

Preface

Eminent philosopher Francis Bacon (1561-1626) once said, "Knowledge is power." In the twenty-first century when there is an explosion of information and the knowledge economy holds sway, how do individuals learn, appreciate and apply knowledge and how do countries help their citizens to achieve these objectives, to promote the development of culture, and to pass on the legacy of human knowledge and civilization? These are the issues that countries around the world should address.

Under the "National Digital Archives Program" initiated in 2002, various kinds of archives kept in Academia Sinica, the National Palace Museum, National Taiwan University, and many other public and private cultural institutions in Taiwan have been digitized. In 2003, the "National Science and Technology Program for e-Learning" was launched. These two national programs have successfully integrated development of various fields in science, technology, humanities and economy. Through the implementation of these programs, experts in different fields were brought together to exchange ideas and to consider how to create, organize and disseminate knowledge. The results of digitization have not only increased accessibility to these knowledge resources for scholars, but also allowed the general public to transcend barriers of time and space in appreciating and utilizing knowledge, thereby creating more fun and happiness in their lives.

This cultural endeavor requires an across-the-board thinking and the participation of specialists from various fields. Beginning on January 1, 2008 the two aforementioned programs were integrated into the "Taiwan e-Learning and Digital Archives Program." It is hoped that with further efforts from interdisciplinary experts, more forward-looking thinking and execution capability will be brought to bear.

With the achievements of the "Taiwan e-Learning and Digital Archives Program" you can feast your eyes on the treasures of five thousand years of Chinese civilization and also take a peep at Taiwan's ecology and history. You can feel the amazing industrial power when contents of domain knowledge and science and technology combine. You can also appreciate the creativity of young people as they utilize knowledge, culture and technology, and personally experience the learning revolution that information technology development has brought forth.

We hope through our efforts today we can bring to light the cultural heritage and knowledge that had been locked away in academic institutions in the past and make them available and accessible to more people. Moreover, we hope that these well-cultivated knowledge crystals accumulated by human civilization can be preserved and passed on to future generations.



Ts'ui-jung Liu

Ts'ui-jung Liu
October, 2008



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Program Overview

Introduction

As information technology becomes increasingly widespread, digitization technology, computer and communications technology and the development of the Internet have influenced our society in an ever more profound way. In the past information technology has brought about local changes to our daily work. Only with the rapid development of the Internet has information technology had such a comprehensive impact on our ways of social communication, knowledge conveyance, presentation and management and moreover, on our perceptions of and approaches to research and education. Nowadays, the influence of digitization is society-wide and is increasing in importance all the time. Information technology has gradually altered our activities in our daily life, work, learning and leisure, thereby unveiling a digital era in which culture and education are changing in every aspect.

The concept that "Knowledge will become industry's most important resource" was put forward in the 1960s and was already widely accepted in the 1970s. Using information technology to improve organizational communication and knowledge management became an essential skill for industrial and economic development. Today, the information economy or "knowledge economy" theory has won many adherents, and a wave of e-commerce has swept the world. Industrial and economic developments are built on knowledge and culture. So, without knowledge, how will economic development be achieved in the future? Culture is the product of accumulated human wisdom and knowledge passed down from generation to generation (knowledge here is not limited to scientific domain). From this perspective, information technology's influence is not limited to intangible social culture; it also has a profound and across-the-board influence on industrial and economic development.

The infrastructure for digital archives and e-learning includes the establishment of electronic databases, user habits, information technology literacy, Internet accessibility, government regulations and policy, advanced academic research environment, capabilities of industrial applications, services and marketing, etc. At present, the proportion of Internet users in Taiwan is one of the highest in the world; all the elementary and high schools have Internet access. In addition, projects for e-government, e-commerce, broadband



fixed network, e-learning and e-health have been set in motion. Furthermore, academia and research institutes have established a solid foundation for electronic databases, information retrieval, language processing, the Internet technology, multi-media presentation and management. Apart from government and academia, Taiwan's information technology industries and e-commerce services are also making good progress. By this criterion, Taiwan is ready for the development of digital archives and e-learning, since most of the required infrastructure has already been set up.

Taiwan has been known to be one of the key countries in terms of its information technology production and services. The government also advocates the vision of the Green Silicon Island and knowledge economy. The digitization of national archives and education will contribute significantly to the accumulation, dissemination and application of knowledge, and will thus play an essential role in the development of the knowledge economy. However, considering China's growing ambitions and influence in the information industry, Taiwan should accelerate its work on e-learning and digital archives.

The "Taiwan e-Learning and Digital Archives Program" (TELDAP) was officially launched on January 1, 2008. TELDAP is aimed to creatively promote national digital archives and e-learning applications and facilitate the development of Taiwan's culture, society, industry and economy, followed by disseminating Taiwan's experience in the international community to expand Taiwan's international space and sustainably maintaining important cultural assets of our nation and the development of e-learning's application in industry, academic research and education.

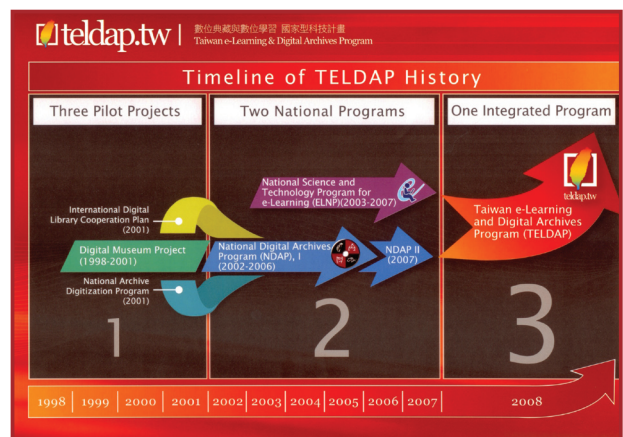
History and Development

The first phase of the National Digital Archives Program (NDAP) and the National Science and Technology Program for e-Learning (ELNP) was designed to digitize national cultural treasures, including archaeology, archives, artifacts, calligraphy and paintings, flora and fauna, rare books, and other cultural assets, to cultivate popular e-learning culture, to encourage innovation in e-learning research, and to lay a cornerstone for Taiwan's e-learning and digital content industries. As the two programs progressed, it has become clear that the work of archives digitization was only a starting point towards establishing the digital content industry, and the establishment of digital archives was the first mile of

the development of digital contents. The next major challenges are promoting and applying the products of NDAP and ELP to culture, education, research and commerce systematically. In order to utilize the outcomes of the previous programs to the highest level for social and economic development, we need to leverage the support of the government and provide incentives to get the private sector engaged. Only when the private sector is engaged will these national science and technology programs be sustainable.

After six years of effort, each participating research institute or organization in NDAP has developed expertise and set its own priorities in the future development of digital archives. Similarly, participating government agencies and companies in the private sector in ELP have also gained tremendous experience in utilizing e-learning to improve quality of services, education and professional training, provided to their stakeholders. By taking advantage of information technology and the expertise of researchers in the fields of culture, history, information, education, and management the NDAP and ELP have not only promoted cultural heritage and given e-learning multifaceted meaning in information society, but also demonstrated the vitality of human civilization. As both programs are closely tied to information technology and require continuous management, TELDAP members will continue their research into the use of modern technology and core techniques for the preservation and representation of historical images, inscriptions and texts that are hundreds or thousands of years old. While we are moving towards the next stage of digital archives and e-learning, we will focus more on the promotion and application of the output products of the previous programs.

As the information technology and communication technology are developing vigorously, e-learning is now considered by most countries in the world to be one of the most promising solutions to the problems of teaching quality, learning environment, limited time and space, and the management of teaching resources. We will commit ourselves to finding and exploiting new e-learning technologies and the development of e-learning culture. Hopefully, in so doing we will reduce the digital divide between



▲ The Development of Taiwan e-Learning and Digital Archives Program



urban and rural areas, fairly distribute digital resources, create quality e-learning contents, strengthen the ability of teachers and students to use information technology, and promote a lively e-learning culture.

In summary, those who participated and were thus trained in previous projects constitute a professional team capable of doing innovative research and development of digital technologies. With this professional team, Taiwan can help other countries develop similar projects. TELDAP will then promote Taiwan's culture and share its experience with the world through international cooperation, multi-national projects and global communication and thereby strengthen Taiwan's competitiveness. TELDAP will also focus on the development of language learning, natural science and digital education. In order to expand Taiwan's share in the global Chinese language learning market, TELDAP will incorporate the resources of universities, the government and the private sector to produce first-rate Chinese language teachers and establish its own brand in the market, making itself a global center for Chinese culture digital archives and e-learning.

Objectives

The aim of TELDAP is to make e-learning and digital archives available and accessible to the general public, moving towards the establishment of a knowledge society, with the ultimate goal of strengthening national competitiveness. The main overall objectives of TELDAP are **archiving the diversity of Taiwan and deepening e-learning in Taiwan**. The sub-objectives are as follows:

1. To showcase the cultural, social and biological diversity of Taiwan
2. To promote the application of technologies and digital contents in cultural, academic, socio-economic and educational development
3. To establish digital archives and e-learning industries
4. To improve the use of e-learning in formal education and lifelong learning
5. To establish Taiwan as a global e-learning center for Chinese language
6. To promote international cooperation network for Chinese cultural heritage and e-learning

Digital archives and e-learning are long-term endeavor for the development of Taiwan's culture and information technology in the age of globalization. Based on the achievement of previous programs in preserving fine cultural

assets, the next primary task of TELDAP is to emphasize indigenous cultures and showcase Taiwan's diversity and identity. To achieve this goal of presenting Taiwan's diversity in culture, society and natural environment, we have to start with the national digital archives, incorporate the cultural contents described by the advanced metadata, develop new technologies and find innovative applications. Accordingly, TELDAP will thoroughly promote both the contents and the technology of digital archives and e-learning and apply them to industries, education, research and social development. Through the joint efforts of the professional team of TELDAP in cooperation with sustainable business models of operation, it is our hope that we can bring Taiwan's rich digital content to the global stage.

As for the strategy of industrial development for TELDAP, in the midst of the time when the first generation products are mature, while the second generation products are in the value creation phase, it is hoped that Web 2.0 (the idea of users' contribution) technology can be used as the main vehicle to turn e-learning activities into a platform for collective intelligence sharing, integrated services for personalized learning and social computing. TELDAP will adopt knowledge- and learner-centered approaches, to evaluate e-learning projects in terms of their practicality and business performance. Concerning the creation of e-learning culture, TELDAP encourages sharing of learning resources and will promote collective marketing to expand the scale of e-learning and digital content industry and the range of applications. As for professional training, TELDAP will hold relevant training workshops with the help of the government, encouraging as many people as possible to learn new knowledge, acquire new skills and improve cultural literacy through e-learning. Various tools for learning and evaluation will be considered, such as instant learning, instant evaluation, learning coupons, and learning passports. For the Chinese language e-learning program, TELDAP will collect information about Chinese language learners from various backgrounds as well as their learning curves with the help of the government, academia and relevant industries. Such information will be extremely useful for the production of learning materials



▲Portal to Taiwan e-Learning and Digital Archives Program
<http://teldap.tw>



and Chinese language teaching course design. Our professional training projects will enable teachers not only to teach but also to edit teaching materials. TELDAP will also create platforms for both teachers and authors of learning materials to promote the development of Chinese language e-learning.

It is hoped that TELDAP will succeed in contributing tremendously to the development of all the main aspects of our information society, promoting Taiwan's cultural identity based on its rich culture, and helping Taiwan to catch up with the advanced Western countries in the era of digital globalization and the knowledge society. Also, with our advanced digital archives and e-learning technologies and the international network we will conduct a series of international cooperation projects in scientific research, education and industrial applications. These international projects will help Taiwan develop flexible connections with other countries, through relationships that are equal, reciprocal, cooperative and dynamic. In the end, we aim to achieve the ultimate goal of increasing Taiwan's national competitiveness in the global market.

Organization and Responsibilities

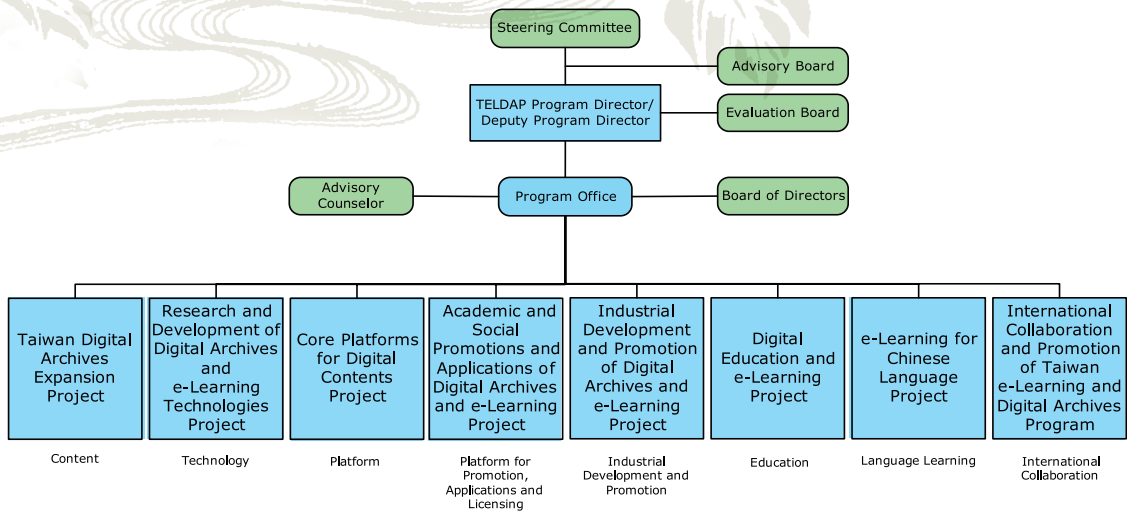
TELDAP has a Program Director and two Deputy Program Directors. Academician Dr. Ts'ui-jung Liu, Vice President of Academia Sinica, serves as the Program Director. Academician Dr. Der-Tsai Lee, Distinguished Research Fellow of the Research Center for Information Technology Innovation and Institute of Information Science at Academia Sinica and Dr. Shing-Tsaan Huang, Professor of the Department of Computer Science and Information Engineering at National Central University serve as Deputy Program Directors.

TELDAP Program Office has one Director who is in charge of the general operation of TELDAP under the supervision of the Deputy Program Directors, who are in turn responsible to the Program Director. TELDAP Program Office has one Deputy Director who is responsible for assisting the TELDAP Program Office Director in dealing with e-learning related work. Also, the Program Office has several Principal Investigators (PIs) and co-PIs as well as Project Managers and Assistants who are in charge of Division Projects. The Program Office is responsible for general administrative activities, including clerical work, overall budgeting, coordination between projects, media and public relations, project reviews and evaluation, progress reports and other paperwork, for organizing international exchange events and serving as promoting links between industry

and academia. The Program Office has a Steering Committee, Advisory Board, Evaluation Board, and Board of Directors that oversee the operations of the various projects.

With respect to archive contents, technology research and development, core platform, platform for promotion, applications and licensing; industrial development and promotion; education; language learning and international collaboration, eight core sub-projects have been established as part of TELDAP. These are:

1. Taiwan Digital Archives Expansion Project
2. Research and Development of Digital Archives and e-Learning Technologies Project
3. Core Platforms for Digital Contents Project
4. Academic and Social Promotions and Applications of Digital Archives and e-Learning Project
5. Industrial Development and Promotion of Digital Archives and e-Learning Project
6. Digital Education and e-Learning Project
7. e-Learning for Chinese Language Project
8. International Collaboration and Promotion of Taiwan e-Learning and Digital Archives Program



▲ The Organizational Framework of Taiwan e-Learning and Digital Archives Program



Members of Taiwan e-Learning and Digital Archives Program

Name	Position	Title and Affiliation
▲Taiwan e-Learning and Digital Archives Program		
Ts'ui-jung Liu	Program Director	Vice President, Academia Sinica
Der-Tsai Lee	Deputy Program Director	Distinguished Research Fellow, Research Center for Information Technology Innovation, and Institute of Information Science, Academia Sinica
Shing-Tsaan Huang	Deputy Program Director	Professor, Department of Computer Science and Information Engineering, National Central University
▲TELDAP Program Office		
Der-Tsai Lee	Director	Distinguished Research Fellow, Research Center for Information Technology Innovation, and Institute of Information Science, Academia Sinica
Gwo-Dong Chen	Deputy Director	Professor, Department of Computer Science and Information Engineering, and Director, Research Center for Science and Technology for Learning, National Central University
Chin-Yea Wang	Postdoctoral Fellow	Postdoctoral Fellow, Research Center for Science and Technology for Learning, National Central University
Shu-Jiun Chen	Project Manager	Systems Analyst, Computing Center, Academia Sinica
I-Hui Chen	Project Manager	Project Manager, Research Center for Science and Technology for Learning, National Central University
Chia-Lin Wu	Project Manager	Research Assistant, Research Center for Information Technology Innovation, Academia Sinica
▲Taiwan Digital Archives Expansion Project		
Fu-Shih Lin	Principal Investigator (PI)	Dean, College of Liberal Arts, National Chung Hsing University, and Research Fellow, Institute of History and Philology, Academia Sinica
Peng-Sheng Chiu	Co-PI	Associate Research Fellow, Institute of History and Philology, Academia Sinica
Ming-Chorng Hwang	Co-PI	Associate Research Fellow, Institute of History and Philology, Academia Sinica
Cheng-Yun Liu	Co-PI	Research Fellow and Deputy Director, Institute of History and Philology, Academia Sinica

Name	Position	Title and Affiliation
▲ Research and Development of Digital Archives and e-Learning Technologies Project		
Hong-Yuan Liao	Principal Investigator (PI)	Research Fellow, Institute of Information Science, Academia Sinica
Fu Chang	Co-PI	Associate Research Fellow, Institute of Information Science, Academia Sinica
Jan-Ming Ho	Co-PI	Research Fellow, Institute of Information Science, Academia Sinica
Chin-Chung Tsai	Co-PI	Professor, Graduate School of Technological and Vocational Education, National Taiwan University of Science and Technology
▲ Core Platforms for Digital Contents Project		
Keh-Jiann Chen	Principal Investigator (PI)	Research Fellow, Institute of Information Science, Academia Sinica
Tsan-Sheng Hsu	Co-PI	Research Fellow, Institute of Information Science and Director, Computing Center, Academia Sinica.
Zong-Kun Li	Co-PI	Associate Research Fellow, Institute of History and Philology, Academia Sinica
Hsin-Min Wang	Co-PI	Associate Research Fellow, Institute of Information Science, Academia Sinica
▲ Academic and Social Promotions and Applications of Digital Archives and e-Learning Project		
Ching-Yi Liu	Principal Investigator (PI)	Associate Professor, Graduate Institute of National Development, National Taiwan University
Chu-Cheng Huang	Co-PI	Associate Professor, Institute of Law for Science and Technology, National Tsing Hua University
Jinn-Guey Lay	Co-PI	Professor, Department of Geography, National Taiwan University
Ming-Yan Shieh	Co-PI	Professor, College of Law, National Taiwan University
▲ Industrial Development and Promotion of Digital Archives and e-Learning Project		
Gwo-Dong Chen	Principal Investigator (PI)	Professor, Department of Computer Science and Information Engineering, and Director, Research Center for Science and Technology for Learning, National Central University
Wen-Pin Lee	Co-PI	Industrial Development Bureau, Ministry of Economic Affairs (retired)
Mu-Chun Su	Co-PI	Professor and Chairman, Department of Computer Science and Information Engineering, National Central University
Fu-Ching Wang	Co-PI	General Director, Information Technology Service Center, Industrial Technology Research Institute



Name	Position	Position
▲Digital Education and e-Learning Project		
Han-Chieh Chao	Principal Investigator (PI)	Director, Computer Center, Ministry of Education, Executive Yuan
Shiang-Wei Fan	Co-PI	Director, Appraisal and Training Department, Central Personnel Administration, Executive Yuan
Jhen-Yu Lin	Co-PI	Technical Supervisor, Bureau of Employment and Vocational Training, Council of Labor Affairs, Executive Yuan
Hui-Shiung Wang	Co-PI	IT Director, Council for Cultural Affairs, Executive Yuan
▲e-Learning for Chinese Language Project		
Kuo-En Chang	Principal Investigator (PI)	Professor, Graduate Institute of Information and Computer Education, and Vice President, National Taiwan Normal University
Shih-Chang Hsin	Co-PI	Professor, Graduate Institute of Teaching Chinese as a Second Language, National Taiwan Normal University
Hwa-Wei Ko	Co-PI	Professor, Graduate Institute of Learning and Instruction, and Chair, Office of Teaching Centers, National Central University
Jie-Chi Yang	Co-PI	Associate Professor, Graduate Institute of Network Learning Technology, National Central University
▲International Collaboration and Promotion of Taiwan e-Learning and Digital Archives Program		
Simon C. Lin	Principal Investigator (PI)	Associate Research Fellow, Institute of Physics, Academia Sinica
Hsueh-Hua Chen	Co-PI	Professor, Department and Graduate Institute of Library and Information Science, and Director, National Taiwan University Library, National Taiwan University
Nian-Shing Chen	Co-PI	Professor, Department of Information Management, National Sun Yat-sen University
I-Chun Fan	Co-PI	Research Fellow, Institute of History and Philology, Academia Sinica
Kwang-Tsao Shao	Co-PI	Research Fellow, Biodiversity Research Center, Academia Sinica

Division Projects

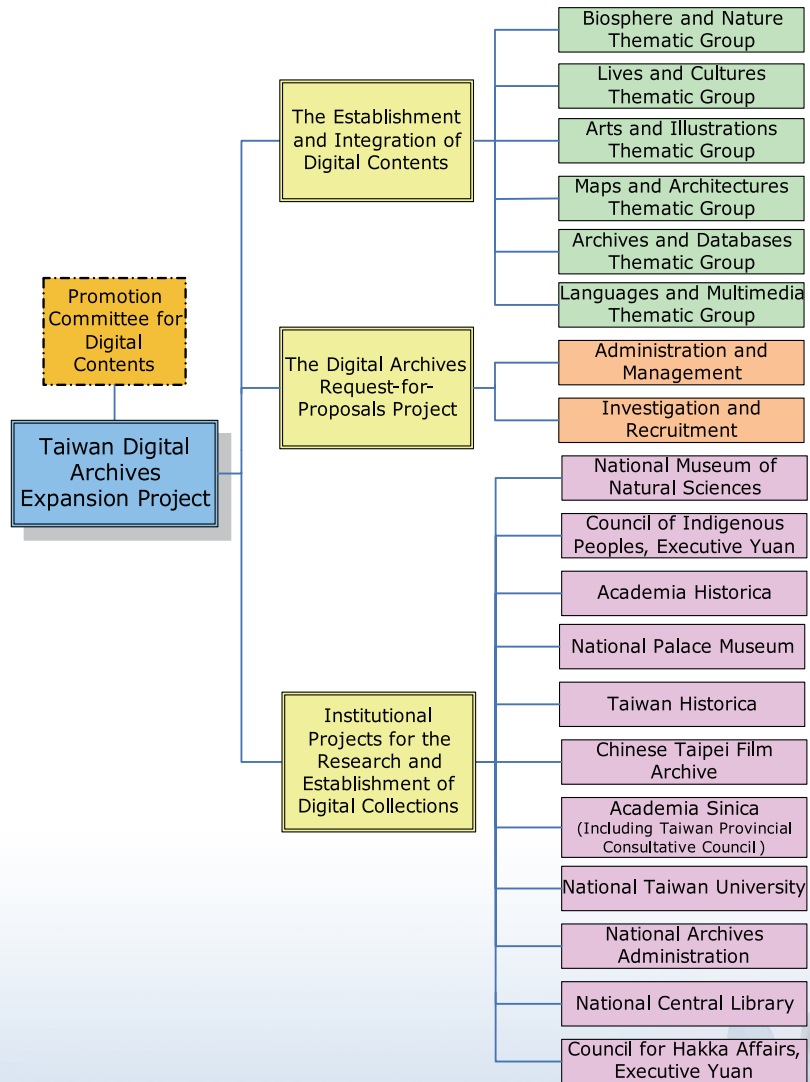
Taiwan Digital Archives Expansion Project

<http://content.teldap.tw>

The main objective of Taiwan Digital Archives Expansion Project is to establish diverse digital content that showcases Taiwan's cultural, social and biological diversity, and to provide basic digitized output to other projects for value-adding and application (including education, business and academic research) or international exchange. Our main missions are to provide easy and ready access, increase the number of digital archive participants, promote



standardization for digitization and experience sharing, reduce set-up costs, increase the added value and influence of digital archives through cross-institutional collaboration. In pursuit of the objective of archiving the diversity of Taiwan, we have collected digital content from private and public organizations and from open request-for-proposals projects. The content types involved include natural sciences, archaeology, languages, geography, ethnic cultures, history, economy, democratization, art, aesthetics, and life. In addition to ensuring that digitization work processes and technology meet international standards, we also take localization needs into consideration and create a model for Taiwan, which can be a model possibly for other countries as well. We in the future will integrate domestic digital resources in natural sciences and humanities, integrate cultures and technologies, and provide digitized content in various areas of knowledge that can be downloaded free and used for non-commercial purposes. In so doing we hope to improve for all citizens of Taiwan the level of identification with their own culture and increase Taiwan's visibility in the international sphere.



▲The Organizational Framework of Taiwan Digital Archives Expansion Project

Research and Development of Digital Archives and e-Learning Technologies Project

<http://tech.teldap.tw>

Research and Development of Digital Archives and e-Learning Technologies Project is formed by the integration of the National Digital Archives Program — Research and Development of Digital Archive Technologies and the National Science and Technology Program for e-Learning — Research and Development of e-Learning Technologies. The main mission of this Division Project lies in digital technology research and development, providing information technology support and consultation services for the content archiving projects and users.



The main objective is creating an integrated technology platform and developing advanced digital archive and e-learning technologies. The main research areas include multimedia technologies, video processing, digital rights management, language processing, meta-data processing, rare and variant Chinese character processing, and multi-modal information querying. Using the integrated technology platform as a foundation the aim is to encourage cooperation between various fields to develop digital archives and e-learning technologies by actually using the contents of the digital archives and nurturing of related human resources.



This Division Project includes a main project, three sub-projects and an open request-for-proposals project. The structure is shown left:

▲The Organizational Framework of Research and Development of Digital Archives and e-Learning Technologies Project



Core Platforms for Digital Contents Project

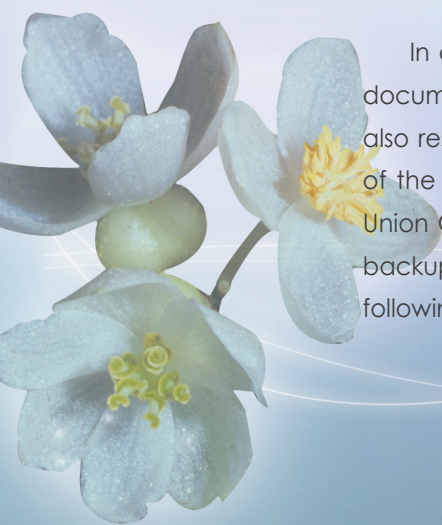
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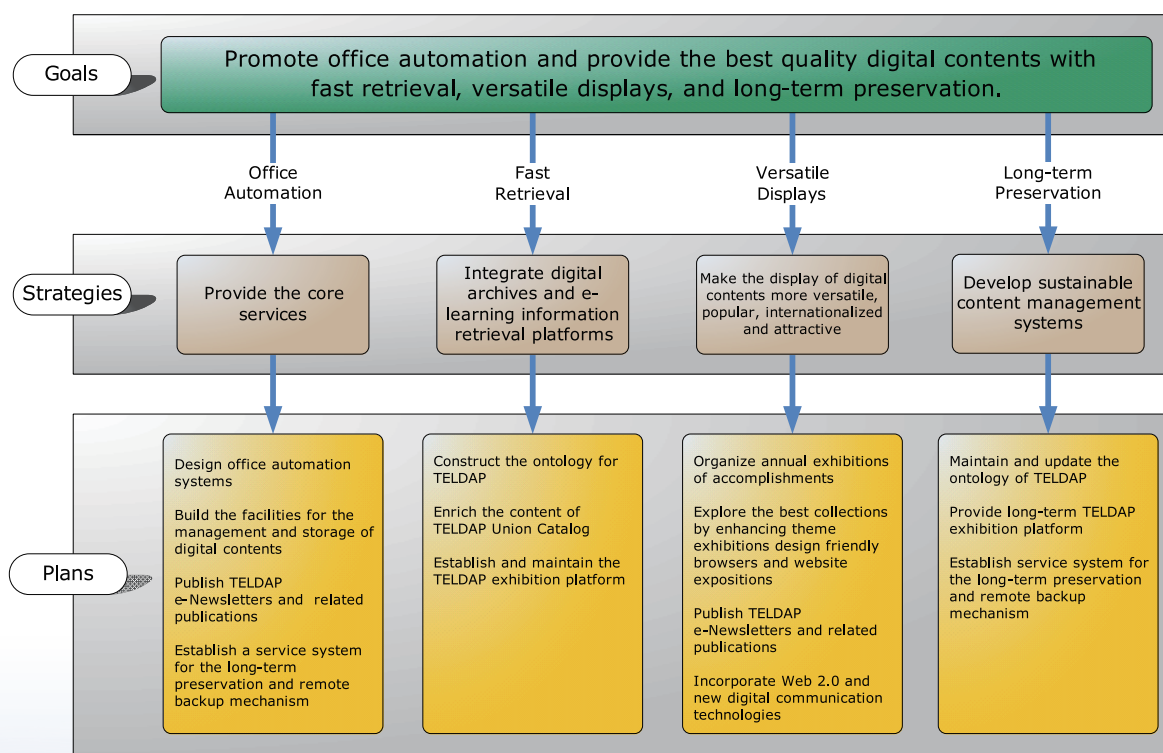
The integration and management of digital contents has become an important issue as the number of projects and the institutions involved in the Taiwan e-Learning and Digital Archives Program increases rapidly. Therefore, the Core Platforms for Digital Contents Project is responsible for establishing and maintaining network operational platforms as well as for integrating, organizing, retrieving, and storing the distributed multimedia digital contents. The goals are to achieve automated office management and optimized preservation, retrieval, and presentation of digital archives. The following strategic plans have been established.

1. Providing common core services
2. Establishing a uniform representation and search platform through a Union Catalog
3. Diversifying, popularizing, refining and globalizing archive exhibitions
4. Achieving sustainable preservation and management for the archives

In addition to setting up an e-services environment for library maintenance, document archiving, system auditing, and e-newsletter publishing, the project is also responsible for several tasks regarding data management including design of the TELDAP main portal, setting up public exhibition systems by creating a Union Catalog of archived holdings from all projects and developing a remote backup system to achieve sustainable preservation. This Division Project has the following four sub-projects:



1. Union Catalog of Digital Archives
2. Platform for Public Exhibition
3. Service System of Long-term Preservation and Remote Backup for Taiwan e-Learning and Digital Archives Program
4. Digital Information - the New and Creative Way of Communicating



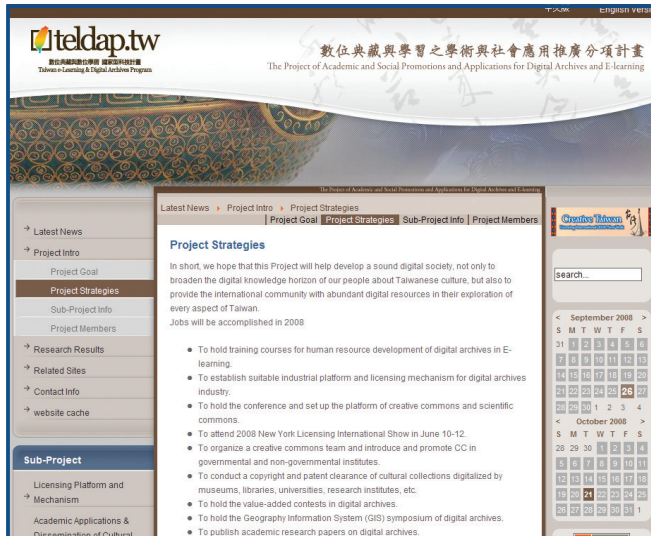
▲The Organizational Framework of Core Platforms for Digital Contents Project





Academic and Social Promotions and Applications of Digital Archives and e-Learning Project

<http://aspa.teldap.tw>



The objective of the Academic and Social Promotions and Applications of Digital Archives and e-Learning Project is to integrate digital archives, learning content and technology into culture, academic, society and the economy. The application of comprehensive digital archives and learning tools in education, research, society and other fields is expected to expand the public's understanding of Taiwanese culture and provide ample resources for Taiwanese cultural studies. Furthermore, this project will engage the

public, the academic community, research institutes and other users to promote digital archives access, to allow the public to share in digital archives, learning materials and related knowledge and also to encourage the development of the public domain jointly created and managed by related communities.

A main function of this project is the development of licensing and promotion strategies, coordination, management and supervision of teamwork across different institutes. The project also oversees the promotion of digital archives, e-learning and international cooperation. Promotional activities, such as the Licensing International, Commercial Application Competition and Instructional Design Competition will be strengthened. This project covers cultural, academic, social and educational applications, and is further divided into five sub-projects:

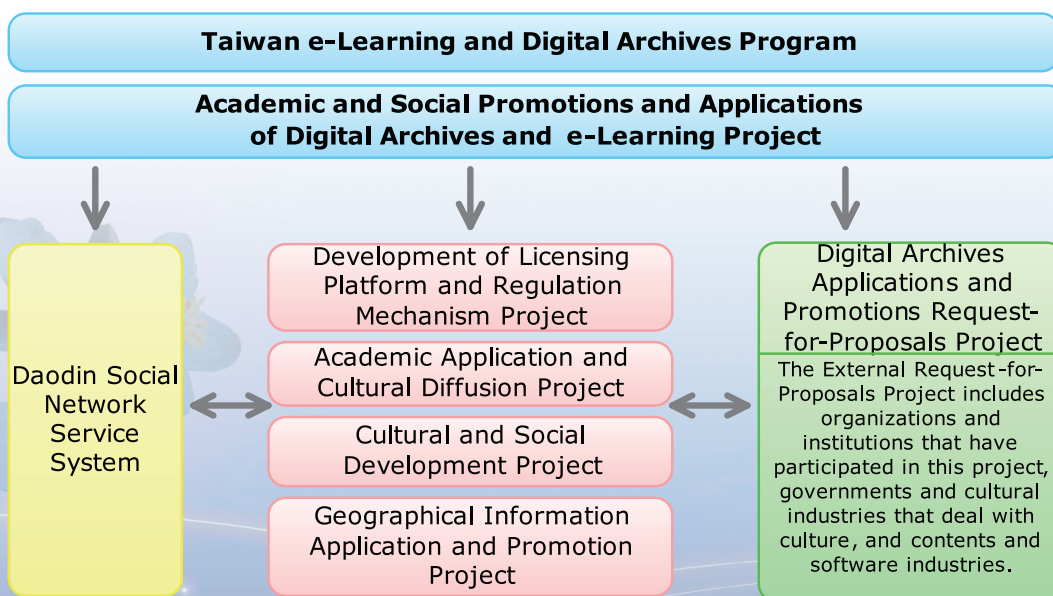
1. Development of Licensing Platform and Regulation Mechanism Project
2. Academic Application and Cultural Diffusion Project
3. Cultural and Social Development Project
4. Geographical Information Application and Promotion Project
5. Digital Archives Applications and Promotions Request-for-Proposals Project



In 2009 the Daodin Social Network Service System sub-project will be added. Guided by a project team with practical experience in industry, the project will promote the value-added application of TELDAP in education, society and industry.

Five major achievements are expected as follows:

1. Common Application: serve as a bridge for research and industries
2. Common Access: build a mechanism for public use, aiming to accelerate the sharing of resources
3. Common Interoperability: introduce licensing and regulation mechanism and apply GIS technology to open up international networks
4. Common Distribution: cultivate the ability to use digital archives materials, overcome the digital divide, and broaden the application of e-learning
5. Common Utilization: inspire users to devote themselves to creating and sharing



▲ The Organizational Framework of Academic and Social Promotions and Applications of Digital Archives and e-Learning Project



▲ Application Competition Poster



▲ LICENSING 2008 International Exhibition in New York, Taiwan Pavilion Website



▲ Digital Access and Archives Licensing Conference



▲ Digital Life' Archiving Ideas - Emulating Workshop 2008

Creative Taiwan



Creative Taiwan

Industrial Development and Promotion of Digital Archives and e-Learning Project

<http://idp.teldap.tw>

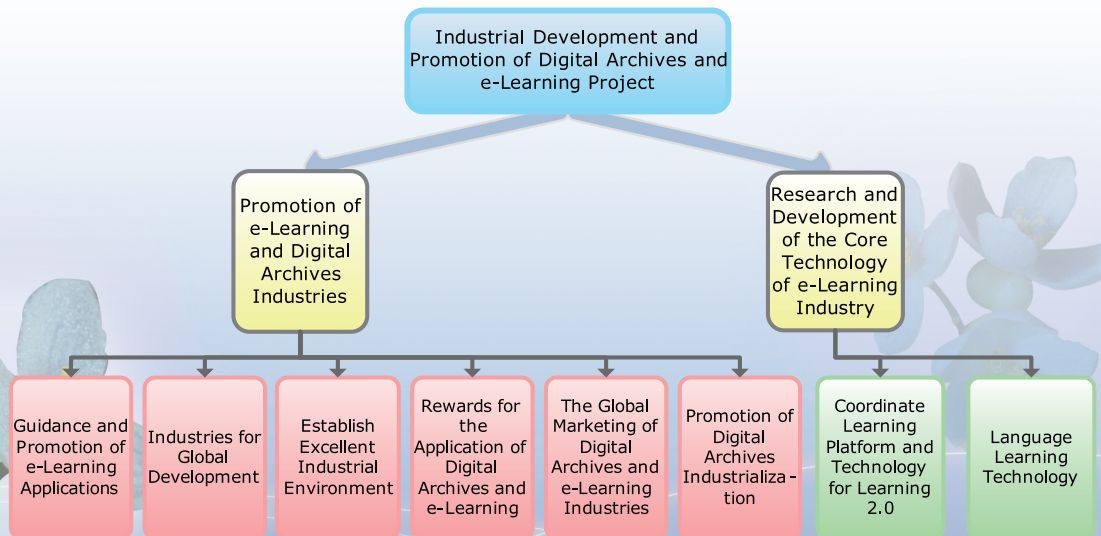
The main objectives of the Industrial Development and Promotion of Digital Archives and e-Learning Project are to elevate the core abilities of the digital archives and e-learning industries, create innovative models of e-learning, service and management, increase market demands with sufficient rewards and incentives, cooperate with the business enterprises to develop e-learning applications, improve the efficiency of existing e-learning applications and promote e-learning based on the requirements of relevant industries. The key tasks are described below:



1. To maximize the value of the academic-industrial collaboration by taking advantage of Taiwan's first-rate academic research in e-learning and the mature level of relevant industries in capacity and production. This project seeks ways of building prototypes based on academic research and helps relevant industries transform academic knowledge into commercial products.
2. To increase value added applications by adapting emerging technologies and vehicles (such as mobile communications, game-based learning and flexible electronics) as well as emerging business models of e-learning contents and services.
3. To strengthen e-learning industry (including vehicles, marketing channels and publishing) and create various new markets and business opportunities by assisting publishers, carrier companies and e-learning enterprises in cooperation with or via integration of heterogeneous businesses.



4. To help transform cram schools, which have developed into a large industry and an important part of Taiwan's education system, with e-learning technologies, extend the application range of e-learning, improve learning efficiency and increase business opportunities for digital industries.
5. To raise the professionalism of Taiwan's e-learning industries by recruiting professional lecturers and consultants from abroad, and encourage international exchange and global marketing, to keep abreast with the development and latest trends of the e-learning industry in the global market, in the hope that it will lead to the upgrade of Taiwan's digital archives and e-learning industries, and also help improve the competence of other related industries.
6. As the elements worth archiving are digitized, in addition to achieving the goal of preservation and promotion, the main point should be how the materials can be applied through creative development and innovative models to different industries such as publishing, learning, decorations, gifts, construction and tourism, to add value to products and services. Promoting industrial efficiency will boost the economy, raise the quality of life and add more production value to archive digitization.



▲The Organizational Framework of Industrial Development and Promotion of Digital Archives and e-Learning Project

Digital Education and e-Learning Project

<http://learning.teldap.tw>

The objective of the Digital Education and e-Learning Project is to expand the application of e-learning in formal education and lifelong learning so that talent and human resources can be effectively nurtured and utilized, raising the quality and skill level of Taiwan's human resources. A complete e-learning application chain from primary and junior high, to high schools (including vocational high schools) colleges and to continuing education is planned. It includes seven sub-projects: the Training Programs for ICT Technologies Project, the Develop e-Learning Materials for Senior High Schools and Vocational Schools Project, the Develop e-Learning General Knowledge Curricula for Higher Education Project, the Integrate Digital Archives into Teaching Project, the e-Learning for Labor Project, the e-Learning for Civil Servants Project, and the e-Learning for Art and Culture Project. The missions are as follows:

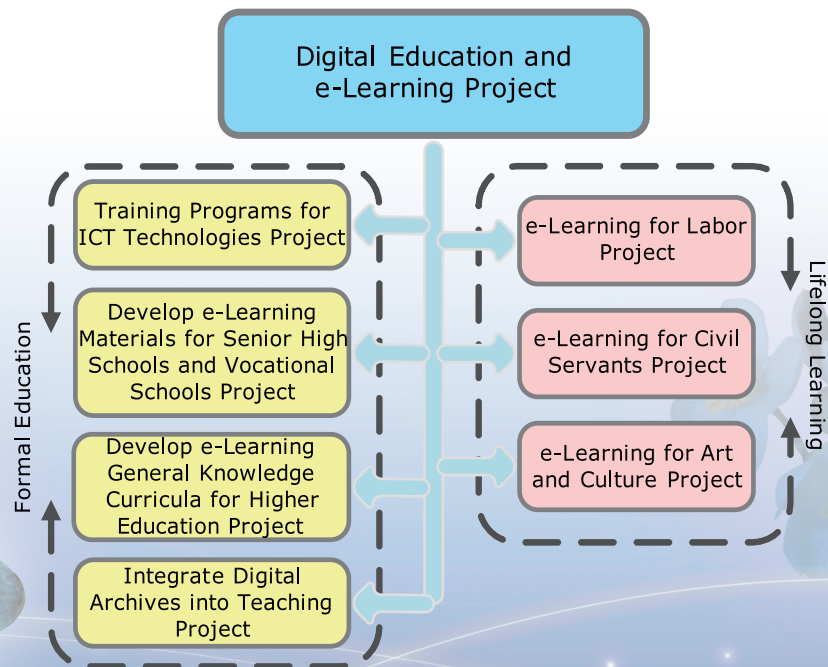
1. Integrating the e-learning resources with the results of TELDAP, encouraging and assisting primary and junior high school teachers to use archive resources, transforming them into Grade 1-9 Curriculum framework learning objects and courses, and promoting the use of information technology in teaching.
2. Providing e-learning materials for senior high schools and vocational schools in 22 subjects, and increasing the use of information technology in teaching.
3. Developing high quality models for e-learning courses for general education in colleges and universities, introducing the developed model and results to college and university e-learning implementation and application, and encouraging colleges and universities to adopt e-learning in training.
4. Training of teachers at various levels to help them apply the results of TELDAP in





teaching, and promoting the development of e-learning in formal education and lifelong learning in Taiwan.

5. Combining existing digital contents and platforms to develop lifelong learning materials for labor and a test database for skill certification examinations, and thus stimulating diversified e-learning by people who are on the job or seeking employment.
6. Combining related resources to create a first-rate learning environment, improving the effectiveness of civil servant e-learning and gradually increasing the proportion of e-learning to at least 20% of civil servants' study time each year.
7. Promoting an art and culture learning portal and e-learning material database of art and culture, and establishing websites and communities of national culture, art and creativity learning information.



▲The Organizational Framework of Digital Education and e-Learning Project

▲ Teaching Resources Network of Ministry of Education
<http://etoe.edu.tw>

▲ Art Learning Website of the Council for Cultural Affairs
<http://learning.cca.gov.tw>

▲ Sample e-Learning Courses of Ministry of Education
<http://environment.edu.tw>

▲ Lifelong Learning Portal of Central Personnel Administration
<http://lifelonglearn.cpa.gov.tw>

▲ Labors Online
<http://cla.hilearning.hinet.net>



e-Learning for Chinese Language Project

<http://elci.teldap.tw>

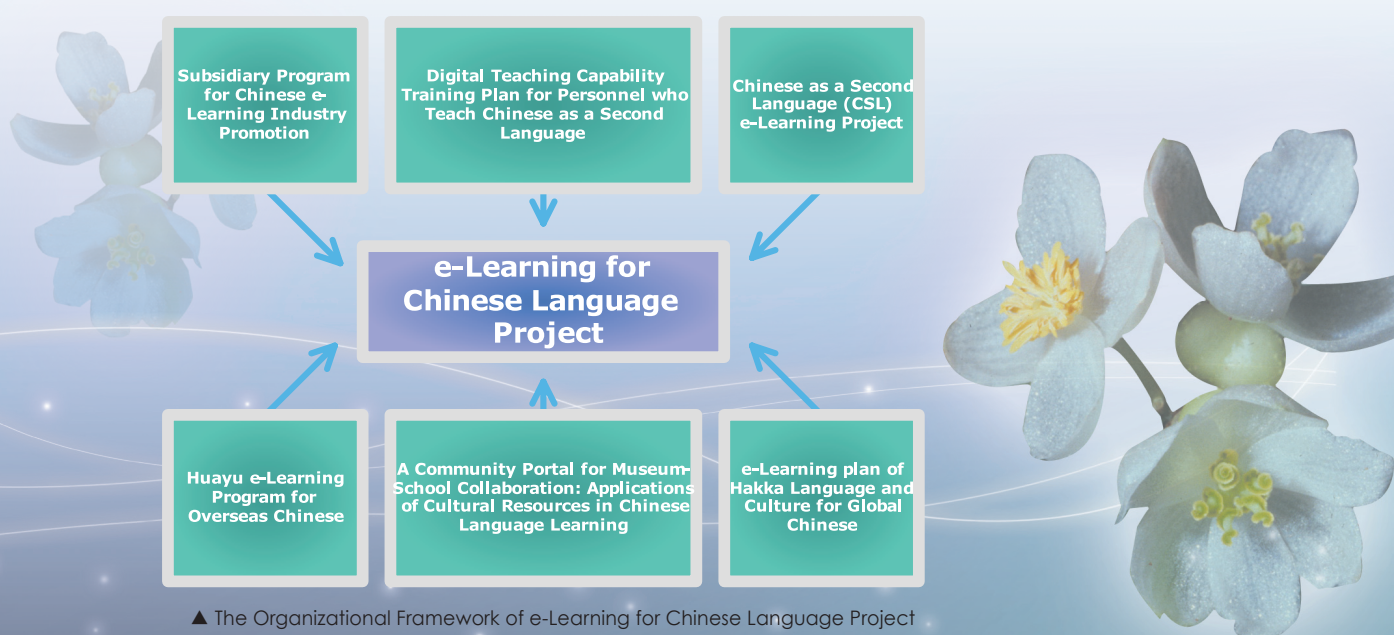


The main objective of the e-Learning for Chinese Language Project is to integrate academic capabilities, industrial infrastructure, and national resources into the development of high quality Chinese language e-learning products, studies, and professional human resources. The project promotes not only the e-learning of Chinese language, but also the spread of culture. The project is not merely educational, but is an extension of the diplomatic and business capabilities of Taiwan. Taking the existing industrial power and national resources and current achievements

in the academic study of Chinese language as its foundation, this project will integrate the resources of the Ministry of Education, Industrial Development Bureau of Ministry of Economic Affairs, Overseas Compatriot Affairs Commission, National Science Council of the Executive Yuan, National Palace Museum, and Council for Hakka Affairs of the Executive Yuan to present Taiwan's excellent digital products for Chinese language learning. It is hoped that by integrating the knowledge and experiences of academic, private and public sectors, high quality Chinese language textbooks will be developed, a website with exquisite and rich contents and a multifunctional e-learning center for the study of Chinese language will be established. Meanwhile, Chinese language teachers who are capable of implementing digital teaching will be trained. Thus, the project will develop Taiwan into an important place for the study of Chinese as a second language.

The project has six sub-projects: Digital Teaching Capability Training Plan for Personnel who Teach Chinese as a Second Language, Subsidiary Program for Chinese e-Learning Industry Promotion, Huayu e-Learning Program for Overseas Chinese, Chinese as a Second Language (CSL) e-Learning Project, A Community Portal for Museum-School Collaboration: Applications of Cultural Resources in Chinese Language Learning, and the e-Learning Plan of Hakka Language and Culture for Global Chinese. The aims of the project are:

1. Training Chinese teaching personnel in Taiwan and abroad and equipping them with e-learning teaching capability, helping them understand e-learning teaching methods and applications, and increasing their teaching skills and their ability to compete in the international Chinese language teaching market.
2. Promoting the involvement of companies related to Chinese language learning, and establishing Chinese language companies with international market competitiveness in order to build a high quality Taiwan brand e-learning industry; and promote the establishment of commercial Chinese language centers around the world to increase Taiwan's influence and expand the overseas market for Chinese learning.
3. Increasing the number of people participating in e-learning Chinese each year through learning websites, on-line courses, training courses and learning centers established by various subprojects.
4. Rapidly increasing the quality of research to strengthen Taiwan's e-learning research advantages through the Outstanding e-Learning Research Center/ Group Project and at the same time, publishing high impact academic papers and articles can help make Taiwan a major research center for learning Chinese as a second language.





▲ Login Page of Online Game, Brave Hearts of LiuDui
<http://game.hakka.gov.tw>



▲ e-Learning Huayu of Taiwan
<http://www.huayuworld.org>



▲ Hakka e-Learning Center
<http://elearning.hakka.gov.tw>

International Collaboration and Promotion of Taiwan e-Learning and Digital Archives Program

<http://collab.teldap.tw>

The main objective of the International Collaboration and Promotion of Taiwan e-Learning and Digital Archives Program is to promote the internationalization and enhance global awareness of TELDAP and establish an international cooperation network. Through the promotion of TELDAP we not only can allow Taiwan's cultural and biological diversity to be presented to the world, enhancing global awareness of Taiwan's beauty, but also can highlight Taiwan's unique experience, expanding its visibility in the international sphere. There are five sub-projects under the project.

They are: Taiwan Digital Archives Multilingual Development Project, Culture Portal of Digital Taiwan Project, Digital Archives International Collaboration Human Resource Development Project, International Cooperation Project of Integrating Digital Contents, and International Collaboration on e-Learning Project.

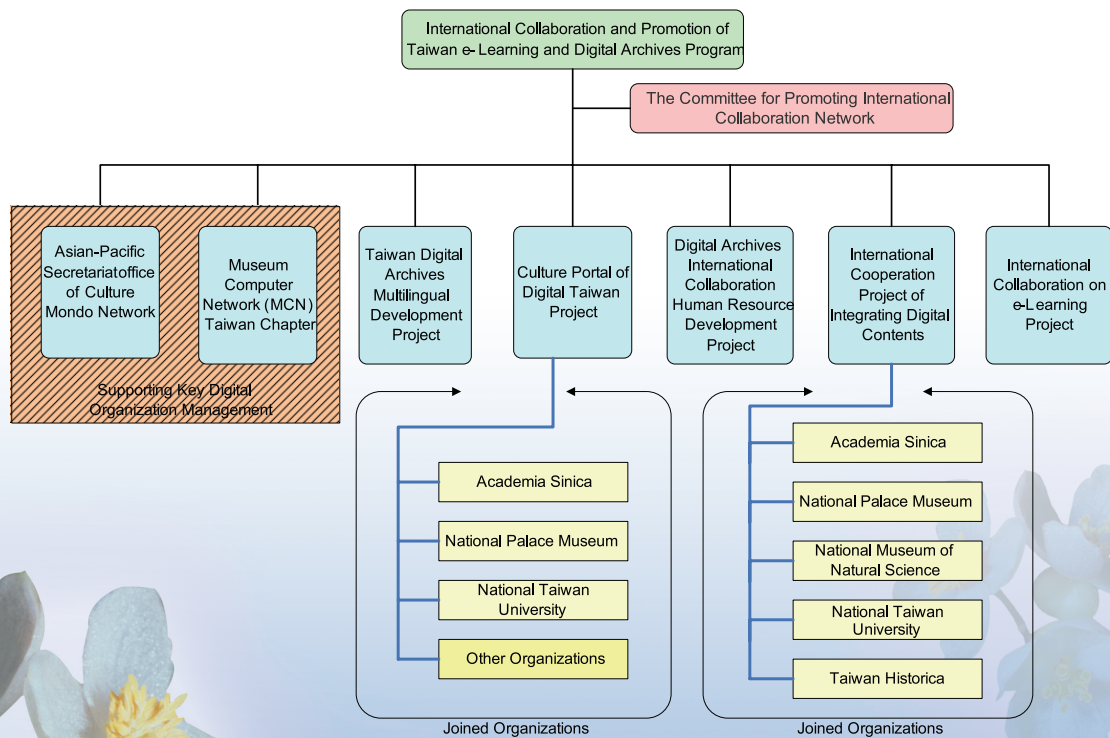
Taiwan Digital Archives (TDA) , which is produced in the previous program, contains a variety of content types, ranging from Anthropology, Archaeology, Architecture, Artifacts, Botany and Chinese Classics, to Zoology; however, most of the contents are in Chinese. The essential approach accessing the TDA content is via the item-level Union Catalog. In order to provide easy access and facilitate understanding of the TDA contents by international community, the Taiwan Digital Archives Multilingual Development Project has adopted a collection-based (rather than item-level) approach to develop the multilingual contents. The Culture Portal of Digital Taiwan Project is the platform for presenting the valuable contents in a multilingual format, which is also an essential platform for dissemination and information exchange. The International Cooperation Project of Integrating Digital Contents is created to collect contents about Taiwan that





had been scattered overseas for many years. The success of this International Collaboration and Promotion Project relies on building an effective international community network and collaboration mechanism. Therefore, this project also supports key international organization affiliation project, such as Culture Mondo Network and Museum Computer Network (MCN), as well as international collaboration human resource development.

In summary, this program will enhance the development of multilingual contents and demonstrate the richness of the cultural diversity as well as biodiversity of Taiwan. Building an international network and collaboration mechanism, based on the TDA contents and digital resources of e-learning, will not only showcase the achievements of TELDAP but also foster the growth of digital communities both in Asia and the world.



▲ The Organizational Framework of International Collaboration and Promotion of Taiwan e-Learning and Digital Archives Program

Open Requests for Proposals Projects

Digital Archives Request-for-Proposals Project

The Taiwan Digital Archives Expansion Project is one of the eight major Division Projects of the Taiwan e-Learning and Digital Archives Program (TELDAP). The goal of the Taiwan Digital Archives Expansion Project is to establish digital archival contents presenting the diversity of Taiwan's culture, society, and natural environment. The Digital Archives Request-for-Proposals Project is the second subsidiary project of the Taiwan Digital Archives Expansion Project.

The goal of this project is attempting to expand the scope of participants involved in the digitization process. We hope to see an increasing number of archival institutes, public and private institutions as well as the general public participate actively in the establishment of Taiwan's digital archives. Through Digital Archives Request-for-Proposals Project and the Cyber Island platform for digital archiving, we hope to stimulate the participation of each sector of society in the digitization project. By holding various types of meetings, workshops, and other events, we hope to promote the knowledge value of the digital archives, increase the digitized collections, and reduce the digital gap in Taiwan.

In order to establish a more comprehensive digitized collection representative of the diversity of Taiwan's culture, society, and natural environment, Digital Archives Request-for-Proposals Project is carrying out the plan delineated by the National Science Council and is openly recruiting participants to establish digital contents. We hope that those who are capable and interested will join our digitization efforts and share their experiences with us.



Digital Archives Applications and Promotions Request-for-Proposals Project

Taiwan's digital archives initiatives have amassed a substantial amount of archive resources, and the efficient application of these contents in the education, academic research or industrial sectors has become an important issue. The Academic and Social Promotions and Applications of Digital Archives and e-Learning Project (ASPAP), a Division Project of TELDAP, has the goal of integrating the content and technology of digital archives into the educational, research, industrial and social sectors, and building upon the foundations laid in the project's first stage to expand and enhance the application of digital archives in the cultural, academic, and industrial fields, and to advance the development of a digital society. In practice, ASPAP will work from the angles of culture, academia, socio-economics and education. It will focus on the following four main areas:

1. Development of Licensing Platform and Regulation Mechanism:

From the legal and economic perspective, we will address intellectual property rights and licensing issues of digital archives, plan and evaluate a licensing platform, establish a standardization mechanism, and draft regulatory policies.

2. Academic Application and Cultural Diffusion:

From the academic and cultural perspective some of the digital archives can be regarded as public assets. With respect to academic application and dissemination of culture, we will promote access to and dissemination of digital archives from the angle of the user.

3. Cultural and Social Development:

From the cultural and social perspective, we will emphasize bridging of the digital divide between urban and rural areas, promote ethical use of information and digital human rights, and improve the user interface and social influences.

4. Geographical Information Application and Promotion:

From the academic and educational perspective, we will create GIS data exchange platforms, promote academic



▲ Digital Archives Applications and Promotions Request-for-Proposals Project Annual Exhibition 2007

and educational applications of GIS in digital archives and develop educational material and resources to support teaching of related courses.

The Digital Archives Applications and Promotions Request-for-Proposals Project is designed to assist ASPA through requesting proposals. Based on the core missions, participants with diverse viewpoints will be openly sought so that more digital archive promotion and application resources can be integrated, promoting the use of digital archive contents and technology in education, research, industry and society at large.

Technology Research and Development Request-for-Proposals Project

The establishment of digital archives involves many information technology (IT) related issues, including use interface, communications network, natural language processing, information compression, information security certification and integrated services. To coordinate the IT requirements of archive institutions, TELDAP has developed the Research and Development of Digital Archives and e-Learning Technologies Project which develops forward-looking, key or innovative IT to improve the production and management of digital collections. It also makes utilization more flexible and convenient and maintains cutting-edge research on related information technologies. Digital archive-related technology research is very large in scale and some key components or technologies cannot be included in this project because of manpower limitations. Thus it is hoped that the Technology Research and Development Request-for-Proposals Project will encourage participation of researchers from different research institutes to enhance the research and development of advanced digital archives technology. Also, for quality control, approval of these projects will depend on the previous experience and achievements of applicants.

Outstanding e-Learning Research Center/Group Project

In order to improve e-learning research and advance the development of e-learning related industries, under the Research and Development of Digital Archive and e-Learning Technologies Project, the Outstanding e-Learning Research Center/Group Project carries out research using an integrated interdisciplinary method which leads to further research and development of



e-learning and integrates social resources. Active cooperation with outside circles will help realize the objective for educational application and industrial development. Outstanding e-Learning Research Centers/Groups are expected to be inter-disciplinary and even inter-university organizations. With this project as a platform, universities and research institutions can integrate relevant talent and the resources of related projects for long-term interdisciplinary research.

The rationale behind setting up Outstanding e-Learning Research Centers/Groups is to expand the scale of original research and establish long-term goals and guidelines for the development of the project. Integration with the resources of other units, such as universities, the Ministry of Education or other government agencies, and industries, is clearly important in promoting synergy in the operation of the overall plan.

Chinese as a Second Language (CSL) e-Learning Project

In the interest of advancing research in e-learning Chinese as a second language, and promoting the commercial development of Chinese e-learning under the e-Learning for Chinese Language Project, proposals for Chinese as a Second Language (CSL) e-Learning Project are requested.

Over the past 50 years, Taiwan has laid the foundation for teaching Chinese as a foreign language, and has accumulated a lot of Chinese language teaching materials while producing a large number of experienced Chinese language teachers. The requested contents include Chinese words and phrases, designs for phonetic teaching, course development, examination and evaluation, and Chinese linguistic psychology research. The goal is to promote interaction between academic organizations and Chinese language-related industries and encourage the production of quality Chinese language products based on sound research, making Taiwan a research center for Chinese language learning and teaching.

The proposals requested are mainly related to research into the process of e-learning Chinese as a second language and the development of foreign-oriented Chinese e-learning modules. By leveraging Taiwan's advanced IT industry and the existing e-learning network, and by combining technology, human resources, creativity and cultural digital archives and digital teaching materials, Chinese language learning research domain will be established, and high quality study materials and teaching services will then be provided to students all over the world.

Showcase Platforms

Taiwan e-Learning and Digital Archives Portal

<http://digitalarchives.tw>

The participants of TELDAP include institutional projects and open request-for-proposals projects run by academic research organizations and archival organizations. The following is a list of institutional project participants: Academia Sinica, National Palace Museum, National Museum of Natural Science, National Taiwan University, National Museum of History, Academia Historica, Taiwan Historica, National Central Library, Taiwan Provincial Consultative Council, Chinese Taipei Film Archive, Council of Indigenous Peoples of the Executive Yuan, and National Archives Administration.

These organizations and open request-for-proposals project participants work together to digitize artifacts in their collections for public use in education, research and industry. The digitalarchives.tw portal is a showcase of these projects, presenting digital archives in four themes:



Treasures – Exploring the Best Collections

The full range of Taiwan's varied collections will be presented in themed exhibits ranging from historical artifacts to natural science. Artifacts may include aboriginal clothing, masterpieces of Chinese and Western painting, secret records of past dynasties, and specimens of fauna and flora that are unique to Taiwan.

Tours – Browsing Millions of National Treasures

Millions of artifacts can be found in the TELDAP Union Catalog. Through the catalog's single portal, digital collections from nearly one hundred organizations covering many disciplines can be freely browsed and searched.

Experience – Experiencing New Archival Technologies Firsthand

Experience the archived content from a different angle using the latest internet technology, such as personalized audio-visual content, querying ancient characters that cannot be called up from your PC, and enjoying the considerable charm of digital archives by using a geographic information system (GIS) and a time corridor!

Education – Establishing Learning Resources without Boundaries

Abundant digital archives are the best sources for teaching materials. From antiquity to modernity, and including the arts, humanities and natural science, teaching resources can be combined to suit your requirements based on the disciplines, fields, and objects needed.



Union Catalog of Digital Archives, Taiwan

<http://catalog.digitalarchives.tw>



Taiwan e-Learning and Digital Archives Program is a collaboration of hundreds of national experts in the sciences and humanities. It has taken more than six years to build our national digital archive resources, which present millions of collected artifacts in a union catalog. A single catalog portal eliminates excessive hours spent surfing the Internet in search of information.

In accordance with international metadata standards, i.e., Dublin Core, the TELDAP Union Catalog provides multiple search modes, including featured collections, quick guides, and thematic and location search functions. The TELDAP Union Catalog acts as a browsing platform for academic research, educational development and

corporate/industrial application. Public use is regulated by the articles of "Creative Commons Taiwan" Legal Code.



▲ *Rapana Venosa*



Digital Taiwan - Culture & Nature

<http://culture.teldap.tw>

In order to showcase the cultural heritage and natural resources of Taiwan to the world as well as complement the existing Chinese portal (<http://digitalarchives.tw>) which demonstrates TELDAP's accomplishments, we have created a new "Digital Taiwan - Culture & Nature" English portal. It provides the global community with an in-depth and convenient way of appreciating Taiwan's culture and digitization achievements. As the contents of archi-

ves increase, so the functions of the portal will expand to meet the public's expectations. In addition, the portal will make Taiwan's academic and digital archives activities more visible to the world community. The planned content of Digital Taiwan – Culture & Nature is as follows:



1. Collection Level Description

This describes the whole collection's archives or databases, giving visitors contextual information so they will gain a more complete understanding when they browse this collection.

Examples are Arts and Illustrations and Biosphere and Nature.

2. Facets of Taiwan

Selected from TELDAP's best exhibitions, these provide a series of stories and detailed background information regarding the chosen special features, giving guests an insight into precious collections.

Examples are The Calligraphic World of Mi Fu's Art and The Physics World of Old Glass Artists.

3. A Slice of Wonder

This presents priceless items in digitized form from TELDAP's collection in order to demonstrate the deeper significance of each item.

Examples are Letter to the Administrator of K'ai-feng and *Oncorhynchus masou formosanus*.



4. Exhibition

This collects TELDAP's thematic exhibitions produced by participants in TELDAP projects in a section which offers a second chance to those who miss exhibitions, such as National Palace Museum's "The Treasures of Eight Thousand Years" and Academia Sinica's "Riding the Currents of History – Four Thousands Years Civilization and Technology."

5. Photo Gallery

6. Multimedia

Digital Taiwan - Culture & Nature also integrates contents funded by Taiwan's Council for Cultural Affairs of the Executive Yuan and Culture Mondo Network; it shares biological information from the Union Catalog of the Global Biodiversity Information Facility (GBIF) , seeks to create a Chinese version of the Encyclopedia of Life (EOL) , and provides English information on Taiwanese endemic species.



▲ Jade Plaque



Exhibition of Cyber Island, Taiwan

<http://cyberisland.teldap.tw>

The Taiwan e-Learning and Digital Archives Program (TELDAP) maintains the goals established by the preceding Taiwan Digital Archives Program. The participation of various groups in the digitization project has already resulted in the considerable enhancement of digital material. However, although various cultural relics have been digitized, the contents and types of materials digitized thus far are not sufficiently diversified, and

thus are not fully representative of the wide range of aspects worth appreciating in Taiwan. We have thus established the Cyber Island platform in the hope of collecting more digital contents from the general public. The contents of materials which can be digitized include Taiwan's natural environment (the flora, fauna, and ecology of the island), social movements and activities, architecture and landscape, daily life, and a variety of other topics. We hope to be able to diversify the contents of the Taiwan Digital Archives and thereby display in full the vitality of Taiwan and the multitude of aspects the island has to offer. We hope to recruit more people to join us in this digitization effort and help us create a new digital society.

Exhibition of Cyber Island, Taiwan welcomes all who love photography or who possess or create valuable artifacts and hope to share their knowledge and images with the public.

1. Participants: individual collectors, photographers, and the general public
2. Website platform: Cyber Island is an internet website platform in which a wide variety of smaller archival institutions, individual collectors, photographers and the general public can participate in the digitization effort. The platform stresses accessibility, equality, and freedom. The digitized material to be collected covers a wide range of items including cultural relics and historical documents, specimens, photographic works, archival collections, artistic and



creative images, and photography of daily life in Taiwan.

3. How to Participate:

- (1) General Users: simply register on-line and log on
- (2) Individual collectors, photographers and archival institutions should contact us.

4. Project Website: <http://cyberisland.teldap.tw>

5. The Program holds a variety of photography competitions, photo exhibitions, and other events on an irregular basis. Announcements of these activities will be made on the above website.

6. Intellectual Property Rights: The Declaration of Intellectual Property Rights of Cyber Island follows the agreements and terms detailed in the "Creative Commons Taiwan" Legal Code.



▲ Heaven Crown Silver Headgear Nine Dragon Gold Armor



▲ Cheng-Feng Yang- Formosa Series



▲ Kuo-Chih Chang Woman Born in Kinmen, 1949



▲ Wu's Dough Sculpting Shop-The Taoist Eight Immortals-Han Xiang Zi



Learning Object Repository in Taiwan

<http://www.lort.org.tw>

The Learning Object Repository in Taiwan (LORT) was established in response to the international trend for sharing learning resources. Based on SCORM (Sharable Content Object Reference Model) and TW-LOM (Taiwan—Learning Object Metadata) standards, the repository integrates governmental organizations in Taiwan (Industrial Development Bureau of the MOEA, Ministry of Education, Council for Cultural Affairs of the

Executive Yuan, Overseas Compatriot Affairs Commission, and Council of Labor Affairs of the Executive Yuan), leading e-learning companies (Taiwan Knowledge Bank, Gjun Information Co., Ltd., Hebron Soft Limited, Hikids Inc., National Education Union, Over-Paradigm Technology Inc., and IQ Technology Inc.), and national universities pioneering in the sharing of e-learning courses and offers queries, learning, editing and production for e-learning courses and teaching materials. LORT is interlinked with domestic and international teaching material repositories including Union Catalog of Digital Archives, and Edshare (Taiwan), and Education Network Australia, making global learning resources available and added value applications possible.

This repository serves to share educational resources. The repository currently holds materials and courses related to art and culture, health care, professional skills, entrance exams, on-the-job training, language learning, information technologies and Chinese language resources numbering in the tens of thousands. The LORT website provides access to a national learning repository for the general public. LORT makes resource sharing possible and promotes education as well as determination and action which will help to nurture talent, with the aim of bringing about large-scale integration of digital resources and creating digital resource which can be shared by all the people of Taiwan.





e-Learning Standards Website

<http://standard.teldap.tw>



e-Learning Standards Website integrates current e-learning standards and related resources to advance the development of the e-learning industry and academic fields. The standards include Sharable Content Object Reference Model (SCORM), Taiwan-Learning Object Metadata (TW-LOM), and Content Package. The website offers the following documents: Introduction to SCORM, TW-LOM and Content Package Standards, TW-LOM Introductory Guides,

Packaging Guides in accordance with SCORM Standards, Survey Report on the Development of Global e-Learning Standards, Survey of Metadata Technology for e-Learning Resources, and Implementation of the Content Object Repository Discovery and Registration/ Resolution Architecture (CORDRA) Structure.



e-Learning Quality Certification Center

<http://www.elq.org.tw>

The e-Learning Quality Certification Center (ELQCC) serves both supply and demand sides by establishing a high quality e-learning environment, improving the quality of the current e-learning industry, promoting e-learning quality certification and enlarging the international market. The center has established regulations and certification procedures to provide more services to industry, improve marketing strategies, and expand the influence of certification. We hope to improve domestic e-learning industry through research into foreign quality regulations. Current tasks of ELQCC include four categories:



1. Research: special columns and analysis reports
2. e-Learning Quality Certification: e-learning courseware certification
3. Promotion: purchasing information of teaching materials and courses, marketing CDs, international and domestic exhibitions
4. Teaching and Learning: learning communities, learning curricula and conferences





Achievements and Contributions

Thanks to the efforts of numerous institutions and organizations throughout the years, TELDAP has accumulated a wealth of digitization experiences and materials. Moreover, better conditions for development have been created, and an impetus for the national development of digital content has been established. In an overall planning to build digital content, this national project has called for digitization of artifacts housed in national institutions and collections held in private organizations through a flexible public selection mechanism, placing digital archive content representative of Taiwanese culture under this project. From 2002-2007 the National Digital Archives Program cataloged the metadata of 2.02 million artifacts and 3.52 million digitized images (including video and text data). The contents span the entire spectra of humanities and nature. They have been divided into six categories: Biosphere and Nature, Lives and Culture, Archives and Databases, Maps and Architecture, Art and Illustrations, and Languages and Multimedia. These digitalized items are all available to the general public through the Union Catalog of Taiwan Digital Archives. In addition, the National Science and Technology Program for e-Learning has collected more than 35,000 digital learning courses (a total of 110,000 hours), from 2003 to 2007. Organizations involved in this process include the Council for Cultural Affairs of the Executive Yuan, Industrial Development Bureau of the MOEA, National Palace Museum, Council of Labor Affairs of the Executive Yuan, Department of Health of the Executive Yuan, Council for Hakka Affairs of the Executive Yuan, Council of Indigenous Peoples of the Executive Yuan, Ministry of Education, and Overseas Compatriot Affairs Commission. These organizations provide multifaceted courses, and new management and reward incentives have been implemented to promote e-learning. There have been millions of logins for these courses, realizing the idea of life-long learning. The Ministry of Education has announced rules and regulations for distance education at college level and above and allowed educational institutions in specific fields to experiment in e-learning Master refresher courses, thereby opening the door for Internet-based advanced degrees. In addition, rules for university distance education have given e-learning a legal status equaling to university-level education, providing a legal framework for carrying out e-learning. All of these developments signify that Taiwan has embraced e-learning and modified its learning model accordingly.

Because of advances of Information Technology, Taiwan leads the world in Chinese data processing, including phonetic processing and Chinese computational linguistics. Taiwan's achievements in digital documentation are also in the leading position in the world. Substantial results have been achieved in Sinology databases, humanities and social computing and educational software. In addition, TELDAP has laid solid foundations for multimedia management, union catalog, audio-visual processing, metadata retrieval, Chinese missing character and segmentation system, panorama object image integration systems, digital archive databases and temporal-spatial information integration systems.

More importantly, Taiwan has comparative advantages in IT manufacturing and services, and has highly developed IT and Internet infrastructures. Taiwanese scholars also have advantages in interpreting Chinese culture and history. Taiwanese academic organizations have long participated in international collaborations to solve Chinese textual and phonetic issues. The digital advantage has opened the doors to cooperation with other cultures in Sinology studies. As one example, the rare book management system developed by the Fu Ssu-Nien Library of Academia Sinica has led to collaboration with the Library of Congress, Harvard Yen-ching Library, and the East Asian Library of Princeton University in the establishment of a database for digitized ancient Chinese books. In addition, many institutes in European, American and East Asian nations have also expressed a strong desire to cooperate in developing technology for processing historical documents and share Sinology resources.

In the area of industrial development, the production value of e-learning climbed from NT\$700 million in 2002 to NT\$12 billion in 2007, a compound annual growth rate of 57%. The rate of internal e-learning implementation in companies with the top 1000 production value in Taiwan increased from 14% in 2003 to 52% in 2007. Most major corporations in the high-tech industry, financial services industry, information industry, traditional industry and distribution industry have implemented e-learning programs. These companies include, just to name a few, Advanced Semiconductor Engineering Inc., Acer Inc., United Microelectronics Corporation, China Steel Corporation, Chinatrust Commercial Bank, First Commercial Bank, Sinon Corporation, China Motor Corporation, and China Airlines. As human talent forms the core resource of corporations, assisting corporations in establishing an e-learning human resources management system will boost their international competitiveness. Moreover, when companies



promote internal e-learning, 85% of them choose a local learning platform solution (foreign solutions often chosen are IBM, Oracle and Saba). Local companies providing such solutions include: LearningDigital.com, aEnrich Technology Corporation, CyberLink Corporation, Over-Paradigm Technology Inc., HamaStar Technology Corporation, Taiwan Knowledge Bank Corporation, KSI Co., Ltd., CoreLight Digital Technology Co., Ltd. and SUN NET Technology Co., Ltd. These companies have established an industrial scale. With improvements in digital technology, changes in the public's learning methods and support from government, digital content industries have unlimited potential, and production values are expected to grow rapidly in the next five years.

To promote e-learning, ELNP has built a foundation for the e-learning industry. The next stage will focus on expanding the international market and exporting international e-learning content based on Taiwan's strengths, such as mathematics, science, medicine, digital game-based learning and information education. At the same time, knowledge creation, accumulation, sharing and renewal will be carried out to drive the knowledge economy. With the increase in the speed of innovation and the shortening of renewal cycles, workers in all industries (especially knowledge-intensive ones) can quickly acquire and renew professional knowledge and skills. After incorporating digital archives and e-learning, TELDAP will upgrade the "corporate knowledge web" to an "industrial knowledge web" for better integration of collective intelligence and improved competitiveness in the knowledge economy era.

Within the framework of the entire project, and through the open request-for-proposals mechanism, continuing support will be given to digitized content that represents Taiwan's local digital archives, and private organizations are encouraged to join in the digital archives program. Through education, the spirit of the archive and the contents of the cultural artifacts in the archive will be passed on to the next generation and, through teaching activities, the meaning and cultural spirit of cultural artifacts will be transplanted to people's hearts, allowing them to be passed on forever. As a result, cultural artifacts will have more meaning and wider influence than if they are kept in a corner or an organization.

Digital technology has greatly changed the way people collect and share experiences, send messages, communicate feelings, acquire knowledge and create culture. Multimedia technology has also combined digital text, images

and audio-visual data into a single electronic device, drastically changing traditional methods of creation and access. Many countries have recognized these new digitization and Internet trends and are carrying out related work. With the digital content growing quickly today, these countries have realized that in order to be successful in the twenty-first century, a leading position in the digital world is essential, and one key to this is transforming achievements of civilization from textual format to digital information.

Compared to projects in other nations worldwide, TELDAP is the only digitization engineering project that utilizes national resources to archive important cultural artifacts and the only one that has created an interdisciplinary database through content-based technology. Thus even though archive contents may be scattered in individual organizations, data exchange and integration can be achieved through common metadata. Information related to biology, literature, arts, and the humanities can be acquired through the single portal of the Union Catalog. The further bonding of digital archives and e-learning will make TELDAP the most comprehensive and integrated digital initiative in the world in terms of platform, technology, content, training, application and marketing. Thus, TELDAP has become a learning model for foreign countries in terms of content, technology, application and management of the project.

It is hoped that TELDAP's efforts will showcase Taiwan's unique culture and bio-diversity as well as its spirit to the world. This will also allow international scholars to get to know about Taiwan and its rich and diverse resources and convey Taiwan's culture to the world.





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Address: 1F North, Humanity and Social Science Building, Academia
Sinica 128, Academia Road, Section 2, Nankang, Taipei 115,
Taiwan

Website: <http://teldap.tw>

Digital Information - the New and Creative Way of Communicating,
Core Platforms for Digital Contents Project

Tel: 886-2-27829555 ext.310

Fax: 886-2-27868834

Address: Institute of History and Philology, Academia Sinica 128,
Academia Road, Section 2, Nankang, Taipei 115, Taiwan

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