologists', Price Waterhouse Coopers, 1998.

45. US: Survey by the Information Technology Association of America, January 1998. Canada: estimate by the US Office of Technology Policy. 'The economic and social impact of electronic commerce', p. 17 and Annex 4.5, OECD 1999.

46. 'Job Opportunities in the Information Society; exploiting the potential of the information

The key issue here is the availability of ICT specialists on the labour market. Because they are trained in the ICT education system, this too is discussed.⁴¹

At the beginning of 1998 the AWT noted that there was a structural shortage of information technologists.⁴² Conservative estimates put the minimum demand for these technologists in the years to come at twice as many specialists as are currently in training. The Cabinet has indicated that it regards this shortage of IT specialists as very threatening because it will severely slow down innovation in the ICT sphere.⁴³ This is a grave risk in an area where 'first mover' advantages are so important. Moreover, a persistent shortage could lead to strong wage increases as a result of which ICT would 'price itself out of the market', or the Netherlands could lose some of its attractiveness as a location for ICT-intensive industrial activity.

The importance of sufficient ICT manpower is not a matter for a single sector of the economy: ICT skills are needed not only in the ICT sector but in the industrial sectors and other domains where information and telecommunications technologies are *applied*, and these days that means virtually everywhere. As a result of the shortage, developments and applications would be either not accomplished or delayed and postponed.

The shortage is above all evident at the level of higher education but it is also felt at the intermediate vocational level. This picture has been confirmed by a number of studies.⁴⁴

On the other hand, ICT manpower shortages exist in all countries. In the US the shortage is estimated at approx. 350,000, in spite of the above-average and still rising wage levels. Canada needs a further 20,000 to 30,000 ICT specialists.⁴⁵ In the European Union, there were 500,000 unfilled ICT vacancies at the end of 1998, and this figure is expected to rise to 1.2 million by 2002.⁴⁶ According to estimates, strains on the ICT labour market are relatively greatest in the Netherlands and Switzerland.⁴⁷ In the Netherlands the shortage for the current year is estimated at 15,000 (Figure B-1).

revolution', European Commission, COM (1998) 590.
[Http://www.europa.int/comm/dg05/soc-dial/info_soc/jobopps/joboppen.pdf](http://www.europa.int/comm/dg05/soc-dial/info_soc/jobopps/joboppen.pdf)

47. Taken from 'Benchmarking study of technology position: The ICT knowledge infrastructure in the Netherlands', TNO-STB, March 1998.

48. 'Shortage of information technologists', Price Waterhouse Coopers, 1998.

49. This relatively high drop-out rate incidentally applies not only to ICT courses but to many other technical subjects as well. University Education Statistics, VSNU, October 1998.

50. For instance, the percentage of women attending higher vocational ICT courses between 1993 and 1997 fell from 9.7% to 8.4% in 1996, and in university education as a whole from 8.3% to 7.5%. See footnote 48.

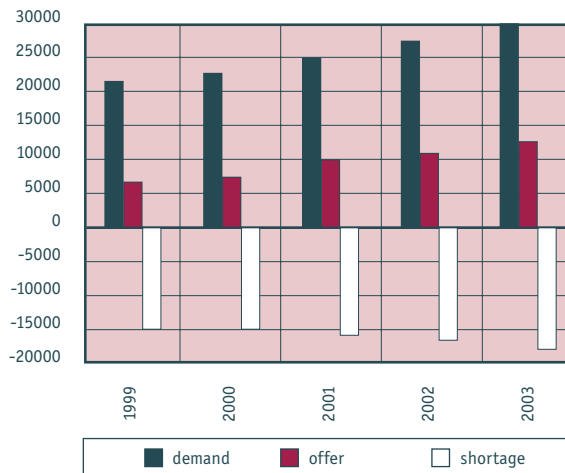


Figure B-1:
 ICT manpower supply and demand in the Netherlands, 1999-2003⁴⁸

The ICT manpower supply can be increased in the short and medium term by means of appropriate conversion training, further training or retraining of workers and job-seekers. At the same time, it is very important that the supply from the future work-force - i.e. those currently in education - will in the longer term lead to a reduction of the ICT manpower shortage. However, major bottlenecks exist here.

ICT education

In the Netherlands the number of persons entering ICT education is far too low to keep up with the fast-rising market demand for ICT specialists, in spite of the increase in the number of enrolments during the past two years.

On top of that the Netherlands - in common with Germany - is faced with a high drop-out rate in ICT education: many students who embark on a course in ICT fail to complete it.⁴⁹ In view of the inflow rate, which is low anyway, we cannot afford this high drop-out rate.

One of the crucial challenges is to make information technology more attractive to women, both as a choice of study and of profession. In the Netherlands the participation of women in ICT training courses is relatively low, and moreover it is falling.⁵⁰ Bearing in mind the needs on the labour market these are worrying trends.

In order to encourage young people, deciding on study or profession, to choose technical subjects in general, last year the Cabinet supported the setting-up of the AXIS Foundation. However, very few projects relating to ICT have been submitted to AXIS. This is probably connected with the fact that in the Netherlands ICT does not exist as a single 'organized' sector.

For that reason, to tackle the specific ICT manpower shortage, supplementary measures will be required in addition to the general approach by AXIS.

Student inflow into ICT education can also be promoted by making sure that young people have already developed the necessary skills in ICT applications while still at home and attending school. The plans of the Minister of Education, Culture and Science (OC&W) relating to the integration of ICT in primary and secondary education, vocational and adult education, and teacher training courses are playing a valuable role here (see § C.2).⁵¹

Another aspect is that new ICT developments must be reflected in the range of training courses offered. The future work-force is already receiving its training in the educational system. It is of great importance that new development like Internet, multimedia and electronic commerce are given a place in the education infrastructure at an early stage.

B.3.2 Actions by this cabinet

With a view to uniting the various actors in ICT (education) for the purpose of drafting a *collective* approach, the Cabinet appointed the 'ICT Shortages Task Force', made up of representatives from a number of sectors as well as the teaching community. A report was submitted to the Lower House in February 1999.⁵²

In September 1999 the work of the Task Force will culminate in a combined plan of action along the following lines:

- improving the image of ICT professions; many young people have hardly any idea what a profession in ICT means;
- adaptations in education, in particular forms of 'dual learning' and the introduction of ICT training packages in non-ICT courses;
- specific actions aimed at enhancing the attractiveness of choosing ICT as a course of study and profession for groups currently under-represented in ICT jobs, such as women.

51. 'Education on-line, connections to the future, ICT programme for education', OC&W, 1999.

52. 'Working on ICT', Cabinet response to AWT advisory report, Parliamentary Proceedings II, session 1998-1999, 25 518, No. 15.

Furthermore, the feasibility is currently being investigated of an initiative aimed at combining representatives from the teaching and business communities and government circles together in a network organization.⁵³ This initiative envisages satisfying at short notice the need for expertise in the field of electronic commerce by encouraging education in this field.

Lastly, in this context a relevant item is the elaboration of the recommendations of the report 'Taxes in a world without distance' (see D.3.2.).

53. The 'Educational Electronic Commerce Centre the Netherlands' initiative, formerly called the 'Internet University'.

Pillar C : Access and skills

Ambition:

Citizens and firms capable of gaining access to the new electronic media and gaining skills in them. A future work-force that is ICT-skilled.

The government's role:

- encouraging the capability of citizens and firms to gain access to information (services);
- encouraging ICT skills in the (future) work-force.

C.1 Access to information (services)

C.1.1 Current status

Households

The Dutch citizen is well positioned to take part in the information society. The Dutch have a high average level of qualifications and their command of the English language, which is important for the Internet, is good. Also, the Telecommunications Act guarantees among other things their connection to the fixed public telecommunications network (a service known as 'universal service provision'). In the technical sense, everybody in the Netherlands therefore has the possibility to gain access to the Internet.

Partly as a result of various fiscal incentive measures ('private PC projects') almost 60% of Dutch households now have a modern PC.⁵⁴ Within the European Union, this figure is only exceeded by Sweden.

The use of the Internet is growing explosively. For example, in the period from June 1997 to December 1998 inclusive, the number of households with an Internet connection doubled, from 8% to 16%. In absolute numbers, at year-end 1998 over one million households were connected to the Internet.⁵⁵ That figure has since risen to over 1.2 million and is expected to continue rising to almost 1.5 million households by the end of this year (i.e. equivalent to 22% of the total number of households).⁵⁶

54. 'Eurobarometer 50.1 - Measuring Information Society', study performed by INRA (Europe) for the European Commission between 29 October and 10 December 1998.

55. Internet consumer research, NIPO, 1998.

56. Heliview 1999; <http://heliview.com/persb-ict.htm>, dated 31 May 1999.

Although there is still a variation in Internet usage amongst different population classes or groups (the average Internet user continues to be a man aged between 25 and 50 with an (above-)average income), a rapid increase is nevertheless visible in all classes and groups. For instance, the number of Internet connections is also growing very rapidly among the below-average income groups (by 21% in the last six months) and the ratio between men and women with access to the Internet has become more balanced. In the past six months the number of women has grown by 61% to 25.3%, while the number of men grew by 18% to 36.7%.⁵⁷

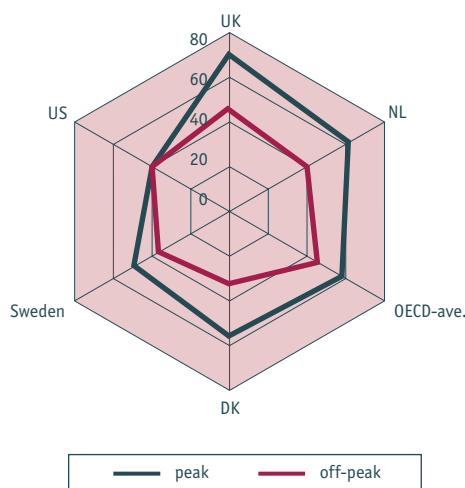


Figure C-1: Price of Internet usage, based on 20 hours on-line a month in 1998, in US\$ PPP⁵⁸

Another rapidly growing group of the Internet are the over-50s. An organization like 'Seniorweb Foundation' (*Stichting Seniorweb*) plays an important role here. Its annual report for 1998 shows that its site was visited 130,000 times. The Foundation now numbers 350 'ambassadors', who tour the country and introduce the older generation to the potentials of the Internet by means of training programmes and courses. So far 10,000 persons have registered, 60% of whom are women. At the beginning of 1999 there were a further 6000 on the waiting list. The oldest 'student' is 94.

57. Third national Internet monitor, Pro Active and Adformatie, March 1999.

58. 'Communications Outlook', OECD, Paris 1999. Prices include both entrance fee and telephone charges, inc. VAT.

Firms

Of the 97,000 firms employing over five persons, 75% have at least one PC.⁵⁹ Internet usage within these firms is growing fast. By the end of this year 50% of them will be using the Internet (at the end of 1997 that figure was 33%). The highest growth rate can be seen in the group of firms employing between five and fifty persons. Furthermore, by the end of 1999 there will be almost 22,000 firms offering their products or services on the Internet, a 70% increase compared with 1997.⁶⁰

59. The degree of automation in firms with between five and ten employees is 60% and in firms with between ten and twenty employees 80%. Firms employing over 20 persons practically all have at least one PC.

60. Automation survey, CBS, 27 May 1999.

61. 'Dutch entrepreneurs: Alice in E-commerce land', Twijnstra Gudde, February 1999.

62. ECP.NL is the authoritative body in the Netherlands in the field of E-commerce, with the objective of accelerating and co-ordinating the implementation of electronic commerce in the Netherlands. Information to the SME sector is the responsibility of Syntens in the framework of Sp.OED-Advies.

63. The Sp.OED secretariat (a joint venture between EZ, VNO-NCW and MKB Nederland) is a facilitatory organization whose main task is to publish a collective range of brochures in collaboration with ECP.NL and Syntens. In addition the Sp.OED secretariat acts as a referral point for business and industry and intermediary organizations.

These are respectable percentages, but even so certain areas of the business world are still insufficiently familiar with the potentials of the Internet. Particularly in SME's there is a shortage of management positions capable of gaining (and maintaining) knowledge of ICT developments, and consequently they have an inadequate picture of how making use of those developments at an early stage could strengthen their competitive position. Implementation of ICT is left to IT departments while marketing, sales and general management play a far smaller role in that process. In only 9% of all firms is the board of management involved in the formulation of policy on electronic commerce.⁶¹

Meanwhile a number of organizations are actively engaged, with government support, in providing the SME sector in particular with information on the developments and potential applications of ICT.

Information provision to the SME sector

In order to guide the SME sector on its way, Syntens is carrying out the Sp.OED-Advice project, which consists of a large-scale information campaign and specific advice for individual entrepreneurs. Syntens is acting for the Ministry of Economic Affairs (EZ) and works in close co-operation with Electronic Commerce Platform Netherlands (ECP.NL⁶²) and the Sp.OED secretariat.⁶³

Complementing these activities, MediaPlaza acts as a demonstration centre for the electronic highway where entrepreneurs can get to know the Internet themselves and see all the opportunities it already offers. MediaPlaza was set up in 1997 for a three-year period; it is jointly funded by industry and government.

The role of the media and cultural institutions

Good, reliable, comprehensive, easily understood and attractively presented information on our society is of essential importance to all people and to the functioning of society itself. For that reason, institutions in the sphere of media and culture also see their task as including the

responsibility to provide innovative access to the information they generate and manage. This approach enables them to form a major factor in increasing the accessibility of new forms of service provision.

The public broadcasting service has an important role in the dissemination on the Internet of information, education and culture of high quality and reliability. This corresponds with one of the messages formulated by the European Commission as a result of the consultation on the Green Book on Convergence.⁶⁴ In so doing, however, they are required to make a clear distinction between public broadcasting activities and activities in areas of free competition. The Media Act provides for this to be tested.

In connection with their main activities, public and commercial broadcasting corporations offer large quantities of information on the Internet. There is a similar trend in other European countries. Digitization of broadcasting will furthermore enable a lowering of the threshold for the use of new services. Digital TV sets, and in the near future decoders, can also provide Internet access and thereby enlarge their range among the population. The way in which this opportunity is worked out is a priority item in the consultations with the players engaged in digitization of the cable and the ether.

The Design Institute and the Old and New Media Society play an important role in raising the quality of the design of Internet sites. One of their main objectives is to lower the threshold perceived by many people ('it's too difficult for me'). The results can be seen at exhibitions such as the annual 'Browsers Day'.

Exhibiting the collections of 'cultural capital' held by museums, archives, and libraries themselves is another way of showing the attractiveness of having Internet access. The presentation of those collections in digital form may stimulate the use of new media in many areas of society. Within Europe, the Netherlands scores well in this respect. According to a study by the European Commission, the Netherlands, with Sweden and Finland, is one of the countries with the largest number of museums on the Internet.⁶⁵

64. 'Convergence of the telecommunications, media and IT sectors and its regulatory implications - Results of the public consultation on the Green Book [COM(97)623]', European Commission communication dated 10 March 1999, COM(1999) 108 def.

65. 'The Euromap Report - Challenge & Opportunity for Europe's Information Society', European Commission, September 1998.

C.1.2 Actions by this cabinet

Since the beginning of 1999, the Cabinet has used a fiscal facility ('PC donation') as an incentive to make surplus PCs - for example where firms and organizations buy newer-generation systems - available for re-use in schools, welfare and care organizations, prisons, etc.⁶⁶ Other relevant recommendations from the report 'Taxes in a world without distance' are still to be elaborated (see D.3.2).

The Government-Citizen Communication project (*Communicatie Overheid - Burger*, COB) encourages everybody visiting a library to get to know the Internet and gain experience with it (for example by taking Internet courses). Support is given to the public libraries by their co-ordinating organization, the Netherlands Library and Reading Centre (*Nederlandse Bibliotheek- en Leescentrale*, NBLC), which is performing pioneering work in this area. Experiences gained within this project are being watched closely, to identify at an early stage whether supplementary measures are needed, e.g. for specific target groups. The project is due to be completed by the end of 2000, after which it will be evaluated.

In order to improve information provision to the SME sector, by year-end 1999 Syntens is due to start 'InnovatieNet', an advanced website on the subject of innovation. In addition, at the end of 2000 Syntens will take over the tasks of the Sp.OED secretariat.

On the basis of an evaluation, this year the government will consider whether it is necessary to extend and increase the support for MediaPlaza, in the expectation that industry will also be willing to extend and increase its contribution. In this way MediaPlaza would be able to intensify its activities starting in the year 2000.

Lastly, in the white paper on culture for 2001 - 2004, the Cabinet will pay special attention to digital access to the national cultural heritage and to encouraging efforts by cultural institutions regarding the quality of Internet sites. In 1999 NLG 4 million is available from the National Action Programme on Electronic Highways for pilot projects in the field of cultural and scientific heritage. In this context, the organization Netherlands Digital Heritage (*Digitaal Erfgoed Nederland*) is developing a programme for projects intended to form the basis for a large-scale digitization effort. Applicability in education will receive special attention.

66. Order of the State Secretary of Finance dated 18 January 1999, No. DB98/4336M, reprint of 16 April 1999, No. DB99/882M.

C.2 Skills

C.2.1 Current status

The government regards education and training in the field of ICT as an important priority.

People who come into contact with ICT in the course of their work must themselves bear responsibility for maintaining their skills by means of reskilling and further training.⁶⁷ Within this facility, efforts by the SME sector and efforts for older employees receive additional encouragement.

For the future work-force, ICT skills must be increasingly considered as one of the basic skills.

67. Section 11c of the Income Tax Act 1964 and Section 3b of the Implementing Arrangement 1990, as further detailed in the Order of the State Secretary of Finance dated 1 May 1998, DB98/1345M.

68. New educational forms become possible (individual learning, independent data gathering, simulation, tele-learning, etc.), and the efficiency of education can be increased as a result (school management, routine training, writing papers, taking tests, recording student performance, etc.).

69. No readily comparable international statistics are available because there are no universally agreed definitions.

70. The Foundation - now part of Stichting Furbie - overhauls computers disposed of by companies and government and then makes them available to schools and sectors such as welfare, healthcare, etc.

Joint declaration by the EU summit on employment and training in the information society (22 September 1998):

‘Technological literacy is quickly becoming as important as the ability to read and write. Yet our educational systems do not treat it as such. Too often, IT training is seen as ancillary, not central, to the educational process. The pace of technological change is far outstripping the investment we are making in our future - in our children and their education’.

One way of making sure that ICT know-how becomes common property is to use ICT in (general) education, starting at the primary level. ICT in education has a dual objective: primarily it helps to embed a knowledge of ICT know-how from primary school level onwards, and secondly it offers new teaching opportunities.⁶⁸

It is felt that the Netherlands is a fair performer in the European context.⁶⁹ However, the United States is far more advanced: two to three years ago the US already had the current computer density at Dutch schools. In the 1997-1998 school year, there was one computer to every 23 pupils in primary education, and one to every 20 pupils in secondary education. Those numbers are now rising fast, partly due to the activities of the Foundation for Computer Mediation in Education (*Stichting Computerbemiddeling Onderwijs*). In the period from July 1997 to March 1999 inclusive, 75,000 computers were supplied to schools.⁷⁰ Incidentally, the Netherlands also has a relatively large and growing market for commercial ICT training programmes, with a varied range of courses and subjects.

Nevertheless there are clear bottlenecks relating to ICT within the educational system: besides a shortage (both local and national) of ICT facilities, up-to-date application of ICT in education is hampered by a shortfall in professional skills among teachers and slow development of both applicable educational software and the use of ICT-related teaching methods.⁷¹

C.2.2 Actions by this cabinet

The Cabinet is allocating large amounts in order to improve the ICT skills of our future work-force. For instance, the Coalition Agreement states that - over and above the amount of NLG 255 million previously allocated for the Action Plan Investing in Progress (now: Education OnLine) in the period 1997-1998 - for the period up to 2002 a non-recurrent sum of NLG 670 million is available, and for the period from 2003 up to and including 2010 an amount tentatively put at NLG 330 million.

The Action Plan 'Education On Line'

The action plan is aimed at primary and secondary education as well as vocational and adult education. Its objective is to help pupils and students soon to be able to work with new technology in a natural way. The teacher has found his new and varied role as pupil/student counsellor and is able to respond better to their individual styles of learning. ICT plays a role in the learning process, also as a source of information and means of communication. Within the school, there will soon be efficient networks supporting the teaching and management processes, and intensive communication will be maintained with the outside world. By the year 2010, remote learning will have become commonplace. In their development as professionals, teachers will gain very many ideas from the Internet. Pupils will get the chance to work at their own pace and in their own style.

In addition to this, work is proceeding on improved integration of ICT in secondary and higher education. For instance, ICT has been introduced as an optional subject in the second-phase VWO course and in the HAVO groups, and in 1999 SURF Foundation received a contribution of NLG 4.5 million for projects aimed at the further introduction of ICT in higher education. In the course of 1999 the Minister for OC&W is to decide on additional contributions for the years 2000 and beyond.

Recommendations of the report 'Taxes in a world without distance' relating to training are to be elaborated (see D.3.2).

71. 'ICT monitor 1997/1998',
A.C.A. ten Brummelhuis, Twente
University/Applied Pedagogics
Research Centre, 1998.

Pijler D : Regulatory aspects

Ambition:

Any impediments in Dutch legislation and regulations on the development and application of ICT are removed, without impairing the legal security these offer. Self-regulation and clear fiscal legislation and regulation play an important role here. This results in sufficient confidence within society to make use of the new opportunities.

The government's role:

- to equip general legislative and regulatory provisions for the information society;
- to offer legal security;
- to create clarity concerning fiscal regimes;
- to build confidence in the information society.

D.1 Equipping general legislative and regulatory provisions

D.1.1 Current status

By means of the white paper 'Legislation for Electronic Highways' the Lower House received comprehensive information on the consequences entailed for Dutch legislation by the digital environment. The white paper was discussed with the Lower House in April 1999 and is broadly endorsed by the House. In short, the conclusions of the white paper - which are embedded in an assessment framework against which new legislation is assessed - read as follows:

- Our legislation is formulated in a reasonably technology-independent way and therefore also applicable in a digital environment: something that is valid off-line is often also valid on-line.
- The government's task is directed towards protecting and maintaining fundamental norms and values and organizing legal practice as applicable to the electronic environment.
- Solutions must be sought as far as possible in an international context.
- Self-regulation is a good way to achieve order in the fast-developing digital world. At the same time the government should make sure that sufficient allowance is made for different societal interests.

Self-regulation on the Internet

A hands-off position has been chosen with regard to regulation of the Internet. This applies all the more where the private Internet community itself takes the initiative to regulate certain aspects of Internet practice.

An important example here is the management of domain names. For this purpose the Internet community recently set up the Internet Corporation for Assigned Names and Numbers (ICANN). It succeeds IANA and assumes the tasks which until recently were performed under US government responsibility with regard to management of the (generic top level) domain names system and IP address locations. All regions of the world are represented in ICANN. The Dutch government keeps a close watch on this process and refrains from legislative action as long as the self-regulation complies with the preconditions set by the above-mentioned assessment framework.

D.1.2 Actions by this cabinet

A number of policy statements are to be submitted to the Lower House in consequence of the consultations on the white paper 'Legislation for Electronic Highways'. The first deals with a progress statement on the implementation of the action items, which also discusses the possible need for updating. In addition, a statement has been promised on liability of intermediary organizations, such as Internet service providers, and which also includes relevant European developments. This considers the Dutch effort and the correlation between the various activities at the international level and the developments within international organizations which may have an impact on the judicial powers of individual states.

Partly as a result of the white paper, the Commission on Basic Rights in the Digital Age was appointed, to chart the necessity and desirability of adapting existing basic rights. The key issues are Section 7 (freedom of speech), Section 10 (the right to privacy in terms of personal data), and Section 13 (confidentiality of the mail, telephone and telegraph) of the Constitution. The Commission is also investigating whether the Constitution lacks any further basic rights that are of importance in the information society, such as a basic right relating to access to (electronic) (government) information. The Commission is to complete its advisory report by 1 May 2000.

Furthermore, the Civil Code is to be expanded with provisions governing electronic legal acts, to give the courts grounds to go on when assessing the legal validity of (the conduct of) electronic legal acts.

Lastly, the research programme on IT and Law is to be continued for a four-year period, with special attention on establishing the programme in the university research world. At the same time the feasibility will be investigated of setting up a virtual legal knowledge centre.⁷²

D.2 Legal security

D.2.1 Current status

In the information society as well, there must be clarity as to what is and what is not permitted, and citizens, firms and organizations must be able to rely on the government to protect their elementary rights. The starting-point here is that something that is valid off-line is in principle also valid on-line.

Acts that may jeopardize the integrity of computers and networks may lead to severe disruptions in society. For that reason the Computer Crime Act was introduced in the Netherlands.

Computer crime

Computer crime is also the subject of attention at the European level. The Council of Europe has appointed a Committee of Experts on Crime in Cyberspace with the brief to prepare a treaty for the fight against trans-frontier computer crime. Countries also involved include the US and Canada (as observers). This treaty will contain both provisions as to legal substance and special procedures for legal aid. The intention is for a draft text to be submitted to the competent organs of the Council of Europe by the end of this year.

As the information society continues to develop, so the registration of personal data will become increasingly simple while it becomes increasingly complex to discover who is collecting and processing personal data, and for what reason. This has also received attention at the European level (directive on personal data protection).⁷³

72. Motion put forward by MP Wagenaar, Parliamentary Proceedings II, session 1998-1999, 25 880, No. 4.

73. Directive 95/46 dated 24 October 1995, Official Journal L281, dated 23/11/1995.

The combating of harmful and illegal content on the Internet is an important precondition for the secure use of the electronic infrastructure and the Internet in particular. For that reason, in the context of the EU Internet Action Plan launched at the beginning of 1999, work is proceeding on the creation of a network of notification points, the development of rating and filtering systems, and raising public awareness.

One legal aspect occupying a special position in the discussion about the information society is copyright. The problem is concentrated on the question of how intellectual property can be protected now that it has become technically possible to make unlimited digital copies (i.e. identical to the original material). At the end of 1996 the World Intellectual Property Organization (WIPO) concluded two treaties governing these matters. Work is now proceeding to convert these into European law.

D.2.2 Actions by this cabinet

The Computer Crime Act is currently being revised in the light of recent (technological) developments, and the draft Second Computer Crime Act is to be submitted to the Lower House in summer 1999.

Furthermore the draft bill on Personal Data Protection is being dealt with by the Lower House. The purpose of this bill is to implement the European directive on personal data protection.

With regard to copyright and new media, a letter was sent to the Lower House recently discussing these problems in detail.⁷⁴ The letter states that in certain respects the European draft directive lacks balance and sufficient substantiation. Balance is absent because the draft over-emphasizes the protection of rights of interested parties, thereby threatening seriously to impede a sound development towards the information society. The draft also curtails further than necessary the possibility for member states to pursue a national policy of their own.

74. Letter from the Minister of Justice and State Secretary of OC&W dated 10 May 1999.

D.3 Fiscal regimes

D.3.1 Current status

Taxes and electronic commerce

ICT and above all electronic commerce raise new questions regarding the tax system. One result of electronic commerce is that the physical distance between market players becomes less and less of an impediment to the conduct of (transfrontier) transactions. In addition, more and more products will be supplied on-line in digital form. In such a situation, differences in fiscal regimes between countries play an increasingly important role. Dutch policy envisages a neutral imposition of tax that does not distort competition. For the present, our efforts are aimed at attaining that objective with the existing tax arrangements. Good international agreements are essential for that purpose. What is needed is a transparent regime with consistent and simple regulations so that entrepreneurs can adopt a more equal starting position on the international market. The Netherlands is playing an active role in this context above all within the OECD and the EU.

An initial international agreement was reached at the OECD conference (in Ottawa, October 1998) on electronic commerce, where ministers welcomed a taxation framework and gave their assent to proposals for future work.⁷⁵ It is above all consumer taxes that demand priority attention at present. The intention is for taxation to apply in the country where consumption takes place. As the framework conditions indicate, this position is now the general starting point. A wide-ranging work programme was agreed in Ottawa, specifically involving the business community.

Both in the area of consumer taxes and direct taxes, future work will focus on setting up effective taxation systems for electronic commerce. The emphasis lies on the application of modern technology for tax systems in general, obtaining reliable and verifiable information, inspection and collection aspects, identification of taxable persons, and the use of modern technology for the purposes of signatures and administration and (international) mutual assistance. A not unimportant part of the future work will relate to taxpayer service. This will require international consensus on the simplicity of tax systems, minimizing their costs, and the use of modern media for registration and filing purposes, and also the development of standard norm-setting systems.

75. For further details refer to the letter from the State Secretary of Finance dated 17 November 1998 to the Chairman of the Standing Committee for Finance on this subject.

Encouragement

Another aspect is the question of whether there is any need for fiscal allowances to firms or citizens in order to encourage ICT applications. At the present time a number of fiscal facilities are already applicable - see elsewhere in this white paper - that have a beneficial impact on the development and use of ICT. The question is warranted as to whether the application of ICT can be further encouraged through supplementary fiscal measures. The key points for fiscal encouragement should be sought in the sphere of support for social and economic goals in general and ICT goals in particular. Examples of this include contributions towards strengthening the Netherlands as an ICT producer and ICT services supplier, implementing the brainport concept, and raising the pace at which ICT usage is introduced in the various sectors of society. The fiscal incentive policy should be regarded in conjunction with other government policy. In this respect it may be questioned whether, in certain cases, it is preferable to apply fiscal instruments alongside or instead of other instruments.

D.3.2 Actions by this cabinet

Within the Tax Service, one or more know-how transfer groups are to be formed in the field of ICT, electronic commerce and taxation. The primary function of know-how transfer is to provide information to and act as *vademecum* or interlocutor for anybody in need of such support, including (potential) foreign investors in the Netherlands. Such an information service should be able to provide in advance the greatest possible degree of certainty as to fiscal treatment.

The recommendations of the report 'Taxes in a world without distance' will be included in the Cabinet's ICT policy on encouraging ICT. In that context, in order to increase the degree of ICT participation and encourage the use of ICT, the recommendations relating to training and to the making available of computer systems will be elaborated. The effectiveness of such a set of instruments will be considered jointly in relation to encouragement by means of other, non-fiscal instruments.

D.4 Building confidence

D.4.1 Current status

In order to enable electronic commerce to reach full development, it is very important for confidence in electronic transactions to be increased substantially.

An important role here is reserved for Trusted Third Parties (TTPs), who can play an intermediary role in guaranteeing the legal reliability of message traffic. They offer among other things services for electronic signatures and for confidentiality (encoding the contents of messages). To ensure that the confidence placed in TTPs is guaranteed, they will have to satisfy a number of preconditions.

Another important subject is the digital signature. The 'Directive on electronic signatures' agreed in April 1999, is intended to encourage the use of electronic signatures by ensuring that they are admitted as evidence in judicial proceedings and by assigning certified electronic signatures the same legal status as hand-written signatures. The requirements included in the directive effectively form a guarantee for the confidence to be placed in the signature. The directive - which is still to be submitted to the European Parliament for second reading - is expected to be published early in 2000.

Even if matters are well arranged from the legal point of view, that in itself does not mean that electronic transactions will become commonplace. For that, confidence is needed as well. A code of conduct is an appropriate instrument for that purpose. In the context of the Action Plan on Electronic Commerce, work is proceeding in consultation with the Dutch business community on drafting such a code. Both in the Netherlands and internationally there is great interest in this code because it can make a contribution towards building confidence.

Another important element of confidence building is to create a secure and reliable facility for electronic payment. There are positive developments in this area at both the national and international level. For example, two major credit card companies recently developed jointly the Secure Electronic Transactions (SET) protocol. SET enables financial transactions to be conducted securely and reliably on the Internet. More and more organizations are joining in this initiative, so that the protocol is beginning gradually to develop into the de facto standard.

Electronic payment in the Netherlands

A recent and important national development is the nation-wide upscaling of an improved version of the I-pay system, the Internet payment system of the joint Dutch banks and Interpay. This system, which enables both credit and debit payments, is based on the SET protocol. The Netherlands is therefore well in line with international developments.

In addition, the European Union is currently dealing with the Directive on certain legal aspects of electronic commerce. The Cabinet welcomes the fact that the EU is concerned about this subject, but it believes that the area co-ordinated by the directive should be confined to that legislation relating to electronic commerce alone. In the Cabinet's judgement, the directive should also not detract from the scope for legal choice as laid down in the various treaties governing private international law.

D.4.2 Actions by this cabinet

Early in June the State Secretary of V&W presented a policy statement to the Lower House dealing with the preconditions to be satisfied by TTPs. In order to meet market needs, and simultaneously with the completion of this statement, the business community - in close co-operation with the government - took early steps towards designing an implementing procedure for a TTP infrastructure. It is possible that a statutory embedment may still need to be found for one element, namely statutory access to encoded messages for investigation and intelligence services.

It will in all probability be possible to launch the Dutch version of the code of conduct at the ECP.NL. Annual Congress in the autumn of 1999. It will not be a static instrument but subject to ongoing modification in the light of its use and as internationally the elaboration of such codes receives increasingly tangible form. The draft code of conduct is indeed to be the subject of a special session of the OECD in October 1999.

Pillar E : ICT in the Public Sector

Ambition:

An effective and efficient public sector through optimized use of ICT. Service provision and accessibility must as far as possible take place electronically (25% in 2002).

Apart from making government information available on a large scale, the government's role is:

- to improve service provision to citizens and firms;
- to improve the internal performance of the government by ICT;
- to formulate more visibly the government's (model) role as an ICT player in the ICT market.

E.1 Improving external services

E.1.1 Current status

The government bears responsibility for the provision of public services. It is the producer of public goods (products which the market does not provide of itself) and tasks of care, such as in the fields of social security, healthcare, and public order and security. ICT will lead to faster product development not only in business and industry but also in government. The scope for achieving more individualized (government) service provision is increasing, and the rapid development of ICT means that the government can begin to operate in a more efficient and effective customer-friendly way. This is not a noncommittal option; the government is obliged to spend every guilder raised in taxes in the most efficient and effective possible way. Just as firms have to innovate constantly in order to retain their competitive position, so the government constantly has to adapt. A vital society with a sound economy demands a strong government that fulfils its role with the most advanced tools available.

Electronic processing of tax returns

Only five years ago many Dutch citizens had to wait until October or later before receiving their tax assessment once they had sent in their income tax return in March. Today, almost everybody receives their assessment in May or June. In recent years, therefore, the processing time has been shortened by five months. This is an impressive result, certainly if we bear in mind that the number of returns has gone up by over 20% in the same period.

The number of staff occupied on this workflow has gone down by over 10% in the same period. These developments are all due to ICT. The income tax processing route has been drastically automated since the early 1990s. In 1996 it also became possible to make income tax returns electronically. Over 1.2 million citizens have already used this facility this year. In 1996 that number was about 400,000. With this electronic tax return system the Netherlands occupies a leading position world-wide.

Recently, an experiment was started up enabling firms to transact their turnover tax and wage tax, including payments, in a secure way via the Internet.

ICT also enables totally new kinds of service provision, either proactive or integrated. New ways of implementing policy, sometimes without human intervention and outside currently standards opening hours, are now coming within reach. On an unprecedented scale, new opportunities will present themselves for co-operation within and between government units, cutting straight through organizational boundaries. Old bureaucratic lines will blur and other forms of vertical and horizontal integration will appear, such as 'virtual desks'. At the same time the creation of electronic databases and use of ICT will give a new definition to the democratic right to accessibility: more government information, easier to consult and more transparent. ICT enforces change.

Both in the Netherlands and abroad, there are already a number of examples of proactive service provision, where the government of its own accord, enabled by ICT, offers tailor-made services.⁷⁶ But far more is possible. In a number of Dutch municipalities, citizens are already receiving notification of when their passport or driving licence is due to expire. Information on special benefit entitlement could be automatically sent to persons already receiving benefit payments but who presumably might also be entitled to receive financial support for non-standard expenses.

ICT also enables the accessibility of government information and government organizations to be drastically improved. There has been a strong increase in the number of government websites. A recent count has shown that about 51% of all organizations appearing in the State directory are present on the Internet as well.

The digital provision of government information in this way may not be confined to the 'basic information' of the democratic constitutional state (legislation and regulations, representative judicial decisions, parliamentary information). Other information is also very important.

76. In contrast to other countries, in the Netherlands it is unnecessary for citizens to register for entitlement to vote. The population administration system ensures that every eighteen-year-old is automatically entered in the electoral register. Notification to the GBA in addition means that this change in status is automatically passed on to 300 organizations in the public sector to the extent that the person concerned is registered with them. Since 1998 the Tax Service has automatically sent 'T-forms' (tax rebate forms) to all persons who according to its administration are entitled to repayment of deducted wage tax.

At the local level, for example, making local government information and zoning plans accessible, as well as Internet publication of municipal and ministerial budgets, or the recommendations of the various advisory commissions can make an important contribution to the transparency of government. This results in greater opportunity for democratic control and participation.

ICT can increase the scope for involving citizens in the process of policy preparation (through electronic citizen consultation). On the government's initiative, in recent years dozens of electronic dialogues have been conducted, at the local, provincial and national level alike. The possibility for giving this new form of government-citizen interaction a more structured position will be evaluated.

E.1.2 Actions by this cabinet

On the basis of experience gained with the OL2000 programme, the government has decided that in the period up to 2002 a nation-wide network is to be established of three integrated (virtual) desks covering the areas Care & Well-being, Businesses and Building & Living, so that services to citizens and firms will no longer be depended on limited opening hours but available 24 hours a day and seven days a week. In time, integrated desks are also to be implemented in other policy areas.

Hard work is being conducted on a portal website for government information (www.overheid.nl), to be completed before the end of this year. It will become easier to consult government information via the centralized website. The design of the website makes allowance for the needs of the visually handicapped.

By the end of 1999, all Parliamentary proceedings and all laws and regulations published since 1995 in the Official Journal (*Staatsblad*), the Official Gazette (*Staatscourant*) and the Netherlands Treaty Series (*Tractatenblad*), decisions of the Supreme Council (*Hoge Raad*) and the State Directory (*Staatsalmanak*) will be available on the Internet free of charge. Shortly after 2000, a database will also be made available containing integrated law texts in addition to a supplement with court decisions and other government information. Advisory commissions, ZBOs and Planning Bureaux will be encouraged to present their specific information on the Internet as well.

Research is being conducted into the effects of ICT on the functioning of parliamentary democracy and government organizations. At the same time the scope is being investigated for further automation of election processes by ICT means, in such a way as to reduce barriers for citizens to cast their vote, to facilitate the election process, and to allow the election result to be called with greater precision and speed.

E.2 The internal performance of the government

E.2.1 Current status

ICT has provided us with new tools that enable government performance to be strongly improved in a wide range of areas. With a little overstatement, it may be said that the time has come for ICT usage in government no longer to be confined to IT departments. A link should be established between the IT directorate and policy-making directorates.

The growing use of ICT in government has already led to more efficient, cheaper and faster working methods. The government is currently engaged in a catch-up operation when it comes to the further utilization of ICT potentials. For example, the workplaces in central government have been strongly improved. Altogether an estimated 40% of all government staff are currently able to use the Internet from their own workplace, more than double the figure of just one year ago. E-mail has also been introduced on a large scale: internal E-mail exists at 93% of all organizational units, and external E-mail as well at 90%. In 1998, the latter percentage was only 46%.⁷⁷ That is a great improvement, but uncertainties surrounding, among other things, the legal status and reliability in electronic mail and difficulties in sending documents as attachments, still require due attention.

Improving external services begins of course with internal innovations, and particularly in the field of streamlining basic data a world remains to be won. Here, more authentic registrations⁷⁸ must be assigned, thereby improving the existing situation, in which citizens and firms are required again and again to supply information that is already stored somewhere on government files.

77. 1-measurement 'Use of Electronic Highway within Central Government', Bureau Blauw, 1999.

78. An authentic registration collects and records basic particulars and makes them available to third parties in a regulated way.

Authentic registrations

Experience with the authentic registration of the Municipal register of population (GBA) shows the efficiency of making clear arrangements about the recording of data. In this respect the Netherlands is playing a pioneering role in the world.

As a matter of fact there are other important initiatives in this field. The RINIS concept - the system of centralized sectoral desks with reference indexes based on personal 'Sofi' numbers (identifying individuals by their social-fiscal reference number) - has already achieved much in the social security sector.

79. In the 'Electronic Corvee Services' (*Elektronische Heerendiensten*) joint project between the Tax Service, CBS, LISV and EZ, an architecture is defined for this automated processing. This architecture is currently being further developed in co-operation with representatives of software suppliers and the industrial sources supplying the data.

80. 'Tackling the paper mountain', interim report by the Commission on the Administrative Burden; May 1999.

81. For example, in the UK each government department is individually responsible for its own information provision, and in that sense there is no standardization, but any department that wishes to follow a different procedure is required to indicate the reasons. 'Government benchmarking study: six times an information society', B&A Group on Policy Research & Consultancy, The Hague, March 1998.

It is also important that the information requested should be collected, processed and delivered in a simple, uniform and automated manner.⁷⁹ Only in this way can a major impulse be given to the instruction by the Lower House to effectuate a substantial reduction in the administrative burden.

In its recently issued interim report, the Commission on the Administrative Burden indicated that the burden on firms can be considerably reduced by means of electronic and more standardized messaging systems and by networking databases. It is estimated that on an annual basis this could save about NLG 550 million.⁸⁰ The Commission urges the fastest possible elimination of present bottlenecks still impeding data collection.

At the present time, records of firms and organizations are currently held in four (apart from a number of smaller records offices) major registration centres: the LISV, the Tax Service, the Central Bureau of Statistics, and the Chambers of Commerce. These centres hold to a certain extent identical records on firms, and each sends out its own requests for information. Quite apart from the fact that this procedure is inefficient, this means that within government there is no clear-cut picture of precisely what a firm or organization represents, and the latter is saddled with an unnecessary burden.

A major bottleneck to the use of ICT is the fact that generally speaking there is as yet too little co-operation and co-ordination between government organizations and public organizations. The benchmarking study performed last year shows that countries where ICT use in the public sector is centrally driven are generally leaders in the use of ICT.⁸¹ The Netherlands has no tradition of centrally driven ICT use in the public sector. In recent years, however, the need for a more co-ordinated approach has become more and more manifest. The joint build-up and

exchange of knowledge, standardization and co-ordination are important conditions for achieving optimized utilization of ICT in the public sector.

E.2.2 Actions by this cabinet

To enable greater use to be made of the benefits of ICT in the wings of government as well, a large boost is being given to developing the government's electronic infrastructure. Based on current research, a form of security-protected electronic mail is to be introduced and use will be made of TTPs in intra-government messaging and government-business messaging. Starting next year with the core departments of government and the High Councils of State, this will enable the central government to operate more as a single entity.

Research is also being conducted into the facilities needed in the area of accountability for and storage of information. Now and in the future, the government must be able to continue to meet its duty of accountability, now that documents are also being created, distributed, processed and stored in digital form. It is not a purely technical problem, but at issue here is a complex set of problems of an administrative, legal, filing, cultural history, and technical problems in which relatively little experience has as yet been gained and for which few solutions are as yet available. If the government solves these problems for its own organization, this may set an important example for business and industry.

Partly for the purpose of reducing the administrative burden, the feasibility is being studied of enlarging the number of authentic registrations. For that purpose the Programme to Streamline Basic Data has been launched with the objective of tackling the legal, administrative and financial impediments that can hamper an authentic registration system. It is also being studied how to follow up on the recommendations of the Commission on the administrative burden.

Knowledge and experience are being combined in order to strengthen the co-ordination function on ICT aspects of policy design and implementation. At the same time an implementing organization has been set up combining among other things the knowledge and experience of the OL2000 and ON21 programme bureaux and the Government-Citizen Communication project.

E.3 Model function of the government

E.3.1 Current status

Large benefits could be gained if the government, or rather the entire public sector (i.e. including executive agencies), could operate more as a single entity. For example, *de facto* standards could be set by procuring ICT products in joint consultation, a move from which the private sector would derive major benefits. Let us take the chipcard as an example. Now, a number of government services (defence, universities, asylum-seeker centres, etc.) still use different types of chipcards with different functionalities. If forces and applications could be combined within the public sector, a breakthrough in chipcard use could be achieved in the market.

A similar possibility would occur if the government were to opt unequivocally for a given form of biometrical identification, electronic signature, TTP, etc. In this respect it is certainly not the intention to allow the government to act as a kind of guinea-pig in testing out new technologies before their market introduction, but rather to allow the government to use proven technology on such a large scale that the cost to government would fall due to large-scale procurement on the one hand, while on the other hand the market would have the benefit of 'certainties' as (*de facto*) standards.

82. CBS, expenditures incurred, 1996.

83. As for example applies to the project OT 2000. Apart from the combination of forces, there are further benefits like encouragement for innovation by providing in a low-threshold way a comprehensive and advanced package of voice services on a broad basis within the public sector. The European tenders put out by OT 2000 result in master contracts each comprising a broad range of ICT services from which the individual government organizations can choose, resulting in an individual agreement with the selected supplier or suppliers.

Central government procurement accounts for approx. NLG 18 billion annually, that by other government tiers approx. NLG 33 billion.⁸² In general, tendering does not take place electronically, although this could lead to greater efficiency and cost-awareness within government. Electronic tendering is therefore capable of contributing towards the goal as set in the 'Coalition Agreement of increasing the efficiency of departments' procurement policy. By requiring electronic tendering the government can moreover give a major boost to the further introduction of electronic commerce in the Netherlands. This would also create opportunities for the SME sector, which would be able to compete better on the transparent market for government orders. In a few cases, forces are already being combined.⁸³

E.3.2 Actions by this cabinet

In the second half of 1999 the Ministry of Economic Affairs is to start a pilot project for the electronic notification of calls for tender, both

beneath and above the threshold for European calls for tender. The experience gained with this project will then be used to introduce an electronic tendering procedure within central government as a whole.

Another pilot is to start in the second half of 1999 to see whether the European identity card can be made suitable for remote (electronic) identification by using a biometrical identification technique. Based on experience gained with this pilot and other projects within government, a joint approach to the introduction of remote digital identification will be developed.

In order to further develop electronic financial dealing with the government, on the basis of an experiment by the Tax Service with electronic payments of turnover and wage tax, it is to be investigated how the government can encourage electronic payments to and by the government. It will also be investigated whether this system could make use of the existing banking infrastructure for electronic payments.

The General Administrative Law Act (AWB) is to be amended in such a way that, subject to certain conditions, electronic documents are equated with written documents, such as ministerial orders. In order to ensure the reliability and integrity of service provision via ICT, an infrastructural solution for the electronic identification problem will be developed on an interdepartmental basis, under the co-ordination of the Minister for GSI. For that purpose the feasibility will be studied of providing citizens with the facility of a generically applicable digital signature or a digital certificate.

The government is also to foster the use of the code of conduct for *electronic commerce* by encouraging its utilization by the greatest possible number of segments of the public sector.

Lastly, as announced in the Action Programme on Electronic Government, by year-end 1999 a framework will be made available providing clarity on the conditions for enlarging (commercial) use of government data-bases. That framework will be drafted in accordance with the Cabinet's response (May 1999) to the European Commission's Green Book 'Public sector information: a key resource for Europe'. The framework will contain among other things a description of (the bottlenecks in) the present legal context and name actions designed to eliminate these bottlenecks.

4 THE DUTCH DIGITAL DELTA: INTEGRATION, COMMUNICATION AND BENCHMARKING

The preceding sections describe the government's current and new policy initiatives. This final chapter deals with the further development, communication, monitoring and embedment of ICT policy.

Ambition:

The government's ICT policy is based on: Integration, Communication and Benchmarking. The government is fully alive to the potentials of ICT and endeavours to apply these in all areas of policy for which it bears responsibility.

The developments in information and communication technologies and applications described in Sections 1 and 2 make it clear that the transition to the information society is now gathering momentum. In this information society there are countless new opportunities to raise our level of prosperity and well-being.

To organize and maintain the five pillars outlined in Section 3 will take more than merely working on a set of measures as to their content. A good ICT policy also satisfies three criteria: integration, communication and benchmarking.

Firstly: it must be *integrated* policy. The government cannot choose at will between attention for the communications infrastructure, know-how and innovation, access and skills, regulations, or in-house application of ICT. An integrated, horizontal approach is required.

An integrated approach within ICT policy

From a Twinning centre and backed by a KREDO loan, a starting entrepreneur develops a novel broad-band electronic service. To test this service he makes use of the research network that is available via GigaPort.

Liberalization of the telecommunications market reduces the cost of using the telephone, and cable companies are able to offer Internet access. This makes it easier for citizens to gain access, particularly if they have first gained the necessary skills in a public library.

By making it possible for forms to be delivered to the government electronically and at the same time providing electronic desks which are open 24 hours a day, seven days a week, the government makes it easier for citizens and firms to supply information.

What is more, it is becoming increasingly clear that ICT has a major impact on the organization and functioning of our society. The possible implications of ICT will therefore have to be taken increasingly into account in all areas of policy for which the Cabinet bears responsibility.

Secondly: *communication* must play a large role in ICT policy. There are various reasons for this.

It is of great importance for citizens and organizations in the Netherlands to be aware of the fundamental changes in society that will, or may, take place as a result of developments in ICT. Communication must therefore form part of the policy.

Communication on the government's ICT policy is also extremely important. Because of the fast speed of ICT developments, government policy unavoidably has to be regularly adjusted to the changing developments (that is precisely necessary). However, this does impose additional requirements on public information regarding ICT policy.

Finally: *benchmarking* is a first priority. The demands to be met by a good ICT base require constant modification. It is therefore impossible to conduct effective ICT policy without regularly benchmarking the national position. And benchmarking must also be applied to the measures taken by the government. These must be as specific as possible, with a time-path that is clear to all. Keeping up requires adaptation and flexibility.

This third item is inextricably bound up with the first two. Clarity on our position and on government measures facilitates the conduct of integrated policy and communication on it. Much has been initiated in recent years. The National Action Programme on Electronic Highways represents a major step towards an integrated and coherent government policy. A structure has been created that assures co-operation and coherence between the various government initiatives. And when this National Action Programme was evaluated in 1998, a number of benchmark studies were carried out marking the start of the systematic collection of data that give an idea of our position in given areas.

The course embarked on with a view to achieving measurable results must be maintained. For that reason, the Cabinet is to add a number of new initiatives to these earlier steps. The objective is to further strengthen the integrated nature of ICT policy, to focus greater attention on communication, and to improve the benchmarking system.

Actions by this cabinet

The public information effort on the potentials of modern ICT for our society is to be stepped up. As far as possible, this will be done using existing channels.

Furthermore, the central government website (www.overheid.nl) will provide electronic government information in general, and more specifically an updated review of Dutch ICT policy. The website is to become operational in September this year.

Every two years, on the basis of a range of indicators an integrated picture will be given of the relative position of the Netherlands in the ICT sphere. This integrated ICT benchmark could consist of a fixed part (periodical measurement of the pillars of the ICT base) and a variable part, in which the use of ICT in two selected public sectors and two market sectors is highlighted. The method to be used for the ICT benchmark will be developed by the end of this year, making use of existing insights into ICT comparison and benchmarking.⁸⁴ The first integrated ICT benchmark study will be published in 2000.

In order to improve the availability of systematic empirical knowledge and information on the societal aspects of ICT, the research programme 'Society and Electronic Highways' (*'Maatschappij en Elektronische Snelwegen'*, MES) is to be performed between 1999 and 2003 under the guidance of Netherlands Organization for Scientific Research. MES will include scientific research programmes on labour, industrial activity, spatial planning, sociocultural processes, education, and knowledge and information flows. The programme will be supported by a data collection project in which a systematic series of databases will be built up derived from existing sources and from self-collected data. The databases will also be available for other research purposes, and periodical reports will be issued on current status and trends.

84. For example 'The IDC/World Times Information Society Index 1999; Moving into the Information Age; international benchmarking study 1998' commissioned by the British Department for Trade and Industry (Spectrum Analysis), April 1998; 'Ready?, Set?, Go!; The CSPP guide to global electronic commerce readiness'; Washington D.C., July 1998 (<http://www.cspp.org>); 'Benchmarking Diffusion and Utilization of Information and Communication Technologies and New Organizational Arrangements', European Commission, Directorate General III-Industry and Ministry of Trade and Industry, Finland, 1998.

The Cabinet also wants to strengthen insights into the correlation between ICT, the economy, spatial aspects and mobility. For that reason a programme of research has started, the results of which will at the earliest possible date be incorporated in the National Traffic and Transport Plan and the Fifth White Paper on Spatial Planning.⁸⁵

A small but authoritative external forum is to be set up as an external sounding-board. The forum will be involved in setting up the above-mentioned ICT benchmark. In appointing the informal forum, government ICT policy can be fuelled in dialogue with persons playing a prominent role in the development of the information society.

In addition, in the 'Infodrome' programme to be carried out under the direction of State Secretary Van der Ploeg (OC&W) between 1999 and 2001 is to elaborate further on general thinking about government policy in the information society. To that end, between 1999 and 2001 the 'Infodrome' Programme will work on generating broader ICT awareness and setting ICT priorities by systematically confronting players concerned with scientifically based expectations for the future. In 'Infodrome' the information society will be approached from a number of domains of daily life: Upbringing and Education, Citizenship and Security, Living, Work, Care, and Sport and Culture. For each of these domains, the available knowledge and insights will be developed into alternative scenarios which will be discussed in workshops with those involved, from business and industry, non-profit organizations and government. In that way the relevant questions will be identified and subjected to assessment in terms of their impact of society, administration and policy. This can make a major contribution towards the prioritization of important issues. 'Infodrome' will generate a permanent stream of publications and events for specific target groups and also for broader public consumption.

Finally, periodical reports will be presented to the Lower House on the progress of the actions and activities outlined in this white paper and the degree in which the ambition of the Netherlands as digital delta is being accomplished.

85. Announced in the white paper on Spatial Economic Policy.

LIST OF ABBREVIATIONS

ASCI	Advanced School for Computing and Imaging
AWB	Algemene Wet Bestuursrecht = General Administrative Law Act
AWT	Adviesraad voor Wetenschap en Technologie = Advisory Council for Science and Technology
BT	British Telecom
BTS	Besluit subsidies Bedrijfsgerichte Technologische Samenwerkingsprojecten = Business-Oriented Technological Co-operation Projects Subsidies Order
BZK	Ministerie van Binnenlandse Zaken en Koninkrijksrelaties - Ministry of the Interior and Kingdom Relations
CBS	Centraal Bureau voor de Statistiek = Central Bureau of Statistics
COB	Communicatie Overheid - Burger = Government-Citizen Communication
COBRA	Communications Technology Basic Research and Applications
CSPP	Computer Systems Policy Project
CWI	Centrum voor Wiskunde en Informatica = Centre for Mathematical and Information Technology Studies
CWTS	Centrum voor Wetenschaps- en Technologie-Studies = Centre for Scientific and Technological Studies
DIMES	Delft Institute of Microelectronics and Submicron Technology
DVBT	Digital Video Broadcasting Terrestrial
ECP.NL	Electronic Commerce Platform the Netherlands
ETSI	European Telecoms Standards Institute
EZ	Ministerie van Economische Zaken = Ministry of Economic Affairs
FENIT	Federatie Nederlandse Informatietechnologie bedrijven = Federation of Dutch Information Technology firms
FES	Fonds Economische Structuur = Economic Structure Fund
GBA	Gemeentelijke Bevolkingsadministratie = Municipal Register of Population
GSI	Ministerie voor het Grote Steden- en Integratiebeleid = Ministry for Major Cities and Integration

GSM	Global System for Mobile Communication
HAVO	Hoger Algemeen Voorbereidend Onderwijs = Upper General Secondary Education
HBO	Hoger Beroepsonderwijs = Higher Professional Education
ICANN	Internet Corporation for Assigned Names and Numbers
ICT	Information and Communication Technologies
IDC	International Data Corporation
INRA	International Research Associates
IOP	Innovatiegericht Onderzoeksprogramma = Innovative Research Programme
IPA	Instituut voor Programmeerkunde en Algoritmiek = Institute for Programming and Algorithmics
IP	Internet Protocol
IST	Information Society Technologies Programme
ITEA	Information Technology for European Advancement
ITU	International Telecommunications Union
KREDO	Besluit Kredieten Elektronische-dienstenontwikkeling = Electronic Services Development Loan Order
LISV	Landelijk Instituut Sociale Verzekeringen = Nation-wide Social Insurance Institute
MBO	Middelbaar Beroepsonderwijs = Secondary Vocational Education
MEDEA	Micro-Electronics Development for European Applications
MES	Maatschappij en Elektronische Snelwegen = Society and Electronic Highways
MESA	Microelectronics, Sensors and Actuators Institute
MKB	Midden- en Kleinbedrijf = Medium and Small sized Enterprises
NACOTEL	Nationaal Continuïteitsplan Telecommunicatie = National Continuity Plan for Telecommunications
NAFIN	Netherlands Armed Forces Integrated Network
NAP	Nationaal Actieplan Elektronische Snelwegen = National Action Plan on Electronic Highways
NBLC	Nederlandse Bibliotheek- en Leescentrale = Netherlands Library and Reading Centre
NIPO	Nederlands Instituut voor Publiek Opinieonderzoek = Netherlands Institute for Public Opinion Research
NIWI	Nederlands Instituut voor Wetenschappelijke Informatiediensten = Netherlands Institute for Scientific Information Services
NWO	Nederlandse Organisatie voor Wetenschappelijk Onderzoek = Netherlands Organization for Scientific Research

OC&W	Ministerie van Onderwijs, Cultuur en Wetenschappen = Ministry of Education, Culture and Science
OECD	Organization for Economic Co-operation and Development
OL2000	Overheidsloket 2000 = One-stop Government Counter 2000
ON21	Overheidsnetwerk 21 = Government Network 21
ONP	Open Network Provision
OPTA	Onafhankelijke Post en Telecommunicatie Autoriteit = Independent Postal and Telecommunications Authority
OT 2000	Overheidstelefonie 2000 = Government Telephony 2000
PPP	Purchasing Power Parities
RINIS	Routeringsinstituut voor (Inter-) Nationale Informatiestromen = Routing Institute for (Inter)National Information Flows
SERC	Software Engineering Research Centre
SET	Secure Electronic Transactions
SIKS	School voor Informatie- en Kennissystemen = School for Information and Knowledge Systems
SME	Small and medium-sized enterprise
Sp.OED	Stimuleringsprogramma Opkomst Elektronische Diensten = Electronic Services Development Incentive Programme
SWAP	Software Actieplan = Software Action Plan
TDAB	Terrestrial Digital Audio Broadcasting
TI	Telematica Instituut = Telematics Institute
TNO	Nederlandse organisatie voor Toegepast Natuurwetenschappelijk Onderzoek = Netherlands Organization for Applied Scientific Research
TTP	Trusted Third Party
UMTS	Universal Mobile Telephony System
UNESCO	United Nations Educational, Scientific and Cultural Organization
VECAI	Vereniging Exploitanten Centrale Antenne Inrichtingen = Federation of Central Antenna Systems Operators
VSNU	Vereniging van Samenwerkende Nederlandse Universiteiten = Association of Collaborating Dutch Universities
V&W	Ministerie van Verkeer en Waterstaat = Ministry of Transport, Public Works and Water Management
VWO	Vorbereidend Wetenschappelijk Onderwijs = Pre-university Secondary Education

VWS	Ministerie van Gezondheid, Welzijn en Sport = Ministry of Health, Welfare and Sport
WIPO	World Intellectual Property Organization
WLL	Wireless Local Loop
WTCW	Wetenschap en TechnologieCentrum Watergraafsmeer = Science and Technology Centre Watergraafsmeer
WTO	World Trade Organization
WvA/S&O	Wet voor Afdracht Loonbelasting/Speur- en Ontwikkelingswerk = Wage Tax and Social Security Contributions Reduced Remittances Act/Research & Development
ZBO	Zelfstandig Bestuursorgaan = Independent Executive Agency

COLOPHON

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