Global Communications Newsletter

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The Development of Telecommunications in Vietnam

By Phan Anh, Vietnam

Achievements of Vietnam Telecom in 1998

In 1998, Vietnam Telecom continued to develop a modern, synchronous and multiform network with a continuously expanding service range. Another 437,748 lines have been installed, raising the total number of telephones to 2,100,000.

The telephone density is 2.6 sets per 100 people. For Hanoi and HoChiMinh Cities , the telephone density is 15 sets per 100 habitants. The number of villages having telephones has increased to 6,950 out of a total of 9,082, accounting for 79 percent of rural communities. Mobile telephone services are available in all 61 provinces and towns along major highways, with a subscriber base of nearly 210,000. Paging services are available in all provinces and towns nationwide. Phone card service has rapidly developed and is available in 13 provinces and towns and in high resident density areas. The VSAT network has 38 stations nationwide. ISDN service has been put into trial in a number of provinces and towns. Internet service, which was introduced in January 1997, has 20,000 subscribers.

So, by the end of 1998, Vietnam's telecom network had basically been modernized, with all provinces and districts equipped with digital electronic exchanges and interconnected by fiber optic or digital microwave transmission links of 2.5Gb/s. Another 750,000 lines have been added to the switching network. The international telecom network has been built with three international gateways, eight satellite earth stations, and state of the art fiber optic submarine cable systems. On October 1, 1998 the SEA-ME-WE3 system was established at Da Nang. There are more than 5000 direct communication channels reaching nearly 40 countries worldwide, with transit to the rest of the countries, ensuring that Vietnam will meet all of its international communications needs in the coming years.

It is possible to say that Vietnam's telecom network and service range has been developed, thus meeting the country's various demands in the areas of economic and international cooperation and development.

Five new production lines have been put into operation: plastic material, stamp printing, optical transmission equipment (VFT) (a joint venture with FUJITSU), the Vietnam telephone set (POSTEF), and the VINECO terminal (a joint venture with NEC).

Now, Vietnam Post & Telecom Corporation (VNPT) has 17 industrial enterprises (nine domestic, eight joint ventures) manufacturing high-quality products for the Post & Telecom network (exchange, optical transmission equipment, copper cable, optical cable, telephone sets) meeting 30 percent of network demand, and exporting initially over $US10 million. The industry's total product value increased annually by 15 percent. Three business cooperation contracts (BCC), worth $US800 million, for the development of Hanoi and HoChiMinh cities' local telecom network have been signed and initiated with C & W (Great Britain), NTT (Japan), and France Telecom (France). A $US40 million contract was signed additionally for the international telecom network in a BCC with TELSTRA. Total foreign investment capital in the form of BCCs is $US1.28 billion. Two new joint ventures have been initiated, with total investment capital of $US50 million from partners, for the manufacture of VINECO J-V exchange equipment and VFT J-V optical transmission equipment.

VNPT officially joined the GSM MoU Association. The Vietnamese Government authorized VNPT to participate as an official member in an operational association of the international satellite organizations INTELSAT and INTERSPUTNIK.

Vietnam Telecom's Plan for the Period 1999 – 2000

General Situation — In 1999, due to the regional monetary crisis, the demand for Post and Telecom services increased slowly, the demand of foreigners has been slightly reduced, the tendency to reduce international communications tariffs became urgent, new post and telecom operators (i.e., Saigon posts-telecom service (a joint stock company), and military telecom-electronics company) entered into competition, leading to market sharing.

In that situation, VNPT continues to develop and modernize its posts and telecom network infrastructure. The priority is on rural telecom development; introducing many new services, especially Internet and ATEC services; human resource training; strengthening the VNPT organizational structure; continuing to adjust the P&T tariff policy; aand expanding the domestic and overseas markets.

Key Targets in the Period 1999 – 2000 — Due to the general socio-economic situation, a density of 3.5-4sets/100 people is expected. Although most villages have telephone services, this is still an aggressive goal.

Another goal is to upgrade and enlarge the national backbone network to meet the communications demand of the entire country. A key element of this effort is the introduction of fiber optic technology to provincial links. Other goals include: the launching of new posts-telecom services; the development of a post & telecom industry; and the manufacture of products according to international standards to meet the demand of the national network first and then for exporting.

Big Projects in 1999 – 2000 — Several projects have been planned for the 1999-2000 time period, including:

- Launching the Vietnam GEO satellite named VINASAT.
- Developing the telecom network of central provinces.
- Sharing satellite mobile communications projects.
- Installing a north-south fiber optic submarine cable.
- Constructing a network controlling center and a concentrated billing system, and establishing a customer care system (CCS).
- Upgrading the north-south microwave transmission link.
- Constructing a national unified data network (phase 2).

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Perspectives of Unlicensed Information Infrastructure Using Spread Spectrum Technology

S. Sanghiran, Y. Takefuji, Japan

Several countries are currently attempting to provide suitable conditions needed to encourage the growth of wireless digital networks and communications markets. Indeed, the future growth of wireless digital networks and communications in the world will result from several developments:

- Competitive prices in relation to those charged for services based on the wired information infrastructure.
- The establishment of standards.
- Deregulation of frequencies.
- The emergence of a critical mass of mobile computing devices.

Comparative polices and regulations in the United States and Europe are presented in this paper as a remarkable example of deregulation facilitating and supporting the widespread use of wireless digital networks and communications, both within their countries and for the global marketplace. Furthermore, we have surveyed wireless digital networks and communications, as well as the market for these services, for approximately one year. Our method of the survey is mainly based on searching and gathering data and information from the Web. In the survey, the implementation rate of wireless digital networks and communications has been compared in four areas: the Unied States, Canada and Latin America; Europe; Oceania; and Asia. Classifying by purpose of use, we categorized wireless digital applications into eight main categories.

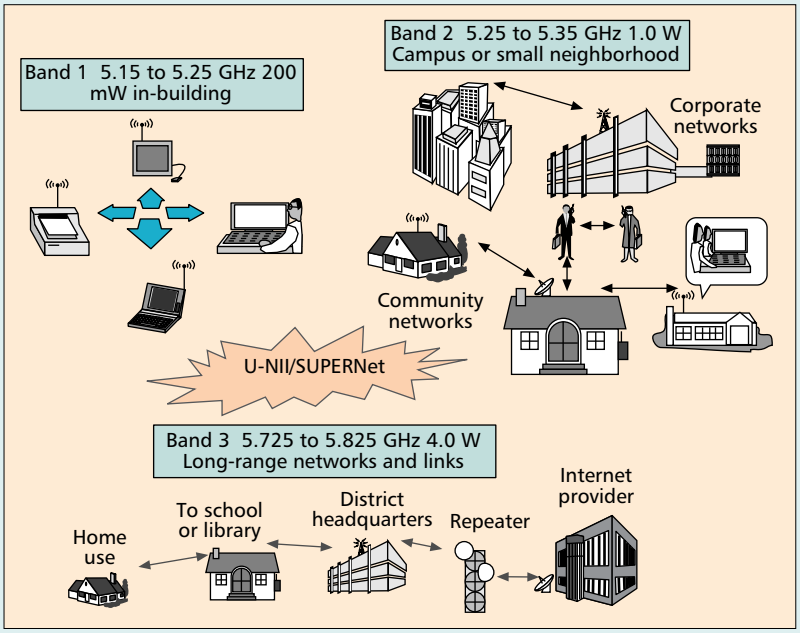

Figure 1. *The U-NII/SUPERNet.*

Comparative Study

In Europe, the European Telecommunications Standards Institute (ETSI) realized that some sectors may derive considerable benefits from the more widespread use of wireless information technology and telecommunications equipment, but it cannot be done without suitable access to wireless local area networks (LANs). Therefore, the ETSI initiated standardization on a High Performance European Radio Local Area Network (HIPERLAN) in February 1995 for unlicensed use. HIPERLAN is a short-range radio-communications sub-system intended for use with computer systems and is designed for operation in two distinct frequency bands. The first band ranges from 5.15 GHz to 5.25 GHz, with potential national extensions to 5.30 GHz, and with power up to 1 Watt. The second band ranges from 17.1 GHz to 17.3 GHz, and a 100 mW transmitter may be operated. Information transfer rates for the first and second bands are estimated to be 24 Mb/s and 100-150 Mb/s, respectively.

Two years after establishing HIPERLAN in Europe, the Unlicensed National Information Infrastructure (U-NII) concept was introduced officially by the United States government on January 9, 1997. Under the supervision of the Federal Communications Commission (FCC), the U-NII/ SUPERNet (Shared Unlicensed Personal Radio Network) can operate on an unlicensed basis in 300 MHz of spectrum at 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.725-5.825 GHz, with a power of 200mW EIRP, 1 Watt EIRP, and 4 Watt EIRP for short to medium range high-speed wireless digital communications, respectively, as shown in Figure 1. The U-NII/SUPERNet enables wireless transmission of digital data and multimedia among computers and other information appliances, both within local area networks and between point-to-point and point-to-multipoint sites at rates of approximately 24 Mb/s. According to the FCC, Apple Inc. estimates that the cost of wiring America's 140,000 K-12 schools would be $50 billion, while equivalent wireless connections would cost substantially less. It is understood that U-NII is intended for the replacement of

		Band 1	Band 2	Band 3
U-NII/Supernet	Frequency	5.15–5.25 GHz	5.25–5.35 GHz	5.725–5.825 GHz
	Power	200 mW EIRP	1 Watt EIRP	4 Watt EIRP
	Range areas	Short-range within one building	Medium-range, - campus-type LANS, small neighborhood	Long-range for community networks around 6 miles radius
	Speed rate	Estimates 24 Mb/s		
High performance European radio LAN (HIPERLAN)	Frequency	5.15–5.25 GHz 5.25–5.30 Ghz	17.1–17.3 GHz	–
	Power	1 Watt	100 mW	–
	Speed rate	24–25 Mb/s on each of five channels	100–150 Mb/s	–

Table 1. *Comparative study of US's UNII and European HIPERLAN.*

Perspectives of Unlicensed Information Infrastructure Using the Spread Spectrum Technology (continued)

very expensive national information infrastructure.

Based on a comparison of policies and regulations, it is remarkable that the FCC allocates the bands for the U-NII/SUPERNet and regulates them by applying exactly the same standard as the European HIPERLAN (see Table 1). However, the UK market is still relatively immature, and the UNII's market movement seems to be faster than that of HIPERLAN.

Simultaneously, Nortel presented their talk, entitled "Voice and Data Transmission over Powerlines," at the FCC on May 5, 1999. Powerline communications will be another key part of UNII. Voice and data will be transmitted over powerlines without any additional communication wires. There are two types of powerline modems: local area network powerline modems and wide area network powerline modems. With wide area network powerline modems, all data will be transmitted over several transformers, while local area network powerline modems can only be used within a single transformer. In the second half of 1999 several powerline communication companies were scheduled to release high-speed transceiver single-chip modules of 100Mb/s, 10Mb/s, and 1.5Mb/s, as well as VCR powerline communication modules. Future home appliances will be equipped with a powerline without any additional communication wires.

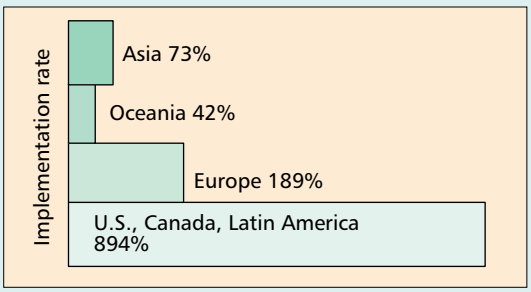

Figure 2. *A comparison of implementation rates in 4 areas.*

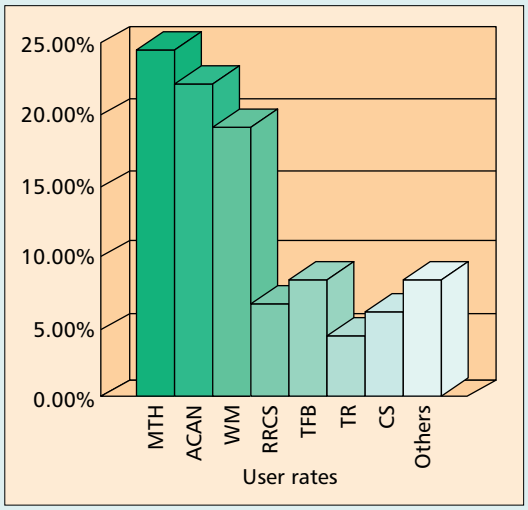

Figure 3. *Main categories of wireless digital applications.*

Survey and Findings

Our Web-based research highlighted many significant facts related to the implementation and application of wireless digital networks and communications. As shown in Fig. 2, the U.S., Canada and Latin America regions together had the highest use rate for wireless digital networks and communications, estimated to be 69.47 percent. Next was the European Union (18.94 percent), followed by Asia (7.36 percent) and Oceania (4.21 percent). We were able to classify wireless digital applications into eight primary categories:

Medical treatment and hospitals.
Academic and campus area networks.
Warehouse and manufacturing.
Restaurant, retail, and chain stores.
Trading, finance, and banking.
Transportation.
Consulting and sales.
Governmental and other purposes.

The three most common applications of wireless digital networks, as shown in Fig. 3, are medical treatment and hospitals (24.61 percent), academic and campus area networks (22.30 percent), and warehouse and manufacturing (19.23 percent).

We also ranked companies that offer wireless digital equipment and related devices. Based on this ranking, Lucent Technologies Inc. holds the largest portion of the wireless networks market, followed by Proxim Inc., Breeze Wireless Communications Inc. (BreezeCOM), and WiLAN Inc. (see Figure 4).

Discussion

By searching more than 1,000 Web pages, we can assert that recent wireless technologies, such as spread spectrum, can make it possible for all classes and sizes of business enterprises and other public users in the world to utilize wireless digital networks and communications in a cost effective manner. However, there are still several interesting points to be researched. Since all the data collected was for 1998, some information may be out of date, such as the number of new wireless suppliers, customers and users. According to the data, wireless digital networks and communications for medical treatment and hospitals, academic and campus area networks, and warehouse and manufacturing are getting the most attention from the public. There is also a strong likelihood for tremendous growth of other wireless applications. From the perspective of wireless networks suppliers, it can be assumed that since wireless technologies and issues are very vital and fragile, larger market share belongs to the only the large and well known companies like Lucent Technologies. However, the market for wireless networks and communications shifts dynamically. Deregulation of telecommunications has become one of the highest priority issues for policy decision makers in many countries, especially in developed countries. The number of new wireless network and communications suppliers, especial-

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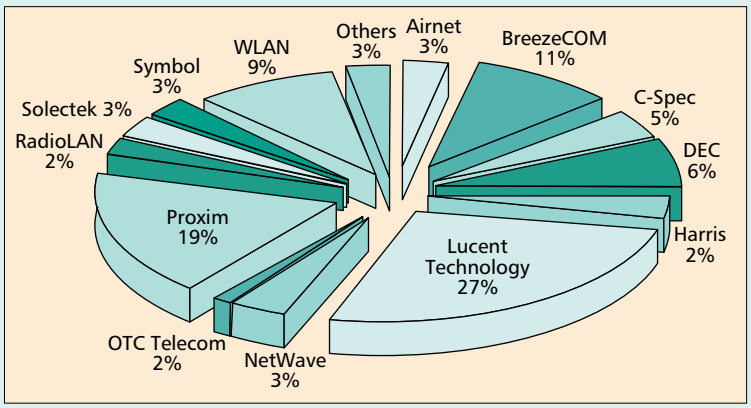

Figure 4. *Market share of wireless networks suppliers.*

The Radio and Electronics Association of Vietnam

By Phan Anh, Vietnam

The Radio and Electronics Association of Vietnam (REV) is the society of electronics and telecommunications engineers in Vietnam. It was founded in 1960, and since 1988 has been acknowledged officially by the Vietnamese government. In January 1999, an REV delegation conference for the entire country was held in Hanoi. The purpose of the conference was to approve the activities program for the next four years and to elect the central executive board for the upcoming period.

Some congratulations letters were sent to the congress from the IEEE president (USA), the IEEE ComSoc president (USA), and the JEICE president (Japan). A new central executive board was elected. Among them, the leading board members are:

REV President — Dr Mai Liem Truc (Secretary General of the Department General of Post and Telecommunications of Vietnam).

REV Vice Presidents — Prof. Nguyen Van Ngo (Hanoi National University), VP and General Secretary; Dr. Trinh Dong A (President of Vietnam Electronics and Informatics Corporation), VP; Dr.Prof Phan Anh (Hanoi University of Technology), VP and General Editor of *REV Magazine of Electronics*; Dr.Prof Nguyen Dinh Ngoc (head of the steering board of the National Information Technology program), VP; Dr. Pham Dac Nghiem (Director of Kasati Company), VP responsible for LINET (the computer communication network for the Union of Science and Technology Societies in Vietnam); Dr.Prof Do Trung Ta (President of Vietnam Post and Telecommunications Corporation), VP.

Three REV Vice Presidents are also IEEE Senior Members: Prof. Nguyen Van Ngo, Prof Phan Anh, and Prof Nguyen Dinh Ngoc

The primary long-range activities of REV are as follows:

- Organize the Vietnam Radio and Electronics Conference every two years. At the same time, organize a nationwide invention competition for Vietnamese electronic products every two years. The most successful products in the competition shall be exhibited and awarded at the conference.
- Advise the government on the strategy and politics for the development of electronics, information technology and telecommunications in Vietnam, including:
  - ♦ Digitization of electronic and communication devices.
  - ♦ Direct access to digital technology for developing the telecommunications network and the audio and video systems of radio and television.
  - ♦ Computerization of the administration and financial management.
  - ♦ Development of satellite use for telecommunications, radio and television broadcasting, and remote sensing.
  - ♦ Recommendation of a project for GEO satellite to Vietnam.
  - ♦ The political policy that supports the local manufacture of electronic products with high quality software and hardware.

The REV has overseas relations with the IEEE from the USA, the JIEC (Japan), the Society of Israel Engineers, the National Space Research Center of France (CNES), and the National Space Center of the UK (BNSC). The REV is preparing to establish a local IEEE ComSoc chapter in Hanoi by the end of the first half of this year.

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Spread Spectrum Technology/*(Continued from previous page)*

ly in the areas of U-NII and powerline communications, is expected to increase rapidly within a few years. Finally, we observe that the awareness and use of wireless digital networks in developing countries is very low when compared with developed countries.

Conclusion

It can be concluded that the U.S. and the European Union have been collaborating on deregulation of UNII, HIPERLAN, and frequency allocation, while Asian countries, including Japan and Thailand, have been moving very slowly in their efforts to deregulate UNII and powerline communications. The difference in implementation rate of wireless networks and communications will widen the gap in IT applications between developed and developing countries. Hence, governments in developing countries should be much more aware of the significant capabilities of wireless digital networks and communications in order to

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- Widening the customer range of value added services on the Internet.

The world will enter the 21st century, the era of the information society. Vietnam Post & Telecom is well aware of the challenges and opportunities involved in maintain its networks, strengthening the posts-telecom industry to integrate it into global development, and contributing to the development of the national and global economy. Vietnam always greatly appreciates the assistance and cooperation of telecom-electronics-information manufacturers and operators, and wishes to cooperate with friends in the world in providing and exchanging products and capital investment, and transferring technology on the basis of equality and mutual benefit.

(This article is based on a VNPT presentation at a Telecommunication Conference in Hanoi, March 18, 1999.)