Information Technology Industry

Industrial Policy
Ministry of Trade and Industry
Government of the Faroe Islands

Tinganes
Tórshavn, Faroe Islands

www.vmr.fo

Faroe Islands Ministry of Trade and Industry
Industrial Policy: Information Technology Industry

Preface

In November 1999, the Minister of Trade and Industry for the Faroe Islands initiated efforts to draft an Information Technology Industry Industrial Policy for the Faroe Islands based on the Industrial Policy of March 1999.

In addition to preparatory work and research, the drafting initiative included community meetings and hearings involving, but not limited to, representatives from the following ministries and organisations:

Faroe Islands IT Association and representatives of its individual members
Ministry of Culture and Education
Ministry of Finance
TK Stovan (the local TIC office in the Faroe Islands)
Faroe Islands Trade Council
Postal and Telecom Surveillance Authority
Office of the Prime Minister
Public Works Department
National Transportation Department
Faroes Data Store, Inc. (FDS)

Sigurd Ó. Vang, senior policy advisor to the Postal and Telecom Surveillance Authority, and Hjørdis Gaard, senior policy advisor in the Communications Department of the Ministry of Trade and Industry, acted as secretaries.

The Minister of Trade and Industry tabled the proposed Information Technology Industry Industrial Policy for debate by the Faroese Parliament on 13 December 2001.

After the debate, the Policy was revised, although there were no fundamental changes to the Policy as presented.

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Forward

Knowledge-based society[1], information technology[2] and globalisation of the information society are terms that are used interchangeably and often their meaning is unknown or obscure. Nevertheless a fundamental change has occurred throughout the world that impacts individuals, businesses, schools, communities, etc.

Within the international economy it is possible to transfer capital; technology is quickly spreading and business transactions occur quickly and easily between regions. Information technology advances in all directions and influences and assists in the globalisation of the information society and the community development that is taking place in the Faroe Islands and throughout the world. Information technology has made our world smaller. Investment in information technology has led to the advancement and development of both government and industry here in the Faroe Islands and in most countries in the world.

Increased international competition demands that we in the Faroe Islands create an operational framework for industries that provide goods and services based on information technology skills and knowledge. Faroese businesses at all times should take advantage of the benefits that information technology provides. The communications potential that information technology generates has created conditions for Faroese participation in the international commercial value-added chain[3]. Businesses can thus engage in cross-border co-operation to produce or sell products or services. The competitive limitations that hinder ordinary business sectors in the Faroe Islands, eg, distance from major markets and the relatively small size of local companies, are not relevant and are of no consequence in the information technology industry. Small businesses here in the Faroes have as good a chance to achieve as do larger companies in more populated countries. Technological development thus creates favourable conditions for the domestic industry as a whole and promotes the development of the information technology sector in the Faroe Islands.

Today, it is well known throughout the world how vital knowledge is for enhanced competitive advantage, regardless of the type of commercial activity. Therefore, the Faroese business community and the Faroese community at large are encouraged to seize the challenge to assimilate and utilize knowledge-based technologies, especially the tool of information technology.

Information technology alters not only the commercial environment, but it is also an economic and social force that changes society. Information technology has influenced society in a variety of ways. The ultimate purpose

of our Information Technology Industry Industrial Policy is not to create a framework for the evolution of information technology in the community as a whole, but rather to create a framework for the development of information technology as an industrial sector.

The Minister of Trade and Industry tabled a proposed industrial policy before the Parliament in March 1999. As a part of the continuing work with the Industrial Policy, it was suggested, among other considerations, that a policy statement should be generated for each industry sector. The overarching Industrial Policy would assure continuity for each business sector. Each individual sector policy would present and discuss in detail the various issues relevant for each industry sector.

The Industrial Policy of the Faroese Government establishes the overarching goals for Faroese business and the economy. In addition to the Industrial Policy, the Information Technology Industry Industrial Policy functions as a directive that the Faroese Government follows in its daily work, eg, when practical political objectives should be effected in connection with the industry. The intent is that the Information Technology Industry Industrial Policy shall be revised and developed in response to changing circumstances and the emergence of challenges and opportunities within the sector.

The Information Technology Industry Industrial Policy requires continuous industry debate, industry focus and co-operative endeavour.

Bjarni Djurholm
Minister of Trade and Industry

Vision

The industrial policy for the IT industry conforms to the vision delineated in the approved main industrial policy, ie, the policy shall be supportive of self-sufficient economic endeavours that yield a profit and that promote progress and social welfare within a structure of free international competition. The industrial policy also gives due consideration to the well being of society and the environment.

The vision for the IT industry industrial policy is articulated as follows:
As one aspect of a many-faceted Faroese economy, the IT industry shall be a financially self-sufficient industry that is based on the development, production and sale of quality goods and/or services within both the domestic and foreign markets and that yields a profit within a regime of free international competition. In order to support the continuing development of this sector, the government should be a leader in the use of information technology.

If the Faroese IT industry is to hold its own against international competition and is to be a source of progress for the community, it must remain continually up-to-date, assimilate the latest knowledge and manifest versatility and flexibility. At the same time, it must operate under those standards that the community sets regarding the environment and social well being.

The IT industry itself shall govern its business and export operations both financially and with regard to research and development within the framework established by the government.

Developing countries are characterised by their reliance on natural resources and they have proportionally smaller value-added potential compared to countries wherein the economy is based on production or manufacturing and special services industries. In the services industry, development is associated with an information society, which is a community wherein development and use of knowledge and technology is important for growth and overall well being. The degree of importance given to knowledge and technology is directly proportional to how large an investment a country is willing to make in education, research and new technology.

In order for industry to attract the best people, it is necessary moreover to be aware that the industry, as well as the community as a whole, is able to offer an excellent quality of life and a beneficial and safe social environment.

If the Faroe Islands is to develop its IT industry, the criteria to which all endeavours must ascribe are: inspiration, innovation, adaptability, education, skill competency, research and development.

Background

The IT industry is now one of the fastest growing industry sectors in the world. The IT industry is known both for large risks and for the possibility of large returns on investment. In addition to the fact that information technology can make businesses more cost-effective and productive, the export of IT products and services can generate more wealth in the community. Israel, Finland and Ireland are examples of countries that were previously technologically developed countries, but by the application of a purposeful IT industry policy and by the effecting of investments and changes that were needed now rank among the most advanced IT nations in the world. (Confer in this regard the ministerial report, *IT Industry Industrial Policy of Israel*, available at www.vmr.fo [in Faroese].)

Currently, the Faroese IT industry supplies IT goods and services to the world market. Individual development of IT products and services is steadily growing and several businesses export IT products and services, and others are working on plans with the aim of exporting.

Examples of exported good and services are the computer software that is used to register, document and service technical medical equipment in hospitals; betting systems; database management; and web page development. Faroese businesses have also developed and exported innovative software and IT systems for the fish and fish farming industries.

Role of Government

The role played by the government is undergoing change. As the community moves toward liberalisation and free competition, the public sector has taken a less active role in micro-managing the business community. The government no longer sets enterprises in motion, but instead creates a favourable environment in which entrepreneurs and investors can operate and assume full responsibility for their investment decisions.

To achieve the goals outlined in this visionary policy, resolute effort is necessary to structure the best possible framework for the industry. In co-operation with the IT industry, the government places great importance on developing a structure for:

• Competency Development and Research
• Opportunities for Financing and the Taxation Regime
• Telecommunications and Infrastructure[4]
• International Networking and Marketing
• Governmental IT Use and Legislation

There is a need to articulate specific goals for each of the above-stated areas, and, at the same time, delineate the course toward each goal. It is no less important to evaluate periodically the various activities and the established policy as a whole.

The five areas named above are delineated in detail; for each goal there is a statement about what must be accomplished in each area and ways to structure the framework for each goal. The aim shall be that the correct goal and means to accomplish the goal are laid out in the industrial policy for the IT industry, the appropriate procedures articulated, and that all interested parties have the same understanding with regard to the goals and procedures that shall be followed.

Competency Development and Research

Production and export of IT goods and services should continue to develop and, thus, it is critically important to have a sufficient qualified workforce. The most important resource used by IT businesses is knowledge and the biggest challenge in the next few years will be to acquire and retain a qualified IT workforce. The whole world needs educated IT professionals and Faroese businesses must compete directly with neighbouring countries, if they are to attract competent people.

According to the IT industry in the Faroe Islands, the number of IT-trained workers is too small to meet the needs of the industry. The industry also considers it to be an issue of concern that too few receive the training that would build IT competency. Industry research is also a precondition for developing the Faroese IT industry, and especially IT research in connection with the fishing and fish farming industries. The Faroese have astute knowledge of these industries: an essential core competency. Combined with a competency in IT, this core competency is a good foundation for IT research and development. It is fundamentally important to do research in the use and application of information technology. For example, the research focus should emphasise the use of computers and telecommunications in various contexts.

Objectives:

❑ **To encourage the pool of IT educated workers to develop expeditiously the IT industry.**

❑ **To foster IT education and research and stimulate research in the use and application of IT.**

It is necessary to identify what hinders individuals from seeking an IT education and what causes those individuals with an IT education to forego work in the Faroese IT industry or in Faroese educational facilities and research institutions.

No survey has been conducted in the Faroe Islands to determine why entry into IT education isn't following the growing demand for qualified personnel. Such research should be done. Research in other countries, however, reveals that, on the whole, the situation is exacerbated by a lessening public interest for the natural sciences and technology education. Given this situation, one way to market IT education would be to provide people with knowledge of the IT education possibilities and what employment opportunities are available with an IT education. Further, making people aware of the possibilities to combine an IT education[5] with other education could also encourage some to obtain special training in IT. One method might be to provide information for Faroese students on the possibilities to obtain an IT education both in the Faroe Islands and in other countries via, for example, an electronic educational marketplace on a web page portal. Such a marketplace site could also be a good tool for new educational guidance programmes for middle school students.

In order for a constant stream of overseas-educated people to move back to the Faroe Islands, they must believe that the possibilities for work and other conditions are good. These other circumstances, which also affect other industry sectors, are, for example, day care, housing, leisure time activities, etc.

Of special importance relevant to an IT industry policy, however, are the obstacles that are unique to the IT sector here. One of the most important of these barriers is that the Faroe Islands from the perspective of research and development (R&D) is not considered interesting, and the professional environment is thought to be more stimulating or challenging in other places. As a result, Faroese with an IT education, who want to work in research and IT product and services development, tend to work outside the Faroes and, thus, Faroese businesses are not able to benefit from their specialised knowledge. Moreover, the synergistic effect[6] that stems from co-operative effort among IT companies, IT researchers and other businesses, such as salmon farming and fish processing, is not realised for the benefit of the Faroese community.

If a Faroese research environment were created, it would be easier for Faroese businesses to maintain connection with researchers and students and in this way develop possibilities for a workforce to remain in the Faroes, so that competency levels and IT goods and services could be develop. International IT companies have their own research and development activities in countries that have a dynamic research environment. If the IT

industry here is to develop large-scale, commercial value growth, it is imperative that the industry has a competitive environment within which to operate.

The Ministry of Culture and Education has in a report and in its own administration worked to ensure that IT is a natural part of everyday schooling so that students have a good grounding in IT, not only through education in IT, but also through education using IT. In recent years, one particular aim and co-ordinated development effort regarding information technology in the school curriculum has been that each student develop the IT competency skills required. The Ministry of Culture and Education has stated that in order to develop specialised knowledge of information technology as a whole in the community, it is necessary to have advanced education in this area. (In this regard, refer to the document from the Ministry of Culture and Education: Toward Development and Strength – Information Technology in Youth Education and Adult Continuing Education [in Faroese] available at www.mms.fo.)

The Faroese Business School in Tórshavn offers a 2-½ year programme in computer science, which emphasises application systems for industry and public administration.

The University of the Faroe Islands intends to offer a B.Sc. degree in information technology. The programme is designed as a half-time, continuing education course stretching over a period of two and one-half years. This education will provide computer technicians with an opportunity to earn a B.Sc. diploma; in addition, it will give individuals with comparable experience, who, for example, are already working within the IT industry, a chance to build on their professional competency. In connection with the intended B.Sc. diploma programme, it is intended to organise a competency support group, led by professors and researchers from foreign universities and by representatives from the IT industry in the Faroe Islands. Another possibility at the University is a one-year advanced study programme leading to a B.Sc. in computer science. This is intended for students who have completed a two-year fundamental course of study in the natural sciences.

There should be close co-operation between businesses and the University, for example, co-operative research programmes, and professionals from the industry should be encouraged to teach classes at the University.

Great importance should be placed on organising international co-operation between educational institutions. Such co-operation might include instructors from foreign institutions undertaking some of the teaching work. Such co-operation could also extend to collaboration in research programmes that transcend borders and involve institutions of higher learning. There is a need

to develop a world-class research environment and to create a professionally stimulating environment.

Means to accomplish the stated objectives:

❏ Develop high-level IT education at the University of the Faroe Islands. As quickly as possible, begin to offer a bachelor programme in information technology and prepare to offer a complete graduate programme.

❏ Appoint researchers to the University of the Faroe Islands and in co-operation with the IT industry organise special areas of study leading toward award of the PhD degree.

❏ Continue to offer at the Faroese Business School in Tórshavn an education as computer technicians and data processors.

❏ Give consideration to preparing for IT education at the Faroese Technical School in, among other courses, IT support.

❏ Focus on the structuring of IT education such that it is an interesting continuing education possibility. In this connection, distance learning[7] could be used so that people around the country could take part in a given course and that continuing education could be offered in co-operation with foreign educational institutions.

Opportunities for Financing and the Taxation Regime

It is well known that the IT industry's main capital asset is knowledge capital[8]. Ordinary financing is not especially workable for a knowledge-based industry. Financing is related more to who is employed in a particular business, for example, how much education they may have. The consequence that the main asset of a company is its knowledge capital is that financial institutions take certain risk precautions because knowledge capital is not a "fixed" asset like other capital and cannot easily be secured.

The capital market in the Faroes is insufficient, when it comes to venture capital available for new businesses. There is a need for entrepreneurial support through which new, cutting-edge companies and existing businesses are encouraged to develop IT products and services.

Access to venture capital and strategic investment consortiums is fundamental to developing the Faroese IT industry.

The government believes, however, that the IT industry, like other industries, must obtain financing as much as possible from the financial markets and not through public subsidy programmes.

Financing possibilities that should be developed:
- A multi-faceted and strong capital market
- An incubator (fiscal services office, advisory services, etc.)
- Other business promotion arrangements

The taxation regime can be used as a practical tool for industry development. In the Faroe Islands, taxes and fees on the whole are combined and simply organised. In addition, taxes can be strategically used to reach certain political goals. Care must be taken that foreign tax regimes do not make Faroese businesses worse-off and at a competitive disadvantage. Importance should be placed, however, on having a simple and universally applicable tax regime.

Objectives:

❏ **To create a good environment for financing;**

❏ **To use tax policies, within reasonable limits, as a tool to recruit and retain a qualified IT workforce and IT businesses in the Faroe Islands.**

Current financing possibilities in the Faroe Islands for the most part are: The Industrial Development Fund, the Faroese Development Fund, and bank financing.

An example of financing and development stages for a given IT business:

Stage one includes research and development or an incubation-stage[9] wherein the project is structured as a sole proprietor or a small company. The capital market for stage one is seed capital[10], owner financing, and Industrial Development Fund capital.
Stage two is a development stage and is structured as a limited company. The capital market for stage two businesses is the Faroese Development Fund.
Stage three companies are characterised by growth and profitability with operations structured as a large limited liability company. The capital markets are the stock market, corporate bonds and bank financing.

The Minister of Trade and Industry has initiated an IT industry advancement programme under the direction of the Communications Department of the

Ministry of Trade and Industry. It is an experimental programme the goal of which is to create a special climate for the development of new IT enterprises, ie, to provide these enterprises with a workable development framework and make it easier for them to obtain financing and advice in the initial start-up phases with the goal of ensuring that their new concept evolves sufficiently to attract development funding and the interest of the ordinary capital markets.

The entrepreneur should develop an idea sufficiently so that a specific product can be defined and that technically conforms to market standards. A prototype or working model should be developed or fabricated and a business plan written. The concept should progress sufficiently as to be ready for commercial or strategic investment.

When the experimental period has run its course, the incubator management shall submit to the Minister a written summation and evaluation including possible suggestions for improvement in the regulatory regime and suggestions as to whether or not incubators could be established in other locations in the Faroe Islands. Furthermore, the report should include an evaluation of which businesses, augmented by, for example, specific government participation, could support incubators in various places in the Faroe Islands, also in other high-tech sectors like fish industry technology and biotechnology. In other word, how local authorities, local business people, educational institutions and the Ministry of Industry can collaborate to develop high-tech incubators in the Faroe Islands.

There is a need for a venture capital fund in the Faroese capital market that could invest in stage one businesses, that is, provide seed capital financing while an idea is developed into a product or service.

The Parliament has approved a law establishing an Industrial Development Fund to strengthen and expand a multi-faceted Faroese economy and to develop sustainable Faroese businesses. The Fund will operate in conformity with the national industrial policy and other directives within its terms of reference as prescribed by the law and in accordance with the protocols and standards promulgated over time by international trade and commercial organisations.

The Minister of Trade and Industry shall stipulate in the subsidy guidelines for the Industrial Development Fund what types of endeavours may be supported and the conditions governing support, including herein which industry sectors are eligible for support. Upon application, grants can be awarded to businesses for action strategies that will in future enable it to be more competitive or that will boost its global position. The Fund can also support special commercial endeavours and comprehensive initiatives regarding export, new product designs, competency skill development, tourism and research. Pursuant to the Parliamentary law, it is possible to use part of the

start-up funding to establish or significantly expand a company's infrastructure.

The Business Development Fund is a for-profit, quasi-governmental entity whose purpose is to invest in new or expanding commercial activities in the Faroe Islands. Investment by the Business Development Fund can be in the form of an equity capital injection or as a loan guarantee and, if the investment has a long-term capital appreciation horizon, the risk is balanced against the potential gain. Investments that are made should be based on a solid commercial foundation wherein the outlook is good for considerable growth. The business concepts funded by the Business Development Fund should be sufficiently advanced as to be ready to enter into the production phase.

Venture capital markets are now international, and venture capital firms throughout the world are looking for partnerships. Such venture capital firms should have the opportunity to invest in the Faroese venture capital market. Co-operation across borders increases expertise, facilitates entry into markets, and diffuses risk.

In addition, venture capital firms attract the kind of investors who will act as strategic partners. They will work closely with a business and assist at all stages of the company's development and with market access. For example, they could assist with

- drafting of a business plan;
- gaining access to marketing specialists and investors;
- day to day management;
- establishment of foreign offices.

In their efforts to attract and retain a workforce, other countries have created special tax regimes regarding stock purchase options. A stock option is an employee right, but not an obligation, to purchase company stock for a pre-set price within a given timeframe.

Sale of subscription rights to stocks and stock options are taxed pursuant to general regulations because special regulations are not in place regarding how these so-called rights (assets) can be sold. If the assets are treated as gifts, except in certain circumstances when family or close relatives transfer the gift, the gift is calculated in the taxable income of the one who receives the gift in the year that it is received. This means that, as far as the tax law is constructed now, subscription rights (options) are taxable when they are given to employees and when they are sold[11].

Building upon the fact that the main resource to develop an IT industry is knowledge, in order to attract foreign researchers and professors to the Faroe Islands, it is deemed necessary to tax these people at lower rates for a stipulated number of years.

Means to accomplish the stated objectives:

❏ Establish incubators throughout the Faroe Islands.

❏ Establish development associations and entrepreneur associations with some public and mostly private investors that have as their goal to place risk capital in newly created business concepts in their early development stages.

❏ Establish a stock market as quickly as possible as a means of generating risk capital.

❏ Draft new tax regulations that allow for lower tax rates for stock options[12] and employee-owned shares.[13] Employees will thus be able to participate in the growth of a company and become working investors. Subscription rights (stock options) should be taxed when sold.

❏ Extend tax reductions to foreign researchers and experts during the first years they work in the Faroe Islands, if engaged in research and development activities.

Telecommunications and Infrastructure

Development of the IT industry is very much conditioned on excellent communication services and that connection fees are such that they do not impede the consumer from utilising to the fullest the possibilities offered by information technology. If the Faroese are to participate in the globalisation of the economy and information technology, a telecommunications market organised in accord with the highest standards in Europe is a major precondition for the enhancement of our competitive edge. All users in the Faroe Islands, as well as sole proprietors and government offices, should have the opportunity to be part of a well-connected and well managed "virtual society"[14] that features high speed networks and a cost basis that is equivalent to or lower than leading western countries.

It is important that the Faroe Islands continue to be a free market and that competition abounds. Competition implies that concessionaires continue to widen and improve their product offerings so that industry is able to obtain customised and ancillary services with special discounts. Experience in other

regions indicates that the more competition, the more quickly development occurs. To achieve this free market goal requires ensuring that competition continually encourages the telecommunications concessionaires to improve their services and wisely use their available resources.

The market itself should decide what technology is most suitable regarding both value and speed. Technological development together with demand results in that the various communications options are joined together in a technological bundle encompassing sound, pictures, text and voice.

If an IT industry is to develop in the Faroes and be capable of providing world class IT service, a prerequisite is that people and businesses are in a networked community, where there is room for new, innovative thinking and ideas and where there is a good working environment. Good communication possibilities throughout the community are an absolute necessity, if the vision of an information society is to become a reality.

It is quite important that new concessionaires should be able to lay their own cable or set up wireless networks unhindered. In this way the capacity of the Faroese Telecom infrastructure could be fully utilised and businesses could be afforded additional options. This will no doubt also stimulate far-reaching development in the region and a wider choice of beneficial options for the IT industry. At the same time, it augurs well that to the extent that technology advances and competition increases, services to more isolated outlying areas will also grow. Technological advancement assures that cost factors, which characteristically limit access to a particular technology by the last 10% of users, continue to decrease. It can also be noted that outer islands, municipalities and co-operatives could learn from and replicate the Svínoy and Fugloy Virtual Community experiments. In other places, for example in Iceland and Denmark, municipalities and co-operatives in association with telecommunications concessionaires have taken steps to offer their citizens, businesses and public offices access to broadband Internet services[15]. More than a third of the households in Denmark that have TV via cable also are connected to the Internet via this arrangement.

The Minister of Trade and Industry intends that the efforts to liberalise the telecommunications market shall continue for the benefit of both industry and the citizens of the Faroe Islands. Reliable, secure and low-priced telecommunications services, together with a wide variety of Faroese Internet content services[16], are, among other factors, the necessary prerequisites in order to propel the Faroe Islands into a true information society. In addition to the expansion of the infrastructure, it is also necessary that people have confidence in the Internet and that interesting services are offered.

Objectives:

❑ **To foster the development of the Faroe Islands Internet infrastructure so that all households, businesses and public offices have access to high-speed and / or broadband telecommunication services by 2004.**

❑ **To foster the development of the Faroese telecommunications industry**

Upon the promulgation of the telecommunications law of 1997, major changes in the Faroese telecommunications system were set in motion. The monopoly held by Faroese Telecom was rescinded; the introduction of competition was another feature of the law. The law was structured in large part along the lines of European Union regulations. In the Faroes, this process of liberalisation began rather late compared to the EEA countries. The process is now, however, well advanced both with regard to technology and price.

Since April 1999, the policy of the government has been a "first come-first served" policy[17]. In accordance with recommendations from the Postal and Telecommunications Surveillance Authority, the Minister awards concessions to applicants who meet the basic minimal requirements. These basic requirements, as set forth by the Postal and Telecom Surveillance Authority, were grouped by the type of service and system for which application was made.

Since May 1999, several concessions have been awarded for telephone service, mobile telephone service, leased lines, text and digital communication services, satellite services and other value-added services, including Internet services. Concessionaires are also authorised to conduct broadcast activities.

In order to secure better conditions to advance the objective of providing expanded access to the Internet for all Faroese, the Minister of Trade and Industry concluded to authorise municipalities, co-operatives, etc to operate telecommunications networks within specific areas and to offer limited telecommunications services through cable, wireless systems, or hybrid broadcast network systems.

Data transmissions, leased lines with underlying infrastructure, Internet services, etc.

In these areas, regarding options, speed and costs, the Faroe Islands is considered to be behind neighbouring countries both with regard to networking departments of the same business or agency, and when it comes to providing digital telecommunications services on the whole.

Competition is expected to stimulate more options, resulting in lower costs and faster data transmission speeds.

Competition can stimulate the construction of new infrastructure utilising advanced wireless technology. New concessionaires have taken up this challenge and are making headway in the creation of their own wireless network.

Domestic and long-distance fixed-line telephony

Price levels in the Faroe Islands for both domestic and long-distance fixed-line telephony are comparable to other countries in Europe. Prices in the Faroe Islands are, however, on the high side for domestic telephony.

Mobile telecommunications: GSM, UMTS, etc. for voice and data transmission

Technology continues to advance and in the coming years it is anticipated that existing technological possibilities will multiply. Moreover, services will continue to be more and more widespread throughout the whole country. The existing GSM (Global System of Mobile Communications) network infrastructure is expected to be augmented with the GPRS (General Packet Radio System) platform. GPRS allows one to be always connected, for example, to the Internet and to receive email directly to a mobile telephone without the necessity of dialling to make a connection. Delays have occurred in efforts to develop UMTS (Universal Mobile Telecommunications System) and it is estimated that the first UMTS system will come on-line in 2002/2003. Existing GSM technology is considered second-generation technology; UMTS technology is considered third-generation technology. Recently, many GSM systems in Europe have been upgraded to GPRS technology. This technology is a bridging step between GSM and UMTS and has many of the same options, but is not as fast and cannot be used in as many countries as UMTS, which is intended to be a worldwide system.

The mobile telecommunications systems of Faroese Telecom are modern and function well. With regard to pricing, the Faroe Islands lies on the high side. The Minister of Trade and Industry has awarded concessions for mobile phone systems, thus, competition is expected in this area in 2002.

Regarding UMTS, the Minister expects to follow world trends and accept applications for UMTS concessions in the Faroes.

International telecommunications

There are two types of connection between the Faroe Islands and the rest of the world: undersea cable and satellite.

Cable transmission capacity is provided to the Faroese telecommunications companies via the CANTAT-3 undersea cable[18], which comes from Canada, via Iceland and the Faroe Islands to Denmark, Great Britain and Germany.

Work is underway to investigate the possibility for a new cable between Iceland and Scotland via the Faroe Islands and possibly Shetland and the oil-producing region, West of Shetland.

Regarding satellite telecommunications, it should be noted that Faroese telecommunications companies now have earth stations for satellite telecommunications.

Investment by foreign investors

The policy is that foreign capital and businesses are not restricted in their participation in the telecommunications market in the Faroes. Thus, foreign businesses are free to invest in businesses that have concessions, or to establish a business in the Faroe Islands.

All must be done to ensure continued investment in telecommunications in the Faroe Islands so that the market will be attractive. One can imagine that the Faroe Islands, for example, could become a test market in connection with IT products and services because, although the Faroe Islands is small, it is a modern society, a so-called microcosm.

Faroese Telecom

That which distinguishes Faroese Telecom from other telecommunications providers in the Faroe Islands is that it is a government-owned company and previously held the telecommunications monopoly. In January of 1998, when Faroese Telecom was converted from a public agency to a corporation (the shares of which continued to be held by the Faroese Government) the company itself became owner of the telecommunications infrastructure assets in the Faroe Islands. This arrangement gave Faroese Telecom a special place in the telecommunications market.

Faroese Telecom, as the owner of the telecommunications infrastructure, has a competitive advantage over new

telecommunications concessionaires; in addition to being a telecommunications service provider, it is the network owner. This means that other telecommunication concessions must contract with Faroese Telecom to obtain access to the infrastructure and pay for this access.

Means to accomplish the stated objectives:

❑ Telecommunications policy is built upon a market-based policy wherein investment in infrastructure is provided by the private investment market. The government creates the regulatory framework and ensures competition under the following conditions, among others:

Accounting regulations – that foster transparency of income and expenses in the various service areas. In nearly all the concessions that thus far have been awarded are regulations that ensure that the companies maintain detailed and transparent accounts.

Operations regulations – that govern the connection and administration of the public telecommunications infrastructure and services.

Price setting – that is also prescribed by regulations within the concession ensuring that the concessionaires follow the regulations regarding competition and the setting of prices for the various services. Regulations should, among other things, prevent price dumping, price gouging[19] and cross-subsidisation[20] between service areas.

❑ According to the law on telecommunications, the Minister of Trade and Industry has the authority to assign universal service obligations to concessionaires. It is stipulated in the concession for Faroese Telecom that the company has a limited universal service obligation[21] in order to ensure outer areas of the Faroe Islands receive telecommunications service. The Minister of Trade and Industry can also place such universal service obligations on other concession holders if they become large enough.

❑ The Minister of Trade and Industry takes telecommunications connections between the Faroe Islands and the rest of the world very seriously and continues to stress the importance of these connections as part of the strategic geo-political interests of the Faroe Islands.

❑ The Minister of Trade and Industry desires to attract foreign as well as Faroese businesses and investors into the Faroese telecommunications

market, and, among other things, thus ensure that the Faroese telecommunications market is world class and that investments are made in the telecommunications infrastructure and services in the future.

International Networking and Marketing

A network is an association or co-operation either internally or among businesses, governmental offices or individuals in a specific business sector. The knowledge community well understands that knowledge is not to be kept centralised. The more access to information, the more people or businesses can keep abreast of knowledge and new developments in their area of expertise. A well-organised network provides its users with the ability to access information and manage its business operations, which in turn can affect business opportunities. A well-run network can also ensure that connections among the various departments or associated partners is maintained and develops so that broad co-operation can benefit all. Networked associations understand that the whole is more than the sum of its parts.

Objectives:

❑ **To foster the development of a good environment for expanded networking**

One must keep in mind the importance that the network concept currently has for a self-sufficient economy in the Faroe Islands, to say nothing of its importance to the future. Thus, the Minister of Trade and Industry desires to foster as much as possible an environment for quality networking. Individual governmental agencies are not to become directly involved with the networks of individuals or businesses, but shall ensure that a network is possible. It is important that individual businesses themselves have the interest and take the necessary steps to develop a network, if the need exists.

The IT Association is an industry association, established in 2000. Its purpose is to advance the interests of the IT industry. There are now 20 members in the association. Under the auspices of the Communications Department of the Ministry of Trade and Industry, co-operation with the IT Association has occurred on two occasions. One was to arrange for the "Faroese Internet Exchange",[22] and the other was to set up the Faroese administration to manage the domain name FO[23]. Moreover, the IT Association is represented on the board of the IT incubator.

One can imagine that the IT Association and the business development offices, The Faroe Islands Trade Council (Menningarstovan) and TK Stovan (the local Faroese Office of the TIC Network in Denmark), could collaborate to strongly promote the IT industry's participation in, for example, CEBIT,[24] as well as inform the IT industry about what export services these offices provide.

Means to accomplish the stated objective:

❑ A network should be developed between the education institutions and the IT industry with the aim of creating a synergistic effect between education, research and industry.

❑ Network associations should be developed among businesses in the Faroe Islands. Rather than perceiving other businesses in the Faroe Islands as competitors, it is more important to visualise a steadily expanding international market and the advantages that will accrue to all through co-operative efforts to carve out more international market share.

❑ The government should encourage and support research co-operation, participation in foreign exhibitions and help to organise international conferences and exhibitions in the Faroe Islands.

❑ The IT Association collaborates with international organisations, for example, the ISOC (International Internet Society),[25] thus keeping abreast of the latest knowledge and advancing its industry network. The result is that excellent co-operation continues between the association and its IT industry membership in the Faroe Islands.

Governmental IT Use and Legislation

How much and in what way the government uses information technology in its services to the public and in its internal activities can affect the use and the awareness of IT in the community as a whole.

Objectives:

❑ **The government should be a leader in the use of IT technology.**

❑ **Legislation should energise and contribute to a transforming IT environment and eliminate unnecessary limits on IT development and IT use such that the legal regime supports and stimulates the development of the IT industry.**

The government purchases IT goods and services and such purchases are a significant part of the domestic market of the Faroese IT industry. If the government were to take steps to augment its IT use in its interaction with citizens and in its in-house operations, it would stimulate both direct and indirect demand for the services offered by the IT industry. There would be direct demand for those services that are critical to the government in order for it to maintain its system operations, such as network administration and programming. The indirect demand would be that IT usage in the community as a whole would grow, as interaction between citizens and the government involves more use of information technology.

To avoid the possibility that an increasing domestic demand for IT goods and services could dampen enthusiasm for the export of IT services, it is especially critical that more individuals seek an IT education. If the number of people trained in IT increases, a flourishing domestic market could become the foundation for an expanding export of IT services.

Decisions regarding which IT services should be done in-house by government IT specialists or contracted out to private IT companies also play an important role in the development of competency within IT companies and whether or not it is possible to generate IT export.

If the government were a discriminating buyer and set high standards for the services it required via its call for tenders, wherein Faroese companies would have the same opportunity as foreign companies to bid on all projects, it could further its policy of building competency in Faroese IT businesses. It is important for the development of the IT industry in the Faroes that Faroese IT companies have the opportunity to submit a bid in connection with government tender offers.

Connected to the goal of developing a networked Faroese community and developing the Faroese telecommunications industry within the framework of a free market, the government should take the lead in the use of newly developed operating systems or infrastructure, especially with regard to IT and Internet-based administrative services.

Legally, communications via the Internet are problematic in that the recipient of a particular message or offer cannot know for certain if the sender is truly who he or she claims to be. The consequence of this reality, among others, is that the Internet is little used for the exchange of legally binding contracts, which might encompass, eg, contracts, agreements, blank forms, and other formal documents. This situation exists even though the advantages of using the Internet are many, including, among others, ease of use, swift transactions and in-expensive administration. Transactions and Internet commerce requires the use of authorised electronic signatures[26] and that

these electronic signatures are as legally binding as an original hand-written signature.

The expansion of electronic commerce progresses very swiftly, but legislation tends to lag behind. As part of the goal of promoting specific development, self-regulation can supplement general legislation. For such self-regulation to work, it is nevertheless necessary that the industry take such initiatives very seriously. One area of self-regulation found in the Nordic region and in the rest of the world, for example, is the administration of domain names on the Internet.

Self-regulation initiatives are useful when circumstances are such that changes in a particular area occur so rapidly that administrative and regulatory agencies would best serve by restraining from promulgating directives until the area had matured or stabilised or when, for example, it became apparent that legislation was needed to address a specific issue. At the same time, such initiatives depend on the stakeholders in the market themselves to quickly identify problems and challenges and quickly take the decisions necessary.

In the Faroe Islands, the Ministry of Trade and Industry together with the IT Association has worked to develop self-regulation regarding a Faroese Internet Exchange (named THOR-IX) and the Faroese administration of the FO domain name on the Internet.

Means to accomplish the stated objectives:

❑ Overall administrative organisation shall operate and be organised such that the use of information technology is more widespread, that the level of service is of the highest standard and that the interface with citizens is user-friendly and of good quality.

❑ A specific IT policy should be drafted for each administrative department with stated objectives and lines of action to accomplish the objectives for that administrative area.

❑ The government, to the greatest extent possible, should restrict itself to stating the nature and specifications for its IT needs and permit the IT companies to devise the solution to the services required.

❑ The government should establish a purchasing policy whereby the IT industry in the Faroe Islands has the possibility to submit bids on IT services for the government. All purchases over a stipulated minimum amount should be let for tender. This can be accomplished by, for example, creating an electronic marketplace through which the

government lists the IT projects available for tender and facilitates the tender process via an IT business registry.

❑ In order to foster Internet-based transactions and commerce, the necessary legislation authorising digital signatures should be promulgated. The government should take the lead in using digital signatures. Preliminary work in this area is underway.

❑ Self-regulation should be used as a tool to supplement legislation and other administrative arrangements, when such an initiative would be deemed especially prudent.

Statistics

It is deemed critical that the government via statistical reports is able to obtain the necessary knowledge to evaluate implemented policy. Statistical information may encompass, among other things:

• Information technology use by the Faroese
• Comparisons of telecommunications costs between the Faroe Islands and other countries
• Fiscal growth and financial statement data of IT companies
• Export value of IT goods and services
• Education situation and educational needs of the IT industry

Notes

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[1] A knowledge-based society is a society wherein knowledge is deemed to be the principal and fundamental resource upon which economic growth is based. In a knowledge-based society, knowledge is more significant than other competitive factors such as wages, resources, and infrastructure.

[2] The term "information technology industry", in this instance, refers to those businesses that are engaged in information and telecommunications technology, such as hardware, programming, and related-services, including telecommunications equipment and services. Information technology is a general term, especially referring to all electronic technology (micro-electronics-based technologies) that are used to store, process and transmit voice, pictorial and text data.

[3] The term "value-added chain", in this instance, means the process by which value is added to a product or service through a series of enhancements from original idea to a prototype that is ready for production, marketing and sales.

[4] The term "infrastructure", in this instance, refers to: 1) Transmission systems (ie, fibre optic cables, electromagnetic (radio) transmissions, undersea cables, etc.) Transmission systems are used in telecommunications between telephone stations; 2) Public access system (ie, the copper cable network and various access systems build upon electromagnetic transmission. Fibre optic cables in the future could be expected to be part of the public access system). The public access system is used for telecommunications between the subscriber and the telephone station. 3) Telephone stations (ie, analog and digital telephone systems, including IP-based connectivity that connect lines and communications, etc. together, eg, that connect public access systems to transmission systems.)

[5] To name but one example, Denmark has set in place a master's degree program [kandidateksamen] in which a student with a bachelor's degree can take an IT-focused curriculum in design, communications, and media or in a curriculum track that focuses on programming, Internet technology and transmission systems.

[6] A synergistic effect is the result that appears from the combination and interaction of two or more units or groups of units. The overall effect is thus greater than the effect of each individual unit.

[7] The development of communications over the last few years has increased the desire to gain access to distance learning, but up to now very little has been attempted in the Faroe Islands in this area. As a small island community with limited specialist knowledge, it takes a long time, of course, to develop the possibilities in this education medium.

[8] Knowledge capital is to be understood thusly: within the traditional business setting, a business would invest more in production equipment, eg, equipment that would augment production, and as a consequence the enterprise would grow in capital worth in relationship to the investment in production equipment. When referring to knowledge-based industries, an investment in personnel with knowledge is an increase in the capital worth of an enterprise. Instead of augmenting production in the form of equipment, for instance, the benefit to the company is in the form of people with knowledge.

[9] An "incubation centre" or incubator, in this context, is an environment the purpose of which is to provide entrepreneurs with good supportive surroundings in order to facilitate early-stage development of a business wherein an idea transforms into a product or service.

[10] Seed capital: Money used for the initial investment in a project or start-up company, for proof-of-concept, market research, or initial product development; also called seed financing or seed money.

[11] Pursuant to Act No. 1285, dated 20 December 2000 entitled Amendment of the Tax Law Governing Stock Options and Probate, the regulations governing the taxation in Denmark of stock options were amended so that one is just taxed when the option is sold.

[12] A stock option is the right at some time in the future to purchase shares in an enterprise for a previously agreed upon price. In the United States, for example, it is usual for new businesses to partially compensate employees with such stock options because the business is unable to offer a salary at the going rate demanded by some employees and specialist consultants. As the value of an enterprise increases, the more valuable such options become to a company's employees.

[13] A company gives or sells employees shares in the company at an advantageous price and they are able to sell them after a set period.

[14] A "virtual society" is a society comprised of people near and far who through their own initiative and for various reasons and purposes establish communication and linkages within an IT environment.

[15] In this context, broadband refers to transmissions at speeds of over 2 Mb/s. High speed refers to transmission speeds ranging from 128 Kb/s to 2 Mb/s. In some countries, the meaning is different. For example, in the United States, it is usual to refer to speeds greater than 128 Kb/s as broadband.

[16] An example of content services is the self-service provision of application forms by official public offices to citizens.

[17] "First come-first served"

[18] CANTAT-3 is a consortium owned by Teleglobe, BT, Iceland Telecom, Tele Denmark and other companies.

[19] "Price dumping", "price gouging", and "highway robbery" are names that refer to market conditions identified with especially hard and greedy pricing set by a significant provider in the market and who consciously focuses its financial resources to squeeze the competition from the market.

[20] Cross-support indicates a situation in which a major enterprise in a market sector combines activities or over a long period of time transfers money from one activity of the enterprise to another activity to cover the losses of the latter activity or to dislodge competitors from a market sector or product line.

[21] The telephone net and related services comprise the universal service obligation. Included within this obligation is the ability to send and receive facsimile transmissions and access to low-speed transmission, eg, Internet connection via a modem. The universal service obligation also includes the ISDN net and related services as of 31 December 2001 with the caveat that at least 10 subscribers have requested said services in a given area within six months. Føroya Tele also has the universal service obligation to provide the hearing impaired with clearly delineated telecommunication services.

[22] The Faroese Internet Exchange is called THOR-IX. "THOR" stands for "Tórshavn" and "IX" stands for "Internet Exchange", short and concise.

[23] The administration of the Faroese domain name address (FO) has been transferred to the Faroe Islands. The Minister of Trade and Industry created the FO-Board. The Board has the administrative responsibility for the Faroese (FO) domain name on the Internet.

[24] CEBIT is an international IT exhibition that is held every other year. See www.cebit.com.

[25] ISOC is an international organisation whose purpose is to manage and co-operate on future developments within the Internet.

[26] The European Union promulgated a directive in 1999 on electronic signatures (Directive 1999/93/EF, Community Framework for Electronic Signatures). Individual members have subsequently promulgated legislation regarding electronic signatures pursuant to this directive. For example, "Law (2000:832) on Qualified Electronic Signatures" in Sweden and "Law on Electronic Signatures, Act No. 417, dated 31 May 2000" in Denmark.