

Vietnam

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Overview

Vietnam is a developing country and a member of the Association of Southeast Asian Nations (ASEAN). The country has a surface area of 331,000 square kilometres and is located in the tropics. It has a total population of nearly 80 million, of which 75 percent are farmers living in rural areas. Vietnam's GDP in 2000 was approximately US\$32 billion. Beginning in 1986, it has implemented reform policies to shift from a centralised economy to a market economy with socialist orientation.

The Vietnamese economy is structured in terms of GDP in 2000 at current prices, as follows (*Vietnam Statistic Yearbook 2000*):

By economic sector:

- Service: 39.1 percent
- Agriculture, forestry, fishery: 14.3 percent
- Industry, construction: 36.6 percent

By ownership:

- State: 39 percent
- Household: 32 percent
- Collective: 8.5 percent
- Private: 3.3 percent
- Mixed: 3.9 percent
- Foreign-invested sector: 13.3 percent

Telecommunications and Internet access

In recent years, the telecommunications and Internet sectors of Vietnam have taken encouraging steps forward. As of June 2002, the total bandwidth of international Internet connection was 106 Mbps, comprising connections to Hong Kong at 56 Mbps, the USA at 14 Mbps, and Singapore at 32 Mbps.

Also as of June 2002, the number of Internet subscribers totalled more than 170,000, accounting for 0.22 percent of the population. However, the actual number of people using Internet services is much higher, accounting for 1.3 percent of the total population.

The development rate of Internet websites in Vietnam is relatively high for a developing country. But this rate has declined recently. Internet content, in both Vietnamese and English is becoming increasingly more diversified. Many government agencies have set up their own websites for publishing official information over the Internet. Many

business enterprises are already using the Internet for promoting their business activities, seeking new partners, and for expanding the market for their products and services.

The total number of telephone subscribers connected since the beginning of 2002 is around 230,000, raising the total number of telephone subscribers to five million. This translates to 6.25 telephones per 100 inhabitants. Fixed-line telephones account for 69 percent.

Currently, Vietnam has 3 Internet access providers and 12 ISPs. Among the 12 ISPs, the top four have captured the following market shares: Vietnam Data Communications accounts for 56 percent, Financing and Promoting Investment 31 percent, Saigon Postel 7 percent, and Netnam 6 percent.

The Directorate General of Post and Telecommunications (DGPT) is gradually reducing the charges for Internet and telecommunications services. It aims to lower local rates to match the average charges of countries in the region by 2003 in order to promote the Internet and telecommunications sectors, which in turn will contribute to the socioeconomic development of the country.

Telecommunications and Internet infrastructure

Although Vietnam already has a modern telecommunications network that can provide various advanced telecommunications services, the reach of the network is still relatively limited. Internet access speed is slow, occasionally experiencing congestion, which in turn affects the rate of Internet penetration.

During the first six months of 2002, the number of Internet subscribers increased to 10,000, meeting only 6 percent of the plan for its popularisation. Adding the number of people accessing via Internet cards, the total number of new subscribers reached 35,000. The Internet access charge has been lowered to an affordable level (according to the charge-lowering roadmap of DGPT), but the growth rate of Internet subscribers did not meet the set targets owing to the limited content of Vietnamese websites. Users face difficulties searching for information they need in Vietnamese on the Web. Only a small number of them can use English to access foreign websites. Most of the users turn to the Internet for e-mail, leisure and chatting online.

The north-south fibre optic cable was built with synchronous digital hierarchy (SDH) technology. It has a 2.5 Gbps speed and self-recovery capacity when a breakdown occurs. The Thailand-Vietnam-Hong Kong marine fibre optic cable system has a speed of 565 Mbps. The first level of the network is equipped with microwave plesiochronous digital hierarchy (PDH) and SDH digital technology transmission equipment with speeds ranging from 2 to 155 Mbps and fibre optic cables with speeds ranging from 155 Mbps to 2.5 Gbps. All the provinces in the country are equipped with electronic exchanges. A fixed wireless system with code division multiple access (CDMA) technology is being implemented in a pilot project. There is also a pilot project for accessing the fibre optic network, as well as the SDH 622 Mbps and 2.5 Gbps fibre optic cable circle circuit transmission system. Internet protocol version 6 has already been introduced to increase the capacity in providing and managing Internet services. High-speed Internet connections are to be provided through ISDN and ADSL technology.

The basic telephone network is already digitised, and the mobile phone network with GSM standard is developing rapidly, covering most of the provinces and cities in the country. X.25 package circuit switch data transmission is already developed in the larger cities.

Open source software

Open source software was first introduced in Vietnam in the early 1990s, but only for research purposes. At the end of 2000, a national conference on open source software was held with the aim of bringing open source software into broader implementation.

During 2001, the government launched a programme to support open source software development in Vietnam. The first version of a computer operating system and some office applications were developed which are now being deployed at the pilot stage. Several research initiatives on servers and parallel computing using open source software are being implemented.

Standardisation of the Vietnamese font

Prior to 1996, too many software programs were developed based on different code pages on the 8-bit platform. This created difficulties in exchanging Vietnamese content (there are 40 different Vietnamese character code pages). In 1996, the government provided free of charge the ABC software and required all government agencies to use it for processing Vietnamese with TCVN 5712 standard, which was also provided by the government and promoted to the other sectors. This helped to establish a common standard for exchanging information using the Vietnamese font over computers in government organisations and agencies.

Vietnam facts

Total population: 80 million

Rural population as a percentage of total population: 75%

Key economic sectors: Oil and gas, agricultural products, fishery

Literacy in the national language(s): 95%^a

Computer ownership per 100 inhabitants: 1.17^b

Internet hosts per 10,000 inhabitants: 0.06^b

Internet cafés/telecentres per 10,000

inhabitants: 6.2 (5,000 Internet cafés)^c

Internet users per 10,000 inhabitants: 124.45^b

Cell phone subscribers per 100 inhabitants: 1.9^c

National bandwidth within the country:

156 Mbps (north-south)^c

National bandwidth to and from the country:

106 Mbps^c

Ratio of incoming to outgoing

Internet traffic volume: 25:75^c

Source:

(a) Ministry of Education and Training.

(b) ITU (2002). *Asia-Pacific Telecommunication Indicators 2002*. Geneva.

(c) General Directorate of Telecommunication and Post

Because of technology limitation, information exchange with Vietnamese characters based on 8-bit code page is not uniform as this standard does not have enough space for all the Vietnamese characters. This limitation led to conflicts with other computer programs. In order to solve this problem, the government issued a Vietnamese 16-bit code page named TCVN 6909:2001 based on Unicode in 2001. In 2002, the government made the decision to use only this new code page in exchanging Vietnamese characters throughout the country beginning from 1 January 2003.

Intellectual property databases

In recent years, Vietnam has created databases on inventions and industrial technologies. These databases contain 20 million records or approximately 40 percent of the total number of registered inventions in the world. All trademarks registered in Vietnam are also included in the databases. These databases can be accessed from locations in Hanoi, Hochiminh City and Danang. Remote access to these databases from other locations is not yet possible. A monthly magazine on intellectual property is published as part of this initiative.

Content

The IT sector of Vietnam is divided as follows: 80 percent for hardware and 20 percent for software, content and services. This proportion shows that the IT development level is relatively low, with focus on hardware but not software, content and services. For countries with a high level of IT development, the proportion is 40 percent and 60 percent respectively. The content of Vietnamese websites is poorly developed, website linkages are weak and the interactivity of interfaces is low.

Several policies on website content management have been issued that provide incentives for publishing online content. However, they have not been implemented owing to differing opinions on the matter.

Most of the existing content on local websites is in Vietnamese. Only a few websites are in English or other foreign languages. The English websites serve mainly foreign users who want to learn about opportunities for investment and cooperation in the country or about travel to Vietnam. The level of English proficiency in the country, particularly among Internet users, is relatively low. Vietnamese who access websites with English content are mostly scientists, IT experts, and exporters of manufactured products.

News

Some of the most popular Vietnamese websites are run by electronic newspapers, such as VNexpress.net and VASC Orient. The number of users accessing these sites is relatively large. The information on these e-newspapers is updated frequently.

Education

The approximately 200 universities, colleges, professional and vocational training schools in Vietnam, and most of the high schools, are equipped with computers. So too are many secondary and primary schools. According to statistics, around 70 percent of universities are connected to the Internet, while 29 percent have their own websites. Several universities have LAN and Internet connections. Some of them are building electronic libraries. The most remarkable one is that of Hanoi Polytechnic University, which was launched at the end of 2002 with linkages to electronic libraries of overseas universities. The networks of the Ministry of Education and Training and of some universities provide services for searching enrolment examination grades. The Education Gateway Project (Edunet), approved by the Ministry of Education and Training, has a goal to connect all universities, colleges, and professional and vocational training schools first. After this is complete, the network will move on to connect all the schools in the country into one unified network.

Agriculture and rural development

There is limited information on the Internet and other conventional information channels which is formatted in a way that is useful to farmers. There are exceptions, such as some small networks which collect data on market prices of farm produce in rural areas. Internet access is not available in most rural areas. The government has built cultural centres in most of the villages to provide information and postal services (newspapers, magazines, telephone service, etc.). It is also implementing a pilot project for installing computers with Internet connections at the cultural centres located in six provinces. In this way, useful information can be provided to farmers through the Internet. The information can also be broadcast over the village public address system so that even farmers without Internet connections can avail themselves of the information.

Science and technology

The information network on science and technology, VISTA, of the National Centre for Document Information on Science and Technology is a WAN set up to transmit online information and the latest developments in science and technology in Vietnam as well as in the world to members. Users of the network can access research results and science and technology publications of Vietnam and other countries.

Government

Almost all ministries and their branch and local offices have established their own websites. But the majority of them operate from servers which are connected to low-bandwidth lines. They also offer a limited amount of information. The websites which offer relatively comprehensive information are those belonging to the National Assembly, General Department of Customs, and Hochiminh City People's Committee. Only two ministries are building websites with English content, but they were not yet in operation at the time writing. The websites of the General Department of Customs and Hochiminh City People's Committee are interactive, the others are not.

Tourism

After the government approved the National Action Plan on Tourism, online content on Vietnam tourism was quickly developed and expanded. The official website of the Vietnam Tourism Administration and e-newspapers such as VASC Orient and VNexpress attract millions of visitors each year. Hotels and travel agencies also create their own websites to promote their services and to accept reservations over the Internet. Most of the websites are published in two languages: Vietnamese and English. Some of them are also published in French.

Business

The Vietnam Chamber of Commerce and Industry (VCCI) launched an e-commerce website to support small and medium enterprises of Vietnam in promoting their products and helping them search for business partners in the local and overseas markets. The firms can use the website free of charge during the initial period. VCCI also developed an electronic transaction point for handicraft and fine-art products, which went online at the end of 2002. Another example is the e-transaction point of Can Gio in Hochiminh City for fishery, coffee and other commodities.

Several IT businesses, such as VASC, IT Telecommunication Centre, and Vietnam Tri Duc Company, have launched “Vietnam electronics supermarket”, “e-shopping”, “online commerce”, and “online export and import promotion” over the Internet to provide factual and updated information to support the business activities of their members, particularly those involved in export and import businesses.

Important local sources of content

Online information network VASC Orient

<<http://www.vnn.vn>>

This network provides the latest news on current affairs, economy, politics, science and technology, sports and culture. VASC Orient also publishes online IT magazine *Internet Today*, the Eximpro website for export-import promotion, the Vietnam Law Database and a range of other topics. This network has many interactive features.

Vietnam Express News (VNexpress)

<<http://www.vnexpress.net>>

This website aims to provide the most up-to-date news. It has gained much popularity among its readers. It offers a full range of news, including socioeconomic issues, world affairs, business, culture, sports, health, science, computer science, law, current affairs, letters from readers, and classified advertisements. However, VNexpress is a dedicated news website with low interactivity.

VDC Media <<http://www.media.vdc.com.vn>>

This is an online information network combining various topics and services. The news section covers local and international issues and the economic, political, social, cultural, sporting, scientific and educational areas. Its media services include a newsletter, e-magazine, e-books, documentary, health consultation, investment consultation and an electronics market. It also offers a photography and videoclip library of notable events.

Vietnam Science and Technology Information Network (VISTA) <<http://www.vista.gov.vn>>

VISTA deals with topics such as regulatory strategies and policy, health care, culture, education, energy, material, biology, agriculture, economy, commerce, electronics-informatics-telecommunications, technology, industry, transport, construction, environment and population. The information services provided include e-newsletter, publications, databank, law documents, etc.

Information network of the Ministry of Culture and Information <<http://www.cnet.vnn.vn>>

This website provides news on Vietnamese culture and information, literature, copyright, newspaper and IT pages. It also facilitates searches for regulatory documents and searching on a business database and websites of cities and provinces.

Saigon Postel Information Network

<<http://www.saigonnet.vn>>

The network offers specialised pages on economy, tourism, law, education, culture, arts, informatics and telecommunications, and entertainment. There are also pages on useful addresses, television programmes, acquaintance clubs, and searches for relatives. Saigonnet also provides services for online chat, FTP, web design, legal consultancy, and job vacancy announcements.

Netnam Information Network

<<http://www.home.netnam.vn>>

This website covers news, socioeconomic issues, beauty, fashion, music, movies, science and technology, IT, urban architecture, culture and tourism, sports, motorbikes and automobiles, and mobile phones. Members of Netnam can chat and participate in forums.

Tourism Information Network

<<http://www.vietnamtourism.gov.vn>>

This website introduces visitors to the history, culture and people of Vietnam. It also provides information on famous sites, tourist destinations, types of tourism services, and the country's rich potential in tourism.

Major online services

E-government

The government is actively implementing the state management computerisation project to improve the capacity of state management bodies in providing public services conveniently, quickly and of high quality. Hochiminh City has already brought into operation the dialogue information network for use between businesses and authorised agencies, as well as implemented online registration. It is currently implementing the system for issuing land-use licences online,

which is being piloted in District 1 of the city. The General Department of Customs has a pilot system for electronic customs declaration.

Distance learning and e-learning

Vietnam has eight universities providing distance learning at different levels for 18,000 students. The largest programme is conducted by the National University of Hochiminh City, which has a capacity for 8,000 students. However, there are still constraints in developing e-learning, which include limitations of the telecom-munications and technical infrastructures; the low quality of training provided; large investment required for operating the programmes; weak cooperation between universities; and the lack of course content that meets job requirements, despite the content being updated regularly.

E-commerce

E-commerce in Vietnam is in the early stages of development. IT awareness among businesses is low which limits the penetration of the new technologies. The necessary legal framework and government incentives for promoting the development of e-commerce are lacking. For such a development to occur, various issues relating to e-commerce, such as telecommunications, law, technology, human resources, security, privacy, electronic payment, and consumer protection, need to be solved.

Telemedicine

This type of service almost does not exist in Vietnam. The Ministry of Healthcare plans to develop a system for online diagnosis and treatment with the system's centre located in Hanoi and connected to all the hospitals in the country. The system will initially connect with large hospitals with fewer skilled and experienced medical staff.

E-conference

This facility is not widely available in Vietnam because of the high cost and low capacity of transmission lines. Some multinational companies and large international organisations in Vietnam are equipped with e-conferencing systems but only for serving their own activities. Several big Vietnamese corporations have plans to install this facility but, again, to meet only their own needs. Several software parks are planning to build e-conferencing systems and make them available to outside organisations.

IT industry and services

Software industry and services

Vietnam has around 300 companies involved in software development and servicing. It is estimated that local companies account for 35 percent of the total market. Revenue generated from software and software services was estimated at US\$70 million in 2001. The government has provided considerable support to the software industry and considers it as a sector with much potential. It has issued supporting policies and provided tax incentives, as well as planned the development of IT industrial and software parks in the major economic zones. The goal is to achieve a US\$500 million turnover for the software and related services sector by 2005. However, the sector is facing many problems, such as the low quality of programmers and project management; limitations in marketing; no penetration into the manufacturing and product development markets by foreign partners; and low labour productivity reaching only US\$7,000 per person per year.

Hardware industry

The total number of computers imported into Vietnam was estimated at 150,000 in 2001. Of this total, fully assembled units accounted for 20 percent, while the remaining 80 percent were assembled locally, mostly without quality and trademark registration. The annual growth rate of computers is around 20 percent. There are now approximately 1,300,000 computers in the entire country. Most of the locally assembled computers are bought by the private sector and households.

The Prime Minister issued a resolution to stimulate the growth of and raise the quality of locally assembled computers through tax and financial incentive measures and policies. However, up to now these policies have not been implemented. The local hardware industry is still small and concentrated mainly in the assembly of machines. It is very important to attract foreign investment into this sector as this is a field which requires large investments. The Japanese company Fujitsu has invested in a factory manufacturing motherboards. It has an annual export value of US\$459 million.

Activities and major projects on IT development

During the period 1996–2000, the government implemented the National Programme on IT with the objective of building an information infrastructure which serves the basic information needs of state management and socioeconomic activities, as well as developing the IT industry to play a leading role in the economy. As a result of this programme, all the ministries, together with their branches and local units, have established

LANs that are connected to the government's WAN. The networks are now used only for information reporting. The ruling Communist Party's WAN is connected with the focal points of the party based in the ministries, their branches and local offices. The IT faculties in the major universities were upgraded at the end of 2000. Over 20,000 specialists were trained at the university or college degree level in IT. The telecommunications infrastructure was upgraded and officially connected to the Internet in November 1997. All the above have met the short-term goals of the programme to support the information needs of the community and society.

The government has issued many policies to promote IT development, such as encouraging investment in the software industry and strengthening the competitiveness and investment in the telecommunications sector. It has also approved the master plan on IT for development up to 2005.

The project on the computerisation of state administration management for the period 2001–2005 has begun to establish an information system to support the management activities of the state administration agencies. It is designed to contribute towards the reform of state administration and improving public services by providing fast and quality electronic services.

Other projects that have already been implemented or are being implemented include the following: establishment of a network for education and training (Edunet); modernisation of the banking, financial and Customs sectors; community Internet access; development of IT and software parks; and the provision of public services in Hochiminh City.

Strategies and plans for IT development

Strategy for IT development up to 2010

IT will be widely applied in all sectors. It will become one of the major enablers of socioeconomic development and will boost national defence. The strategy aims to develop a national information system covering the whole country with broad bandwidth and at affordable prices. The aim is to increase Internet access to the average world level. The goal is also to nurture the IT industry to spearhead the economy and to grow at the highest annual rate compared to the other sectors, thereby increasing its contribution to GDP.

IT development strategy up to 2005

The aim is to reach the average IT usage level of the countries in the region. An Internet and telecommunications network will be developed with modern technology and increased bandwidth to provide a diversity of services at prices comparable with the average price level of the other countries in the region. Internet subscription rate is targeted to reach

1.3–1.5 percent and user rate of 4–5 percent of the total population. All universities, colleges and vocational training schools are to be connected to the Internet. Half of all high schools and hospitals under the control of the central government will be connected to the Internet. All cities and provinces are to be connected by fibre optic cable. The annual growth rate of the IT industry will reach 20–25 percent, supporting other key sectors in development and ensuring a high and sustainable economic growth rate. Total software production will reach US\$500 million, of which US\$200 million will be exported. The quantity and quality of computers and related equipment assembled locally will meet 80 percent of domestic demand and, at the same time, lend themselves to the export market. More than 50,000 IT specialists will be trained at different levels. Out of this total, 25,000 will be experts with advanced professional skills and fluent in foreign languages.

To reach these targets, the following key national programmes and projects have been approved:

Key programmes

- “Developing and Improving Telecommunications and Internet Infrastructures”, headed by the Directorate General of Post and Telecommunications
- “Developing IT Human Resources”, implemented by the Ministry of Education and Training
- “Establishing and Developing the Software Industry”, by the Ministry of Science, Technology and Environment.
- “Establishing and Developing the Hardware Industry”, executed by the Ministry of Industry.

Key proposal

“Computerisation of the State Administrative Management for the Period 2001–2005”

Key projects

- Project 1: “Improving and Upgrading the Party's Information System” is the main responsibility of the Central Office of the Communist Party
- Project 2: “Modernising the Banking System” managed by the State Bank of Vietnam
- Project 3: “Completing the Financial Information System” is the main responsibility of the Ministry of Finance
- Project 4: “Modernising the Customs Information System” by the General Department of Customs
- Project 5: “Improving the State's Statistical Information System” by the Department General of Statistics.
- Project 6: “Organising and Developing E-Commerce” headed by the Ministry of Trade
- Project 7: “Using IT for Industrialising and Modernising Agriculture and Rural Development” is the responsibility of the Ministry of Agriculture and Rural Development
- Project 8: “Developing Pilot Information Systems for Urban Management in Hanoi and Hochiminh City” is carried out by the Hanoi People's Committee and Hochiminh City People's Committee

- Project 9: “Using and Developing IT in National Defence” is taken main responsibility of the Ministry of Defence

- Project 10: “Using and Developing IT in National Security” is the main responsibility of the Ministry of Police.

- Project 11: “The Electronic Information System on Science-Technology, Education-Training and Culture-Society” headed by the Ministry of Culture and Information

- Project 12: “Improving the Electronic Information System on Law” managed by the Ministry of Justice

Policy-making organisations and agencies

The National Steering Committee for IT is a national focal point for IT. It is in charge of IT application and development.

Directorate General of Post and Telecommunications is the agency in charge of Internet and telecommunications management, monitoring and development.

E-Commerce Department, Ministry of Trade, is an advisory body to the Minister of Trade on the development and implementation of the E-Commerce Application and Development Plan as well as policies relating to e-commerce application and development.

Regulatory environment

In recent years, the government has issued various legal documents related to prioritised policies for IT application and development in the country. However, these documents are only for orientation, so they are very general in nature. There are not many policies and regulations for IT application and development; those that exist deal mainly with taxation and Internet management. The implementation of prioritised policies is slow and ineffective. There is poor coordination among the organisations designated to implement the policies.

Laws and regulations related to electronic transaction (cyber law) are not in place. Vietnam is now studying and developing laws and regulations related to electronic transaction, cyber crime, digital signature, e-commerce, privacy protection, consumer protection, intellectual property, etc. It has issued the following legal documents:

Electronic transaction: The Prime Minister issued *Decision No. 44/2002/QĐ-TTg* on using electronic documents as accounting documents in processing payments to vendors of services.

Digital signature: The Governor of the State Bank of Vietnam issued *Decision No. 534/2002/QĐ-NHNN* on the regulation of the development, issuance, management and use of digital signatures on electronic documents in interbank payments.

Privacy protection: The protection of privacy is regulated by the *Civil Code*. However, it provides only the principles relating to the privacy of individuals.

Cyber crime: Regulations on computer and communications crimes are provided for in the *Criminal Code*.

Copyright: The government issued *Decree No. 76/CP* on the implementation of regulations on copyright in the *Civil Code*. However, these regulations are not concrete enough to implement. Furthermore, the enforcement system for copyright in Vietnam is unreliable.

Internet: The government issued *Decree No. 55/2001/ND-CP* on the management, provision and use of Internet services, which regulates the issuance of licences, and the publishing and management of information on the Internet. This is a big step forward in the Internet management area, but some experts consider these policies to be still not sufficiently “open”.

International agreements: Vietnam is in the preparatory stage of acceding to the World Trade Organisation. It has already signed the Vietnam-US bilateral trade agreement, which addresses in part foreign investment in the telecommunications sector and intellectual property protection. Vietnam has also signed a bilateral agreement on intellectual property protection with Switzerland.

Open source software

Many research groups were established in research and training institutes to study Linux following its introduction to the country. Several groups and companies have since launched their products. Vietnam Informatics and Electronics Corporation, together with the Vietkey Group, developed the Vietnam Linux operating system called Vietkeylinux. The Computer and Communication Company <<http://www.cmc.com.vn>> also localised Linux based on Linux Redhat version 7. Some open source software products for servers and parallel computing are now being developed. A national plan on the use and development of open source software in Vietnam is being developed for the approval of the Prime Minister.

Research into ICTs

As Vietnam lags behind in IT, most of the new technologies are imported. The big multinational companies in IT and telecommunications are all represented in Vietnam, but only for marketing purposes. They have made no investment in research in the country. Private firms active in this sector are all small and medium enterprises, which do not have the resources to invest in research activities. The funds for

research in IT and telecommunications are provided mainly by the government. Some major research initiatives include the following:

Designing and testing digital television transmitter DVB-T: The objectives are to harness the technology for manufacturing digital television transmitters, analyse and evaluate the quality of these transmitters made in Vietnam, and apply value-added services using the technology.

Studying and applying the digital radio transmitter: The objectives are to make recommendations on a digital broadcasting standard for Vietnam, build a development roadmap for digital broadcasting in Vietnam, and manufacture digital radio receivers and digital radio transmitters locally.

Videoconferencing: The aim is to study and develop a comprehensive process and solution for ensuring information security in videoconferencing systems.

VINASAT: The project aims to study and develop the structure for a terrestrial telecommunications system which will make effective use of the VINASAT satellite for communication and defence and security purposes.

Field Programmable Gate Array (FPGA): The goal is to study, design and manufacture a high combining component based on FPGA. Several types of components of 32, 64 and 128 bits with high transmission speeds of 33 and 66 MHz are under study.

Future trends

IT use and development in Vietnam is still at a low level compared with the rest of the region and the world. Vietnam faces these major challenges and constraints:

- The trend of integration and globalisation in the world
- Low management capacity of the government and local enterprises
 - Low competitiveness of the economy
 - Threat of lagging increasingly behind
 - Low level of telecommunications infrastructure in terms of network scale, quality, speed and price
 - No mature institution for IT development
 - Inadequate legal framework, particularly for electronic transactions
 - An education system which is not IT-oriented
 - A software industry which is unable to meet local demands
 - Low IT application in government and enterprises
 - Low IT awareness within the society

The following development will help provide IT in the country

- **Open source software:** A national master plan on open source software will be approved soon by the government in the hope of promoting IT use and development while addressing problems related to copyright.
- **E-government and e-commerce:** These will be promoted to integrate the country into the regional and world markets and to increase local competitiveness.
- **Standards:** EDI and XML will be developed soon to meet the demand for information exchange and electronic transactions.
- **IT applications:** Sectors with potentially high IT application capacities include:
 - The public sector in the provision of public services.
 - Sectors with high integration requirements, such as banking, finance, customs, foreign trade, and aviation.
 - The education and training sector, where there is a high demand for IT applications in schools and universities and where IT can be used to enhance teaching and learning methods.
 - The service sector, which has a high growth rate and increasingly requires fast, convenient, high-quality and affordable services. It has to harness the power of IT to improve management capacity, productivity, quality and competitiveness to cope with globalisation.

Select bibliography on Vietnam

National IT Steering Committee

<<http://www.itvietnam.gov.vn>>

This website provides mainly information related to strategies, policies, plans, implementation status, technology, and IT activities in Vietnam and overseas.

Hochiminh City IT Association

<<http://www.hca.hochiminhcity.gov.vn>>

This site provides mainly information related to IT application and development status in Hochiminh City.

Vietnam Software Association

<<http://www.vinasa.org>>

This site provides mainly information related to the software industry's development activities in Vietnam.

VASC <<http://www.i-today.com.vn>>

This site provides information related to IT in Vietnam and in the world.

Internet Information Centre of Vietnam

<<http://www.vnnic.net.vn>>

This too provides information related to IT in Vietnam and in the world.

PC World Magazine

Published by the Science, Technology and Environment Department of Hochiminh City, it provides information related to IT in Vietnam and the world.

Informatics and Life Magazine

Published by the Vietnam Information Processing Association, it provides information related to IT in the daily life.

Post and Telecom Magazine

Published by the Directorate General of Post and Telecommunications, it provides information related to telecommunications and the Internet.

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