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Quang Trung Software City - The Largest Vietnamese Software Park[1]

What would be technical issues and human resource management challenges for this software park when it was planned for expansion?

In 2000, the Vietnamese Government implemented the National Program for Promoting Application and Development of Information Technology for Industrialisation and Modernisation. As part of implementing the Government's policy on the formation and development of the software industry, the Ho Chi Minh City People's Committee decided to build Quang Trung Software City (QTSC) in October 2000. In order to manage and operate QTSC, this Committee also formed a professional organisation for IT park management, namely QTSC Development Company, a state-owned enterprise. QTSC Development Company launched its business in March 2001. Since 2001, QTSC has been regarded as the preferred investment destination for IT investors. Investments, focusing on software and IT services fields were developing rapidly in the area. By 2015, it was projected that this area would be fully filled.

In 2012, the City Council planned to expand QTSC for enhancing the economic sector and pursuing the 2010 National Strategy in Transforming Vietnam into an advanced ICT country by 2020. The QTSC Development Company was chosen to implement this expansion plan. One of the key aspects guiding the expansion plan was how this company could share its telecommunications infrastructure and human resources with newly established companies. In his role as the Chairman of this company, Mr. Chu Tien Dung considered a number of technical and human resource management issues to be addressed carrying out the plan. Firstly, Mr. Dung thoroughly evaluated the investment for telecommunications infrastructure for these new areas to ensure high quality telecom services for their potential customers. Additional investment issues to be considered included choosing technology and integrating between the current telecommunications infrastructure and future technologies. Finally, the challenges of how to recruit and develop human resources to manage future QTSCs were examined. He thought about how to utilise the current QTSC's staff in recruiting and training key personnel for these coming parks. He wondered what reward programs he needed to employ to attract these employees to work for these new parks that were outside this city.

These considerations were the key technical issues and human resource management challenges that needed to be addressed to guide the expansion to success. He intended to organise several executive meetings to discuss these matters before he retained a consulting group.

Information Technology in Vietnam

A 2011 report by Vietnam's Ministry of Information and Communications indicated that, for the previous 10 years, the Vietnamese IT sector has developed rapidly. It played an important role in the national economy that, together with infrastructure, was a driving force for the socio-economic development of the country. In 2010, the Vietnamese Government introduced major IT strategies to transform Vietnam into an advanced Information and Communication Technology (ICT) country in the coming years. These strategies reflected the political determination of the Government to support the development of the IT industry providing favourable conditions and incentives to promote its development.

The Industry

Vietnam's IT industry had developed in several areas, including the software industry, hardware industry, digital content industry, and IT services. According to *Viet Nam Information and Communication Technology – White Book 2011*, the IT industry had become an important economic sector, with an annual growth rate higher than any other major sector. The IT industry's average revenue growth rate in the period 2001-2009 was estimated at 20-25 percent per year. By the end of 2010, the combined revenue of the software and digital content industries reached US$2 billion and the hardware industry revenue reached US$5.6 billion. Within the IT industry, during the period 2006-2010, the fields of software development and IT services achieved significant growth in both revenue and market share, becoming some of most promising economic sector in the country. The digital content industry and IT services, in particular, were expected to continue to boom in coming years (see Exhibit 1).

The Direction for IT Industry Development to 2015 and the Vision to 2020

According to The National Strategy on Transforming Vietnam into an Advanced ICT Country by 2020, the key objectives for IT industry development are as follows:

- By 2015, Vietnamese IT enterprises would be fully capable of designing manufacturing equipment, gradually replacing imported parts, promoting research and manufacture of integrated circuits, and be able to design and manufacture of some hardware products that were Vietnamese brands. They would meet domestic demands and act as a source of exports. Furthermore, Vietnam would be among 15 leading countries providing outsourcing services and digital content industry.

- By 2020, research on and development in new high-tech products would be carried out by Vietnamese enterprises with strong capacity in ICT R&D. The Vietnamese software industry and outsourcing services were to be promoted and encouraged, pushing Vietnam into the top 10 leading countries in providing outsourcing services and in the digital content industry. Information technology industry segments, especially the software industry, IT services, and services-based IT would experience the fastest growth rate within national economic-technology sectors and would make significant contributions to the GDP of the country.

Quang Trung Software City Development Company

Quang Trung Software City (QTSC) was located in Ho Chi Minh City, the largest economic centre in Vietnam. Ho Chi Minh City was regarded as the best place to concentrate many IT enterprises in Vietnam and hosted many multinational corporations such as Intel, HP, IBM, Renesas, Fujitsu and NEC. Located on an area of 43 hectares, QTSC was the largest IT park in Vietnam. Since 2001, QTSC became a preferred investment destination for both IT foreign and local investors because of the number of incentives, facilities and services located there to support their businesses (see Exhibit 2).

History

To implement the Government's policy on the formation and development of the software industry, the Ho Chi Minh City People's Committee decided to build QTSC in October 2000. It was one of the key projects in this city's development plans in the period of 2000-2005. In order to manage and operate QTSC, this Committee also formed a professional organisation for IT park management, namely the QTSC Development Company, a state-owned enterprise. QTSC Development Company launched its business in March 2001. At that time, there were 21 IT enterprises, with 250 employees in QTSC.

Prior to its opening, spending on infrastructure investment in QTSC, including telecommunications infrastructure, was given a priority by the City Council to provide telecommunications and internet services for enterprises locating in the area. A number of incentive policies were also employed to promote IT investment in the park. From this starting point, QTSC Development Company steadily enhanced its business performance to meet all requirements for a state-of-the-art IT park (see Exhibit 3).

Core Services

QTSC Development Company provided three main types of services for enterprises and organisations in this IT area. First, it offered office leasing office service, providing utilities such as electrical systems, air conditioning, internet, and fire protection systems. Second, there were various categories of telecom services for clients, all of them providing high quality and good maintenance. Among these telecom services were internet connections, data centres, hosting, domain names, and telephony. Its technical staff provided technical consulting 24 hours a day and 7 days a week for all services. The third type of service included event organisation service for IT enterprises, consultancy services, and other support services, such as kindergarten, food and beverage service, and rental services for conferences, meetings, and training.

The Favourable Investment Destination

Since its establishment, QTSC Development Company pursued its strategic goals of becoming a destination for IT investors in Asia, where both local and foreign investors could expect high quality facilities and services, human resources, a professional working environment, and a variety of incentives. Apart from strategic location and the government's support for the IT industry, these investors were attracted by facilities, services, and attractive investment conditions in QTSC. Towards this end, QTSC Development Company steadily improved its core services. Ultimately, there were six reasons why investors choose QTSC as their investment destination:

Strategic location

QTSC was located in Ho Chi Minh City, the largest economic centre in Vietnam. It took only 15 minutes to travel from QTSC to the international Tan Son Nhat Airport and 45 minutes to downtown. Around QTSC area there were many hi-tech projects such as a medical high-tech park, bio high-tech park, and new urban areas - west of Ho Chi Minh City established to facilitate in trade and cooperation. There were also convenient bus systems connecting QTSC, the city centre, and high-tech zones. A railway system connecting the regions was projected to be built in the near future.

Incentives

Investors in QTSC were entitled to many different highest tax incentives in Vietnam. Among these were included:

- Income tax exemption for the first four, followed by a 50% exemption for the next nine years

- Tax exemption for imported equipments that could not be produced in Vietnam that was needed to establish new business
- Machinery and equipment could be imported temporarily for the project then re-exported under an exemption from VAT and import tax
- VAT for software products and software services consumed in Vietnam is 0%
- Exported software products were entitled to import and export tax of 0%

Telecommunications infrastructure

Telecommunications infrastructure was regarded as the fundamental service that facilitated business's communications. For IT enterprises, it was essential to make many businesses viable. In order to meet these enterprises' demands for communications, QTSC Development Company continually invested in its telecommunications infrastructure. QTSC telecom systems were connected by fiber optic cable based on Multiprotocol Label Switching (MPLS) technology. These were directly connected to four international internet portals. The QTSC Data center met Tier 3 requirements.

Facilities and services

QTSC's goal was to become a "green" software city, creating a perfect working environment with surrounding trees, beautiful landscape, and a modern wastewater disposal system. Besides a one-stop customer service, QTSC Development Company was looking forward to build a "city" with a diversity of living services in order to meet the customer demands. In QTSC, investors could easily acquire facilities and services that could accelerate their business operations. For example, there were 18 buildings, 120 apartments, 4 banking centres, a post office and a number of services such as consultancy, kindergarten, and a food and beverage service (see Exhibit 4).

ICT community

Global software and IT services corporations such as HP, IBM, TUV Rheinland, GHP Far East, Digi-TEXX, and Luxsoft decided to invest in QSTC because of its effective and efficient working environment. Located with top Vietnam enterprises such as TMA Solutions, Globalcybersoft, Larion, Viettel, and Vinadata, they created a high quality ICT community that included some of the top 100 ICT enterprises in Vietnam. Through building this community, QTSC intended to help businesses penetrate the domestic market, with ICT connections and resources shared when deploying large-scale projects. In addition, QTSC also provided incubation environments, helping IT start-up businesses.

Human resources

With six human resources training centres specialised in ICT in QTSC, there was reliable access to quality personnel ranging from technicians to masters, including nearly 16,000 students from nearby institutions:

- FPT University
- Hoa Sen University
- SaigonTech (University of Houston branch)
- Charm IT Center Co., Ltd. (Cooperation with Korea University - Soongsil)
- ICT Training School in Ho Chi Minh City of Department of Information and Communications
- NIIT Institute (India)

In addition, QTSC Development Company was also connected to the 30 universities and colleges in Ho Chi Minh City, available to provide IT training for customer personnel as well as for organising many activities such as a job fair, iDay, that helped businesses looking for suitable human resources.

Its Achievements

During the 11 years since its establishment, QTSC had grown quickly to become the biggest software park in Vietnam. QTSC Development Company has achieved a number of significant milestones. It had attracted 107 software and IT services enterprises, including 49 foreign and 58 local ones. These foreign enterprises were from 20 countries including the United States, Japan, Korea, and Germany. Global software and IT services corporations such as HP, IBM, GHP Far East, Digi-TEXX, Luxsoft, and TUV Rheinland located offices in QTSC. There were 25,228 people who worked and studied in the area. In particular, IT professionals numbered 6,121 and IT students numbered 19,107. Since 2004, QTSC Development Company had provided its services based on a quality management system ISO 9001:2000. In 2011 its telecom services (i.e., Internet Service Provider and Online Service Provider) were granted an ISO/IEC 27001:2005 certificate for information security management system.

QTSC's Telecommunications Infrastructure and Its Telecom Services

In QTSC, the telecommunications and information technology networks were developed synchronously to provide a very high level of redundancy. This network system applied new technology to reduce operating costs while continuing to provide high quality telecommunications and information technology services for enterprises in this area. The company offered a variety of telecommunications and information technology service options, all of which were high quality and provided high levels of security to meet all enterprises' requirements.

Multi-service Integrated Network

The latest technology to be introduced was QTSC's Multi-service Integrated Network. Optical fiber offered extremely high bandwidth, enabling the transmission of large amounts of information. Thus, an optical fiber backbone played the fundamental role in its integrated network. IP-based technologies were used to provide multiple services such as video, data, and security. Cloud computing (virtualization), Multiprotocol Label Switching Virtual Private Network (MPLS VPN), Resilient Packet Ring (RPR) known as Dynamic Packet Transport (DPT) technologies were employed. There were several broadband Ethernet (100/1000Mbps) ports for each enterprise to access the internet (see Exhibit 5). For security system management, leading security solutions from Checkpoint, Cisco, IBM, TrendMicro, Imperva, and ArcSight were utilised. Thus, the network was able to provide high security and fast connections for enterprises in QTSC (see Exhibit 6).

Data Centre Infrastructure Management

In order to ensure the reliable operation of the data centre, there were a number of facilities that were employed. This data centre was supplied by uninterruptible power sources including the mains power systems, electric generators, and uninterrupted power supplies. Data centre cooling systems were also used to meet the cooling requirements of sensitive electronic equipment. In addition, QTSC had lightning protection systems to reduce the dangerous effects of lightning for its telecommunications and information technology equipment. For fire protection there were fire alarm and automatic fire protection systems. Furthermore, security for this data centre was seriously considered. Access control and surveillance cameras 24/7 were employed. Netvision, a telecommunications networks inventory tool, and APC InfraStruXure Central products and Environmental Monitoring systems were utilised for managing its company-wide physical infrastructure devices.

Network Operation Management

Apart from the previously mentioned specialised tools and equipment that were employed for managing physical infrastructure devices, QTSC Development Company had its own IT and telecom professionals to manage its telecommunications and IT systems. They were trained and qualified by international professional telecommunications and IT vendors such as Cisco, Checkpoint, IBM, Sun, Microsoft, Krone, and AMP. They were fully qualified to operate its comprehensive network systems. They kept its networks safe and secure 24x7x365. Since 2011, the company applied information security management system ISO/IEC 27001:2005 for providing Internet and Online services.

Telecom Services

To exploit its professional telecommunications systems, QTSC Development offered a variety of high quality telecom services for enterprises with in this software park. In terms of network connection services there were a number of services, such as high speed Internet, Intranet (MPLS VPN), PSTN remote access, and wireless access. It also supplied many types of hosting services, for example, Internet hosting, Intranet hosting, and Virtual hosting. Furthermore, security and network management system services were offered. The company recently provided cloud computing options for enterprises such as Infrastructure as a Service (IaaS) and Software as a Service (SaaS) to facilitate enterprises' business performance, especially for IT companies. Telecom services were seen as the most important core service that contributed to creating QTSC's competitive advantage.

QTSC's Expansion Plan

Since 2001, QTSC had been seen as the favourable investment destination for IT investors. Investments, focusing on software and IT services fields, were increasing rapidly in the area. By 2015, it was projected that the area would be fully occupied. Consistent with the *National Strategy on Transforming Vietnam into an Advanced ICT Country by 2020*, the IT industry was regarded as a critical economic sector. In 2012, therefore, the Ho Chi Minh City Council decided to expand QTSC to further enhance the economic sector as it pursued this national strategy in the coming years. QTSC Development Company was chosen to implement this expansion plan. As Chairman of this company, Mr. Chu Tien Dung identified many specific requirements for enabling the plan.

The Direction of Expansion

There were four important aspects to the expansion plan:

1. Gaps in the market should be identified to meet specific needs of potential enterprises that might choose to run their business in software parks. All these requirements would be supplied by newly created QTSCs.

2. Potential locations needed to be evaluated for their transport infrastructure and services for supporting convenient travel and liveability. Many IT research centres and IT training institutions should be located on these locations or close to them.

3. The current QTSC, as the heart of the expansion plan, would need to share its operating experiences, business expertise, human resources, and telecommunications infrastructure with newly established enterprises.

4. QTSC should be enlarged in some places within Ho Chi Minh City to utilise the current QTSC's capacity and continually enhance its IT sector. Alliances between the City and other regions in Vietnam should be formed to extend QTSC in these areas. Thus, the software park could be ex-

panded in series. In doing so, newly formed software parks would inherit its brand name. In fact, the QTSC's brand name was recognised as the successful brand for software parks in Vietnam and throughout Asia.

Participants

New QTSCs would be attractive locations for the IT community. QTSC Development Company needed to be looking for appropriate participants. Highest priority was IT enterprises that had businesses related in relation to IT products and services. Next were R&D centres that focused on IT fields, followed by IT training institutions. Finally, services firms that provided working and living services for IT enterprises in these areas. These participants could be recruited by promotion programs offered by this company and professional marketers. Mr. Dung said, "We aim at global and leading local IT enterprises to invest in these software parks; they will play an important role as *the anchor* in these areas."

Facilities and Services

In order to provide facilities and services for potential enterprises and meet all requirements for an IT park, planned QTSCs would supply specific facilities:

- Physical and energy technical infrastructure, such as local roads, electrical grids, water supply, and sewers.
- IT and telecom services, including internet connectivity, data centres, hosting, domain names, and telephony
- Land for building offices (or offices for lease) and facilities for working and living in these areas
- IT training and human resources services
- Support services, such as one-stop services and business logistics

The original QTSC experience had demonstrated that the availability of these facilities and services would be the most important factor that potential enterprises would consider when they decide to invest in software parks.

The Decision

QTSC's expansion plan was regarded as one of key projects in the city's development plans in the coming period of 2012-2015. This reflected the political determination of the Vietnamese government to develop its IT industry, especially the software sector. Mr. Dung considered a number of challenges and solutions associated with supporting this plan. Both technical and human resource management issues needed to be resolved.

On the technical side, the investment for telecommunications infrastructure was central to QTSC's competitive advantage. There were a number of investment alternatives that needed to be carefully considered. For example:

- What technology these coming QTSCs should employ for their Multi-service Integrated Networks and Data centres and how to ensure that these devices were properly operated to offer desired services for these customers. For example, how did a cellular network and wireless local area networks interwork well in these areas? The interworking between these devices was seen as an essential aspect of resource management for taking advantage of the overlay network structure to efficiently share the multi-service traffic load between the interworked systems.

- How to integrate the current telecommunications infrastructure with the new technologies being introduced in the new QTSCs. Utilising this current infrastructure for these new areas was initially recognised as one of important attributes to the expansion plan.

On the human resources side, how to recruit and develop human resources for managing these coming QTSCs was a source of concern. Providing professional services such as telecom services, one-stop customer service, and a variety of living services for its customers was important in attracting customers. The new QTSCs would need to provide similar resources. Mr. Dung considered utilising the current QTSC's staff as a core group of key personnel for these planned parks. He thought about what an appropriate HR Internal Mobility policy should be employed to solve the issues of employee relocations. This would not be a big problem for these coming online in Ho Chi Minh City. In fact, the working and living in the city appealed to many of the best professionals. Other HR alternatives were also regarded. He wondered what reward programs would be needed to attract employees to work at those new parks that were outside this city. The selection and training of employees for these places were seriously deliberated. He recognised that it was not easy to recruit excellent IT professionals and other skilled staff for outlying locations. Thus, he thought about policies to attract them and how to provide necessary training programs for them.

Mr. Dung intended to organise several executive meetings to discuss these issues before retaining the services of a consulting group. He thought about the role these planned QTSCs would play in developing the Vietnamese software industry. For him, this was an important project in his life; therefore, he needed to do everything possible to make sure this project would go well.

Acknowledgements

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Biographies

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Exhibit 1: Vietnamese IT Industry Revenue (Million USD)

	12/2008	12/2009	12/2010	Growth rate of 2010 (%)
Total revenue of IT industry	5,220	6,167	7,629	23.71
Hardware industry revenue	4,100	4,627	5,631	21.69
Software industry revenue	680	850	1,064	25.17
Digital content industry revenue	440	690	934	39.71

Source: NSCICT & MIC (2011)

Exhibit 2: A Location Map of Quang Trung Software City
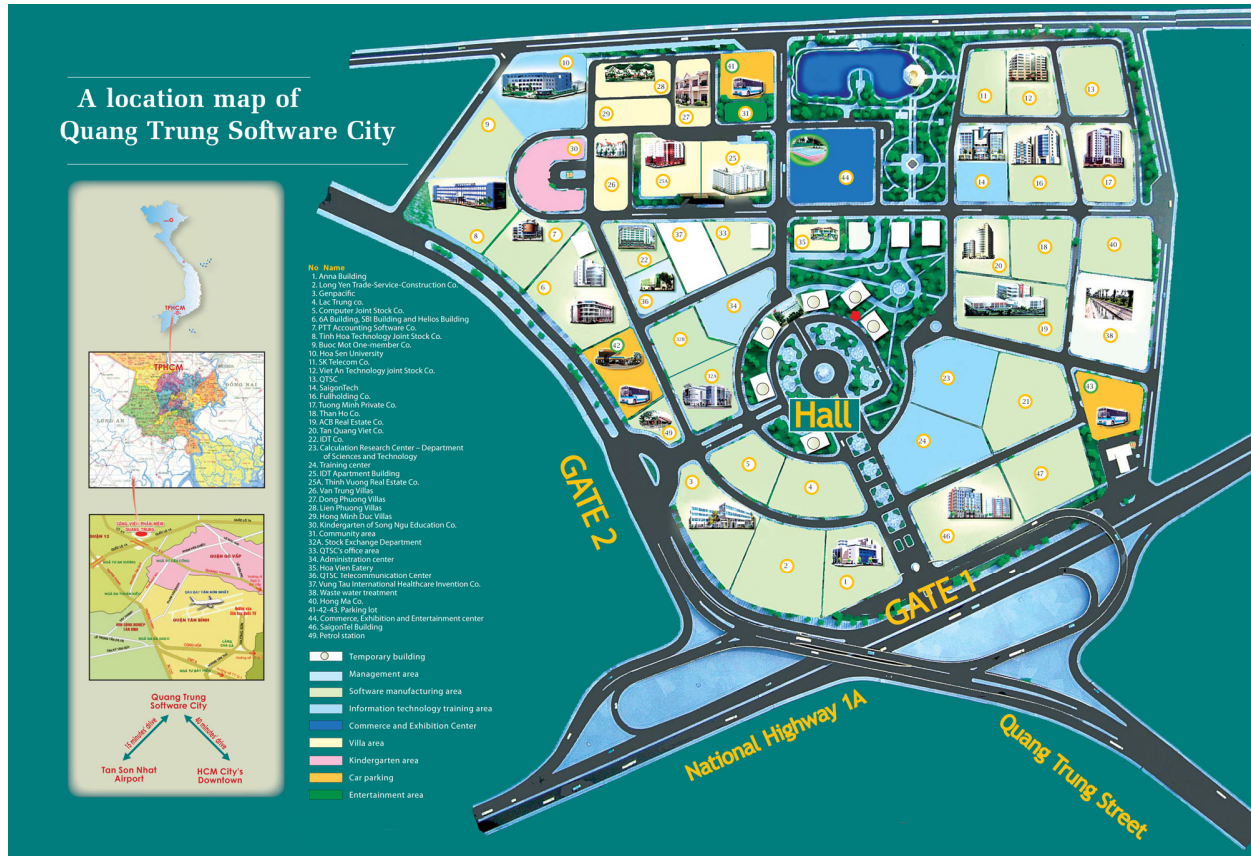
Source: Quang Trung Software City Development Company (2012)

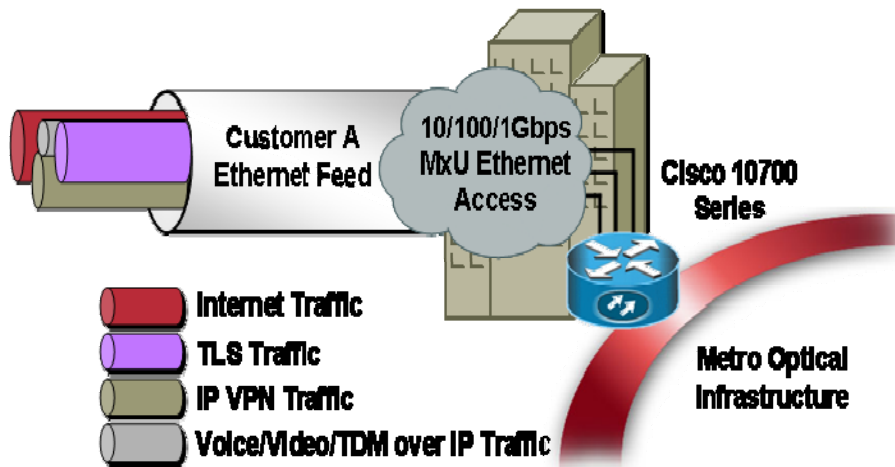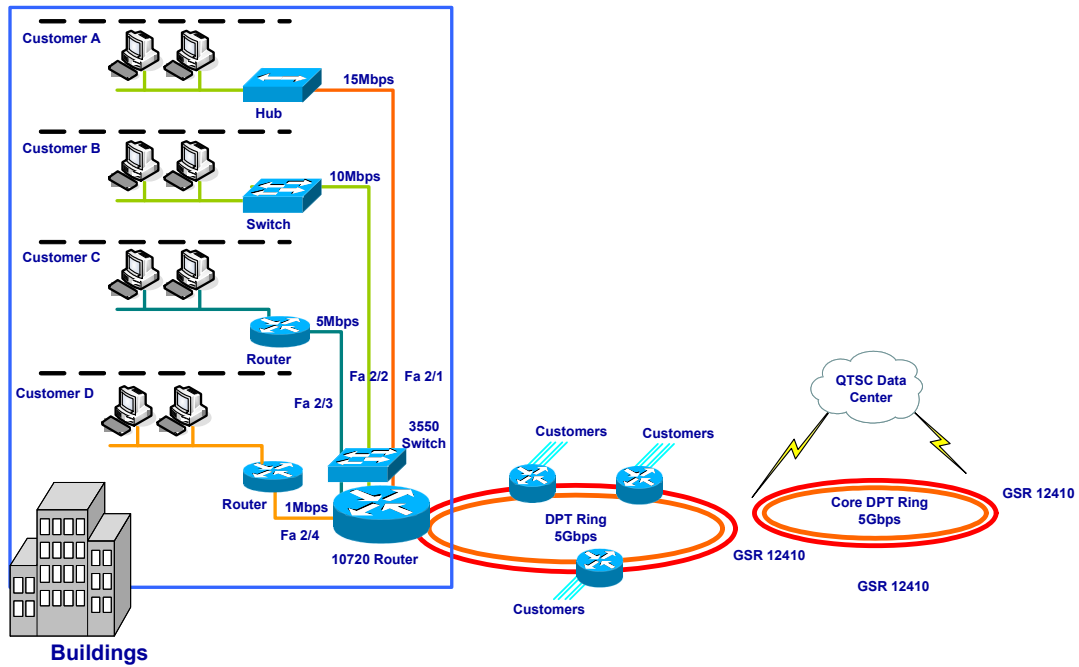## Exhibit 3: Quang Trung Software City Development Company

Source: Quang Trung Software City Development Company (2012)

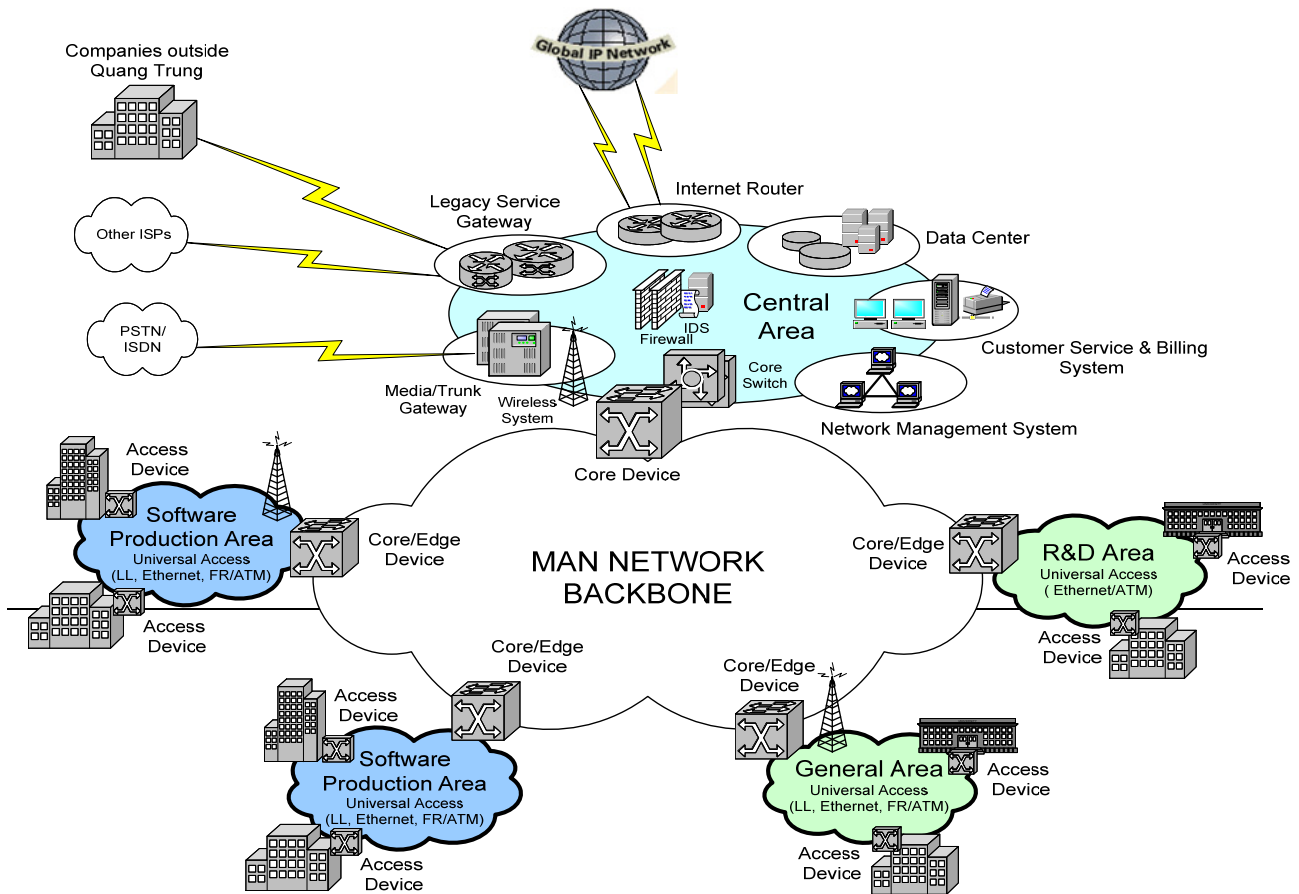## Exhibit 4: Facilities and Services in Quang Trung Software City

Source: Quang Trung Software City Development Company (2012)

Exhibit 5: QTSC's Broadband Internet Ports for each enterprise

Source: Quang Trung Software City Development Company (2012)

Exhibit 6: QTSC's Broadband Internet Ports for each enterprise

Source: Quang Trung Software City Development Company (2012)