2.1 Broadband Digital Content Industry in Taiwan

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The digital content industry has been selected by Taiwan government as one of the key industries to ride Taiwan into the 21st century and, to succeed her successful information industry so another wave of economic growth could be sustained. In this paper we study the current status of this industry in Taiwan, the development goal in year 2006, and subsequently the government strategies and initiatives to promote this industry.

I. Background

With the fast development of the Internet, world economy has been greatly affected by the impact of Digital Convergence on related industries such as IT, communication, and media industry. New business models as well as new market opportunities emerged in various business sectors. The key driving force behind the development is the strong need of “digital content”. Many countries have invested heavily into this new industry. Taiwan, based on her past success in developing the IT and electronic industry, is in no exception and would like to create another wave of economic growth.

It is believed that Taiwan has the relative advantage of developing this digital content industry. According to many world famous consulting firms, by 2007, Chinese language will be the most used language on the net world. Taiwan, situated between the eastern and western culture, rapidly marching into democratic political system, being a pluralistic society with colorful life style, therefore riding with the existing IT and electronic industry, digital content industry in Taiwan has the opportunity to secure a solid position in the global market.

On May 13, 2002, Taiwan government approved the “Strengthening Digital Content Industry Development Promoting Initiative”, outlined the six areas where special efforts must be made:

- Environment and regulation
- Manpower cultivation and recruiting
- Investment and Financial Aid
- R & D and application
- Industry information and marketing
- Promotion and Facilitation

In addition, and ad hoc “Executive Yuan Digital Content Industry Development Steering Committee”. chaired by a minister of state, is designed to oversee the planning, promotion, and evaluation work. As for the daily operation and industry service window, a “Digital Content Industry Promotion Office (DCIPO)” is formed within the Ministry of Economic Affairs (MOEA).

II. Definition and Scope

Digital Content, is defined here as the integrated product and/or service of video, text, image, voice, data……through information technology. From the value-chain point of view, those traditional yet commercially valuable content of arts, entertainment, education, and culture, by applying IT on them, not only have we transformed their original form into
digital for the obvious benefit of easily duplicatable and value-additive, we have also imposed with those new digital content products the capability of being interactive and integratable with image, voice, and video. Subsequently, again through IT (Flow and protection technology, including content management, bandwidth management, streaming technology, copyright management, fee-collection mechanism, ....), variety of digital content can be passed through networks and media to the end customer and hereby form various digital content service.

With this definition in mind, also considering that any industrial policy needs focus, Taiwan government has made the scope of this digital content industry to include eight categories. They are:

1. **Digital Games**:
   - Console (such as PS2, XBOX, GameCube), game software.
   - PC game software (single user game, on-line game)
   - Palm-Top (such as PDA, Gameboy, mobile phone game software)
   - Arcade game software

2. **Computer Animation**:
   - Entertainment application: Movie, TV, Network broadcasting, game, ...
   - Industrial application: on architecture, industrial design, medical support and service

3. **E-learning**:
   - Including digital content authoring, tool software, courseware, and e-learning service

4. **Digital A/V Application**:
   - Digitized traditional A/V on new media (internet or digital broadcasting network).
   - Digital A/V innovation application

5. **Mobile Content**
   - Including handset, wireless LAN messaging and mobile data service

6. **Network Service**:
   - Including ICP, ASP, ISP, IDC services.

7. **Content Software**:
   - Including content developing tools/platform software, content application software, content professional service.

8. **Digital Publishing/Archiving**

III. **Industry Current Status**

One key factor to the development of the digital content industry is the domestic market. Although Taiwan has an advantage of penetrating the huge mainland China market by sharing the same language and same culture, it is acknowledged that Taiwan itself with a population of 23 million people and GDP per capital income which has now reached US$13 K provides a solid foundation for this emerging industry. In Table 1 we list the growth of internet population, xDSL+Cable household subscription, mobile phone subscribers, and WAP+GPRS subscribers, respectively, in the past 3 years.

Another strong input to the development of the digital content industry is the existing content industry, which includes the traditional magazine, book, newspaper, music, movie, TV, and other related industries. They provide the material such that the digital content industry may get an easy start. In this respect, Taiwan has nurtured a very good environment for the traditional content industry. In Table 2, we list some basic information of them in the year 2001 and the year 2002, respectively.

### Table 1 The Growth of digital content users

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet</td>
<td>6.3 M</td>
<td>7.8 M</td>
<td>8.6 M</td>
</tr>
<tr>
<td>XDSL+Cable Modem</td>
<td>22 K</td>
<td>1.1 M</td>
<td>2.1 M</td>
</tr>
<tr>
<td>Mobile Phone</td>
<td>18 M</td>
<td>21 M</td>
<td>23 M</td>
</tr>
<tr>
<td>WAP+GPRS</td>
<td>—</td>
<td>132 K</td>
<td>1.1 M</td>
</tr>
</tbody>
</table>

### Table 2 Traditional content industry in Taiwan

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#Published</td>
<td>Employee</td>
</tr>
<tr>
<td>Magazine</td>
<td>5,208</td>
<td>50,000</td>
</tr>
<tr>
<td>Book</td>
<td>36,546</td>
<td>39,700</td>
</tr>
<tr>
<td>Newspaper</td>
<td>454</td>
<td>45,000</td>
</tr>
<tr>
<td>TV</td>
<td>100 channels</td>
<td>9,000</td>
</tr>
<tr>
<td>CD</td>
<td>1,860</td>
<td>13,000</td>
</tr>
</tbody>
</table>
2.1 Broadband Digital Content Industry in Taiwan

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Taiwan digital content industry in 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2001</td>
</tr>
<tr>
<td>Production (NTD)</td>
<td>122 B</td>
</tr>
<tr>
<td># Companies</td>
<td>1,500</td>
</tr>
<tr>
<td># Employees</td>
<td>30,000</td>
</tr>
<tr>
<td>Export %</td>
<td>10%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Segment growth of Taiwan digital content industry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2001</td>
</tr>
<tr>
<td>Digital Games</td>
<td>5.1</td>
</tr>
<tr>
<td>Computer Animation</td>
<td>2.4</td>
</tr>
<tr>
<td>e-learning</td>
<td>1.8</td>
</tr>
<tr>
<td>Digital A/V</td>
<td>25.9</td>
</tr>
<tr>
<td>Mobile Content</td>
<td>4.5</td>
</tr>
<tr>
<td>Network Service</td>
<td>31.5</td>
</tr>
<tr>
<td>Content Software</td>
<td>41.8</td>
</tr>
<tr>
<td>Digital Publishing</td>
<td>20.4</td>
</tr>
<tr>
<td>Total</td>
<td>133.4</td>
</tr>
</tbody>
</table>

* Unit: NTD in Billion

Due to the aforementioned, the newly defined digital content industry has a well nurtured environment to drive its growth. According to DCIPO, the total production of the industry reached NT$153 billion (∼US$4.5 billion) in 2002, which represents a 15% growth from the 2001 production, NT$133 billion (∼US$3.9 billion). There are approximately 1,680 companies working in this industry which employs more than 33,000 workers. Most of the production were for domestic use, only 12% accounted for export. Table 3 provides an overall picture of the industry in 2002, compared with the year 2001.

A more detailed analysis about the industry in 2002 is given in Table 4, which shows the production of each segment industry. Comparison to the year 2001 is also given. It is found that the digital games industry enjoyed highest growth among all the segments. The others with high growth are e-learning and mobile content industry.

The tremendous growth of the digital games industry in 2002 was due to mainly the populous of on-line game. According to a report released by IDC in May 2003, the size of Taiwan’s on-line game market in 2002 was around NT$4.8 billion (∼US$139 million), which took 26% of the Asia-Pacific on-line game market, 533 million US dollars. Further, in 2002 the market size of the on-line game first-time outpaced that of the single-user game which was around NT$2 billion (∼US$58 million).

Table 5 shows that in 2002 PC on-line game took 58% of the NT$8.5 billion digital game market, far exceeded that of the single user game which only took 25%. Console game ranked number three with 11% and mobile game had 6%. It is expected that this ranking will maintain for a while. However, due to the strong injection and promotion of PS 2 and XBOX in Taiwan, we forecast that by 2007 the console game market has a good chance to reach the scale of the PC single-user game, or even beyond.

<table>
<thead>
<tr>
<th>Table 5</th>
<th>The segmented digital game industry in Taiwan</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2001</td>
</tr>
<tr>
<td>PC on-line game</td>
<td>2.64</td>
</tr>
<tr>
<td>PC single-user game</td>
<td>3.23</td>
</tr>
<tr>
<td>Console game</td>
<td>—</td>
</tr>
<tr>
<td>Mobile game</td>
<td>—</td>
</tr>
<tr>
<td>Total</td>
<td>—</td>
</tr>
</tbody>
</table>

Unit: NTD in Billion

IV. Industry Development Goal

While there is a general consensus that Taiwan has a sound infrastructure and thus a great potential to develop the digital content industry, based on above information, one still has to set a clear goal for the growth of this industry. This goal must be measurable and be able to show the strength and the developing status of the on-going industry. Further, this industry goal must be reachable and extra effort from the government and private sectors are needed to make this goal realizable in a given time of period.

In order to set a reasonable goal of this industry, we have to ask a question about the market. Where is the market? How does the market grow?

The target market is currently aimed at the greater Chinese market where the Chinese language is widely in use. It therefore includes Taiwan, China, Hong
Kong, Singapore, and the vast overseas Chinese in South East Asia, North America, and Europe.

The most notable market segment is of course the China market, with its 1.27 billion population and a prosperous economy. Although the GDP per capital in China in 2002 was barely over one thousand US dollars, way below that of Taiwan, Hong Kong, and Singapore, China maintains a robust economic growth rate in 2001, 2002 and 2003 (by forecast) in a row. In Table 6 we compare the economic data of the four regions in 2002.

There is no statistics about the digital content market in greater Chinese at this moment. The real numbers could be very low compared with those of the US, Japan, and Europe market. But thanks to the wide availability and affordability of IT-related end-user equipment, the greater Chinese market has been able to build up a very solid foundation for the growth of the digital content industry. In Table 7 detailed numbers are provided for the penetration rate of TV and PC per household, mobile phone to the population, as well as the number of subscribers to the internet and the broadband, respectively, in the second quarter of 2002. It is noted that Taiwan, Hong Kong, and Singapore are relatively at the same level in terms of IT utilization. Although China is low on those numbers, we would like to point out that the disparity existing between her coastal and the inner provinces; we should regard the coastal provinces as a readily available market, and those inner provinces as a future potential market.

Based on the industry strength in 2001, as shown in Table 3, and the analysis about the current status and the growth potential of the greater Chinese market, the Taiwan government announced an ambitious goal in 2006 for the development of the digital content industry, where DCIPO was inaugurated on June 27, 2002. The goal is, by 2006,

- Industry production reaches NT$37 B
- # of companies: ~3,000
- # of employees: ~70,000
- export ration: >30%

It is obvious that everything is more than doubled and the compound average growth rate (CAGR) for the industry production between 2001 and 2006 is 22.6%. One impetus to set this highly aggressive goal is considering Taiwan already plays a leading role in the provision of traditional content in the greater Chinese market. Further, there are 1,490 Taiwan investment cases to China with the total investment amount 3,858,757,000 US dollars, by the end of 2002. Such huge investment should be a positive factor to help the industry to expand into China and to gain market share.

V. Government Strategies and Initiatives

Although it is claimed that Taiwan has the relative advantage to develop the broadband digital content industry, it is also acknowledged that weakness exists within its current status. Further, along with opportunities, these are still threats to the development work. In the following, we first examine the SWOT analysis of this industry and then provide the government strategies hence incurred.

Strength
- High degree of computer literacy
- An open and vibrant economy
- Existing content industry
- Culture leading role in Chinese-speaking society

Weakness
- Digital content industry scale still small
- Shortage of quality manpower
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- Lack of clear financial support mechanism
- Insufficient intellectual property right protection

Opportunity
- Vastly greater China market
- Attraction of 2008 Olympics in Beijing
- Chance to team up with international companies
- Attention shift from well-established hardware industry to content industry

Threat
- China may want her own digital content industry
- The outflow of Taiwan companies to China
- Head on competition from Korea
- Fastly growing copycat activities

Based on the above analysis, Taiwan government has further identified issues this industry has to deal with urgently:

Manpower cultivation side
- Strong demand of medium-to-high level professionals
- Courseware which matches international standards
- Merge of literature/history/arts with science on this industry participants

Technology build-up side
- Introduce international game platform
- Furnish highly desirable professional-level developing equipment

Capital investment side
- Special venture capital fund dedicated for this industry (which shall be led by the government)
- Digital content appraisal and loan guarantee

Marketing side
- Participate international exhibitions and shows through government sponsored theme pavilion
- Invite those exhibitions/shows to hold their event in Taiwan

Therefore, to ensure the successful launch of the digital content industry, Taiwan government has initiated a series of program to improve infrastructure as well as to provide incentives so as to encourage the participation from private sector since 2002.

1. Broadband To The Home Program
- Telecommunication deregulation
- Next generation network

- IPv6 project
- Information and communication security

It is hoped that through this program by the end of 2008. There are at least six million household subscription of broadband service in Taiwan.

2. Digital Content College Program
- Medium-to-high level professionals cultivation
- Cooperation with international schools/institutes
- Support local education/training services
- Job placement and incubation facilitate

3. Investment appraisal Program
- Appraisal of intangible assets
- Subsequent loan & guarantee mechanism
- Evaluate important investment projects
- Study business models and related legal issues

4. National Digital Archive Program
- Mobilize the digitization work of museum/library/university collections
- Promote the usage of digitized works
- Provide the industry with formidable source contents

Other programs including national e-learning program, culture innovation industry initiative, e-Taiwan Program, etc. Involved government including the Ministry of Economic Affairs, the Ministry of Communication and Transportation, the National Science Council, the Council of Culture Construction, and the Council of Economic Construction.

DCIPO, serves as a staff of MOEA, is a task force to draft promotional plans as well as to monitor the progress of those plans under execution. It also serves as a window for the private sectors to communicate with government agencies. Further, it has the responsibility to build up relationships with her counterpart in other countries, such as DCAj in Japan and KOCCA in Korea, A subsidiary office in Los Angeles, U.S.A., is formed in April 2003 to facilitate the interaction between Taiwan digital content industry and Hollywood.

VI. Conclusion

Taiwan, as a small island with limited natural resources, has no choice but to follow the world current and to utilize the brain power to earn her
living. In the past years it has successfully built up the agriculture, the light industry, the petro-chemical industry, the electronic industry, and the information industry, to name a few. However, past experience though treasurable, provides no guarantee to future success. Digital content industry is innovation oriented and therefore highly different from those previously experienced. Nevertheless, with the joint efforts of the government and the private sectors, an anticipated new era of digital content is coming in sight.

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He received B.E. degree in Electrophysics from National Chiao-Tung University, Hsin-Chu, Taiwan, and M.S. and Ph.D. degree in Computer and Information Science from Syracuse University, New York, in 1971, 1973, and 1977, respectively. He joined the Institute for Information Industry, Taiwan, in 1982 and now serves as a vice president of the institute. Since 1995 he was asked by the Ministry of Economic Affairs to lead the Information Industry Development Promotion Office. In June 2002, he was again named as the director of the newly formed DIPO. His research interests including coding theory, cryptography, and information security.